Health Council of the Netherlands

Forensic medicine dissected

Towards a full position for a special discipline

2013/04E

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Gezondheidsraad
Health Council of the Netherlands

To the State Secretary for Education, Culture and Science

Subject : presentation of advisory report *Forensic medicine dissected; towards a full position for a special discipline*
Your reference : 335930
Our reference : -1028/BG/ts/847-I
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Date : 26 april 2013

Dear State Secretary,

At the end of October 2011, your predecessor asked the Health Council of the Netherlands for an advisory report on Dutch knowledge infrastructure in the field of forensic medicine. I hereby submit the advisory report in question.In its advisory report, the Committee describes various points of concern in the practice of forensic medicine.

There is, for instance, evidence that the quality of medical care for detainees in police custody is not always what it should be. In addition, attending physicians regularly and incorrectly certify death by natural causes, and injuries resulting from child abuse or sexual assault are not always clearly identified as such. As a result, evidence is frequently lost.

In its advisory report, the Committee identifies five areas for improvement in the practice of forensic medicine. These are education in forensic medicine, monitoring and promoting quality, scientific research in forensic medicine, the organisational position and funding of the practice of forensic medicine, and the associated legislation. The Committee has formulated recommendations for each of these five areas. It proposes that a steering group be set up to monitor the implementation of these recommendations. This steering group would consist of representatives from the relevant ministries and from the forensic medicine profession.

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At the Committee's request, nineteen separate organisations (including professional organisations) have reviewed the draft advisory report. The Committee drew on these reviews when drafting the definitive version of the advisory report. The advisory report has also been reviewed by the Advisory Committee on Health Research, by the Standing Committee on Medicine, and by the Standing Committee on Public Health. I endorse the Committee's recommendations.

Today I have also presented this advisory report to the Minister of Security and Justice and to the Minister of Health, Welfare and Sport.

Yours sincerely,
(signed)
Professor W.A. van Gool,
President

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Forensic medicine dissected

Towards a full position for a special discipline

to:

the State Secretary for Education, Culture and Science

the Minister of Security and Justice

the Minister of Health, Welfare and Sport

No. 2013/04E, The Hague, April 26, 2013

The Health Council of the Netherlands, established in 1902, is an independent scientific advisory body. Its remit is "to advise the government and Parliament on the current level of knowledge with respect to public health issues and health (services) research..." (Section 22, Health Act).

The Health Council receives most requests for advice from the Ministers of Health, Welfare & Sport, Infrastructure & the Environment, Social Affairs & Employment, Economic Affairs, and Education, Culture & Science. The Council can publish advisory reports on its own initiative. It usually does this in order to ask attention for developments or trends that are thought to be relevant to government policy.

Most Health Council reports are prepared by multidisciplinary committees of Dutch or, sometimes, foreign experts, appointed in a personal capacity. The reports are available to the public.

The Health Council of the Netherlands is a member of the European Science Advisory Network for Health (EuSANH), a network of science advisory bodies in Europe.

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INAHTA

This report can be downloaded from www.healthcouncil.nl.

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Contents

Executive summary

Health Council of the Netherlands. Forensic medicine dissected; towards a full position for a special discipline. The Hague: Health Council of the Netherlands, 2013; publication no. 2013/04.

A complex yet crucial role

Forensic medicine is a unique discipline, which works for the judicial system. It deals with both suspects and victims. On the one hand, forensic physicians provide care to people taken into custody by the police, and assess whether they are fit enough to be held in custody and questioned. On the other hand, it is part of their job to contribute to tracing perpetrators. Forensic physicians collect and evaluate forensic evidence in the case of sexual and physical assault. They conduct a post mortem external examination when an unnatural cause of death is presumed or when there is doubt that a person died of natural causes.

This complex set of tasks, which in most regions in the Netherlands is carried out by the Municipal Health Service (Gemeentelijke of Gemeenschappelijke GezondheidsDienst, GGD), requires a specific expertise. Forensic physicians must, for instance, be aware of the high incidence of addiction and psychological or psychiatric problems among detainees in police custody. Here, their professional care relationship differs significantly from the one in a non-judicial setting. A relationship of trust is often impossible. Forensic professionals have to be prepared for feigned illnesses and sometimes have to break their rule of confidentiality. With victims, they must be able to assess abuse-related injuries,

secure forensic evidence and distinguish between natural and unnatural deaths. These tasks require specific expertise, as well.

Forensic physicians operate at the junction of the medical and judicial domain, in a municipal or regional setting. They play an essential role in tracking down and prosecuting perpetrators, which is much valued in society. They also guarantee quality care for people taken into police custody, which is equally important in a state governed by the rule of law. The police officers benefit from this as well.

Forensic medicine being of fundamental concern to society and given the need for developing a knowledge infrastructure in this field, the State Secretary for the Ministry of Education, Culture and Science turned to the Health Council of the Netherlands for advice. To answer the questions that were posed, the President of the Health Council appointed a special committee.

Inadequate education, weak academic position

The Committee has established that current academic training in forensic medicine in the Netherlands is not up to standard given its important task.

The medical undergraduate programme provides only limited training in forensic matters, such as external post mortem examinations, identifying unnatural deaths and assessing injuries due to violence and sexual assault. Postgraduate programmes in disciplines, such as general practice, geriatric and pediatric medicine, and emergency medicine, in which extra awareness and knowledge are required, also provide insufficient training in forensic skills.

Qualified forensic physicians may also lack experience, knowledge or skills. In the Netherlands, postgraduate programmes in forensic medicine are only of limited duration and academic status, with insufficient opportunity to train practical skills. Funding these programmes is a problem. Unlike in other medical disciplines, postgraduate students in forensic medicine have to pay for their own training, or find an employer willing to bear the costs. Employers, however, sometimes only pay for specific courses. As a result, students will not enjoy the benefit of an all-round professional training.

Moreover the Netherlands, unlike surrounding countries, lack a tradition in forensic medical research. As a matter of fact, none of the Dutch universities provide for an academic chair and accompanying research group dedicated to forensic medicine. This situation is detrimental to the status of the forensic discipline. It hinders development of knowledge and affects the quality of professional practice.

Given all this, forensic medicine is not a popular choice with students enrolling for a postgraduate programme. As a result, not enough students are being trained to replace the forensic physicians expected to retire in the next few years. A shortage is therefore to be feared.

Points of concern in the professional practice

What are the consequences for the professional practice in forensic medicine? First, the Committee establishes that several cases of unnatural death escape notice. Research suggests that attending physicians often wrongfully issue a certificate of natural death. They do not ask a forensic physician to perform an external post mortem examination. Any chance of further investigation and prosecution, if any, is thereby gone. When a forensic external post mortem examination *is* performed, this is no guarantee for detection of an unnatural death, due to varying professional standards. The field is lacking in evidence-based guidelines, and the guidelines that exist are not applied consistently. Forensic physicians reporting on a case or appearing in court often do not perform at the required level, due to inadequate training and experience.

Second, signs of physical and sexual assault may remain undetected. Non-forensic health-care professionals tend to focus on treatment and therefore neglect forensic traces that could be important to prosecutors. They simply do not have an eye for or knowledge of the forensic aspects. Their focus often is on treatment and treatment alone. In addition, they can be reluctant to report possible violence, referring to their rule of confidence.

Third, general practitioners are regularly asked to provide medical care to detainees in police custody. These patients require specific knowledge and the judicial setting asks for a different approach between physician and patient. General practitioners may not always be aware when they are allowed or required to break the rule of confidentiality. Conversely, forensic physicians might lack clinical experience, and do not meet the required standards of practice. The ultimate consequence can be avoidable death, for instance when a condition such as cocaine-induced excited-delirium syndrome remains undetected. Additionally, custody officers may be uncertain about who should be consulted: a general practitioner or a forensic physician.

It can be concluded that general forensic medicine does not currently hold a strong position, neither academically nor in professional practice. The same applies to other specific forensic fields, such as forensic toxicology. A lack of forensic expertise can also be observed in non-forensic medical disciplines where this knowledge is obviously desired.

Strengthening the position of forensic medicine

What should be done to improve upon the current situation? A first recommendation is to assign forensic medicine a clearly identifiable position in the medical undergraduate programme, and to increase forensic awareness and expertise within specific medical disciplines. This will improve the assessment of abuse-related injuries and the detection of unnatural deaths. It will also help bridge cultural differences between forensic and non-forensic medical disciplines. Specially trained forensic nurses can also contribute by serving both interests, medical and forensic, in the treatment of patients.

In addition, the postgraduate programme for forensic medicine should be awarded similar weight and financial facilities as postgraduate programmes in other medical disciplines, with enough scope for practical training, requiring at least a three-year post-graduate programme. This will enhance the status and appeal of the discipline, and increase the essential influx of postgraduate students.

To strengthen its academic position and stimulate research, a chair and accompanying research group should be installed, to enable the development of scientific evidence for effective practice. Starting a so-called academic collaborative centre (academische werkplaats) is also recommended, to stimulate collaboration with other (clinical) disciplines.

Professionalising the practice of forensic medicine is also necessary. Working in accordance with evidence based guidelines and standard quality checks, such as discussion in peer groups and inspections, must become the norm. European procurement of forensic medical care and forensic medical research may, however, once again lead to fragmentation, and thus to new variations in practice. This calls for careful consideration. In any case, clear quality requirements must be set. A registration system is also required to ensure accountability of forensic medical practice, eventually resulting in the development of quality standards.

From an organisational point of view, an increase of the area where the forensic medical service is operating would be beneficial. This is already under consideration, albeit for other reasons. A larger working area would enable forensic physicians to take on a full range of responsibilities, including medical care for detainees in police custody. They would thus gather and maintain crucial work experience in all aspects of their profession, and tasks would not be fragmented and allocated to other physicians. In accordance with this, the status

of forensic physicians within the Municipal Health Service (GGD) should be equal to that of other physicians working within this organisation.

The financial structure should be transparent. Since forensic physicians perform their tasks in the service of the judicial system, it would make sense for the Ministry of Security and Justice to cover the costs of forensic medical care and research. The possibilities for funding the medical postgraduate programme on forensic medicine need further consideration. A government fund comparable to the Fund for Education in Care (Opleidingsfonds Zorg) would be an option in order to remedy the current situation in which individual students or their employers have to bear the costs. This in turn would increase the appeal of the programme, and encourage students to choose a field in which shortage is imminent.

The Committee proposes to install a special steering committee, consisting of representatives of the relevant ministries and the profession itself, to oversee the implementation of the comprehensive package of recommended measures.

Chapter 1

Introduction

1.1 Background

Forensic medicine is a unique discipline within the wider field of medicine, as the professionals involved use their medical expertise in support of the police and judicial authorities. Accordingly, their responsibilities include providing medical care for detainees in police custody, conducting post-mortem external examinations, the assessment and recording of injuries together with trace evidence analysis with regard to victims of physical assault (or child abuse) and of sexual assault. In addition, forensic physicians determine whether it is medically acceptable for detainees in police custody to be questioned and incarcerated.

This requires specific expertise which, in the current situation, is not always available. The existing postgraduate programme in forensic medicine is mainly theoretical in nature, and rather short. Its academic position is also relatively poor. In contrast to the situation in neighbouring countries, such as Great Britain, Germany and Belgium, this subject has neither a chair nor an associated research group.

This means that points of concern can arise, especially in issues to which society attaches great importance, such as identifying cases of physical assault (or child abuse) and death by unnatural causes, presenting reliable forensic medical evidence, and providing good medical care for those in custody.

This situation prompted the State Secretary for Education, Culture and Science (OCW) to approach the Health Council for advice about forensic medicine in the Netherlands. The text of the request for advice is contained in Annex A. This includes a request for a description of the current knowledge infrastructure, an analysis of those areas that need strengthening, and recommendations for specific steps.

1.2 Committee and procedure

The Health Council has appointed a committee to answer the State Secretary's questions. This committee was chaired by Professor W. Stalman. Details of the make-up of the Committee are given in Annex B. The Committee included observers from the Ministry of Education, Culture and Science, the Ministry of Security and Justice, and the Ministry of Health, Welfare and Sport. This was prompted by the fact that these ministries have underscored the importance of the issues identified in the practice of forensic medicine. The Committee, which was installed at the end of January 2012, has met on six occasions. The Advisory Committee on Health Research provided advice on the make-up of the Committee and on how the topic of the report should be tackled. The advisory report was reviewed by the Advisory Committee on Health Research, by the Standing Committee on Medicine, and by the Standing Committee on Public Health. In response to a request, a number of organisations also provided comments on issues specific to the profession in question (Annex C).

The advisory process involved extensive reviews of the relevant sources and literature, as well as a series of interviews with forensic physicians in various regions of the Netherlands. Representatives of the police and the Public Prosecution Service were consulted. In addition, discussions were held with professional practitioners in fields that frequently intersect with areas of forensic medicine. The names of the experts who were consulted during this process are listed in Annex D.

The advisory report focuses on what is needed to make the practice of forensic medicine fully effective. This places the general area of forensic medicine, as practiced by the municipal or community health service and by physicians employed by regional forensic services, at centre stage. The term "primary care" is often used in this context. The advisory report also includes statements about the medical undergraduate programme, about forensic pathology, and about other specialisms that are occasionally involved in

problems of a forensic nature, such as general practice medicine, paediatrics, geriatrics, and emergency medicine.

Forensic psychiatry lies outside the scope of the present advisory domain, and this is especially true of those areas that focus on the legal accountability of suspects and on their detention under a hospital order. However, this profession will often be mentioned in the context of an important associated specialism. The same applies to disciplines that do not yet have a specifically medical orientation, such as forensic toxicology, odontology and biology. This is because each of these disciplines can contribute to the knowledge infrastructure that is needed to make the practice of forensic medicine fully effective.

1.3 Request for advice and design

The questions addressed by the Committee in this advisory report are as follows:

1 What does the profession of forensic medicine involve, and which medical and non-medical disciplines intersect with it?
2 How are forensic physicians and specialists trained?
3 What is the field's academic position?
4 What is the current situation in professional practice?
5 What are the points of concern with regard to forensic medical care and forensic medical examination?
6 How can these problems be solved?

Chapter 2, which is devoted to the first of these questions, gives details of the nature and scope of the profession. Chapter 3 focuses on training, research and current professional practice. This involves the way in which professional practitioners in this field are trained, the nature of the academic landscape, and issues affecting the practice of this profession. Accordingly, this section of the report provides answers to questions two to four. In Chapter 4, the Committee discusses the major points of concern affecting forensic medical care and forensic medical examination, thereby answering question five. In Chapter 5, the Committee addresses the final question, by indicating what is needed to improve the situation. Chapter 6 contains a summary of the recommendations.

Chapter 2

Contours of the field

Forensic medicine provides medical care for detainees in police custody and conducts medical examinations in support of the police and of the judicial authorities. These duties are primarily performed by general forensic physicians. Where necessary, the assistance of associated forensic disciplines is enlisted. This chapter addresses these disciplines, in order to map out the contours of the field.

2.1 General forensic medicine

In the field of forensic medicine, the details of day-to-day practice are primarily shaped by forensic physicians. These practitioners provide medical care for detainees in police custody and act as local authority forensic physicians. They are also responsible for the assessment and recording of injuries, as well as trace evidence analysis with regard to suspects and to victims of physical assault (or child abuse) and of sexual assault.[1,2] Attending GPs or physicians* can call in these "primary care" or general forensic physicians when their expertise is required, as can the police and the judicial authorities. Forensic physicians also provide advice in cases where individuals are arrested for confused or disturbed behaviour.

* Aside from medical practitioners, therapists such as obstetricians and physiotherapists can also enlist the assistance of primary care forensic physicians.

Basically, forensic physicians are the first experts to be present at injury assessments or forensic post mortem external examinations. Where necessary, the forensic-medical expertise of bodies such as the Netherlands Forensic Institute is enlisted.* Very occasionally, the Netherlands Forensic Institute will be directly involved from the very beginning.

Forensic physicians often work on a part-time basis and in non-academic settings, such as municipal or community health services or regional forensic medical services. They usually carry out forensic work in parallel to their role as public health medicine physicians (e.g. specialists in infectious disease control or specialists in child health care). Occasionally, GPs will also do forensic work, involving contracts with a municipal or community health service or a regional forensic medical service.[1]

Following the January 2010 amendment to the Burial and Cremation Act, only adequately trained and registered physicians can be appointed as local authority forensic physicians.[3] However, a transitional arrangement which remained in effect until January 2013 allowed those physicians (and forensic physicians) who were not specially registered to retain their posts as local authority forensic physicians.

2.1.1 *Role in the provision of medical care to detainees in police custody*

About 70 to 75 percent of a forensic physician's work involves providing medical care to detainees in police custody.** In some respects this work is similar to primary health care, however specific expertise is also required.[2] This is because the target group consists mostly of males aged from twenty to forty, many of whom have specific problems such as addiction, poisoning/overdose and infectious diseases. There is also a high incidence of mental health problems.

Another way in which this work differs from general practice medicine is that there is generally no opportunity to develop professional care relationships based on mutual trust.[4,5]

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* In addition to their customary primary care forensic duties, the Institute's forensic physicians can provide additional services. These include acting as consultants and assisting forensic pathologists before and during medico-legal autopsies, as well as conducting complex crime scene investigations (including the sampling and interpretation of various types of trace materials).

** Here, the term "detainees in police custody" refers to individuals who have been deprived of their liberty by the government and who, as a result, are incarcerated in police cells. Accordingly, the definition of medical care provided to detainees in police custody is not applicable to prisoners in penal institutions. A characteristic common to all detainees in police custody is that they are only held in police cells for short periods of time (no more than a few days).

Another typical feature of this work is that forensic physicians not only provide medical care to individuals who have been taken into custody, but that they also advise the police and the judicial authorities on the medical status of detainees in police custody and on whether these individuals are sufficiently medically fit to remain in detention and healthy enough to be questioned. Accordingly, they have a "foot in two camps". For that reason, primary care forensic physicians must always consider the possibility that someone may be feigning illness while, at the same time, remaining alert to the possibility that detainees may have sustained injuries or that they might be ill.[2]

In Amsterdam, forensic nurses are increasingly being deployed in the provision of medical care to detainees in police custody, mainly to handle standard questions relating to care and to determine which care needs are urgent (triage).[6]

2.1.2 *Role in post mortem external examinations*

In forensic post mortem external examinations, a forensic physician's role is to conduct an external examination to determine the type, cause, and date of death[2,7,8] During forensic post mortem external examinations, blood and urine samples may be taken, and possibly samples of vitreous humour from the eye, for further toxicological analysis. The conclusions reached are used to determine whether further steps are needed, such as a medico-legal autopsy of the body, including an internal examination and supplementary analysis. Conducting forensic post mortem external examinations represents only a relatively small part of a forensic physician's duties, about 10 percent in fact.*

The expertise of forensic physicians is enlisted when attending physicians are not convinced of a natural cause of death, and in the event of the discovery of a body** (Figure 1). In 59 percent of the cases in which they are involved, forensic physicians conclude that the death in question was indeed unnatural. In 32 percent of cases, it was nevertheless possible to certify death by natural causes.

* However, this only applies in situations where forensic physicians carry out the full range of duties (i.e. including the provision of medical care to detainees in police custody). Clearly, the situation is quite different in regions where the forensic physician's duties are limited to post mortem external examinations and injury assessment.

** A distinction is drawn between the discovery of a body in general (material) and the discovery of a body within the meaning of the law (formal). In forensic medicine, the term "discovery of a body (in the absence of others)" is used when the place and/or date of death are not known. A formal "discovery of a body (in the absence of others)" (Dutch Civil Code Article 1:19 f, paragraph 2) means that, following an investigation, the date and/or place of death can not be determined with sufficient accuracy

These mainly involve cases of sudden death, in which it is not possible to determine the exact cause of death with any certainty. In the remaining 9 percent of cases, the nature of the death remains unclear.[9,*] Since the 2010 amendment to the Burial and Cremation Act, in the event of the death of a minor, the attending physician is required to consult a forensic physician (see Box Describing the NODO procedure governing further investigations to establish the cause of death).

Forensic physicians are trained to recognise external indications of injury, suffocation or poisoning. They are also trained to establish the time of death (based on body temperature, ambient temperature, and post-mortem changes).[7,8,10]

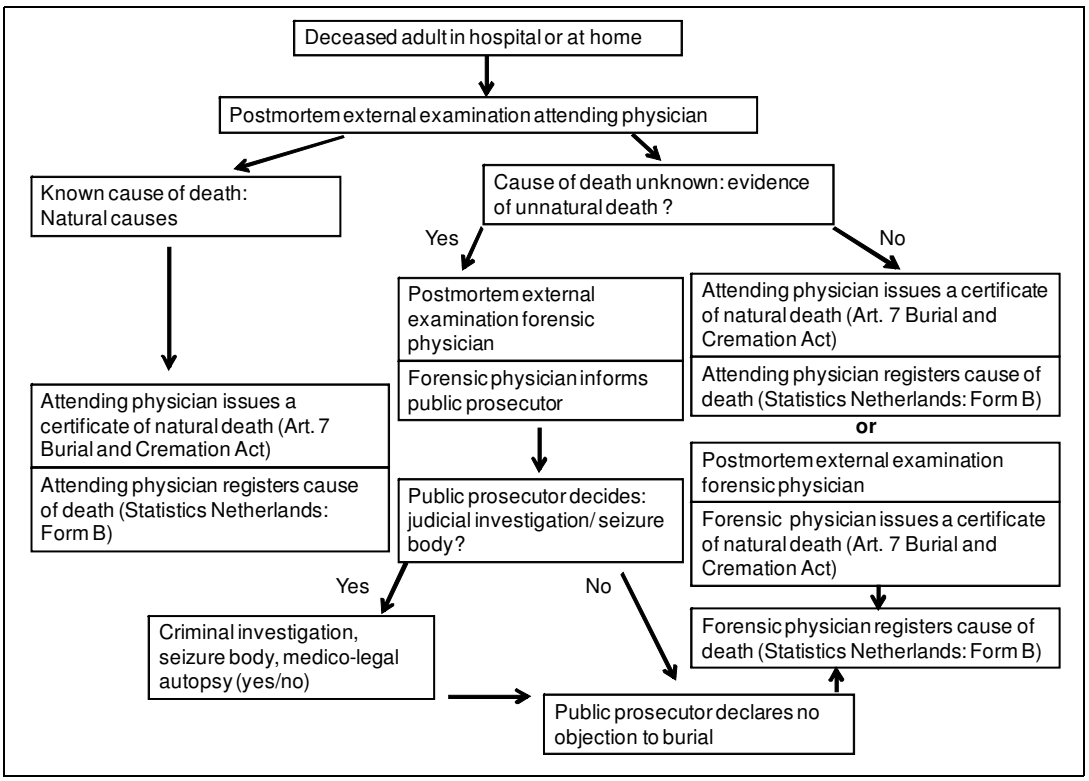

Figure 1 Flow chart showing the practical procedures involved following the death of an adult.

* If the nature of the death in question is unknown or unclear, then this is described as an unexplained death.

2.1.3 *Role in forensic investigation*

A forensic physician's duties also include providing services to support investigations by the police and the judicial authorities. They are required to issue injury certificates in cases of reported physical assault (or child abuse).[2] This injury certificate gives details of the type of injury found, how it originated (or how it might have done so), how severe it is, and whether or not it will heal. The statement also indicates whether the injury is in keeping with the specified circumstances.[11,12]

Forensic physicians also conduct analyses following offenses (including sexual offenses). An important aspect of this work is the collection of material for DNA testing, such as any semen, saliva, hair, and skin cells left on the victim by the perpetrator. This requires special consideration as this role sometimes has to be temporarily combined with that of attending physician to the victim.[13]

The Forensic Investigation Standards* describe how forensic physicians should collect and package biological traces. They also indicate how trace material and reference samples should be dispatched. The use of such Forensic Investigation standards enables the "chain of custody" to be monitored, which – in turn – is important in terms of safeguarding the integrity of forensic traces.[14-16]

Primary care forensic physicians also perform blood tests in the context of the Road Traffic Act (driving while intoxicated).[2]

2.2 Associated forensic disciplines

General forensic physicians cooperate with associated forensic disciplines. The assistance of these specialists is enlisted if the forensic physician's findings indicate a need for further investigation. In this section, the Committee discusses the disciplines in question.

2.2.1 *Forensic pathology*

If, following an post mortem external examination, a forensic physician concludes that the case in question involved an actual or suspected unnatural death, and that a criminal offense might have taken place, then the public

* The Forensic Investigation Standards also give detailed descriptions of the methods of investigation to be used. The Netherlands Forensic Institute, the National Criminal Intelligence Service, and the Forensic Investigation departments of regional police forces were all involved in drafting the Forensic Investigation standards.[14]

prosecutor will order a medico-legal autopsy.* Such autopsies are carried out by pathologists (or medical examiners). The purpose is to "determine the cause of death and to uncover anything else of importance". In addition to the public prosecutor, the Netherlands Health Care Inspectorate is also empowered to request autopsies of this kind. This can involve deaths in prisons or hospitals, for example, as well as those resulting from aviation accidents.[17]

The forensic pathological examination (autopsy) consists of an external examination, an internal examination and various additional analyses, including a microscopic examination of the internal organs and toxicological analysis. A forensic autopsy takes about three to eight hours, depending on the complexity of the case. This is partly determined by the nature of the injuries encountered, and by whether the body is in a state of advanced decomposition and/or exhibits severe burns. All findings are described and photographed in accordance with standard protocols.[18,19] Autopsies are increasingly being supplemented by prior examinations using imaging techniques, such as MRI or CT scans.

Immediately after the autopsy, a preliminary report is prepared for the client (the public prosecutor). Once all of the tests and examinations have been completed, the medical examiner compiles the results into a final report. This report, together with any photographic documentation, is sent to the public prosecutor, and ultimately forms part of the criminal case file.[18]

Forensic pathology is practiced by clinical pathologists who have undergone further specialised training in the examination and interpretation of injuries, and in determining causes of death.[10,18] Forensic pathology in the Netherlands is carried out in the Netherlands Forensic Institute. Currently, there is also an independent medical examiner. The field of forensic pathology features several areas of special interest, such as paediatric pathology, neuropathology, and injury interpretation in traffic accidents and aircraft accidents.

Forensic autopsies differ from clinical post-mortem examinations in that, in accordance with protocol, full external and internal examinations are carried out. Clinical post-mortem examinations, which require the consent of the deceased individuals themselves (or that of their next of kin), are less detailed. Their purpose is to determine the cause of death or to assess the accuracy of the diagnosis.

* Under Article 76 of the Burial and Cremation Act the body can be legally seized.

2.2.2 *Forensic radiology*

Forensic radiologists use imaging techniques in the context of judicial investigations. These techniques can be used when determining the cause of death, as well as in trace evidence analysis and for the purpose of reconstructions. Imaging is also used for the purpose of identification.

In the past, imaging was often used purely to support pathologists. These days, forensic radiology is developing into a distinct method of forensic investigation in its own right. This means that the public prosecutor orders the investigation, and that the radiologist reports directly to the public prosecutor.

Accordingly, the Radiological Society of the Netherlands has recently established a post-mortem and forensic radiology section. At international level too, forensic radiology is developing into a new subspecialism. In 2012, the International Society of Forensic Radiology and Imaging was founded. In the Netherlands, forensic radiology is carried out at Maastricht University Medical Center (MUMC), the Academic Medical Center (AMC) Amsterdam, the Groene Hart Hospital (in the province of Zuid-Holland), and the University Medical Center Groningen (UMCG).

2.2.3 *Forensic psychiatry*

Forensic psychiatrists provide mental health care services in a penal context. Their duties also include conducting Pro Justitia examinations , which involve diagnostic examinations and advice concerning a suspect's mental state. Such work may also be carried out at the instigation of the judicial authorities.[20] Forensic psychiatric care is provided in detention centres, prisons, psychiatric detention centres, forensic outpatients clinics, institutions for individuals placed under hospital orders, youth custody centres, in special forensic psychiatric wards, and in forensic psychiatric clinics that are part of normal Mental Health Care institutions.

The target group has a larger age range than is normally seen in the provision of medical care to detainees in police custody. However, all of the individuals concerned are (or have been) either the subject of criminal proceedings or else they exhibit behaviour that could potentially cause them to commit punishable offences. Forensic psychiatric care also extends to patients with addiction problems or a mental handicap.

Forensic psychiatric care can take the form of inpatient care, "transmural" care (the integration of primary and secondary care), and outpatient care.

Forensic psychiatry often takes place within a mandatory framework put in place by the judicial authorities. The most severe form of mandatory treatment is a measure known as Detention Under a Hospital Order with compulsory psychiatric treatment. The purpose of this measure is to protect society by providing the patient (perpetrator) with treatment and nursing care until their risk of recidivism has reached what is considered to be an acceptably low level. This measure can only be imposed or terminated by the judicial authorities.

The primary duty of forensic psychiatry is to examine those suspected of serious offenses in cases where there is evidence that the offense resulted, either wholly or in part, from a mental disorder. However, forensic psychiatrists also provide assistance to prisoners suffering from mental disorders. Other duties include providing treatment, care and (in extreme cases) compulsory psychiatric treatment for convicted patients whose offense resulted either wholly or in part from a mental disorder. Young people receive a similar type of treatment when they are subject to a PIJ order*

In forensic psychiatric practice, psychiatrists (or forensic) psychiatrists) cooperate with psychologists (or forensic psychologists), psychotherapists and sociotherapists, senior house officers, psychiatric nurses (or social psychiatric nurses) and social workers.

Rather than being a separate medical postgraduate programme in its own right, forensic psychiatry is part of the learning objectives of the psychiatry programme, which identifies three areas of special interest.[21] These areas of special interest (which can be taken after completing two and a half years of basic training) are child and adolescent psychiatry, adult psychiatry, and geriatric psychiatry (each of which takes two years). All psychiatrists are expected to master the basic skills for the entire spectrum of patients. Those psychiatrists who want to super-specialise in forensic psychiatry have the option of taking an elective internship in forensic psychiatry during their postgraduate programme in psychiatry. Continuing education courses and refresher courses are also available at home and abroad. Examples of such courses in the Netherlands are the behavioural expert examination reporting course, and care in detention by the Netherlands Institute of Forensic Psychiatry and Psychology. Specific training and work experience is required in order to register as a rapporteur for behavioural expert examinations in the Netherlands Register of Court Experts. As yet, however, there is no assessment framework for forensic psychiatric practitioners.

* PIJ order: placement in a judicial institution for juvenile offenders.

2.2.4 *Forensic anthropology*

Forensic anthropology is a sub-discipline of the field of physical anthropology. Forensic anthropologists bring physical-anthropological expertise to bear in support of judicial investigations involving aspects such as advanced body decomposition or the dating of a bone fracture. The prime objective is usually to determine the identity of the individual concerned. The outcome of forensic anthropological analysis, such as the gender of an unidentified individual and their approximate age at death can provide a valuable point of reference for the tactical investigation.[22] In addition to basic medical training, Netherlands-based forensic anthropologists also follow a postgraduate programme in anatomy.

2.2.5 *Forensic odontology*

Forensic odontologists interpret dental records and bite marks for judicial purposes.[23,24] This discipline's expertise can be used to identify unidentified bodies which, as a result of decomposition, trauma, fire or protracted submersion in water, are no longer recognisable. In addition, forensic odontologists can use the various stages of dental development and any unusual characteristics of the teeth to estimate the age of the individual in question. The contexts of such work range from victim identification to determining the age of suspected underage asylum seekers.[23,24] Elements of an individual's dentition can also be used as sources of DNA material, although this requires a special processing technique which can only be carried out at a limited number of locations.[23,24]

Forensic odontologists in the Netherlands are required to have completed their basic training in dentistry, and to have passed the examination in that subject. In addition, they will have taken a programme in forensic odontology (usually outside the Netherlands), and many will also have taken a programme in forensic medicine (or some of its modules).

2.2.6 *Forensic biology*

Forensic biology has two distinct but partially overlapping sub-fields, the examination of human and non-human material.

The latter involves the identification of animal and plant species, possibly through the use of DNA-based methods of analysis. A case in point is the identification (through the use of microscopy) of larvae (maggots), pupae and

adults of various fly species that are found in, on, or around corpses, and which can give an indication of the time of death.

In other cases, DNA analysis is used almost exclusively. The focus here is mainly on the compilation and comparison of DNA profiles in biological forensic traces and reference material derived from victims, witnesses, and suspects. However, there is a sound enough judicial basis to allow these methods to be used for other applications in the field of criminal law. For instance, based on DNA in forensic traces, it is possible to predict the geographical origin and eye colour of an unknown suspect. In time, development work on this technique will result in further major enhancements. These include tests aimed at predicting the skin colour, hair colour, and age of the individual from whom the trace material originated, as well as the age of the trace itself and the type of cellular material in the trace.

2.2.7 *Forensic toxicology*

Forensic toxicologists investigate the role of potentially harmful substances in disease, death (both natural and unnatural), traffic accidents, as well as crimes of violence and sexual offenses. Aside from a knowledge of the behaviour of substances in the body, both before and after death, the interpretation of the results requires an understanding of the effects that they can cause during life.[25,26]Forensic toxicologists may also play an equally significant part in civil law cases or administrative law cases. They can also take on government advisory roles, such as establishing limit values in legislation or providing substantiation for drug policy. [25,26] Forensic toxicology is usually considered to be an area of special interest within the subspecialism of human or medical toxicology, alongside other areas of special interest such as occupational toxicology and clinical toxicology. Forensic toxicologists will ideally have taken a postgraduate programme in toxicology, and will be listed as European registered toxicologists. However, this is not always the case.*

* Some forensic toxicologists working in the Netherlands have no medical or biomedical basic training. Most of these individuals will have studied pharmacy or chemistry. As a result, some forensic toxicologists might fail to recognise certain clinical pictures. Accordingly, this is seen as a potential point of concern. The ideal forensic toxicologist will primarily be a pure toxicologist, with additional qualifications in pharmacy, analytical chemistry, and internal medicine. All of these areas of expertise cannot be united in a single individual, but they can certainly be represented in the profession as a whole. It would be beneficial for forensic toxicologists to gain clinical experience and for clinical toxicologists to be involved in cases involving forensic toxicology. One way in which this might be achieved could be through peer review. Another avenue might be cooperation of forensic toxicology departments with internal medicine departments in hospitals or with the National Poisons Information Centre.

2.2.8 Forensic statistics

Forensic statistical analysis is widely used in various areas of forensic investigation, such as DNA analysis, shoe trace evidence analysis, toxicology and graphology. The expertise of forensic statisticians can be used, for instance, to calculate the strength of the evidence with regard to items of evidence obtained.[27]

2.3 Conclusion

Forensic medicine is a unique medical discipline that supports the police and the judicial authorities. General forensic physicians become involved at the request of the police or the judicial authorities, or if an attending physician reports a death by possible unnatural causes or suspicious types of injury. In this connection, the medical care provided to detainees in police custody and victims and the medical procedures used to support investigations are simply two sides of the same coin. This requires a different perspective on the profession to that encountered in general practice medicine, for example, where relationships based on mutual trust are central to the provision of care, and where there is less risk of conflict between the various interests involved. Specific medical expertise is also required, especially with individuals who exhibit confused or disturbed behaviour or in cases where the actual severity of somatic symptoms needs to be assessed in individuals who may be feigning illness.

There are a number of associated forensic disciplines, such as forensic pathology and psychiatry. This expertise is called upon when further investigation is needed, such as a death that a forensic physician considered to be unnatural and which may have resulted from an offense. Another example would be detainees who are suspected to be suffering from psychological problems. Forensic anthropology and forensic odontology are forensic disciplines that can be helpful in identification or in determining the age of an individual. Other forensic disciplines that can be used to support the practice of forensic medicine are forensic biology, toxicology and statistics.

Chapter 3

Training, research and professional practice

The previous chapter outlined the contours of forensic medicine. It made clear that the profession imposes special demands on the expertise of the professionals involved and on the perspective from which they operate. Training, research and efficient professional practice are extremely important to the effectiveness of those working in this field. In this chapter, the Committee addresses the situation in each of these three areas.

3.1 Programme

What sort of training do physicians get in forensic medicine? The Committee offers a brief summary, which is set out below.

Medical undergraduate programme

In the medical undergraduate programme, forensic medicine comes under the subject of “public health medicine”, which is either taught as a separate block or is integrated into the curriculum. However, the focus on the forensic aspect is very limited. The emphasis is on physicians and how they deal with death, for instance instruction is given in how to complete a death certificate. Furthermore, the terms “violence”, “physical assault” and “child abuse”' have been incorporated into the blueprint for the medical training programme provided by the Dutch Federation of University Medical Centers (NFU).[28] However, the way in

which these terms are interpreted is left to the individual medical faculties, so there is considerable variation in this area.

Some universities offer “forensic medicine” as an optional subject which explores every aspect of the field. In some cases, it is even possible to do forensic housemanships, which allow students to acquire a degree of practical experience.

Postgraduate programmes in forensic medicine

After they have completed their medical undergraduate programme, physicians (or senior house officers) can opt to train as forensic physicians. The Netherlands School of Public and Occupational Health offers two options in this regard, both of which are fairly limited in scope.*

Firstly there is basic training in forensic medicine, which involves thirty teaching days. Six basic modules are covered: “Forensic medicine: introduction and organisation”, “Post mortem external examinations, the basics”, “The provision of medical care to detainees in police custody”, “Post mortem external examinations, special situations”, “Trace evidence analysis and forensic techniques” and “Sexual offenses, trauma and injury certificates”. As these modules have a theoretical bias, they mostly involve lectures. Physicians who have completed this basic training can register as forensic physicians with the Forensic Medical Society (FMG).

In a second variant, which involves a two-year specialised training programme, physicians (or senior house officers) first complete their basic training in forensic medicine. Next, they receive an additional eight days of forensic training (which involves the in-depth modules of “Child abuse” and “The forensic physician as a professional practitioner”), twenty days of basic public health medicine modules and twenty days of optional modules. In addition to lecture courses, this programme includes practical training in the workplace, in the form of supervision by experienced forensic physicians. Those completing this specialised training programme can register as a KNMG (Royal Dutch Medical Association) forensic physician. This registration is recognized by the Specialists in Public Health Medicine Registration Committee (SGRC). Like forensic physicians who have only completed their basic training, the names of

* See http://www.nspoh.nl.

these specialised physicians are entered in the BIG (Individual Health Care Professions Act) register as senior house officers*.

Some of these specialised physicians then go on to take the specialist in Public Health Medicine programme. Here, the specialised training programme in forensic medicine is followed by elements that transcend the individual profiles. The goal is to achieve a wider range of competencies while also tackling them in greater depth. There is an emphasis on policy, management and research in the field of public health. Those completing the programme can register in the BIG register under the legally recognized specialism of "Physician in Public Health Medicine" with the Specialists in Public Health Medicine Registration Committee, and under the specific title of "Specialist in public health medicine".

Forensic pathology programme

Forensic pathologists have a much longer and more intensive period of postgraduate training. Following the medical undergraduate programme, they must complete a five-year programme to become legally recognised specialists in "clinical pathology". Next comes a further two years of additional training provided by the Netherlands Forensic Institute.[30]

Training in non-forensic medical specialisms

In a number of other postgraduate medical programmes also focus, to some extent, on forensic medicine. This applies to the general practice programme, which briefly addresses the procedures surrounding death and post mortem external examinations, physical assault (or child abuse) and skin trauma.[31] Forensic medicine also makes up part of the teaching programme for postgraduate training in geriatric medicine, with a particular focus on the distinction between natural and unnatural death.[32] Paediatrics includes a focus on ways of detecting child abuse, one example being injury assessment.[33]

* The requirement to register in the BIG register derives from the Individual Healthcare Professions Act.[29] Anyone can consult the BIG register to find out whether a given individual is qualified to practice their profession. The CIBG (Central Information Unit on Health Care Professions), an agency of the Ministry of Health, Welfare and Sport, manages the BIG register. More than 400,000 health care professionals (e.g. physicians, pharmacists, dentists and nurses) are currently entered in the register.

Comparisons with other medical postgraduate programmes

When basic training in forensic medicine and specialised training programmes in forensic medicine are compared to other postgraduate programmes for medical specialists, it can be concluded that the first two are relatively short and one-sided in terms of structure, with only a limited degree of practical supervision. For instance, the emergency room physician and GP programmes take three full years, compared to the two year, limited intensity programme for forensic medicine.[31,34] They are also much broader in scope, including practical training, internships and scientific training. In contrast, the clinical pathology training programme takes five years, and involves a combination of practical training, internships, scientific training and knowledge development comparable to that involved in the training of paediatricians.[33.35]

Comparison with forensic medicine programmes outside the Netherlands

There is also a substantial difference at international level, though that is partly due to the unique position occupied by forensic physicians here in the Netherlands. In neighbouring countries, medical examiners (*Gerichtsmediziner, wetsdokter*) are generally called in immediately. Accordingly, in these countries, programmes for forensic physicians are based on pathology (and forensic pathology), in contrast to public health medicine in the Netherlands (Annex G).[36]

In Germany, training in forensic medicine as a specialisation takes five years. It consists of modules in clinical pathology, psychiatry, forensic psychiatry, toxicology and public health. There is also a practical component in which a minimum number of procedures must be carried out.[37] The corresponding Belgian programme is similar to that in Germany, in terms of duration and content. [38] In Great Britain, the programme involves histopathological training, followed by a sub-specialism programme to qualify as a medical examiner. In all, this takes at least four years.[39]

Unlike their counterparts in neighbouring countries, Dutch forensic pathologists have to complete a programme to qualify as clinical pathologists.

3.2 Scientific research

In the Netherlands, forensic medicine in the broadest sense, (i.e. including specialisms such as forensic pathology, forensic toxicology, and forensic anthropology) is only integrated into the academic world to a very limited degree. However, this situation is starting to be rectified, as a number of

academic appointments have now been made. For instance, the University of Amsterdam has appointed part-time professors in forensic biology, forensic statistics, and forensic analytical chemistry. These individuals are also partly employed by the Netherlands Forensic Institute. In addition, Erasmus MC has appointed a professor of forensic molecular biology, while the University of Maastricht now employs a forensic physician and a forensic toxicologist.

As a result of this limited grounding in the academic world, the Netherlands lacks a substantial scientific research tradition in forensic medicine. What limited scientific research there is focuses on the provision of medical care to detainees in police custody and on forensic procedures. Such research is only carried out at a few institutions (the Amsterdam municipal or community health service, Radboud University Nijmegen/IJsselland municipal or community health service, the Netherlands Forensic Institute and the Maastricht Forensic Institute (TMFI).

Forensic technical research in the Netherlands is conducted at a high level, by bodies such as the Netherlands Forensic Institute, the Forensic Laboratory for DNA Research, and the Department of Forensic Molecular Biology at Erasmus MC. This is also reflected by the large number of publications in peer reviewed journals (including peer reviewed forensic journals). Forensic biology has performed particularly well in this regard (see Annex H). A summary of current research in forensic medicine and forensic technology is shown in Table 1.

Table 1 Scientific research in forensic medicine and its associated disciplines.

Type of research	Research group	Subject (or subjects)
Forensic medicine	Amsterdam municipal or community health service	Post-mortem toxicological analysis, temperature measurement using an infrared thermal camera, deceased minors, rapid testing for cardiac enzymes (troponin test), uniform post mortem external examination procedures, reducing deaths in police custody (excited delirium syndrome), analysis of injury certificates, provision of medical care to detainees in police custody, willingness of victims to report sexual assault, drug mules, cause of sudden death in young adults, gamma-hydroxybutyric acid (GHB) addicts in police custody, causes of death in bodies found in water, forensic nursing, treating victims of accidents (including traffic accidents)
	Radboud University/ IJsselland municipal or community health service	Suicide in detention, suicide among young people, deaths in custody, determining post-mortem interval

	Netherlands Forensic Institute	Post-mortem radiological examination (post-mortem changes, the added value of MRI, bullet trajectory reconstruction), injuries in children, dating injuries (fractures and soft tissue), age estimation, forensic test site, reporting quality, diagnostic value of physical examination (genital) in cases of suspected sexual abuse in prepubertal children, injury dating (histological and radiological), forensic toxicology (including post-mortem redistribution, value of thyroglobulin assay following violence to the neck), quality reports (evidential value of medical findings, logically correct reporting, context management)
	The Maastricht Forensic Institute	Forensic radiology, 3D bullet trajectory reconstruction and injury animation, added value of post-mortem MRI, forensic toxicology and forensic medicine in the broad sense of the word.
Forensic technology	Forensic Laboratory for DNA Research[a] Department of Forensic Molecular Biology at Erasmus MC[a]	Geographical origin and external visual characteristics of the donor, cellular origin and age of a biological sample
	Amsterdam Centre for Forensic Studies[b]	Blood spatter analysis, fractures, human and non-biological traces, DNA analysis, statistics, objectification of forensic methods
	Netherlands Forensic Institute	Interdisciplinary forensic investigation (e.g. microanalysis of invasive injuries), forensic genomics - including the molecular genetics of sudden death, the collection and analysis of contaminated forensic traces in chemical, biological, radioactive and/or nuclear (CBRN) disasters, cybercrime, crime scene (including reconstruction)

a Together, the Netherlands Forensic Institute, the Forensic Laboratory for DNA Research and the Department of Forensic Molecular Biology at Erasmus MC make up the Forensic Genomics Consortium Netherlands (FGCN).

b ACFS, Amsterdam Centre for Forensic Studies. At this centre, the Netherlands Forensic Institute works in close cooperation with the Academic Medical Center and the University of Amsterdam. The purpose of the Amsterdam Centre for Forensic Studies is to apply the scientific insights and research methods of the Academic Medical Center and the Faculty of Science, Mathematics and Computer Science of the University of Amsterdam to forensic investigation.

Comparison of research situation at home and abroad

Unlike other medical disciplines such as general practice medicine or the rapidly developing field of A&E medicine, forensic medicine in the Netherlands has little or no grounding in the academic world. There is no tradition of research in forensic medicine, nor are there any chairs in this subject. As a result, while considerable forensic expertise is available (which generates publications), there is still only a very limited basis for the requisite evidence-based working procedures. In addition, the results of research in forensic medicine (both at home and abroad) have insufficient impact on professional practice in the Netherlands.

This view is underscored by comparisons with neighbouring countries. The scientific position of the profession in Great Britain, France, Germany and Belgium is firmly anchored, as almost every university in these countries has a department of forensic medicine.[36] This also applies to related disciplines, such as forensic toxicology (Annex G).

3.3 Professional practice

What is the current situation in professional practice, both in quantitative and qualitative terms? The Committee first addresses current and future capacity, in addition to the current and future organisational position, before moving on to examine the quality mechanisms involved.

3.3.1 Current and future capacity

Current capacity

About 340 forensic physicians are active in the Netherlands.[40] In March 2013, a total of 146 physicians were registered* with the Medical Specialists' Registration Committee (RGS)**. Fifty seven of these individuals were forensic physicians who were specialised in forensic medicine only. A further 89 were specialists in public health medicine who were also registered as specialised physicians in forensic medicine.

In addition, 140 forensic physicians are registered with the Forensic Medical Society. Eighty one forensic physicians only completed the basic training (or a programme) in forensic medicine. Fifty nine physicians are also registered with the Medical Specialists' Registration Committee. That means that about 115 forensic physicians have not (or not yet) registered with the Medical Specialists' Registration Committee or the Forensic Medical Society. In addition, twelve forensic physicians have specialised in recognizing, identifying and documenting cases of child abuse.[41] Four of these work at the Forensic Medical Child Abuse Center in Utrecht[42], three at the Netherlands Forensic Institute, four at Formedex

* See http://knmg.artsennet.nl/Opleiding-en-Registratie/RGS-1/Aantallen/Overzicht-aantal-geregistreerde-specialistenprofielartsen.htm

** On 1 January 2013, the three registration committees (the Registration Commission for General Practitioners, Nursing Home Doctors and Doctors for the Mentally Disabled, the Committee for the Registration of Medical Specialists, and the Public health medicine Physician Registration Committee) merged to form a single registration committee, the Medical Specialists' Registration Committee.

(a centre of expertise for primary forensic medical care), and one is a member of staff at VU University Medical Center.

Finally, six forensic pathologists are currently active, five of whom are on the staff of the Netherlands Forensic Institute (one of these individuals is still in training). The sixth works as an independent forensic pathologist. The Netherlands Forensic Institute employs a forensic anthropologist and another who is still in training. There is also an emeritus professor of forensic anthropology on the staff of the Leiden University Medical Center.

Future requirement

Given the numbers involved, it is anticipated that forensic physicians will be in short supply in the near future. This is due both to the ageing of the profession and to the registration requirement set out in the Burial and Cremation Act.[40] When the transitional scheme terminates at the end of January 2013, any physicians who are not listed in a register will not be able to obtain (or retain) an appointment as a local authority forensic physician.

Over the next five years, 35 individuals are expected to leave the profession, in most cases because they will have reached the age of retirement. In the five year period after that, another 52 individuals will follow in their footsteps. In a profession consisting of just 340 individuals, this represents a significant loss of capacity. There will need to be a greater influx into forensic medicine programmes if these vacant positions are to be filled.[40] However, this is dependent on the working model that is used in future. On the basis of forensic physicians working full-time, which is the Committee's preference, a total of 150-200 forensic physicians will be needed, so a smaller influx into the programmes will be sufficient. If we use the current model, however, in which individuals often perform the duties of a forensic physician in parallel with other tasks, then a total of around 300-350 forensic physicians will be needed.

The Netherlands Institute for Health Services Research expects forensic capacity to come under increasing pressure. While figures from Statistics Netherlands show stable or slightly declining trends for death by unnatural causes, deaths among minors, and victimhood, it is expected that more time will have to be spent on individual cases. This trend has recently been seen in cases of murder and manslaughter, in sexual offenses, in traffic accidents involving fatal injuries, and in the deaths of minors. The rising number of euthanasia cases will also increase the pressure on forensic capacity.[43] The restructuring of municipal or community health services and police regions will also affect occupancy standards and the duty rosters of forensic physicians per region.[40]

The expected shortfall represents a serious threat to the practice of forensic medicine. For instance, more time will be required for forensic medical examinations, which may lead to longer handling times in criminal cases. There is also a risk that the quality of forensic medical examinations will decline.

Required influx

In view of these facts, what level of influx would be needed? The Netherlands Institute for Health Services Research has calculated that, if the current working model is retained, an annual influx of 20-30 physicians (or senior house officers) in both the specialised training programme in forensic medicine and the public health medicine programme with a specialisation in forensic medicine will be needed to compensate for the expected number of individuals leaving the profession and the increased pressure on forensic capacity.[40]

This is in stark contrast to the present situation, in which just two residents training to become specialists are currently taking the specialised training programme in forensic medicine.[44] However, the municipal or community health services report that approximately 40 physicians (or senior house officers) are taking the basic training programme in forensic medicine. After successfully completing this programme they will be able to register with the Forensic Medical Society[44] While the Netherlands Institute for Health Services Research has not included this training programme in its estimates of capacity, this may – to some extent – help to compensate for individuals leaving the profession.

Nevertheless, influx levels continue to be a cause for concern. The field appears to be suffering from a systematic image problem. This problem is partly a matter of perspective. In forensic medicine, the interests of the individual involved do not always come first, yet many medical students consider this very aspect to be of fundamental importance. Furthermore, little mention is made of this during the undergraduate programme, nor does the profession enjoy a prominent position in academic terms. Salaries, too, have fallen behind those in other medical specialisms, such as general practice medicine*, and a forensic physician's working conditions are often less than ideal.[44]

* Forensic physicians earn about as much as specialists in child health care (up to EUR 4,378 per month), but this is topped up by compensation for unsocial working hours, which can amount to approx. EUR 500-1000 per month. The maximum gross salary for specialists in public health medicine amounts to EUR 5,173 per month. GPs with a salaried position earn EUR 4400-6157 (gross) per month (plus compensation for unsocial working hours), while specialists with a salaried position earn, on average EUR 13,000 (gross) per month.

Meeting the costs of their postgraduate programme is another major obstacle for physicians (or senior house officers). Programmes in forensic medicine are relatively expensive. For instance, the basic training in forensic medicine costs EUR 10,000, while specialised training programmes cost EUR 30,000. Indeed, the programme for physicians in public health medicine with a specialisation in forensic medicine costs as much as EUR 65,000. The cost of these programmes is not covered by the Fund for Education in Care*, unlike most other post-graduate programmes in medical specialisms, including the specialised training programmes in public health medicine, as well as those for TB control physicians, specialists in infectious disease control, specialists in child health care, and specialists in environmental health.[46-48]

The forensic medicine programmes should therefore be paid for by the trainee physicians themselves, or by the institution for which they work, such as the municipal or community health service or the regional forensic medical service. However, in regions where forensic physicians have a limited range of duties (i.e. no provision of medical care to detainees in police custody), municipal or community health services will not always cover the costs of the full basic training programme. In such cases, trainee forensic physicians only take those modules that they need to practice their profession in the region in question. This, in turn, may tend to exacerbate any unwarranted quality differences. It is worth noting that, since 1 January 2013, any physicians with limited educational backgrounds are not allowed to work as local authority forensic physicians, as they are unable to register with the Forensic Medical Society.

The role of the Netherlands Forensic Institute and other bodies

What role can the Netherlands Forensic Institute and other bodies play in meeting the demand for expertise in forensic medicine? The Netherlands

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* The Care Training Fund, which is financed by the Ministry of Ministry of Health, Welfare and Sport, regulates the funding of training for such positions as surgeon, radiologist, A&E physician, physician in child health clinics/school medical officer, psychiatrist or psychotherapist. The Training Fund is intended to ensure that sufficient good-quality specialists are trained within each healthcare training programme, at a reasonable price. The subsidy schemes for the Fund for Education in Care lapsed in January 2013. These have been replaced by an availability contribution based on the Healthcare (Market Regulation) Act, implemented by the Dutch Healthcare Authority (NZa). This transfer involves the general practitioner programme and almost all of the programmes that were previously funded from the Fund for Education in Care. The exceptions to this are the training programmes for specialists in child health care, specialists in infectious disease control, TB control physicians, and specialists in environmental health. The Ministry of Health, Welfare and Sport uses a separate subsidy scheme for this purpose.[45]

Forensic Institute carries out forensic investigations on behalf of clients within the criminal justice system, such as the police and the Public Prosecution Service.* This work is paid for by the Ministry of Security and Justice, on the basis of annually agreed service level agreements.

The Netherlands Forensic Institute will also mediate in the event of investigation requirements that are outside the scope of its expertise. In cases such as these, assistance is enlisted from bodies such as the Forensic Laboratory for DNA Research or the Maastricht Forensic Institute. Alternatively, experts from outside the Netherlands may be consulted. For the purposes of , counter checking in criminal cases, for example, aside from the Forensic Laboratory for DNA Research, use can also be made of the services of private forensic laboratories, such as the Maastricht Forensic Institute or Verilabs. There is also the opportunity to obtain forensic-medical advice from the Forensic Medical Society's Formedex centre of expertise in forensic medicine or from the Forensic Medical Child Abuse Centre .

The Forensic Medical Child Abuse Center in Utrecht provides specialised forensic medical expertise in the field of child abuse to customers in the medical and judicial domains. It gives advice, carries out case-file studies, and assesses and records injuries to children in suspected cases of child abuse.

Since the year 2000 there has been a substantial growth in the demand for forensic investigation. This is due to the rapid pace of developments in this field, as well as to the introduction of the Experts in Criminal Cases Act in January 2010, which grants the defence the right to a counter-investigation.[49] The police and the Public Prosecution Service can contract out this work to private institutes at home and abroad. The resources available for legal fees and investigations can be used for this purpose.[50] As the result of a commitment made by the Minister of Security and Justice, the interim scheme can also be used (throughout 2013) to engage the services of private institutes. Those wishing to be considered for a contribution based on this interim scheme must submit a request to the National Review Committee, which will then determine whether the request meets the relevant criteria.

* See http://www.nederlandsforensischinstituut.nl/

3.3.2 *Current and future organisational position*

Current position

Forensic medicine in the Netherlands is traditionally part of public health medicine, as this is part of the public health domain. Accordingly, forensic physicians (as we saw in Section 2.1) are usually employed by municipal or community health services. For that reason, forensic medicine in the Netherlands is part of primary care. This situation is unlike that in neighbouring countries, where the profession is pathology based (secondary care).

Future position

New developments, such as the introduction of the National Police Force in January 2013, mean that forensic physicians will have to deal with changes in their working environment. One of these changes involves more extensive cooperation between existing municipal or community health services. An increase in scale will generate adequate workloads for all forensic physicians employed by municipal or community health services. This, in turn, will provide better safeguards to ensure that there are sufficient procedures to maintain the requisite level of expertise. The Dutch Association of Municipal or Community Health Services is currently reviewing plans for further regionalisation.[51] This would involve ten regions, analogous to the National Police Force regions. The Committee views this development as a step in the right direction, with regard to the professionalisation of forensic medicine. However, it is vital to involve efficient regional forensic services, such as Forensic Physicians Rotterdam/ Rhine Delta and the Utrecht Society for Forensic Medicine.

Procurement of forensic medical care

The National Police Force is currently studying the option of putting forensic medical care and forensic medical examination out to tender, possibly within the framework of the European public procurement process.* This relates both to the

* At the moment, decisions regarding the procurement of forensic medical care and forensic medical examination are made at the level of the existing police forces (of which there are 26 throughout the Netherlands). Procurement procedures are used by the police in Amsterdam, Rotterdam and The Hague, while some other forces make no use at all of such procedures. Given the sums involved, the European public procurement process is used.

provision of medical care to detainees in police custody and to forensic medical procedures, such as injury assessment.

3.3.3 *Quality mechanisms*

In an effort to monitor and promote the quality of forensic medical practice, efforts are being made to establish forensic practice guidelines and to develop quality systems.

Guidelines

The Forensic Medical Society and the Dutch Association of Municipal or community Health Services have drawn up several forensic medical guidelines. These include guidelines for the treatment of opiate addicts in police custody, for assessing poisoning in individuals taken into custody, for post mortem external examina-tions, for the late termination of pregnancy, for organ and tissue donation, for injury reporting, for determining the post-mortem interval, for sampling cellular material for DNA, for blood sampling in the context of Article 8 of the Road Traffic Act, and for the treatment of drug use in police cells, with the exception of opiates and alcohol.[52-61]

Quality systems

In 2006, a forensic medicine certification schedule was established by the Harmonisation of Quality Review in Health Care and Welfare. This certification schedule is compatible with the international ISO-9001: 2008 standards, but it also includes sector-specific requirements.[62] Harmonisation of Quality Review in Health Care and Welfare standards relate to the quality of the primary process and to organisational quality.

The requirements for the primary process, such as influx/indication, implementation of services plus evaluation/aftercare, are mainly procedural in nature. Support processes, such as human resources policy, must also meet specific requirements. Certification takes place following an audit conducted by Harmonisation of Quality Review in Health Care and Welfare (HKZ) auditors from one of that organisation's consultancies. Twenty four institutions currently deliver HKZ-certified forensic care. Some institutions are not HKZ-certified.

Quality is also monitored by means of peer review. This is a mandatory element for any forensic physicians wishing to be considered for re-registration.

Professional association

The Forensic Medical Society was founded on 19 August 1980. It currently has 338 members, of whom 251 are physicians. The stated aim of this professional association is to promote the forensic medical sciences, in the broadest sense of the word. Another aim of the Forensic Medical Society is for forensic medical practice to be continually assessed against standards of quality, independence, and general medical ethics. The Society is responsible for the registration of physicians who have completed a basic training in forensic medicine. In 2007, the Forensic Medical Society founded Formedex, the first centre of expertise for primary forensic medical care. This centre can also be consulted for the purposes of counter checking. Together with the Dutch Association of Municipal or Community Health Services, the Forensic Medical Society has drawn up a set of forensic medical guidelines.

3.4 Conclusion

Limited tradition of training and research

In comparison to other specialisms, the forensic physician postgraduate programme is shorter and less intensive, both scientifically and in terms of practical experience. That picture is consistent with its poor academic position and limited scientific tradition. Neighbouring countries use a different system. There, some of the duties carried out by forensic physicians in the Netherlands (such as post mortem external examinations and injury assessment) are performed by specialists in forensic pathology who have completed demanding postgraduate programmes.

Increasing demand for forensic physicians

A total of about 340 forensic physicians are currently active in the Netherlands. In the years ahead, a significant percentage of these individuals will retire and leave the profession. In addition, the process of reviewing the Forensic Medical Society's registry, will reveal how many forensic physicians are adequately trained, and how many can remain registered as local authority forensic physicians. In the near future, increasing pressure on forensic capacity, together with changes to the municipal or community health service regions and police regions, is expected to boost demand for forensic physicians. There are also indications of a shortage of forensic pathologists.

Limited influx, but broader registration options

The level of influx into the specialised training programme in forensic medicine is currently insufficient both to meet growing demand and to compensate for individuals leaving the profession. As a provisional measure, recognition of the basic training in forensic medicine as a requirement for registration with the Forensic Medical Society, might go some way towards compensating for the increased demand for forensic physicians. Nevertheless, further measures are also going to be needed for the future influx of forensic physicians and forensic pathologists.

Regionalisation of forensic medical services

New developments require a further regionalisation of forensic medical services. This increase in scale would be beneficial to the workload of forensic physicians employed by forensic medical organisations, such as municipal or community health services. This would make it easier to maintain the requisite levels of expertise, which would benefit the practice of forensic medicine.

Chapter 4

Points of concern in forensic medical care and investigation

The previous two chapters explored various aspects of the profession, such as what type of people work in this field, and what is involved in training, research and professional practice in this area? At this point in the advisory report, the Committee switches its focus to the performance of the forensic medical profession. Studies, case reports and personal experience all highlight various points of concern. These are discussed here. Potential solutions will be addressed in the following chapter.

4.1 Points of concern in the medical care and treatment of detainees in police custody

One of a forensic physician's most important duties is to provide medical care and treatment to detainees in police custody. What is the present situation? Records are only kept of deaths, so there is little solid information on the overall quality of the medical care and treatment provided to detainees in police custody. Nevertheless, it is possible to identify a few problems.

The quality of care may be inadequate

An initial issue is the quality of medical care in general. While experienced forensic physicians may have acquired the necessary practical expertise, current programmes for forensic physicians address the provision of medical care to

detainees in police custody on a purely theoretical basis, as described in section 3.1. Forensic physicians lack training in the area of general practice medicine. A knowledge of – and experience with – the target group is also required.

Furthermore, the limited range of guidelines was not systematically set up in accordance with the procedures of evidence-based medicine, nor is there much evidence available. There is also some doubt about the extent to which protocols are being followed, and in other cases there are no protocols at all. Despite the lack of details on the actual quality of the medical care provided to detainees in police custody in the Netherlands, this situation does at least make it clear that guarantees for the practice of care do not correspond to what is usual in other medical disciplines.[63,64]

Variation in quality of care

Another problem is that the medical care provided to detainees in police custody can vary in quality. In many places, this work is performed by forensic physicians working for a municipal or community health service or a regional forensic service, but it can also be outsourced to specialised local GP practises, in which case a different type of expertise and a different care perspective will be involved.[64] Experienced forensic physicians will be aware of the problems specific to the target group and of the procedures relating to incarceration and questioning.[4,65] This understanding enables them to assess whether treatment is required and to determine whether incarceration poses any unacceptable risks. GPs do not always have such specific expertise. For example, the general practice programme does not address addiction treatment and care in any great detail. Furthermore, GPs are unable to take much account of the forensic setting. As a result, they will not be able to provide the police with sufficient information, while those who have the detained individual in their charge will be poorly prepared to deal with any problems affecting the detainee. For instance, not all GPs are aware that they are allowed to break the rule of professional confidentiality in certain situations.[66-69]

From the police's perspective, a failure to allocate care duties clearly may cause a police officer or police cell guard to wait too long before sounding the alarm. Alternatively, these individuals might not know which physician to call in.

If, as mentioned in Section 3.3.2, the National Police Force does indeed introduce the European public procurement process into the provision of medical care to detainees in police custody, this may exacerbate the differences in quality still further. It is important to avoid a situation in which the duties of forensic

physicians become fragmented, as private institutions cherry pick those aspects of the work that will deliver a profit.

Professional confidentiality

Professional confidentiality (as described in Article 88 of the Individual Health Care Professions Act, and in Article 7:457 of the Medical Treatment Agreements Act) involves the duty of confidentiality and evidentiary privilege.[29,70] The duty of confidentiality covers an individual's dealings with everyone else. Evidentiary privilege covers an individual's dealings with the judge, the examining magistrate, the public prosecutor and the police. This right allows medical care providers to defend themselves against powers of criminal investigation, such as seizure, searches and handing over medical details.[68,69]

Professional confidentiality covers any information obtained by physicians about their patients in the exercise of their profession. This also includes any non-medical matters that physicians may learn about through sources other than their patients.

Physicians are also required to observe professional confidentiality in all of their dealings with the police. The quest for the truth cannot justify breaching professional confidentiality, neither during investigations nor during preliminary judicial investigations, nor indeed at court hearings.[67,69]

However, there are three situations in which professional confidentiality can be broken. First, if the patient gives their consent. Second, if physicians have a legal duty to speak, for example, if they have detected the presence of a notifiable infectious disease (e.g. the rabies virus). Third, if there is a conflict of duties. This is the case where releasing information to the police or the judicial authorities might prevent serious harm to the patient or to others.[17,67,69]

In February 2012, the Royal Dutch Medical Association published a new guide entitled "*Beroeps-geheim en politie/justitie"* (Professional Confidentiality and the Police/judicial authorities). This document offers guidance regarding situations in which it may be necessary to breach professional confidentiality.[71]

Potentially preventable deaths

How often do we hear about the deaths of detainees in police custody? This is the only area for which figures are available. Each year, between five and seven individuals die while in the care of the police. The estimated total number of incarcerations* ranges from 160,000 to 200,000 per annum[72-74]. This amounts to 0.025 to 0.04 per thousand. In forty percent of the deaths investigated by the National Police Internal Investigations Department from 2000 to 2004, the cause of death was poisoning, usually resulting from cocaine use. In cases of suicide, hanging or strangulation were the most commonly used methods. The most common natural cause of death was heart failure. In many fewer cases, death resulted from an accident or injury that occurred or was inflicted before the individual in question was taken into custody.

The majority of deaths could be attributed to the actions of detainees themselves, or to a poor physical or mental condition that existed before the individual in question came under the care of the police. Deaths in police custody usually occur within twelve hours after the first contact with the police, and more often at night than during the day. This does not apply to suicides, which occur more often during the day. Well over half of the deaths in police custody concern individuals with a history of addiction (alcohol, drugs).[73]

In some cases it appears that too much time was allowed to pass before the assistance of a physician (or forensic physician) or another expert was sought. This means that, in some cases, death might have been avoided. This may occur, for example, when a detainee is suffering from cocaine-induced excited delirium syndrome.** If the situation is not properly recognized and there is a failure to take appropriate steps in time, this may result in the death of the detainee.[73,79,80] However, it is impossible to put a figure on the number of cases in which the death of a detainee in police custody might have been prevented.

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* No detailed figures are available, so this number is just an estimate.[72]

** Excited delirium syndrome occasionally results in the death of aggressive, agitated individuals who have used cocaine after a struggle with the police or with medical staff.[75] The acute effects of cocaine on the cardiovascular system (such as coronary artery spasms and adrenergic overstimulation through a combination of the physical effects of cocaine use and the normal physiological response to stress) are risk factors for a fatal outcome.[76-78] For this reason it is vital to avoid escalation. The patients can be medically sedated, then taken to a hospital.[79]

4.2 Points of concern in forensic medical examinations

Aside from providing medical care and treatment to detainees in police custody, another important aspect of a forensic physician's work is conducting forensic medical examinations. There are a number of points of concern in this area.

4.2.1 Incorrectly certifying "death by natural causes"

One crucial aspect of forensic medical examinations is the identification of a unnatural death. If an attending physician fails to identify a death by unnatural causes then, if a crime has been committed, no further investigation or prosecution will be possible.[19,81-84] Accordingly, this issue recently resulted in various parliamentary questions.[85]

Each year, there are about 136,000 deaths in the Netherlands. About four percent of these (i.e. about 5,900 individuals) involve cases of death by unnatural causes, such as suicide, accidents and violence (Figure 2, Annex F1).

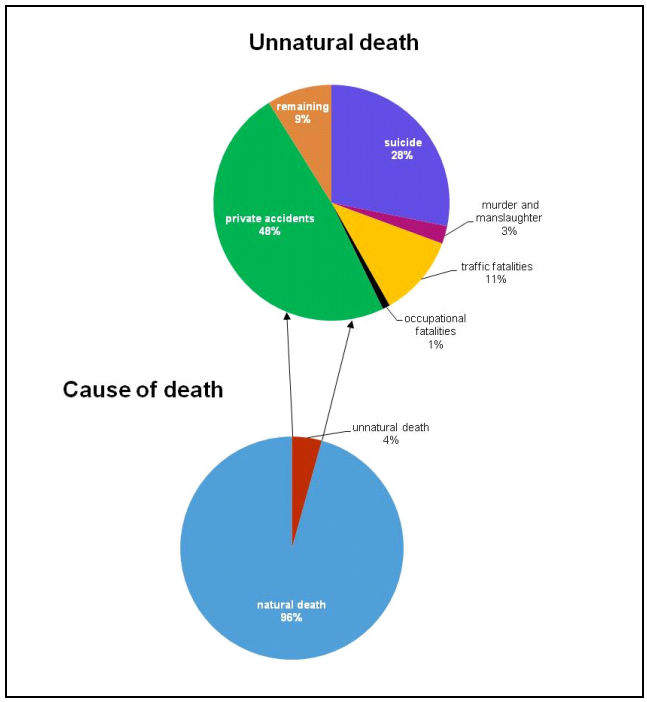

Figure 2 Causes of death.

Natural and unnatural death

In practice, there are often misunderstandings concerning the meaning of the terms "natural death" and "unnatural death".[87,88] This is because they are not defined in the Burial and Cremation Act.[89]

One commonly used definition of natural death (used by bodies such as the Netherlands Health Care Inspectorate, and in the Royal Dutch Medical Association's guide to post mortem external examinations) is death as a result of spontaneous disease or old age, including death following properly performed medical procedures.[90] However, the international definition only involves death as a result of disease.*

The latter variant is to be preferred, as old age itself is not a cause of death. Accordingly, a verdict of "natural death" can only be reached if a well-defined disease has been diagnosed, if this disease has been treated by a physician, and if this disease is likely to have caused the death in question.[7,8]

A common definition of death by unnatural causes is death as a direct or indirect result of an accident, violence or other external cause, or suicide or death by the intent or negligence of another.[7,8] For example, if a pedestrian is hit by a car, loses consciousness, develops pneumonia and dies, then – according to the above definition – this would constitute death by unnatural causes. Take the case of an elderly man who falls downstairs, breaks his hip, becomes bedridden, develops bed sores, and eventually dies of sepsis. This too – according to the above definition – would constitute a case of death by unnatural causes.

This serves to demonstrate that the concepts of natural death and unnatural death are not sharply defined. This means that there will always be a grey area, as it is not always easy to decide whether there is a causal link between a given event and the death in question. This is emerged from a survey of general practitioners and nursing-home physicians, who experienced difficulty in distinguishing between natural and unnatural death some time after a hip fracture.[87,91,92]

* See http://www.who.int/en/

On an annual basis, forensic physicians conduct post mortem external examinations on approximately 10,000 deceased individuals. In approximately 450 cases, this leads to an autopsy conducted by a clinical or forensic pathologist (Annex F3). In practice, in clear cases of murder and manslaughter, this usually means that a forensic autopsy will be carried out, but this will usually not take place in cases of unexplained death, even though such cases may involve events that merit further investigation.[86]

Points of concern in recognizing death by unnatural causes occur at various points in the chain. It starts with an attending physician who wrongly certifies death by natural causes.[81,82,*] Ideally, every post mortem external examination (i.e. including the one performed by an attending physician) should include a complete physical examination and an examination of the medical history of the deceased. However, this is not always the case, so some cases of unnatural death will inevitably be overlooked.

This problem is partly due to the fact that medical practice does not always dovetail neatly with judicial practice. From the judicial standpoint (see Box Natural and unnatural death), the death of an elderly individual following a hip fracture, and in the absence of external violence, is seen as an unnatural death. In medical practice, however, this would commonly be described as death by natural causes at advanced old age.[83,87] Accordingly, it is vital to achieve consensus between medical and judicial practice. One solution might be to use similar definitions of natural and unnatural death, another would be to foster effective interdisciplinary cooperation.

A 2003 study established that in about thirty percent of deaths involving death by unnatural causes (as deduced from Form B submitted to Statistics Netherlands)[**], the attending physician also certified death by natural causes (Form A, the death certificate).[91,***] If we add this to the total number of deaths

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* Attending physicians may only certify death by natural causes if they are fully convinced that the death in question was entirely natural.

** In Form B (which is used by Statistics Netherlands to compile data on causes of death) physicians must specify both the direct cause of death and any factors that either contributed to the death or that are causally linked to it. Accordingly, Form B is completed by the physician who carried out the post mortem external examination. The information contained in Form B is confidential and anonymous, in the sense that the name of the deceased does not appear on this form. Access to such data is restricted to the medical officer of Statistics Netherlands and to scientific researchers.

*** For the purposes of this study, copies of Form B relating to 470 deceased individuals (which had been classified as death by unnatural causes (excluding traffic deaths) by the medical officer of Statistics Netherlands), were further investigated. In 130 cases, it was found that Form B had been completed by the attending physician, who had also certified death by natural causes Accordingly, approximately thirty percent of deaths by unnatural causes had been wrongly certified as death by natural causes.

by unnatural causes – with the exception of traffic deaths (5191) – we find that approx. 1,500 deaths were wrongly certified as death by natural causes.

The actual numbers may be even higher, as no systematic investigation has ever been carried out to determine how often cases certified as death by natural causes actually involve death by unnatural causes. Estimates vary, but it is thought that, each year, 5,000 to 10,000 cases of death by unnatural causes are not reported to local authority forensic physicians. In particular, deaths resulting from accidents in the home are wrongly seen as death by natural causes.[91]

In addition, the report entitled "*Euthanasie en andere medische beslissingen rond het levenseinde*" (Euthanasia and other medical decisions concerning the end of life; 2010 deaths survey) show that twenty-three percent of cases of euthanasia were not reported to the local authority forensic physician nor to the Regional Review Committee.[43] The reason for not reporting euthanasia or assisted self-chosen death was almost always that the physician in question did not see the procedure as a form of life termination. Furthermore, many physicians have not yet read the Royal Dutch Medical Association's document entitled "*De dokter en de dood"* (Physicians and death), which includes a physician's guide to post mortem external examinations.[90]

If the attending physician wrongly certifies a death as natural, then a forensic physician will not be called in. In such cases, therefore, an incorrect or – at the very least – premature conclusion will be drawn. This not only impedes an adequate assessment of medical practice, it can also mean that some cases of murder, manslaughter, and medical errors may be missed, and that the causes of some accidents will not be thoroughly studied.[91]

But where forensic physicians are called in, there is no guarantee that cases of death by unnatural causes will be recognised as such.[81] This is because no consistent use is yet being made of the guidelines for post mortem external examinations drawn up by the Forensic Medical Society and the Dutch Association of Municipal or Community Health Services. This results in unwarranted variation. The proposed European public procurement process for forensic medical care and investigation can be instrumental in generating differences in quality and expertise, due to the potential fragmentation of forensic physicians' duties. In this situation, there are no safeguards to ensure that there are sufficient procedures to maintain the requisite level of expertise

The lack of a NODO procedure (further investigations to establish the cause of death) in cases of unexplained death in adults also serves to exacerbate the lack of uniformity in the working methods used in everyday practice.[81,93,94]

Recently, however, a procedure of this kind has been established for minors (see Box).

Further Investigation into the Cause of Death of Minors

In 2010, the Burial and Cremation Act was amended to include a separate regulation governing the procedures to be followed in the event of the death of a minor. Before issuing death certificates (Article 7 paragraph 1) attending physicians performing post mortem external examinations should first consult the local authority forensic physician (Article 10a paragraph 1). This recommendation does not specify the channel of communication to be used, i.e. this can be by telephone, in person, or in writing. Article 10a came into effect, in its entirety, on 1 October 2012. As a result, in cases where the cause of death is unclear, the local authority forensic physician may decide that a further investigation into the cause of death is required. To this end, the local authority forensic physician can opt to initiate the NODO procedure.[95-99]

The NODO procedure is intended to provide a neutral context in which both medical examinations and forensic investigations can be carried out. A NODO Core Team consists of three specialists, a forensic physician who has been specifically trained in the NODO procedure, a NODO paediatrician, and a NODO pathologist. NODO centres have been established at the academic medical centres in Amsterdam and Utrecht. The remains of deceased minors from all around the country will be examined at these centres.[100] The forensic physicians, paediatricians and pathologists involved will all receive special training, to ensure that the NODO procedure is as effective as possible. In early 2013, 14 paediatricians, five pathologists and 47 forensic physicians will undergo the NODO procedure training course.

Due to the sensitivity and complexity of the subject, the introduction of the NODO procedure will commence with a start-up phase lasting until 1 October 2013.[101] An evaluation study will take place during this start-up phase. One of the issues to be assessed will be whether two NODO centres are enough to serve the entire country's needs, another will involve the points of concern encountered when implementing the procedure.[96] Based on the results of the evaluation study, a decision will be taken on how best to proceed.[101]

Given the problems affecting the performance of post mortem external examinations, it can be assumed that the actual number of deaths by unnatural causes may well exceed the figure quoted at the start of this section.

4.2.2 *Omitting a toxicological analysis*

If a death is certified as potentially unnatural and if, as a result, a forensic post mortem external examination is carried out, then a toxicological analysis may be required to complement the external examination. In practice, however, this is seldom the case. As a consequence, some deaths remain – quite needlessly – unexplained.[102] This has, therefore, been the subject of recent parliamentary questions.[103]

For example, one study in the Amsterdam region indicated that 53 percent of urine samples from deceased individuals tested positive for one or more substances, including amphetamines, barbiturates, benzodiazepines, cannabis, cocaine, and morphine. This does not mean, of course, that all 53 percent of deaths were caused by poisoning. In three to ten percent of the cases that tested positive, the individual's medical record made no reference to use of the drug in question nor was any such evidence found at the place of death (medication packaging, syringes, etc.).[104,105] Accordingly, intentional or accidental poisoning cannot be ruled out in these cases.

Forensic medicine postgraduate programmes, do not focus specifically on poisoning (either intentional and accidental) as a possible cause of death. The same applies to post-mortem toxicological analysis. Nor are there any guidelines on how to carry out such analyses. The Amsterdam municipal or community health service is the only body that currently supplements forensic post mortem external examinations with post-mortem toxicological analysis, as standard. However, this approach is increasingly being adopted by other bodies. The Forensic Medical Society and the Dutch Association of Municipal or Community Health Services have also drawn up a guideline for assessing poisoning in individuals taken into custody.[53]

4.2.3 *Failure to recognize physical assault (or child abuse)*

Physical assault in general, and domestic violence and injuries in particular, are serious social and medical problems. Domestic violence occurs in all walks of life. It mainly affects women, children and the elderly.

Yet friends and family are often unaware of what is going on.[12] Physicians* too may fail to associate injuries with abuse.[12,106-109]

The importance of making sure that this *does* happen is underscored by the figures (Annex F2). Figures cited in a 2010 report from the Ministry of Security and Justice's Research and Documentation Centre entitled "*Huiselijk geweld in Nederland*" (Domestic violence in the Netherlands) indicate that there are an estimated 200,000 victims and about 110,000 possible perpetrators.[110] Twenty percent of these victims currently go as far as reporting incidents to the police, which in forty percent of cases results in an official police report. In twenty to thirty percent of cases it leads to the arrest of the perpetrator.[110,111] Physical assault on the elderly appears to be even more difficult to establish. It is estimated that this affects one in twenty elderly people.[84,112-115] This issue is expected to become an even more significant in future, given our longer life expectancy and the growing number of elderly people in the Netherlands.

Inadequate forensic knowledge among attending physicians may once again prove to be a point of concern, as injuries resulting from domestic violence may not be recognized as such. [12,42,106,116-118] Injuries can be registered in the VeiligheidNL (formerly the Consumer Safety Association) association's injury database and in the National Trauma Registry of the Dutch trauma regions.

While an "injury reporting" guideline has been drawn up by the Forensic Medical Society and the Dutch Association of Municipal or Regional Public Health Services, this is mainly used by forensic physicians, and not by other attending physicians, such as GPs or paediatricians.[57] This gives rise to unwarranted variability in injury assessment in suspected cases of physical assault (or child abuse). Indeed, with regard to the examination of victims of sexual offenses, there is no separate guideline whatsoever.** However, the so-called "sexual offences kit" includes a very comprehensive manual, which serves as a guideline.

* In practice, it is usually GPs, A&E department physicians, paediatricians, surgeons, trauma surgeons, gynaecologists, obstetricians, dentists, and physiotherapists who encounter injuries (including serious injuries) in their day-to-day practice.

** Work is in progress on a guideline for forensic medical examinations following sexual offenses. This guideline will come into effect in mid-2013.

In some cases, the attending physician may be reluctant to report possible cases of physical assault. While the Mandatory Reporting Code (Domestic Violence and Child Abuse) Act* was adopted by Parliament in mid-March 2013, compliance with the Act in practice is still by no means certain. As a result, further steps, such as calling in a forensic physician, may not be taken.

If, however, forensic physicians are called in – following notification by an attending physician (or by some other agency) – their main duties will consist of advising on injury assessment and drafting an injury report for the judicial authorities.** This helps to ensure that – in the case of victims of physical and sexual assault – the roles of attending physician and forensic physician are kept separate wherever possible (an approach that is favoured by the Committee). However, if no attending physician is available to cover the care aspect, the forensic physician can carry out medical procedures in accordance with a protocol (prescribing contraception, providing prophylaxis against infectious diseases, etc.).

4.2.4 *Careless handling of evidence*

Another point of concern is that evidence is frequently lost while physicians are examining the victims of physical assault (including child abuse) or sexual assault. This, too, is related to the different roles of the attending and forensic physicians, together with a lack of expertise and experience.

Attending physicians are focused on treating the victim, not on securing any potential evidence. Accordingly, when an injured patient arrives at a hospital, the physicians there just want to administer treatment without having to wonder whether it is necessary to secure any biological trace material.[123] In addition,

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* A reporting code is a roadmap that describes how professional practitioners (teachers, physicians, etc.) are expected to deal with the identification and reporting of domestic violence and child abuse.[119,120]A reporting code clarifies the steps that professional practitioners can take to help victims, such as opening a dialogue with parents, consulting a physician on the staff of an Advice and Reporting Center on Child Abuse and Neglect (and Domestic Violence), or calling in a forensic physician.[121,122]

** Some forensic physicians specialise in the diagnosis of injuries in children. There is a real need for their services, as injury diagnosis in children is quite different from injury assessment in adults. For instance, evidence of injury tends to disappear more quickly in children than in adults. Children are sometimes not able (or not yet able) to describe what has happened to them. In cases such as this, forensic physicians must be on the lookout for other clues provided by the victims of suspected child abuse. Increasingly, forensic physicians (from the Forensic Medical Child Abuse Center) are being called in before the police and the judicial authorities become involved. The goal is to help to clarify the problem by conducting a preliminary procedure (of a medical nature). This approach is mainly used in the areas of child abuse, elder abuse and domestic violence, as treatment is often preferred to prosecution.

such physicians often lack a knowledge of forensic medicine. In America, specialised forensic nurses are trained for this very purpose. In addition to tending to the victims of physical or sexual assault, they are also concerned with the collection of evidence. This approach is also gaining ground in the Netherlands. Indeed, the Accident and Emergency Department of Erasmus MC in Rotterdam already has a forensic nurse (who trained in the USA) on its staff. Forensic nurses* are also to be found at the Forensic Medical Child Abuse Center in Utrecht and at the various sexual assault centres.Their duties include recording details of injuries and collecting evidence. These forensic nurses are the link between medical treatment and forensic investigations.

Attending physicians are not the only ones to lose valuable biological trace material. Forensic physicians, too, are not always familiar with procedures for securing evidence. While the basic training in forensic medicine does include a module on "Trace evidence analysis and forensic techniques", the specialised training programme in forensic medicine and the programme for specialists in public health medicine a forensic medicine specialisation devote no further attention to securing evidence.

4.2.5 Inadequate reporting

Forensic medical reports drawn up by physicians, including injury reporting, are not always suited to the needs of the police and those of the Public Prosecutor.[64] This mainly concerns reports (including injury reports) by attending physicians. Physicians need to remember that these reports are destined for individuals who have no medical training. Suggestive language ("This injury is a stab wound") and technical jargon tend to undermine the usefulness of such reports. If attending physicians are to produce effective injury reports, they must have a basic knowledge of criminal law. This is not usually the case.

Yet this point is covered in medical postgraduate programmes in forensic medicine. For instance, basic training in forensic medicine includes a module entitled "Injury and sexual offenses", which deals both with the photographic recording of injuries and with injury reporting. No practical training is given, however. This gives rise to doubts about whether novice forensic physicians are indeed able to deliver the required quality.

* In January 2013, the Centre for Forensic Medicine and Behavioural Sciences launched a forensic nursing programme that was developed by the Forensic Medical Child Abuse Center and the Amsterdam municipal or community health service. See http://www.polikindermishandeling.nl/over-ons/publicaties/opleiding-forensische-verpleegkunde.

4.2.6 *Poor performance in the role of court expert*

Forensic physicians often perform poorly in the role of court experts in criminal cases. The use of specialised jargon can be a particular problem for public prosecutors and criminal court judges. In addition, physicians are often unfamiliar with court procedures.

To date, only a limited number of general forensic physicians have acted as court experts. If such physicians are likely to carry out this duty more often in future, then the current training programmes, at least, are not fit for purpose. Postgraduate programmes in forensic medicine make no mention of the role of court expert. However, experts at the Netherlands Forensic Institute do receive training in this area, one of the options being court training courses.

The lack of legislation is also partly responsible for the problems associated with those acting as court experts. Because the area of expertise in which forensic physicians work has not (or not yet) been standardised by the Netherlands Register of Court Experts, ad hoc experts are appointed by an examining magistrate. That can give rise to unwarranted variability in terms of individuals' expertise and their ability to act as court experts. This is because only those experts whose names appear in the Netherlands Register of Court Experts have passed tests of their professional competence. By using the experts listed in the Netherlands Register of Court Experts it is possible to meet the quality requirements imposed by the Experts in Criminal Cases Act on those acting in this capacity.[49]

4.3 Conclusion

This chapter addresses various points of concern in the practice of forensic medicine.

Points of concern in the provision of medical care to detainees in police custody

Although little data is available, it seems that the provision of medical care to detainees in police custody occasionally has to pay the price for the fact that forensic physicians (due to their relatively limited postgraduate programmes) do not always have the medical knowledge and practical experience needed. Similarly, general practitioners (who are occasionally called in for the care and treatment of detainees) lack any knowledge of the target group, nor are they

familiar with the forensic perspective. Yet specific expertise is particularly important in the area where care intersects with investigation, together with a perspective that serves both interests.

Points of concern in forensic medical examination

There are also problems in the second most important task in forensic medicine, forensic medical examination. Here, too, data is not always available.

Nevertheless, research has shown that probably about thirty percent of cases of death by unnatural causes (as derived from Form B) were wrongly certified as death by natural causes, as the attending physicians failed to perform the post mortem external examination properly. The result is that there is no additional forensic medical examination in such cases, and a potential prosecution – if applicable – is ruled out from the outset.

With regard to the assessment of injuries resulting from physical assault or child abuse (another point of concern), the scale of the problem will not be fully appreciated until the recognition of such injuries improves. This would require attending physicians and other practitioners to make consistent use of the reporting code in the event of suspected or confirmed injury from violence.

There is also a problem with regard to securing evidence. Attending physicians often have little regard for such matters, as their focus is on the health of the patient. Moreover, their forensic knowledge is somewhat limited. Yet forensic physicians, too, do not always have the necessary expertise.

Finally, reporting on injuries and acting as a court expert are roles that both need to be strengthened.

Chapter 5

Strengthening in five areas

Now that the points of concern have been identified, it is time to explore various avenues for potential solutions. The Committee discusses five areas that offer scope for improvement.

5.1 Towards a new position for the profession

When discussing the points of concern, it emerged that medical and forensic medical procedures differ significantly from one another in certain respects. Attending physicians tend to focus on the health and welfare of patients, whereas forensic physicians serve the judicial system, in which context they also provide care.

This necessarily involves a difference in perspective. In practice, however, the existence of cultural differences between the two fields is less than ideal. These differences are also more pronounced than is necessary. Attending physicians often have little regard for the social importance of security and investigations. They also appear to have a poor understanding of these areas.

That is hardly surprising, given the current position of forensic medicine. The medical undergraduate programme pays scant attention to forensic issues. The same applies to non-forensic postgraduate programmes, even if the issues of physical assault or death by unnatural causes are eminently relevant to the field in question (e.g. general practice medicine, paediatrics, emergency medicine, and geriatric medicine). The specialised forensic medical postgraduate programmes,

too, should ideally be far more intensive, both in theoretical and practical terms. The field also has a very restricted academic position.

This makes it difficult for forensic medicine to resolve its image problem. The limited status and reputation of the profession tend to undermine attempts to interact with other disciplines on an equal footing. Accordingly, the influx of physicians (or senior house officers) is insufficient to meet expected future demand, so quality might once again be at stake. Moreover, each of these factors can amplify each other's adverse effects.

The question, of course, is how to bring about change. The Committee has put forward proposals in five areas, each of which needs to be strengthened. These are set out below. Together, the recommended measures represent a package that can give the profession of forensic medicine renewed impetus in its efforts to achieve a new position within medicine as a whole.

5.2 Strengthening in five areas

5.2.1 Strengthening and improving training

Inclusion in the medical undergraduate programme

The Committee believes that certain aspects of forensic medicine, such as injury assessment in suspected cases of physical assault (or child abuse) and post mortem external examinations, are relevant to clinical practice in many specialisms. These can be seen as general competences of physicians, and thus part of their basic skill set. Accordingly, it should ideally be placed on an equal footing with the other aspects of basic medical training. The way in which VU University Amsterdam, the University of Amsterdam, and Utrecht University have integrated forensic medicine into their existing medical undergraduate programmes could serve as a useful model in this regard.*

The inclusion of basic forensic medical skills in the medical undergraduate programme offers one solution to the future shortage of forensic physicians. It will also benefit the quality both of injury assessment in cases of physical assault (or child abuse) and of post mortem external examinations. Quality improvements in post mortem external examinations might also help to prevent the wrongful omission of forensic autopsies (and post-mortem toxicological analyses).

* Forensic aspects are, of course, also important for vocational training programmes such as the obstetrician programme and the physiotherapy programme. However, any consideration of these programmes is beyond the scope of the present advisory report.

Expanding the scope of forensic medical postgraduate programmes

In Chapter 3 it was established that forensic-medical programmes are relatively short, and primarily theoretical in nature. This is especially true of the basic training programme offered by the Netherlands School of Public and Occupational Health and, to a lesser extent, of the specialised training programme. That has to change.

The inclusion of practical training and internships would not only improve the postgraduate programmes, and make them more attractive, it would also enhance the prestige of forensic physicians, thereby easing any cultural imbalances with the rest of the medical sector. This expansion of scope will also help to improve quality in the medical care provided to detainees in police custody, in forensic post mortem external examinations, and in forensic medical reports. Furthermore, practical training and internships will benefit those involved in the careful collection of evidence, while enabling individuals acting as court experts to do so more effectively.

In the short term, trainee forensic physicians will at least complete the full basic training in forensic medicine, as this will enable them to register with the Forensic Medical Society. In the long term, however, it will be essential to expand the forensic medicine programme. This is also in keeping with the policy of instructing residents in training to become specialists in the seven CanMEDS* competencies: medical practice, communication, cooperation, knowledge and science, social practice, organisation and professionalism. With effect from 2015, all residents in training to become specialists must have demonstrably mastered these competencies. However, the current basic training programme in forensic medicine does not yet meet this requirement. Unlike the general practice medicine programme or the emergency medicine programme, for example. In the Committee's view, a fully rounded postgraduate programme in forensic medicine that is also capable of meeting the CanMEDS competencies requires a three-year programme. In Annex E, the Committee provides a blueprint of the new postgraduate programme in forensic medicine, which is still in the planning stages.

It might also be worth considering whether forensic medicine should become a separate specialism, like the profession of sports physician, which is recognised

* CanMEDS is a competency-based framework for medical education. It was developed by the Royal College of Physicians and Surgeons of Canada. The term CanMEDS is a contraction of the words Canadian Medical Education Directives for Specialists.

by the Specialists in Public Health Medicine Registration Committee.*

Furthermore, if a university medical postgraduate programme in forensic pathology was to be established, as an alternative to the postgraduate programme offered by the Netherlands Forensic Institute, this would help to strengthen the practice of forensic medicine. It would also be helpful in terms of harmonising the salaries of clinical and forensic pathologists and for creating combined positions in which individuals could practice both clinical and forensic pathology. Such measures might lower the threshold for individuals considering a career in forensic pathology.

Consideration should be given to the possibility of amending the programme in forensic pathology to eliminate comprehensive training in clinical pathology. This would bring the Netherlands into line with neighbouring countries. The new programme could involve three years of clinical pathology, for example, plus a year of molecular biology, training in reporting and court procedures, and a science internship. This would then lead to the establishment of forensic pathology as a new specialism with a clear scientific status.

Expanding forensic expertise in other postgraduate programmes

Although natural and unnatural death, skin trauma, physical assault (or child abuse) and social issues are included in the final attainment levels of various medical specialist postgraduate programmes (e.g. general practice medicine, geriatric medicine, paediatrics, and emergency medicine), little attention is devoted to specific forensic and judicial aspects. That needs to change. The inclusion of forensic medical skills, such as performing post mortem external examinations *lege artis* (in accordance with the law), the proper assessment of injuries in cases of physical assault (or child abuse) or sexual assault, and identifying cases of poisoning, will give a significant boost to the quality of forensic medical practice. It is also important to improve the judicial expertise of attending physicians, especially in relation to professional

* Sports physicians are trained at the Netherlands Institute of Sports Medicine, which has been accredited as a training institute by the Specialists in Public Health Medicine Registration Committee. In addition to theoretical and practical modules, the four-year sports physician programme includes scientific research. Those completing the programme can register with the Specialists in Public Health Medicine Registration Committee. There are currently 103 registered sports physicians, and another 34 are in training. At the end of 2011, the College of Medical Specialisms launched a procedure to recognise sports medicine as a distinct specialism.

confidentiality.*

This could also help to improve communication between medical practitioners and those working in the field of forensic medicine, in addition to encouraging interdisciplinary cooperation. Greater use could be made of specially trained forensic nurses who, in addition to tending to the victims of physical or sexual assault, would also collect evidence. This, too, would benefit interdisciplinary cooperation.

Increased expertise among attending physicians will also result in fewer cases being wrongly certified as death by natural causes. This could lead to increased demand for forensic autopsies and post-mortem toxicological analysis – which needs to be taken into account when safeguarding available capacity.

5.2.2 *Monitoring and promoting quality*

In order to perform their vital quality assurance role, the police and the judicial authorities need a basic understanding of the requirements to be met by the practitioners of forensic medicine. The Committee feels that the relevant programmes need a greater focus on forensic medicine than is currently the case. In addition, it is important for the police and judicial authorities to be sufficiently aware of the relationship between investigations and professional confidentiality, and of when they may (or may not) request information from attending physicians.

Quality assessment and quality promotion are a first step towards formulating forensic medical guidelines and developing quality systems. However, there is certainly still room for improvement. For instance, many guidelines have not been formulated in accordance with the procedures of evidence-based medicine, so their actual status is more that of a protocol.

A strengthened scientific field should be able to generate the impetus needed for evidence-based guideline development. The development of evidence-based guidelines is also expected to expose any gaps in our knowledge, which may then help to steer the research agenda (see Section 5.2.3).

However, it will not be possible to create a fully fledged quality system until the guidelines have been adequately substantiated, implemented, and tested in

* In the event of suspected child abuse, medical counsellors on child abuse from the Advice and Reporting Center on Child Abuse and Neglect (and Domestic Violence) work closely with physicians (and forensic physicians), mainly to confirm or exclude the possibility of child abuse. The medical counsellor can also advise fellow physicians on when it is, or is not, acceptable to break the rule of professional confidentiality. This is because medical counsellors are continually being confronted with dilemmas of this nature.

practice. It is worth noting that these issues are closely interlinked. The better the quality of the underlying research data, the more effectively the guidelines can be applied in practice. It also helps when guidelines are drawn up within the profession itself and where a system is in place to support their application in practice, for example, by fostering in-service training and continuing education in the context of registration and re-registration as a forensic physician. Recording the procedures followed in everyday practice is another essential element of a quality system.

In forensic medicine, this triad of guidelines, knowledge expansion, and assessment needs strengthening. The lack of an adequate recording system to document the reasons for taking a given action and the results obtained means that it is not yet possible to compare the procedures followed by one forensic physician with those used by another, nor is it possible to select a benchmark*. Moreover, the Harmonisation of Quality Review in Health Care and Welfare's forensic medicine certification schedule is mainly procedural in nature. Peer supervision, peer review and independent quality inspection are insufficiently formalised.

What is needed, in terms of quality assurance and quality promotion, to achieve real improvements? To some extent, the answer is to strengthen the scientific basis of the profession. This would allow guidelines to be properly substantiated, in addition to being more fully accepted and implemented. In addition, peer supervision, peer review and independent quality inspections could be made mandatory. A registration system is also required, to ensure the accountability of forensic medical practice. This will ultimately lead to the development of quality indicators.

Quality policy could also be extended to include a system designed to evaluate the performance of individual medical specialists, as recommended by the Royal Dutch Medical Association in the "Staan voor kwaliteit" (We Guarantee Quality) quality framework for medical care.[124]

* "Benchmark" is a quality assurance term. It refers to a frame of reference or calibration framework, and provides a procedure that can be used to compare the performance of one organisation with that of another.

Instruments for quality assurance and quality improvement

Peer supervision

Peer supervision is a professional development tool that enables professional practitioners or staff to jointly reflect on issues that they each encounter in their own working situations. Rather than providing concrete solutions, these joint reflection sessions involve the use of a peer supervision method to pose questions.[125,126]

Peer review

The purpose of peer review is to monitor and promote professional procedures by comparing current procedures with the standards and guidelines used by other professional practitioners in the same discipline. Professional practitioners use peer review as an opportunity to discuss technical expertise, professional practice, and the way in which work processes are organised.[127]

Independent quality inspection

Independent quality inspection is a form of external inspection based on an inspection plan and predetermined quality criteria. It involves an assessment of the quality of a department or practice by a team of experts from the same sector. Such teams have no links to the institution or professional practitioners undergoing the independent quality inspection.[128]

Evaluation of the individual performance of medical specialists

Evaluations of the performance of individual medical specialists involve an evaluation interview, and an assessment of the portfolio maintained and updated by the individual under evaluation (i.e. data on the professional performance of the specialist in question, including their personal views of the matter), as well as the resulting personal development plan (PDP).[129]

Interdisciplinary collaboration (which is also important in terms of quality) can be improved by the creation of additional multidisciplinary regional centres* to address the medical and forensic aspects of physical assault (or child abuse) or sexual assault. This makes it possible to achieve a more integrated approach to physical assault (or child abuse) and sexual assault.[130,131] In centres of this kind, which focus on the victims/patients, attending physicians, child and youth care services, the Advice and Reporting Centre on Child Abuse and Neglect (and Domestic Violence), forensic physicians, and the police/judicial authorities operate as an integrated whole.

Ultimately, a fully functional quality system in forensic medicine can help to bring about the hoped-for improvements in such areas as the provision of medical care to detainees in police custody, post mortem external examinations, post-mortem toxicological analysis, injury assessment, and the proper collection of evidence.

5.2.3 *Strengthening scientific research*

In the Netherlands, scientific research in forensic technology, and especially the forensic biological branch, is of a relatively high level. The same cannot be said of scientific research in the fields of forensic medicine and forensic toxicology, which is still in its infancy (Annex H). In part, this may be due to problems with the funding of applied scientific research in the field of forensic medicine, together with a lack of instruction on the scientific attitude, within the forensic medicine programme.

Research projects currently being carried out at the Amsterdam municipal or community health service, Radboud University Nijmegen/the IJsselland municipal or community health service, the Netherlands Forensic Institute, and the Maastricht Forensic Institute are a first step towards raising Dutch scientific research in forensic medicine to a higher level. However, it is vital to pursue this path still further while at the same time expanding the available options. In addition to boosting quality assurance and promotion, this will also help forensic physicians to be more effective in their professional practice.

After all, it is solid scientific research that provides the basis for evidence-based guidelines (see box).

* Existing multidisciplinary centres for tackling child abuse and sexual assault include the multidisciplinary child abuse centres in the Haarlem and Leeuwarden regions, and the centres for victims of sexual assault in the Utrecht and Nijmegen regions.

Evidence-based medicine and guideline development

Evidence-based medicine

Evidence-based medicine involves the conscientious, explicit and judicious use of the best available evidence when making decisions for individual patients, given the current level of knowledge (or medical knowledge).

Guideline development

In line with the analysis of the best external evidence for the efficacy of medical care, professional groups are developing evidence-based guidelines for use in everyday practice.

An evidence-based guideline is a document containing recommendations aimed at improving the quality of care. It is founded on systematic summaries of scientific research and assessments of the pros and cons of different care options, supplemented by the expertise and experience of healthcare professionals and care consumers.[132]

A structured development process (evidence-based guideline development) is used to assure the quality of such guidelines. This process consists of the following steps: an analysis of the points of concern and the identification of problems, formulating initial questions, systematically searching for relevant scientific literature. The next step is to select, assess, grade and systematically summarize such scientific literature. This process also includes formulating recommendations for everyday practice while also paying due regard to other considerations and client preferences. This ultimately results in a draft guideline, which is assessed by scientific bodies and patient associations. This is followed by the authorisation, dissemination, implementation and evaluation of the definitive guideline.[132]

One way of encouraging such knowledge development would be to expand the existing funding arrangements for applied scientific research in forensic medicine. A chair in forensic medicine, together with an associated research group, would clarify the position of the profession and raise its status. This, in

turn, would facilitate relations between the medical profession and forensic medicine, both in the educational programmes and in everyday practice. It would also motivate physicians (or senior house officers) to take the forensic physician programme.

Strengthening the academic position of forensic medicine would also make it easier to initiate scientific research projects, for instance by facilitating cooperation between forensic laboratories (or laboratories specialising in forensic technology) and clinics or municipal or community health services, since effective cooperation is a pre-requisite for good-quality forensic-medical investigation.

If an academic collaborative centre were to be established, this would enhance the effectiveness of interactions between the everyday practice of forensic medicine and the field of scientific research. Academic collaborative centres provide an environment in which expertise can be exchanged between the areas of everyday practice, research, policy and educational programmes. As a result, institutions involved in everyday practice will shift towards evidence-based practice, while research institutes will carry out more applied research. Academic collaborative centres also offer a suitable platform for cooperation with non-forensic medical disciplines. In an academic collaborative centre for forensic medicine, a chair in forensic medicine should also be represented along with the associated research group. There should also be representatives of the Dutch Association of Municipal or Community Health Services, regional forensic services, the police and the judicial authorities. These representatives would then establish research priorities through a process of consultation.

5.2.4 *Improvements to organisational position and funding*

Improving the organisational position

The Committee takes the view that it is important for the practice of forensic medicine in the Netherlands to be organised effectively, through the municipal or community health services, for example, as this will ensure the quality of forensic medical care and forensic medical examination.* It is important to involve those regional forensic services that are operating effectively, as mentioned in Section 3.3.2. In addition, the increased scale of the municipal or

* This would ideally involve one municipal or community health service per regional unit of the National Police Force, making ten in all. This could be very compatible with existing plans for the extensive regionalisation of the Dutch Association of Municipal or Regional Public Health Services.

community health services should create an adequate workload for forensic physicians. As a result, the number of procedures carried out should be sufficient to maintain forensic physicians´ expertise at the requisite level.[51]

The current situation involves differences (sometimes quite substantial ones) in the quality of forensic medical care and forensic medical examination. This is partly due to the fact that, in certain regions in the Netherlands, some aspects of this care are outsourced, leading to the fragmentation of forensic physicians' duties. This fragmentation could lead to a reduction in the volume of forensic medical procedures. This, in turn, would limit forensic physicians' opportunities to gain experience or leave them with insufficient routine work. This can be detrimental to quality and expertise. The Committee is, therefore, of the opinion that forensic physicians must have a full range of duties, i.e. including the provision of medical care to detainees in police custody.

If forensic medical care and investigation become subject to the European public procurement process (a development that is not favoured by the Committee), it is of paramount importance that the contracting parties are able to meet very strict requirements and that they are able to deliver the full range of forensic medical care and investigation. This is because the provision of medical care to detainees in police custody and the independent investigation of deaths are government responsibilities inherent in the European Convention on Human Rights* and because fragmentation of the range of duties involved would be undesirable.

In addition, it is also important to strengthen the position of forensic physicians within municipal or community health services. This position is currently not as strong as that of other physicians in municipal or community health services, such as specialists in child health care, and infectious disease control. A fixed range of duties should be assigned to forensic physicians, to strengthen their position.

* In a number of judgments, the European Court of Human Rights (ECHR) has determined that the government is responsible for providing medical care to detainees in police custody. If no such care is provided, or if it is inadequate, then this may be a violation of Article 3 (inhuman treatment) or, if a lack of care results in death, a violation of Article 2 of the European Convention on Human Rights. It also follows from Article 2 that the state is responsible for conducting independent investigations into the circumstances surrounding any deaths (post mortem external examination), especially in the case of criminal offences.

Simplifying funding

The expenses incurred by forensic physicians in their role as local authority forensic physicians are currently covered by the local authority in question, although the work involves investigations and prosecutions. One problem with this funding structure is that local authorities do not consider this judicial task to be a priority, and they sometimes even refuse to pay.

There is an even greater uncertainty about the reimbursement of expenses to cover both the costs of assessing injuries relating to physical assault (or child abuse) or sexual assault, and the injury report. While the costs involved are sometimes reimbursed by victims' health insurance companies, they are usually charged to the police, the judicial authorities, or the municipal or community health service. In some cases they are not reimbursed at all.

As shown in a previous section of this advisory report, the funding of medical postgraduate programmes in forensic medicine is poorly organised. Most postgraduate programmes in medical specialisms are funded by the Fund for Education in Care. However, this does not apply to forensic medicine programmes. This can have the effect of reducing influx, while adversely affecting quality.

In addition, quality assurance and promotion pay the price for this fragmented funding. No single agency is responsible for the quality of the practice of forensic medicine as a whole.

How can the situation relating to funding be further clarified? With regard to reimbursements for procedures, it seems obvious that these should be handled by the Ministry of Security and Justice. After all, security and jurisprudence are at the heart of a forensic physician's work, both when conducting forensic post mortem external examinations and when providing care and treatment to detainees in police custody. The same is true of injury assessment in suspected cases of physical assault. As all of these procedures are carried out in a judicial context, they should preferably be reimbursed by the Ministry of Security and Justice. By extension, this ministry should also bear the financial responsibility for quality assurance and quality promotion.

The funding of postgraduate programmes also needs modification. This could be simplified by setting up a new government fund, similar to the Fund for Education in Care, to reimburse the cost of the forensic medicine programme. The Ministry of Security and Justice, the Ministry of Health, Welfare and Sport, and the Ministry of the Interior and Kingdom Relations should all contribute to this new fund. This could help to ease the future shortage of forensic physicians

by making the programme more appealing to physicians (or senior house officers).

5.2.5 *Amending legislation and regulations*

When discussing the various points of concern, a number of legal issues were raised that require further consideration. The Committee would like to address these points here.

The Burial and Cremation Act states that only physicians who are listed in a register specially kept for the purpose (and who have therefore been adequately trained) can be appointed as local authority forensic physicians. However, the Act gives no details of the exact procedure to be followed during post mortem external examinations.* In addition, there are no good quality, widely applicable professional guidelines. That simply serves to undermine quality.

Another point is that, as stated in the Burial and Cremation Act, all autopsies (whether or not ordered by a judicial authority) must be performed by a qualified physician. However, the Act makes no mention of mandatory specialisms. This means that forensic autopsies can be performed by physicians who have not been specially trained for the purpose. This is not an ideal situation.

The Committee has also noted that, on the death of a minor, the NODO procedure (further investigations to establish the cause of death) comes into effect, yet there is currently no equivalent procedure for adults. It also noted that the area of expertise in which forensic physicians work has not (or not yet) been standardised by the Netherlands Register of Court Experts. Experts are appointed on an ad hoc basis by an examining magistrate. This can give rise to unwarranted variability in terms of individuals' expertise and in their ability to act as court experts. Finally, the Committee notes that there is a need for effective harmonisation of the action protocols used by physicians (including attending physicians) and the police.

It is therefore recommended that the relevant legislation and regulations be amended. That would involve:

- Preparation and adoption of the Post mortem external examination and Forensic Investigation Act or amendment of the Burial and Cremation Act,

* In cooperation with the Forensic Medical Society, the Centre of Expertise for Medical Affairs of the Rotterdam public prosecutor's service is preparing an Post mortem external examination and Forensic Investigation Act.

such that details of the procedure to be followed during post mortem external examinations are determined by law.
- Drafting a widely applicable guideline for post mortem external examinations.
- Introducing a NODO procedure (further investigations to establish the cause of death) in the event of the unexplained death of an adult (after first evaluating the NODO procedure used for minors).
- Standardisation of the area of expertise in which forensic physicians work, carried out by the Netherlands Register of Court Experts.
- The preparation of action protocols for attending physicians and the police: "If an investigation is required after providing care", "Who will assess injuries and who will issue an injury certificate in suspected cases of physical assault (or child abuse)"?

These measures, in particular the preparation of professional protocols and guidelines, will contribute to the quality of post mortem external examinations. This may help to prevent the wrongful omission of forensic post mortem external examinations and post mortem toxicological examinations. The proposed changes will also contribute to the quality of injury assessment and will help to improve the performance of individuals acting as court experts.

5.3 Conclusion

This chapter addresses five areas that are in need of attention, to resolve various points of concern in the practice of forensic medicine. If measures are taken in each of these areas, then forensic medicine as a profession will occupy a first-class position in the medical world, giving its practitioners a solid practical and scientific grounding in both the medical and forensic aspects of their profession. It will also strengthen cooperation with other disciplines, while improving the way in which the forensic perspective is presented within those disciplines. Taken together, this can boost quality in general and the influx to postgraduate programmes in forensic medicine in particular, both of which are vital, given the omissions that have been identified and future capacity problems.

Chapter 6

Recommendations

In this chapter, the Committee formulates recommendations for each of the areas (mentioned in Chapter 5) that need strengthening in order to tackle points of concern in the practice of forensic medicine. These recommendations are building blocks for the process of professionalising forensic medicine in the Netherlands.

Forensic psychiatry has been largely disregarded in this advisory report on forensic medicine. Nevertheless, the Committee would like to call attention to the fact that here too there are points of concern, especially in terms of the relevant academic knowledge infrastructure. Accordingly, before formulating recommendations on forensic medicine, the Committee concludes that a request for advice could justifiably be submitted for this discipline as well. The same applies to forensic pathology and forensic toxicology.

6.1 Strengthening and improving teaching

1 To the Dutch Federation of University Medical Centers

The Committee recommends that basic forensic medical skills be included in the current medical undergraduate programme. The inclusion of the post-mortem physical examination and injury assessment in the list of skills set out in the Dutch Federation of University Medical Centers' blueprint for the basic medical

programme is seen as a significant spur to this end (5.2.1).*

2 To the Forensic Medical Society, the Dutch Association of Municipal or Community Health Services, and the College of Medical Specialisms

The medical postgraduate programme in forensic medicine is in need of further reorganisation (5.2.1).

3 To the professional associations involved**

Lecture-based courses and practical training in the field of post mortem external examinations, injury assessment in suspected cases of physical assault (or child abuse) or poisoning should be added to the relevant specialist medical postgraduate programmes, such as general practice medicine, emergency medicine, paediatrics, geriatric medicine, trauma surgery, medical counsellor training programmes, obstetrics and gynaecology, pathology and dentistry, disciplines that frequently come into contact with forensic medicine (5.2.1).

4 To the Dutch Federation of University Medical Centers and the College of Medical Specialisms

The Committee recommends that judicial expertise in the areas of maintaining or breaching professional confidentiality and of dealing with this issue in practice should be expanded, both in the case of senior house officers and residents in training (5.2.1).

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* The numbers cited in the recommendations refer to the sections (in chapters four and five of this advisory report) in which the recommendations are explained in detail.

** Dutch College of General Practitioners; the Netherlands Society of Emergency Physicians; the Dutch Pediatric Association; the Dutch Association of Elderly Care Physicians and Social Geriatricians; the Dutch Society for Trauma Surgery; the Dutch Society for Obstetrics and Gynaecology; Royal Dutch Organisation of Midwives; the Dutch Pathological Society; the Association of Medical Child Abuse Counsellors; the Dutch Dental Association; the Royal Dutch Society for Physical Therapy; and the College of Medical Specialisms.

6.2 Monitoring and fostering quality

5 To the Ministry of Security and Justice

There must be a greater focus on forensic medicine in the relevant training programmes for the police/judiciary, including the area covering the relationship between investigations and professional confidentiality (5.2.2).

6 To the University Medical Centers, the Dutch Association of Municipal or Community Health Services, regional forensic services and other parties

The Committee recommends that an academic collaborative centre in forensic medicine be established (5.2.3).

7 To the Forensic Medical Society

Ideally, a system of registration and re-registration should be established, with the associated quality requirements (activities in the practice, in-service training and continuing education, peer review, peer supervision) (5.2.2).

8 To the Forensic Medical Society

It is recommended that a programme for the drafting and updating of evidence-based guidelines be launched (5.2.2 and 5.2.3).

9 To the Forensic Medical Society and other professional associations/groups, such as the police

The Committee recommends that a widely applicable guideline for post mortem external examinations be established, as well as the following action protocols: “If an investigation is required after providing care”, “Who will assess injuries and who will issue an injury certificate in suspected cases of physical assault (or child abuse)” (5.2.5)?

10 To the Forensic Medical Society

Every effort should be made to create a structured quality policy (including checking procedures carried out in practice). In particular, this should involve the implementation of guidelines in practice, for example by mandating independent quality inspections and evaluating the performance of individual forensic physicians (5.2.2).

6.3 Strengthening scientific research

11 To the University Medical Centres, and the Dutch Federation of University Medical Centers

The academic position of forensic medicine requires the establishment of a chair in forensic medicine, with an associated research group (5.2.3).

12 To the Forensic Medical Society

The Committee recommends that, as with other medical postgraduate programmes, academic development be included in postgraduate programmes in forensic medicine (5.2.3).

13 To the Ministry of Education, Culture and Science, the Ministry of Health, Welfare and Sport, the Ministry of Security and Justice, the Netherlands Organisation for Scientific Research, the Netherlands Organisation for Health Research and Development, and partners

Funding options should be created for applied research in the field of forensic medicine. In addition to the funding of an academic collaborative centre, consideration could be given to the establishment of a research programme in forensic medicine, and to optimising the use of European research budgets (5.2.3).*

* Details of some of the financial implications of this recommendation are set out in Annex I.

6.4 Improvements to organisational position and funding

14 To the Ministry of Security and Justice

The Committee recommends that the practice of primary forensic medical care throughout the Netherlands should be organised effectively, to ensure the quality of forensic medical care and forensic medical examination. This could be achieved, for example, by incorporating this practice into municipal or community health services throughout the Netherlands (5.2.4).

15 To the Ministries of Health, Welfare and Sport, and of the Interior and Kingdom Relations, and of Security and Justice

The Committee recommends a further exploration of ways in which the government could best fund the new postgraduate programme in forensic medicine. This could involve setting up a new government fund, similar to the Fund for Education in Care (5.2.4).*

16 To the Ministry of Security and Justice

The Committee recommends that all forensic medical procedures (post mortem external examinations, injury assessment and reporting, the provision of medical care to detainees in police custody) should be funded by the Ministry of Security and Justice, as well as the quality assurance and promotion required for high-quality forensic medical practice (5.2.4).*

6.5 Amending regulations (and legislation)

17 To the professional associations and the Ministries of Health, Welfare and Sport and of Security and Justice

Following a thorough evaluation of the NODO procedure (further investigations to establish the cause of death) for deceased children, this should gradually be extended to include other age groups (5.2.5).

* Details of some of the financial implications of this recommendation are set out in Annex I.

18 To the Ministries of the Interior and Kingdom Relations and of Security and Justice

The Committee recommends that an Post Mortem External Examination and Forensic Investigation Act be drawn up or that the existing Burial and Cremation Act be amended to ensure that a detailed description of the exact procedure to be followed during post mortem external examinations is defined in a law (5.2.5).

19 To the Royal Dutch Medical Association

If the "Child abuse and domestic violence" reporting code is reviewed, a clear role should be assigned to forensic physicians (4.2.3).

20 To the Netherlands Register of Court Experts

It would be best to start with standardisation of the area of expertise in which forensic physicians work, by the Netherlands Register of Court Experts (5.2.5).

21 To the Forensic Medical Society, the Dutch Association of Municipal or Community Health Services, the regional forensic services and hospitals

The areas of cooperation between clinical specialisms, medical counsellors for physical assault (or child abuse) at Advice and Reporting Centres on Child Abuse and Neglect (and Domestic Violence) and forensic medicine need to be formalised. To this end, therefore, every hospital would need to enter into a partnership with an Advice and Reporting Centre on Child Abuse and Neglect (and Domestic Violence) and a regional forensic service or municipal or community health service. This must include agreements on post mortem external examinations, injury assessment, sexual offenses and the exchange of data (5.2.2 and 5.2.5).

6.6 To take care of implementation

22 To the Forensic Medical Society and the ministries involved

The Committee feels that a steering group should be appointed to monitor implementation of the formulated recommendations. This steering group could be composed of representatives from the Forensic Medical Society and from the relevant ministries.

Literature

1 Crommentuyn R. Alleen zinloos geweld went nooit. Medisch Contact 2011; 66(16): 966-970.

2 Das C, Duijst WLJM. Forensische geneeskunde in Nederland. In: Duijst WLJM, Das C, editors. Handboek forensische en penitentiaire geneeskunde. Apeldoorn-Antwerpen: Maklu; 2011: 9-17.

3 Staatsblad van het Koninkrijk der Nederlanden. 320 Wet van 12 juni 2009, houdende wijziging van de Wet op de lijkbezorging. Den Haag: Sdu Uitgevers.

4 Bender PPM. Medische zorg aan arrestanten. In: Duijst WLJM, Das C, editors. Handboek forensische en penitentiaire geneeskunde. Apeldoorn-Antwerpen: Maklu; 2011: 209-222.

5 Traa M. Dokter achter tralies. HP/De Tijd 2011; week 33: 30-36.

6 Dorn T, Ceelen M, de Keijzer JC, Buster MCA, Das C. Medische zorg aan arrestanten: ervaringen met het verschuiven van taken van artsen naar verpleegkundigen. TSG 2009; 8: 366-373.

7 Das C. De lijkschouw. In: Duijst WLJM, Das C, editors. Handboek forensische en penitentiaire geneeskunde. Apeldoorn-Antwerpen: Maklu; 2011: 43-66.

8 Reijnders UJ, Das C. De lijkschouw in de praktijk. Houten: Prelum uitgevers; 2007.

9 Das C. Forensische geneeskunde in Nederland. In: Mackenbach JP, van der Maas PJ, editors. Volksgezondheid en gezondheidszorg. Maarssen: Elsevier gezondheidszorg; 2008: 343-348.

10 Pronk E. Medici en moordzaken. De forensische geneeskunde in de praktijk. Medisch Contact 2001; 25

11 Das C. Letsels en letselverklaringen. In: Duijst WLJM, Das C, editors. Handboek forensische en penitentiaire geneeskunde. Apeldoorn-Antwerpen: Maklu; 2011: 71-81.

12 Reijnders UJL, Das C, Drijber BC, Lulf R. Herkenning van letsel door lichamelijk geweld. Onderzoek, evaluatie en beleid. Een praktische handleiding voor hulpverleners met 600 afbeeldingen in kleur. Houten: Prelum uitgevers; 2008.

13 Stomp SJ. Forensisch onderzoek bij zedendelicten. In: Duijst WLJM, Das C, editors. Handboek forensische en penitentiaire geneeskunde. Apeldoorn-Antwerpen: Maklu; 2011: 107-114.
14 van Amelsfoort AG, Groenendal H, van Manen J. Werkwijze bij het onderzoek op de Plaats Delict (PD). Justitiële verkenningen 2004; 4: 72-83.
15 Benschop CC, Kloosterman AD. Forensisch DNA-onderzoek bij zeden- en geweldsmisdrijven. In: Duijst WLJM, Das C, editors. Handboek forensische en penitentiaire geneeskunde. Apeldoorn-Antwerpen: Maklu; 2011: 129-145.
16 NFI. Factsheet. Het hoe en waarom van FT-normen. Rijswijk: NFI; 2007: maart.
17 Duijst WLJM. Juridische aspecten van de forensische geneeskunde. In: Duijst WLJM, Das C, editors. Handboek forensische en penitentiaire geneeskunde. Apeldoorn-Antwerpen: Maklu; 2011: 19-42.
18 Kubat B. Ontleding in factoren: over forensische pathologie. In: Bol P, Das C, van Everdingen J, de Wolff FA, editors. Speuren naar sporen. Den Haag: Stichting BWM; 2009: 21-27.
19 van Venrooij T. Talloze lijken glippen erdoorheen. Medisch Contact 2011; 66(16): 978-981.
20 Wat is forensische psychiatrie. Nationaal Kompas Volksgezondheid, Geraadpleegd 11 oktober 2012. www.nationaalkompas.nl
21 Het Concilium Psychiatricum van de Nederlandse Vereniging voor Psychiatrie. Herziening Opleiding en Onderwijs Psychiatrie (HOOP). Utrecht: De Tijdstroom uitgeverij; 2009.
22 Mejierman L, Maat GJR, Hovinga-de Boer MC, de Haas M. Forensische Antropologie. In: Duijst WLJM, Das C, editors. Handboek forensische en penitentiaire geneeskunde. Apeldoorn-Antwerpen: Maklu; 2011: 159-173.
23 Tinsel LBGM. Forensische odontologie. In: Duijst WLJM, Das C, editors. Handboek forensische en penitentiaire geneeskunde. Apeldoorn-Antwerpen: Maklu; 2011: 147-157.
24 Gebit zonder end. Tanden zijn soms de enige identificeerbare resten van slachtoffers van rampen. Over forensische odontologie. In: Bol P, Das C, van Everdingen J, de Wolff FA, editors. Speuren naar sporen. Den Haag: Stichting BWM; 2009: 28.
25 Pennings EJM, de Wolff FA. Forensische toxicologie. In: Duijst WLJM, Das C, editors. Handboek forensische en penitentiaire geneeskunde. Apeldoorn-Antwerpen: Maklu; 2011: 175-202.
26 Pennings E. Teveel van ‘t goede: over dosis en effect: over forensische toxicologie. In: Bol P, Das C, van Everdingen J, de Wolff FA, editors. Speuren naar sporen. Den Haag: Stichting BWM; 2009: 31-34.
27 Sjerps M. Forensische statistiek. www.kennislink.nl, Geraadpleegd 2 augustus 2012
28 van Herwaarden CLA, Laan RFJM, Leunissen RRM. Raamplan Artsopleiding 2009. Utrecht: NFU; 2012.
29 Wet op de beroepen in de individuele gezondheidszorg. wetten.overheid.nl, Geraadpleegd 8 november 2012
30 NFI. Vakinhoudelijke opleiding Forensische Pathologie. Eindtermen; versie 1.1 januari 2012. 2012. Den Haag NFI.
31 Werkgroep actualisering Eindtermen en Competenties. Competentieprofiel en eindtermen van de huisarts. Utrecht: Concilium voor de Huisartsopleiding; 2009.

32 Samenwerkende Opleidingen tot specialist Ouderengeneeskunde Nederland (SOON). Landelijk opleidingsplan voor de opleiding tot specialist ouderengeneeskunde. Utrecht: 2011.
33 Nederlandse Vereniging voor Kindergeneeskunde (NVK). Generieke Onderwijs en Evaluatie Doelen (GOED) binnen het curriculum van de opleiding tot kinderarts. Utrecht: Nederlandse Vereniging voor Kindergeneeskunde (NVK); 2010.
34 Projectgroep Ontwikkeling curriculum SEH-arts. Curriculum opleiding tot Spoedeisende Hulp Arts. Utrecht/Tilburg: SOSG/NVSHA; 2008.
35 Nederlandse Vereniging voor Pathologie. Modernisering Opleiding Pathologie. Curriculum 2011. Utrecht: Nederlandse Vereniging voor Pathologie; 2010.
36 Madea, B and Saukko, P, editors. Forensic medicine in Europe. Lübeck, Germany: Verlag Schmidt-Römhild; 2008.
37 Madea B. Forensic medicine in Germany. In: Madea B, Saukko P, editors. Forensic medicine in Europe. Lübeck, Germany: Verlag Schmidt-Römhild; 2008: 143-164.
38 Piette M. Forensic medicine in Belgium. In: Madea B, Saukko P, editors. Forensic medicine in Europe. Lübeck, Germany: Verlag Schmidt-Römhild; 2008: 31-45.
39 Jones R, Shepherd R. The role of the forensic pathologist. http://fflm.ac.uk
40 Batenburg RS, Kalf RRJ. De arbeidsmarkt voor forensisch artsen in 2010. Utrecht: NIVEL; 2011.
41 Buysse W, Loef L, van Dijk B, Verweij S. Vraag en aanbod forensisch-medische expertise bij de aanpak van kindermishandeling. WODC, ministerie van Veiligheid & Justitie: Den Haag; 2011.
42 Maassen H. Mijn kind pakte een heet strijkijzer vast ... Medisch Contact 2011; 66(16): 986-990.
43 van der Heide A, Brinkman-Stoppelenburg A, van Delden H, Onwuteaka-Philipsen B. Sterfgevallenonderzoek 2010. Euthanasie en andere medische beslissingen rond het levenseinde. Den Haag: ZonMw; 2012.
44 Brandt E. Wie wordt er nog forensisch arts? Medisch Contact 2011; 66(16): 1026-1029.
45 Brief van de minister van Volksgezondheid, Welzijn en Sport inzake aankondiging ontwikkelingen betreffende het Opleidingsfonds. 2012.
46 Ministerie van Volksgezondheid WeS. Subsidieregeling zorgopleidingen. 2e tranche. Zorgopleidingen A. Den Haag: Ministerie van Volksgezondheid,Welzijn en Sport; 2011.
47 Ministerie van Volksgezondheid WeS. Subsidieregeling zorgopleidingen. 1e tranche. Den Haag: Ministerie van Volksgezondheid,Welzijn en Sport; 2011.
48 Ministerie van Volksgezondheid WeS. Subsidieregeling zorgopleidingen. 2e tranche. Zorgopleidingen B. Den Haag: Ministerie van Volksgezondheid,Welzijn en Sport; 2011.
49 Staatsblad van het Koninkrijk der Nederlanden. 33 Wet van 22 januari 2009 tot wijziging van het Wetboek van Strafvordering tot verbetering van de regeling van de positie van de deskundige in het strafproces (Wet deskundige in strafzaken). Den Haag: Sdu Uitgevers.
50 Tweede Kamer. Brief van de minister van Veiligheid en Justitie inzake Standpunt over toekomst forensisch onderzoek. 2011-2012, 33 000 VI 106.
51 ALV van GGD Nederland. Toekomstvisie Forensische Geneeskunde binnen de Publieke Gezondheid. GGD Nederland; 2012.

52 Forensisch Medisch Genootschap, GGD Nederland. Richtlijn Forensische Geneeskunde Behandeling opiaatverslaafden in politiecellen. 2009. Internet: www.ggdkennisnet.nl.
53 Forensisch Medisch Genootschap, GGD Nederland. Richtlijn Forensische Geneeskunde Beoordeling Intoxicaties bij ingesloten personen. 2009. Internet: www.ggdkennisnet.nl.
54 Forensisch Medisch Genootschap, GGD Nederland. Richtlijn Forensische Geneeskunde Lijkschouw. 2009. Internet: www.ggdkennisnet.nl.
55 Forensisch Medisch Genootschap, GGD Nederland. Richtlijn Forensische Geneeskunde Late zwangerschapsafbreking. 2010. Internet: www.ggdkennisnet.nl.
56 Forensisch Medisch Genootschap, GGD Nederland. Richtlijn Forensische Geneeskunde Orgaan- en Weefseldonatie. 2009. Internet: www.ggdkennisnet.nl.
57 Forensisch Medisch Genootschap, GGD Nederland. Richtlijn Forensische Geneeskunde Letselrapportage. 2009. Internet: www.ggdkennisnet.nl.
58 Forensisch Medisch Genootschap, GGD Nederland. Richtlijn Forensische Geneeskunde Postmortaal interval. 2010. Internet: www.ggdkennisnet.nl.
59 Forensisch Medisch Genootschap, GGD Nederland. Richtlijn Forensische Geneeskunde Afname celmateriaal voor DNA. 2010. Internet: www.ggdkennisnet.nl.
60 Forensisch Medisch Genootschap, GGD Nederland. Richtlijn Forensische Geneeskunde Behandeling drugsgebruik in de politiecel m.u.v. opiaten en alcohol. 2011. Internet: www.ggdkennisnet.nl.
61 Forensisch Medisch Genootschap, GGD Nederland. Richtlijn Forensische Geneeskunde Bloedafname in het kader van artikel 8 Wegenverkeerswet. 2012. Internet: www.ggdkennisnet.nl.
62 Stichting Harmonisatie Kwaliteitsbeoordeling in de Zorgsector. Forensische Geneeskunde. certificatieschema. Utrecht: Stichting HKZ; 2006.
63 Paauw S. Te dom voor specialist, te lui voor huisarts. Medisch Contact 2009; 64(22): 968-972.
64 Geneeskundige Inspectie van de Volksgezondheid. Gerechtelijke geneeskunde geschouwd. Een onderzoek naar de forensisch geneeskundige dienstverlening in Nederland. Rijswijk: Geneeskundige Inspectie van de Volksgezondheid; 1993.
65 Ceelen M, Dorn T, Buster M, Stirbu I, Donker G, Das K. Health-care issues and health-care use among detainees in police custody. J Forensic Leg Med 2012; 19(6): 324-331.
66 Dekker S. Wat vertel je de politie? Nursing 2007; mei: 14-17.
67 Duijst WLJM. Medisch beroepsgeheim en aansprakelijkheid. www.njb.nl, Geraadpleegd 14 augustus 2012.
68 Duijst WLJM, de Vries AW. Verschoningsrecht van medische hulpverleners in theorie en praktijk: incident of trend? P&I 2007; 5: 210-214.
69 Duijst-Heesters WLJM. Boeven in het ziekenhuis. Een juridische beschouwing over de verhouding tussen het medisch beroepsgeheim en de opsporing van strafbare feiten. Den Haag: Sdu uitgevers; 2013.
70 Wijzigingswet Burgerlijk Wetboek, enz. (geneeskundige behandelingsovereenkomst). wetten.overheid.nl, Geraadpleegd 8 november 2012
71 KNMG. Handreiking Beroepsgeheim en politie/justitie. Utrecht: KNMG; 2012.

72 Duijst-Heesters W, Thoonen E, Van der Gaauw S, Korthals N. Suïcide in detentie & EVRM. Apeldoorn/Antwerpen: Maklu-Uitgevers; 2012: NUR 824.
73 Rijksrecherche. De politie een zorg! Analyse van overlijdensgevallen onder de zorg van de politie 2000-2004. Den Haag: Rijksrecherche; 2006.
74 Kubat B, Duijst W, van de Langkruis R, Thoonen E. Dying in the arms of Dutch governmental authorities. J Forensic Leg Med 2012; 1-4. Article in Press.
75 Wetli CV, Fishbain DA. Cocaine-induced psychosis and sudden death in recreational cocaine users. J Forensic Sci 1985; 30(3): 873-880.
76 Blackman BT. Cocaine use and acute coronary syndromes. Lancet 2001; 358(9290): 1367-1368.
77 Di Maio TG, Di Maio VJM. Excited delirium syndrome. Cause of death and prevention. Boca Raton, Florida, USA: CRC Press , Taylor & Francis Group; 2005.
78 Lange RA, Hillis LD. Cardiovascular complications of cocaine use. N Engl J Med 2001; 345(5): 351-358.
79 Das C, Ceelen M, Dorn T, de Jong JT. Cocaïnegebruik en plotseling overlijden: het geagiteerd-deliriumsyndroom. Ned Tijdschr Geneeskd 2009; 153(B299): 1-4.
80 Kievits F. Plotselinge dood door cocaïnegebruik. Ned Tijdschr Geneeskd 2010; 154(C470)
81 Das C, Duijst-Heesters W. Veel lijkschouwers ondeskundig. Lacunes in voorstel tot wijziging Wet op de lijkbezorging. Medisch Contact 2007; 62(4): 154-156.
82 Kruyer F. Licht op lijkschouw. Blauw 2007; 2007(7): 6-9.
83 Wiersma T. Meer helderheid gewenst. Medisch Contact 2008; 25: 1078-1081.
84 Korterink HJ. Terwoert: de dood van de oude meester. www.misdaadjournalist.nl, Geraadpleegd: 20 september 2012
85 Tweede Kamer. Brief van de staatssecretaris van Veiligheid en Justitie inzake beantwoording Kamervragen over het niet melden van een niet-natuurlijke dood. 2011-2012, 2233.
86 van den Brandhof A. 'Honderden moorden blijven onopgemerkt'. www.deondernemer.nl
87 Visser J. Wankel evenwicht. Melding van een niet-natuurlijke dood lijkt niet altijd logisch. Medisch Contact 2007; 62(16): 688-690.
88 Das C, van der Wal G. Het begrip 'doodsoorzaak': een internationale vergelijking. Ned Tijdschr Geneeskd 2002; 146(43): 2040-2043.
89 Das C, van der Wal G. Overlijdensverklaringen in Nederland: ontoereikende procedures bij niet-natuurlijke dood, lijkvinding en overledenen met onbekende identiteit. Ned Tijdschr Geneeskd 2001; 145(37): 1806-1810.
90 KNMG. De dokter en de dood. Utrecht: KNMG; 2002.
91 Das C, van der Wal G. De beoordeling van niet-natuurlijke sterfgevallen. Een analyse van doodsoorzaakverklaringen. TSG 2003; 81(6): 355-359.
92 Das C, Slootweg-van de Craats JG, Pot AM. Natuurlijke en niet-natuurlijke dood: beoordeling door verpleeghuisartsen en melding aan de gemeentelijk lijkschouwer. Tijdschr Gerantol Geriatr 2003; 34: 60-64.
93 Borleffs JW, c.s. Obductie redt levens. Medisch Contact 2007; 62(45): 1851-1854.

94 Visser J. Aantal obducties moet omhoog. Medisch Contact 2007; 31/32: 1288.
95 Duijst WLJM. De NODO-procedure. In: Duijst WLJM, Das C, editors. Handboek forensische en penitentiaire geneeskunde. Apeldoorn-Antwerpen: Maklu; 2011: 67-69.
96 GGD Kennisnet. Vastgestelde werkwijze NODO. De praktische uitwerking. www.ggdkennisnet.nl, Geraadpleegd 29 augustus 2012
97 Rijksoverheid. Voorlichtingsbrochure. De NODO-procedure. Informatie voor behandelend artsen. Publicatienr. J-15692. 2012.
98 Rijksoverheid. Voorlichtingsbrochure. Het NODO-onderzoek. Informatie voor ouders. Publicatienr. J-15690. 2012.
99 Tiessen JJ. Doodsoorzaak onbekend. Gemeentelijk lijkschouwer standaard inschakelen bij overleden kinderen. Medisch Contact 2007; 62(2): 70-72.
100 Fetter W, Wierenga H. NODO maakt valse start. Medisch Contact 2012; 39: 2130.
101 Tweede Kamer. Vaststelling van de begrotingsstaten van het Ministerie van Veiligheid en Justitie voor het jaar 2012. 2011-2012, 33 000 VI 113.
102 van Ingen G, van Loenen AC, Voortman M, Zweipfenningen PGM, Meijer CJLM. Aanbeveling voor toxicologisch onderzoek bij plotseling, onverwacht overlijden. Ned Tijdschr Geneeskd 1996; 140: 179-181.
103 Tweede Kamer. Vragen gesteld door de leden der Kamer, met de daarop door de regering gegeven antwoorden. 2010-2011, Aanhangsel, 1999.
104 Ceelen M, Dorn T, Buster M, Stomp J, Zweipfenning P, Das K. Post-mortem toxicological urine screening in cause of death determination. Hum Exp Toxicol 2011; 30(9): 1165-1173.
105 Das C. Urineonderzoek bij lijkschouw. Blauw - Opsporing 2011; 5: 30-31.
106 Haasnoot M, de Vries MAG, Mérelle ME, van Houten MA. Kinderverwaarlozing beter in beeld. Medisch Contact 2012; 67(20): 1213-1215.
107 Reijnders UJ, Giannakopoulos GF, de Bruin KH. Assessment of abuse-related injuries: a comparative study of forensic physicians, emergency room physicians, emergency room nurses and medical students. J Forensic Leg Med 2008; 15(1): 15-19.
108 Ceelen M, Dorn T, Buster M, de Keijzer K, Reijnders U. Signalering van lichamelijke mishandeling. Huisarts & Wetenschap 2010; 53(9): 479-483.
109 NRC Weekend. Verbraak C. Ik ben hooguit drie keer een echte sadist tegengekomen. 9-7-2011; 26-27.
110 van der Veen HCJ, Bogaerts S. Huiselijk geweld in Nederland. Overkoepelend syntheserapport van het vangst-hervangst-, slachtoffer- en daderonderzoek 2007-2010. Den Haag: WODC; 2010.
111 Factsheet. Huiselijk geweld: aard en omvang, gevolgen, hulpverlening en aanpak. Movisie 2011; mei: 1-8.
112 Janssen H, Wentzel W, Vissers B. Basisboek huiselijk geweld. Signaleren, melden, aanpakken. Bussum: Uitgeverij Coutinho; 2009.
113 Lindenberg J, Polman-van Stratum ECF, Westendorp RGJ, Leyden Academy on vitality and ageing. Ouderenmishandeling uit de schaduw. Medisch Contact 2012; 39(2167): 2169.

114 Royers T, van Bavel M. Oud leed. Basisboek ouderenmishandeling. Amsterdam: Uitgeverij SWP; 2012.
115 van Bavel M, van Delft A, Janssens K, Goes A. Zorg en grenzen. Werken aan sociale veiligheid in de ouderenzorg. Utrecht: Movisie; 2012.
116 Reijnders UJ, van Baasbank MC, van der WG. Diagnosis and interpretation of injuries: a study of Dutch general practitioners. J Clin Forensic Med 2005; 12(6): 291-295.
117 Reijnders UJ, Hageman A. Letsel door lichamelijk geweld. Herken verdachte verwondingen. Nursing 2008;(oktober): 28-32.
118 Inspectie voor de Gezondheidzorg. Signalering van kindermishandeling op de huisartsenposten is verbeterd, maar is nog niet voldoende. Vervolgonderzoek naar de signalering van kindermishandeling op huisartsenposten. Utrecht: Inspectie voor de Gezondheidszorg; 2012.
119 Nederlands Jeugdinstituut. Kindermishandeling aanpakken. Informatie voor professionals betrokken bij kinderen en gezinnen. Nederlands Jeugdinstituut . 2010. Utrecht.
120 Ministerie van Volksgezondheid WeS, Ministerie van Veiligheid en Justitie. Kinderen Veilig. Actieplan aanpak kindermishandeling 2012-2016. Den Haag: Ministerie van Volksgezondheid,Welzijn en Sport/Ministerie van Veiligheid en Justitie; 2011.
121 Ministerie van Volksgezondheid WeS. Basismodel meldcode huiselijk geweld en kindermishandeling. Stappenplan voor het handelen bij signalen van huiselijk geweld en kindermishandeling. Den Haag: Ministerie van Volksgezondheid,Welzijn en Sport; 2009.
122 KNMG. KNMG-meldcode Kindermishandeling en huiselijk geweld. Utrecht: KNMG; 2012.
123 den Breejen M. Wij zien het topje van de ijsberg. Politievakblad Blauw 2010; 19: 24-28.
124 KNMG. Kwaliteitskader medische zorg 'Staan voor kwaliteit'. Utrecht: KNMG; 2012.
125 Rietmeijer C. Huisartsen versterken functioneren. Supervisie en intervisie in de geneeskunde. Tijdschrift voor Coaching 2008; 1: 52-54.
126 NHG-Scholing. Intervisie. Informatiefolder. Nederlands Huisartsen Genootschap . 2012.
127 Intercollegiale toetsing in de sociale geneeskunde 2006. SGRC Beleidskader bij art. D.20 Kaderbesluit CSG. http://ajn.artsennet.nl
128 Fossen JA, Hagemeijer JW, de Koning JS, van Logtestijn SI, Lombarts MJMH. Kwaliteitsvisitatie nieuwe stijl. Handboek voor wetenschappelijke verenigingen. Alphen aan den Rijn: Van Zuiden Communications BV; 2005.
129 Orde van Medisch Specialisten. Individueel functioneren van medisch specialisten. Persoonlijk beter. Utrecht: Orde van Medisch Specialisten; 2008.
130 Welten A. Eindelijk één plek waar alle hulp samenkomt. Zorg+Welzijn 2011; 9: 14-15.
131 Bramsen RH, Elklit A, Nielsen LH. A Danish model for treating victims of rape and sexual assault: the multidisciplinary public approach. Journal of Aggression, Maltreatment & Trauma 2009; 18: 886-905.
132 Regieraad Kwaliteit van Zorg. Richtlijn voor richtlijnen. 20 criteria voor het ontwikkelen en implementeren van een klinische richtlijn. Den Haag: Regieraad Kwaliteit van Zorg; 2012.
133 KNMG. Regeling specialismen en profielen geneeskunst (inwerkingtreding 1 januari 2013). 2012. Utrecht KNMG.

134 World Mortality 2009. United Nations. www.unpopulation.org
135 World Health Organization. European report on preventing elder maltreatment. WHO; 2011.
136 Baartman H. Kindermishandeling: de politiek een zorg? In: Baartman H, Bullens R, Willems J, editors. Kindermishandeling: de politiek een zorg. Amsterdam: Uitgeverij SWP; 2005: 14-31.
137 Alink L, van IJzendoorn R, Bakermans-Kranenburg M, Pannebakker F, Vogels T, Euser S. Kindermishandeling 2010. De Tweede Nationale Prevalentiestudie Mishandeling van Kinderen en Jeugdigen (NPM-2010). Leiden Attachment Research Program. TNO Child Health. Leiden: Casimir publishers; 2011.
138 Kuyvenhoven MM, Hekkink CF, Voorn ThB. Overlijdensgevallen onder 0-18-jarigen door vermoede mishandeling: naar schatting 40 gevallen in 1996 gebaseerd op een enquête onder huisartsen en kinderartsen. Ned Tijdschr Geneeskd 1998; 142(46): 2515-2518.
139 Sieswerda-Hoogendoorn T, Boos S, Spivack B, Bilo RAC, van Rijn RR. Abusive head trauma part I. Clinical aspects. Eur J Pediatr 2012; 171: 415-423.
140 Soerdjbalie-Maikoe V, Bilo RAC, van den Akker E, Maes A. Niet-natuurlijk overlijden door kindermishandeling; gerechtelijke secties 1996-2009. Ned Tijdschr Geneeskd 2010; 154(A2285): 1-6.
141 Nieuwenhuis A, Ferwerda H. Tot de dood ons scheidt. Een onderzoek naar de omvang en kenmerken van moord en doodslag in huiselijke kring. Arnhem: Bureau Beke; 2010.
142 Nog altijd veel dodelijke slachtoffers huiselijk geweld. www.huiselijkgeweld.nl, Geraadpleegd 28 augustus 2012
143 Tweede Kamer. Brief van de minister van Veiligheid en Justitie inzake aanpak huiselijk geweld. 2010-2011, 28 345 110.
144 Meerding WJ. De maatschappelijke kosten van kindermishandeling. In: Baartman H, Bullens R, Willems J, editors. Kindermishandeling: de politiek een zorg. Amsterdam: Uitgeverij SWP; 2005: 46-64.
145 Wat zijn de producten van forensische geneeskunde? Nationaal Kompas Volksgezondheid, Geraadpleegd 27 februari 2012. www.nationaalkompas.nl
146 NFI. Annual report 2011 Department of Forensic Medicine, May 2012. NFI; 2012.
147 Ongewoon sterfgeval. www.uzleuven.be, Geraadpleegd 30 oktober 2012
148 Masteropleiding Arts-Specialist, afstudeerrichting Gerechtelijke Geneeskunde. http:// www.med.kuleuven.be, Geraadpleegd oktober 2012
149 The British Association in Forensic Medicine. About forensic pathology. www.bafm.org, Geraadpleegd 24 oktober 2012
150 Leadbeatter S. Forensic pathology in England and Wales since 1971. In: Madea B, Saukko P, editors. Forensic medicine in Europe. Lübeck, Germany: Verlag Schmidt-Römhild; 2008: 65-85.
151 Stark MM, Norfolk GA. Training in clinical forensic medicine in the UK--perceptions of current regulatory standards. J Forensic Leg Med 2011; 18(6): 264-275.
152 Simonsen J. Denmark. In: Madea B, Saukko P, editors. Forensic medicine in Europe. Lübeck, Germany: Verlag Schmidt-Römhild; 2008: 59-64.
153 Larsen ST, Lynnerup N. Medico-legal autopsies in Denmark. Dan Med Bull 2011; 58(3): A4247.

154 Specialist training in Forensic Medicine, Denmark. Nordic Congress of Forensic Medicine in Aarhus, Denmark, June 13-16, 2012.
155 Eriksson A. History of forensic medicine in Sweden. In: Madea B, Saukko P, editors. Forensic medicine in Europe. Lübeck, Germany: Verlag Schmidt-Römhild; 2008: 387-404.
156 Rammer L. Quality management in Swedish forensic medicine - an international comparison. Stockholm: Swedish National Board of Forensic Medicine; 2011.
157 Specialist training in Forensic Medicine, Sweden. Nordic Congress of Forensic Medicine in Aarhus, Denmark, June 13-16, 2012.
158 Ludes B. Forensic medicine in France. In: Madea B, Saukko P, editors. Forensic medicine in Europe. Lübeck, Germany: Verlag Schmidt-Römhild; 2008: 113-141.
159 Pompilio CE, Vieira JE. The technological invention of disease and the decline of autopsies. Sao Paulo Med J 2008; 126(2): 71-72.
160 Ferrara SD, Bajanowski T, Cecchi R, Boscolo-Berto R, Viel G. Bio-medicolegal scientific research in Europe: a comprehensive bibliometric overview. Int J Legal Med 2011; 125(3): 393-402.
161 Boscolo-Berto R, Viel G, Cecchi R, Terranova C, Vogliardi S, Bajanowski T e.a. Journals publishing bio-medicolegal research in Europe. Int J Legal Med 2012; 126(1): 129-137.
162 Viel G, Boscolo-Berto R, Cecchi R, Bajanowski T, Vieira ND, Ferrara SD. Bio-medicolegal scientific research in Europe. A country-based analysis. Int J Legal Med 2011; 125(5): 717-725.
163 Berden B, Groenewegen N, van Baalen M, Bosman P. Beter zicht op opleidingskosten. Medisch Contact 2012; 67(48): 2735-2737.

Annexes

Annex **A**

The request for advice

Letter dated 28 October 2011 (reference 335930) from the State Secretary of Education, Culture and Science to the President of the Advisory Council on Health Research.

Forensic medicine is the branch of medical science that involves providing medical care to detainees in police custody and which conducts investigations in support of the police and of the judicial authorities. It is a broad field that includes sub-fields such as general forensic medicine, forensic pathology, forensic anthropology and forensic paediatrics. The activities of forensic physicians range from determining causes of death (including death by unnatural causes) and studies of post-mortem phenomena, injuries, physical assault (or child abuse), sexual offenses and biological traces, to assessing the health status of detainees in police custody.

In contrast to the situation in neighbouring countries, such as Great Britain, Germany, Belgium and France, in the Netherlands forensic medicine is seldom the topic of academic research. None of the university medical centres has a forensic medicine department. The postgraduate programme in forensic medicine is provided by the Netherlands School of Public Health. Other postgraduate programmes in medical specialisms devote little or no consideration to forensic aspects. In the Netherlands, little scientific research of direct relevance to general forensic medical practice is carried out. Moreover, the results of research conducted outside the country have insufficient impact on professional practice here. In terms of developments involving evidence-based medicine, forensic medicine in the Netherlands has largely missed the boat.

Given the importance I attach to forensic medical examination, and partly in view of the situation outlined above, I would like to request an advisory report on the Dutch knowledge infrastructure needed for scientific research in forensic medicine, on the postgraduate programme in forensic medicine for physicians, on the quality assurance and promotion of forensic medical practice (with the exception of forensic psychiatric assessment in support of assessments of legal accountability, and the measure of detention under hospital order). I am asking you to describe and analyse the existing knowledge infrastructure in the light of the knowledge requirements of the field of general forensic-medical practice and with regard to the scientific basis for medical judgment that has become commonplace in medicine in recent years. In this connection, I would ask you to consider the ways in which knowledge infrastructures are organised in countries that are leaders in terms of providing a scientific basis for forensic-medical practice. In areas where, in your view, current medical postgraduate programmes or the quality assurance and promotion of forensic-medical practice in the Netherlands do not meet the required standards, I would ask you to consult the responsible professional associations to identify avenues in which potential improvements might be sought.

The State Secretary for Education, Culture and Science,
(signed)

Halbe Zijlstra

Annex **B**

The Committee

- Prof. W.A.B. Stalman, *Chairman*
  Vice Chairman/Dean of the Executive Board of VU University Medical Center, Amsterdam
- Dr. C. Das
  Specialist in Public Health Medicine, Forensic Physician, Head of Forensic Medicine Amsterdam Municipal or Community Health Service, Instructor in Forensic Medicine at the Netherlands School of Public and Occupational Health, Amsterdam
- Dr. W.L.J.M. Duijst
  Forensic Physician at IJsselland Municipal or Community Health Service, Senior Researcher, Radboud University Nijmegen
- Prof. P. Knijff
  Professor of Population Genetics and Evolutionary Genetics, Leiden University Medical Center
- Prof. J. Meulenbelt
  Professor of Clinical Toxicology, Institute for Risk Assessment Sciences, Utrecht University; Head National Poisons Information Centre, University Medical Center Utrecht
- Dr. H.G.T. Nijs
  Forensic Physician Registered at the Royal Dutch Medical Association, Netherlands Forensic Institute, The Hague

- M.C.W.M. van Nimwegen
  Procurator-General, Public Prosecution Service, Board of Procurators-General, The Hague
- Prof. A. Patka
  Professor of Emergency Medicine, Erasmus MC, Rotterdam
- Dr. E.M. van de Putte
  Paediatrician General Paediatrics/Social Paediatrics, University Medical Center Utrecht
- Prof. R.J.P.M. Scholten
  Professor of Clinical Epidemiology, in particular Evidence-Based Medicine, Academic Medical Center, University of Amsterdam, Director of the Dutch Cochrane Centre, Amsterdam
- Dr. M.B.M. Soethout
  Teaching Coordinator in Public Health Medicine, VU University Medical Center Amsterdam
- Dr. C.J. in 't Veld
  GP, Brielle, until 1 January 2012 Head of the Implementation Department, Dutch College of General Practitioners
- Prof. R.R.J.M. Vermeiren
  Professor of Child and Adolescent Psychiatry Curium-LUMC, Leiden University Medical Center, professor of forensic child and adolescent psychiatry, VU University Medical Center, Amsterdam
- R. Visser
  Forensic Pathologist not practising, Riemst (Belgium)
- H. Vissers
  Police Quartermaster, South-Western Region of the Netherlands, Tilburg
- D.I.M.J. Hoefnagel LLM, *observer*
  Department of Economic Affairs, Unit Professions, Education and Labour market, Ministry of Health, Welfare and Sport, The Hague
- B.E. Mooijman-Venema LLM, *observer*
  Legislation Department, Ministry of Security and Justice, The Hague
- Dr. J.W.A. Ridder-Numan, *observer*
  Directorate of Research and Science Policy, Ministry of Education, Culture and Science, The Hague
- Dr. B.C. Godthelp, *scientific secretary*
  Health Council of the Netherlands, The Hague

The Health Council and interests

Members of Health Council Committees are appointed in a personal capacity because of their special expertise in the matters to be addressed. Nonetheless, it is precisely because of this expertise that they may also have interests. This in itself does not necessarily present an obstacle for membership of a Health Council Committee. Transparency regarding possible conflicts of interest is nonetheless important, both for the chairperson and members of a Committee and for the President of the Health Council. On being invited to join a Committee, members are asked to submit a form detailing the functions they hold and any other material and immaterial interests which could be relevant for the Committee's work. It is the responsibility of the President of the Health Council to assess whether the interests indicated constitute grounds for non-appointment. An advisorship will then sometimes make it possible to exploit the expertise of the specialist involved. During the inaugural meeting the declarations issued are discussed, so that all members of the Committee are aware of each other's possible interests.

Annex **C**

Organisations consulted

In March 2013, at the Committee's request, 19 organisations (including professional organisations) commented on the draft advisory report entitled "Forensic medicine dissected".

- Elderly care physicians (Verenso, Dutch Association of Elderly Care Physicians and Social Geriatricians): R. Helle
- Centre against sexual assault (CSG): I.A.E. Bicanic
- Forensic Medical Society (FMG): K.H. Gan
- Forensic Medical Child Abuse Center (FPKM): L.L.B.M. van Duurling
- Dutch Association of Municipal or Community Health Services: J. Doosje
- Royal Dutch Organisation of Midwives (KNOV): D.G. Korfker, R.M. Vink
- Umbrella organisation for physicians and health (KAMG): R. Duzijn
- National Police Force: L.Th.C. Kuijs
- Dutch Federation of University Medical Centers: M.L. Köhlen
- Netherlands Forensic Institute (NFI): P.M. van Berkel
- Dutch College of General Practitioners (NHG): Tj. Wiersma
- Netherlands Institute of Forensic Psychiatry and Psychology (NIFP): J. Groeneveld, C. Herstel
- Dutch Dental Association (NMT): K-J. Bakker
- Netherlands Society of Emergency Physicians (NVSHA): Board
- Dutch Society for Trauma Surgery: S. Meylaerts

- Dutch Pathological Society (NVvP): F.J. van Kemenade
- Public Prosecution Service, Board of Procurators General: M.C.M.W. van Nimwegen
- The Maastricht Forensic Institute (TMFI): G.P.M.F. Mols, S.W.G. Huntjens
- Association of medical child abuse counsellors (VVAK): N. Coebergh

Annex **D**

Experts consulted

In preparing the advisory report, the following individuals were consulted:

- Dr. P.P. Bender, Forensic Physician and Managing Director, Forensic Physicians Rotterdam/Rhine Delta (FARR), Rotterdam
- Dr. P.M. van Berkel, Head of Department of Forensic Medicine, Netherlands Forensic Institute (NFI), The Hague
- R. Bilo, Forensic Physician, Subspecialisation Paediatrics, Netherlands Forensic Institute, The Hague
- D. Botter, Forensic Physician, Netherlands Forensic Institute, The Hague
- L.L.B.M. van Duurling, Forensic Physician, Forensic Medical Child Abuse Center, Utrecht
- T. van Egmond, Trauma Surgeon and Former Accident and Emergency Instructor, St. Elisabeth Hospital, Tilburg
- N. Eken-de Vos LLM, Specialist Policy Officer, National Centre of Expertise for Medical Affairs, Rotterdam
- M. van Eyckelen LLM, Public Prosecutor and Coordinator of the National Centre of Expertise for Medical Affairs, Rotterdam
- F.B.A.M. Hofstee-van der Meulen, Inspector of the Sanctions Inspectorate, Ministry of Security and Justice, The Hague
- S.W.G. Huntjens, Managing Director, The Maastricht Forensic Institute, Maastricht

- L.Th.C. Kuijs, Chairman of the Board of Police Chiefs, Quartermaster of the National Police Board, The Hague
- E. de Leeuw, Specialist in Public Health Medicine, Head of the Public Health Training Programme, University Medical Center Utrecht
- Prof. emeritus G. Maat, Forensic Anthropologist, Leiden
- H. van der Meer, Tactical Manager of the Forensic Investigation Department of the Haaglanden Police Force, The Hague
- J.J. Merkus, Inspector of the Sanctions Inspectorate, Ministry of Security and Justice, The Hague
- M. van de Merwe, Medical Counsellor, Maasstad Hospital, Rotterdam
- H. Molenaar, Acting Coordinator, National Police Consultant, Police Academy, Apeldoorn
- M. Mulders, Forensic Physician, Forensic Physicians Rotterdam/Rhine Delta, Rotterdam
- Dr. E. Pennings, Forensic Toxicologist, the Maastricht Forensic Institute (TMFI)
- A. Ribberink, Youth Protection Service, Judicial Youth Policy Department, Ministry of Security and Justice, The Hague
- Dr. R.R. van Rijn, Paediatric Radiologist, Emma children's hospital, Amsterdam, and the Netherlands Forensic Institute, The Hague
- Prof. emeritus J.J. Roord, Paediatrician not practising, Bilthoven
- R.P. de Roode LLM, Health Law Consultant, Royal Dutch Medical Association, Utrecht
- L.M. Spooren, Forensic Medicine Coordinator, Municipal or Community Health Service (Nijmegen region)
- A.C. van der Tuin, Ministry of Health, Welfare and Sport, Youth Division, The Hague
- Prof. Emeritus F.A. de Wolff, Forensic Toxicologist, Amsterdam
- A.M. van der Zande, General Health Care Physician and Forensic Physician, Zuid-Holland West municipal or community health service, Zoetermeer

Annex **E**

Blueprint for forensic medical training

What form might a medical postgraduate programme for primary care forensic physicians (similar to the emergency room physician programme or the international health and tropical medicine programme) take? [133] The Committee has drawn up a blueprint for this purpose.

In due course a competence profile for primary care forensic physicians will have to be drawn up, based on the seven CanMeds competencies:

- medical practice
- communication
- cooperation
- organisation
- social practice
- knowledge and science
- professionalism

The starting point is a three year programme in forensic medicine. This programme is divided into two eighteen month periods. In one of these periods, trainee forensic physicians acquire work experience in a large forensic medical department. During the other period, they follow six three-month internships in related institutions/departments, such as:

- clinical pathology
- forensic pathology

- emergency medicine
- general practice
- addiction treatment and care
- acute psychiatry/crisis service
- paediatrics

The Committee takes the view that the field (together with the primary care forensic physician programme) can be broken down into the 17 themes shown below. These themes give trainers and residents in training to become forensic physicians an opportunity to develop certain knowledge, skills and behaviour and to test them (or have them tested). The themes reflect the individual expertise of primary care forensic physicians. The contents of a given theme will have to be further subdivided into the identified competencies.

Forensic medicine themes:

1 Forensic medicine in the Netherlands:
   - organisation
   - legal framework
   - relationship with police and the Public Prosecution Service
   - the place of forensic medicine within the health service
2 Medical care for detainees in police custody:
   - acute medicine
   - poisoning
   - injuries/fractures
   - infectious diseases
   - dental problems
   - medication: prescription and management
3 Acute psychiatry:
   - psychosis
   - depression
   - suicidality
   - personality disorders
4 Forensic psychiatry:
   - observation, diagnosis, reporting
   - legal accountability
   - substance abuse and addiction
   - results of trauma (including post-traumatic stress disorder)

5 Addiction treatment and care
6 Acute poisoning
   - alcohol
   - opiates
   - cocaine, ecstasy, amphetamines
   - GHB, body packers
7 The post mortem external examination:
   - post-mortem phenomena
   - estimating time of death
   - discovery of a body (in the absence of others)
   - bodies found in water
   - suicides
   - traffic accidents
   - murder and manslaughter
   - crime scene
8 Post mortem external examination (special types):
   - euthanasia
   - death following a medical error
   - death in a nursing home
   - death in prison
9 The medico-legal autopsy
10 Forensic techniques:
   - basic forensic techniques
   - general toxicology
   - post-mortem toxicology
   - toxicology (alcohol and drugs)
   - odontology/anthropology
   - DNA
11 Injuries:
   - wounds and wound healing
   - stab wounds, gunshot wounds
   - blunt trauma, burns
   - Injury dating
   - Injury reporting
12 Sexual offenses
13 Child abuse and domestic violence
14 NODO procedure (further investigations to establish the cause of death)

15 Acting as an expert
   - witness and expert
   - expert report
   - appearing in the courtroom
16 Medical ethics
17 Knowledge and Scientific Research

Annex **F**

Forensic epidemiology

This annex gives details of Dutch mortality figures (Statistics Netherlands StatLine)* as well as figures on physical assault and domestic violence. It also presents figures on procedures carried out by forensic physicians. This information was supplied by the Dutch Association of Municipal or Community Health Services, the Netherlands Forensic Institute's Forensic Medicine Department Services, and the Forensic Medical Child Abuse Center. Where possible, comparisons are made with the situation in other countries.

* See www.statline.cbs.nl/

F.1 Mortality statistics: causes of death

Table 2 Causes of death (2011 figures, Statistics Netherlands StatLine).

Total of all causes of death	Natural	Unnatural	
		1.647	Suicide
		143	Murder and manslaughter
		653	Road traffic fatalities
		59	Occupational fatalities
		2.821	Private accidents:
		2.376	Falls
		21	Struck by object
		27	Burned
		70	Drowned
		119	Suffocated
		119	Other
		89	Unknown cause
		521	Other/unknown
135.741	129.897	5.844	

Of the total number of deaths in 2010, 2.8 percent involved active euthanasia mediated by physicians, while assisted suicide accounted for 0.1 percent of all deaths.[43] The reporting rate for euthanasia and assisted suicide in 2010 was estimated at 77 percent. The causes of death statistics do not record active euthanasia as the cause of death, but rather the disease from which the patient suffered (e.g. oesophageal cancer). In this table that is listed under death by natural causes (which has no further subcategories). Strikingly, there are a relatively large number of unnatural deaths from falls (2,376) (Figure 2 and Table 2).

According to figures from the United Nations, unnatural causes of death (including suicide) in the Netherlands made up four percent of the total, as it does in Germany.[134] According to the UN, the figure for Sweden is five percent, while unnatural causes of death make up seven percent of the total in America and France, and just three percent in Great Britain.[134] For the world as a whole, the figure is ten percent. In addition, unnatural causes of death make up eight percent of the total in more developed countries, and 10-40 percent of the total in less developed countries.[134]

F.2 Epidemiology of domestic violence and child abuse

In 2006, 5.116 million offenses were recorded by Statistics Netherlands. Of these, 1.157 million were violent crimes, and 46 percent of these involved domestic violence. The Research and Documentation Centre's 2010 report entitled "Huiselijk geweld in Nederland" (Domestic violence in the Netherlands) estimates that there are 200,000 victims of clear-cut domestic violence (these cases involve more serious forms of sexual assault or physical violence, or repeated incidents of a less serious nature, such as mocking, belittling and making threats of physical violence) perpetrated by an estimated 110,000 suspects. 110 The victims of domestic violence are increasingly prepared to report such incidents to the police. In 2010, twenty percent of these victims took such action. Official police reports are prepared in about forty percent of the reported incidents. In twenty to thirty percent of cases the perpetrators are arrested.[110,111]

It is not possible to determine the exact extent of elder abuse, as there are no national figures for domestic violence involving the elderly. It has been estimated that at least one in 20 elderly people is subject to some form of abuse.[84,112-115] The issue of elder abuse has also been recognised by the World Health Organization (WHO). The 2011 "European report on Preventing elder maltreatment" states that four million elderly people are abused in Europe each year.[135] The actual number is probably much higher. In addition, it is anticipated that the increasing life-expectancy seen in Europe will cause this number to increase still further. [135]

Children can also be the victims of abuse. The most common form of child abuse is neglect, including physical and emotional neglect, as well as not sending them to school.[106,112,136] Physical child abuse includes all forms of physical violence against children, such as hitting, punching, shaking, and inflicting burns, cuts or puncture wounds.[12,112] It is estimated that, in 2010, 119,000 children suffered some form of child abuse, but here too registration is not fully comprehensive.[112,137]

In total, there are around 190 fatalities among victims of violence in the Netherlands per year.[12] There are 60 to 80 such cases among adult women each year, while the corresponding mortality figures for children are estimated at 40 to 50 per year. 12,138 Abusive head trauma (previously known as "shaken baby syndrome") is a relatively common cause of traumatic brain injury in children. It has an estimated incidence of 14 to 40 cases per 100,000 children under the age of 1 year per year. About 15 to 23 percent of these abused children die within a

few hours or days after the incident in question.[139] Medico-legal autopsies are carried out on 49 deceased minors each year. In 35% of these cases, the deceased minors most likely died from the effects of child abuse.[140] A study commissioned by the police showed that, in 2006, there were 145 recorded victims of murder or manslaughter. Of these fatalities, 34 percent died as a result of domestic violence.[141-143] Given the problems affecting the performance of post mortem external examinations, it can be assumed that the actual figures may be higher (indeed, much higher).

In terms of cost, domestic violence has a threefold impact. Firstly there are the charges for the use of official services (such as the police, the judicial authorities, the health service and care), secondly there are the costs arising from absenteeism (loss of production) and finally there is the cost in terms of human suffering.[111] In each of these cases it is difficult to obtain accurate figures for the actual costs involved, however, it is estimated that the treatment of injuries relating to child abuse in the Netherlands alone amounts to 1 billion euros.[144]

F.3 Forensic procedures

General forensic physician

It is estimated that 10,000 forensic post mortem external examinations take place each year, as well as 1,900 cases of euthanasia (included reported cases), 1,000 examinations are carried out in cases of suspected sexual abuse, 9,000 injury descriptions are prepared, and 4,800 blood and/or tissue samples are taken by primary care forensic physicians. In addition, care was provided to detainees in police custody on 50,000 occasions.[145] If we compare the number of forensic post mortem external examinations with Statistics Netherlands' mortality statistics, we see that about 5,800 cases of death by unnatural causes are recorded annually and that 10,000 post mortem external examinations are performed by forensic physicians. This means that in about 4,200 cases of suspicious death, forensic physicians can still certify the death in question as death by natural causes.

Netherlands Forensic Institute

According to figures from the Netherlands Forensic Institute, each year 400 to 600 forensic autopsies are performed by the Institute´s forensic pathologist, at the instigation of the public prosecutor. Thus, in the Netherlands as a whole, forensic autopsies are carried out in 0.3-0.4 percent of deaths. In Belgium,

forensic autopsies are carried out in 0.5-1 percent of deaths, while the figure for Germany is 2 percent. Sweden and Finland have a much higher percentage of forensic autopsies, at 6 percent and 24 percent respectively. Accordingly, the Netherlands carries out relatively few forensic autopsies in comparison to Sweden and Finland.[36]

The Netherlands Forensic Institute carried out 411 forensic autopsies in 2010 and 428 in 2011.[146] In 2011, the Netherlands Forensic Institute's forensic physicians were consulted on 25 occasions with regard to adults. This involved telephone calls or brief written (email) recommendations to physicians, the police and the Public Prosecution Service. In addition, they carried out customised work in 245 cases. This included case-file studies, examinations of living victims, assessing victims at crime scenes, and providing advice during forensic autopsies. In 2011, in the area of paediatrics, there were 90 consultations and 66 customised examinations, which mainly consisted of case-file studies.[146,*]

Forensic Medical Child Abuse Center

In 2012, the Forensic Medical Child Abuse Center received a total of 358 examination requests. These involved 176 requests for consultation, 109 requests for the assessment and recording of injuries, 33 case-file studies, and 40 nursing recommendations. These examination requests originated from the legal sector, the Advise and Reporting Center on Child Abuse and Neglect, and the medical sector.

* Some of the figures listed here were supplied by Dr P.M. van Berkel, head of the Netherlands Forensic Institute's Forensic Medicine Department.

Annex G

Knowledge infrastructure in forensic medicine outside the Netherlands

Unlike the Netherlands, none of the countries listed in this annex (with the exception of Great Britain) distinguishes between general forensic physicians and forensic pathologists . Forensic physicians in these countries are required to complete a full training programme in forensic pathology. In addition to their forensic pathology work, they are also required to perform tasks that, in the Netherlands, would be carried out by general forensic physicians. Some European countries are not included in this annex. It's scope was restricted to those neighbouring countries in which sufficient information was available.

G.1 Germany

Germany has 28 forensic institutes attached to universities, six state institutions and four independent forensic institutes.[37] Routine forensic medical examinations in that country are mainly conducted by university-based forensic medical institutes. Routine trace evidence analysis, however, is mainly carried out in specialised police laboratories. In the past few years, the number of autopsies carried out in Germany has decreased. Today, autopsies are only carried out in five percent of all deaths, with forensic autopsies accounting for two percent of cases. Forensic medicine in Germany has a rich history. A law passed in 1532 mentioned forensic medical experts. The German professional association was founded at Breslau in 1904.[37]

In general, the university forensic institutes are funded by the Ministry of Education, while the state institutions are funded by the Ministry of the Interior or the Ministry of Health. The fees for forensic work are often not cost-effective.[37]

As part of their basic medical training, medical students in Germany are required to take programmes in forensic medicine. These programmes cover many topics that, in the Netherlands, are only dealt with as part of the basic training in forensic medicine, such as thanatology (study of the causes and nature of death), injury mechanisms, physical assault, and sexual offenses.[37]

In Germany, there is also a postgraduate programme in forensic medicine. This takes five years and includes internships in clinical pathology, psychiatry/ forensic psychiatry, and toxicology. The junior doctors then go on to acquire three and a half years of practical experience in forensic medicine. During this period they are required to carry out 400 complete post mortem external examinations (plus report), 25 crime scene examinations, 300 forensic autopsies, 2000 histological studies (200 reports for the courts), as well as trace evidence analysis in at least 10 cases and 25 forensic osteological and odontological examinations. The programme is concluded with an oral examination.[37]

G.2 Belgium

Belgium has seven university-based forensic medicine departments. Since 2007, the Netherlands Forensic Institute has been cooperating with forensic medicine departments at the Flemish universities (Louvain, Brussels, Ghent and Antwerp). Forensic medicine in Belgium has a rich history. For instance, Andries van Wesel (alias Andreas Vesalis; 1514-1564) was one of the pioneers of forensic autopsy. The Belgian Society of Forensic Medicine was founded in 1889.[38] In Belgium, autopsies are only carried out in two percent of all deaths, with forensic autopsies accounting for 0.5-1 percent of cases.[147]

Belgium has had a specialised postgraduate programme in forensic medicine since 2002. This five-year postgraduate programme includes 12 months of general medical training, 18 months pathological anatomy (anatomical pathology), and 30 months of theoretical and practical training in forensic medicine. The main themes of this programme are thanatology, forensic pathology, medical criminalistics, and clinical forensic medicine, as well as the legal, medical insurance, deontological aspects of an expert's report. By the end of their postgraduate programme, trainee forensic physicians must have published at least one forensic medical article in an international scientific journal.[38,148]

G.3 Great Britain

In Great Britain, forensic medicine has traditionally been the domain of forensic pathologist, who carry out both forensic autopsies and clinical examinations of the victims of physical or sexual assault.[149]

In 2008, Great Britain had 41 registered medical examiners. They were employed at group practices, in universities, in independent practices, and by the National Health Service (NHS). In that same year, there were also twelve medical examiners in training.[150] In addition to medical examiners, Great Britain also has a number of forensic physicians (forensic medical examiners or police physicians) who carry out clinical examinations of the victims of physical or sexual assault.[149,151] However, clinical forensic medicine in Great Britain is not a recognised specialism, nor is there an associated training programme. The profession is mostly practiced by GPs, who are employed as forensic physicians.[151]

In Great Britain, the postgraduate programme in forensic pathology involves a two to three-year histopathology programme, followed by a two-year sub-specialism programme to qualify as a forensic pathologist (medical examiner). This forensic pathology programme provides junior doctors with the skills needed to assess pathological indications of injury, to determine the cause of death, and to examine the pathological aspects of crime scenes. The forensic pathology programme also includes modules in neuropathology and paediatric pathology.[39]

G.4 Denmark

Denmark has three university-based forensic medical institutes (at Copenhagen, Aarhus, and Odense). In addition to medico-legal examinations, these institutions carry out clinical-forensic examinations, such as assessing the injuries of victims of physical or sexual assault. The forensic institute in Copenhagen also conducts forensic anthropological examinations.[152] In Denmark, autopsies are performed in about 16 percent of all deaths, with forensic autopsies accounting for 2.5 percent of cases.[153] In Denmark, forensic autopsies were carried out in about 68 percent of unnatural deaths (murders, suicides, accidents).[153] While Denmark has a lower frequency of forensic autopsies than other Nordic countries, it is much higher than those of the Netherlands, Germany and Belgium, for example. According to Danish forensic pathologists , however, this means that they are unable to obtain as much

practical experience as their counterparts outside Denmark. This, in turn, can adversely affect the quality of forensic autopsies.

Forensic medicine in Denmark, too, has a rich history. Medico-legal examinations were carried out in Denmark as long ago as the 17th century, and the medical faculty of the University of Copenhagen performed the role of a medico-legal council.[152] The Danish Society of Forensic Science was founded in 1994. Its main goal was to increase awareness of the forensic sciences and of forensic pathology in Denmark.

After completing their basic medical training, senior house officers in Denmark are required to take a one-year introductory course in forensic medicine. After this introductory course, residents in training to become specialists take a four-year programme in forensic medicine, which involves two and a half years of forensic medicine and eighteen months of clinical pathology. They also have to take eleven different courses on various forensic medical subjects, and are required to complete an individual research project.[154]

G.5 Sweden

Sweden has six forensic medical institutes. Four of the forensic medical institutes are university-based and have a professor or lector in forensic medicine. These institutions perform forensic examinations of deceased individuals (autopsies), in addition to examining the victims of physical assault. They also perform toxicological and genetic analyses both of deceased individuals and of the victims of physical or sexual assault. Together with the government departments of forensic psychiatry, forensic toxicology and forensic genetics, these six forensic institutes make up the National Board of Forensic Medicine.[155,156] In Sweden, 20 percent of all deaths involve an autopsy, with forensic autopsies accounting for 6 percent (5500) of cases. It should be noted in this connection that a clinical autopsy would have been sufficient in the case of 5-10 percent of these forensic autopsies, while a post-mortem external examination would have sufficed in a further 20 percent of cases. This means that, in retrospect, about 70 percent of these forensic autopsies were appropriate. In Sweden only 55 percent of unnatural deaths are subjected to forensic examination. Accordingly, it is suspected that here too some instances of murder and manslaughter are missed.[156]

Forensic medicine in Sweden, too, has a rich history. As far back as the 16th century there were physicians in Sweden specialising in the examination of injuries.[155]

The cost of forensic autopsies in Sweden is reimbursed by the Ministry of Justice, as are the costs incurred by the toxicological and genetic analysis of samples taken by medical examiners. In contrast, the assessment of injuries to the victims of physical and sexual assault is funded by the police. Any costs related to training and research are borne by the universities. The National Board of Forensic Medicine also has a limited budget for research projects.[155]

After their basic medical training, forensic pathologists in Sweden take a five-year programme consisting of a minimum of three and a half years of training in forensic medicine and eighteen months devoted to clinical pathology and other specialisms, such as radiology, dermatology, and gynaecology (options). In addition, they are required to take at least ten courses. These are not only forensic-medical courses. There are general courses, such as communication skills, and an individual research project. These general courses are the same for all medical postgraduate programmes.[157]

G.5 France

France has eight official autonomous forensic medicine departments, which are associated with university hospitals. In addition there are 51 forensic accident and emergency clinics, where both forensic autopsies and the assessment and recording of injuries are carried out. France has 250 registered forensic physicians.[158] In France, post-mortem examinations are coordinated by the courts, while clinical forensic medical procedures are coordinated by the hospitals. In France, autopsies are performed in about four percent of all deaths[159], with forensic autopsies accounting for 1.4 percent of cases. The French Society of Forensic Medicine was founded in the 19th century, and in 1996, a society was founded for university-based forensic physicians (La Collégiale des médecins légistes hospitaliers et hospitalo-universitaires, The collegiate society of forensic practitioners in university and university hospitals).[158]

The medical undergraduate programme in France covers forensic medicine and health law, as well as abuse and sexual assault. Junior doctors who have completed a two-year specialisation in occupational medicine, public health medicine, psychiatry, pathological anatomy, internal medicine, surgery or general practice medicine can register for the two-year postgraduate programme in forensic medicine and medical expertise. In the course of their postgraduate programme, trainee forensic physicians are required to perform at least 100 forensic autopsies under supervision.[158]

In France, forensic medicine is regarded as a competency rather than a specialism. The French Society of Forensic Medicine offers a continuing education course that includes modules on crime scenes, medical records, and child abuse.[158]

Annex **H**

International forensic scientific research

A bibliometric analysis of European bio-medicolegal scientific output in the period from 2005 to 2010 shows that the description of new analytical methods, the analysis of short tandem repeat (STR)-systems, and the analysis of injury mechanisms, are the most popular topics in the literature that has been analysed (Table 3), respectively accounting for 5.7, 5.6, and 4.9 percent of the total number of publications.[160]

Table 3 The most commonly published topics in Europe.

Topic	Subdiscipline of	% of total number of articles
New analytical methods	Forensic toxicology	5.7
STR systems	Forensic biology	5.6
Analysis of injury mechanisms	Forensic pathology/clinical forensic medicine	4.9
Child abuse:	Clinical forensic medicine/forensic pathology	4.2
Radiology	Forensic pathology/clinical forensic medicine	2.9
Sudden Infant Death Syndrome (SIDS)[a]	Forensic pathology	1.4
Other		75.2

[a] SIDS, Sudden Infant Death Syndrome

Most scientific articles on bio-medicolegal topics are published in Forensic Science International, the International Journal of Legal Medicine, or the Journal of Forensic Sciences.[161]

An analysis of authors' origins shows that German authors take first place in the forensic sub-disciplines of pathology, toxicology, genetics, anthropology and biological criminalistics.[162] British authors lead the field in the categories of clinical forensic medicine, medical malpractice, and disability/ social insurance. Dutch authors come third in the "medical legislation and ethics" categories and in clinical forensic medicine.[162] The latter category includes such topics as the mechanism of injury, child and elder abuse, radiology and sexual offenses.

Forensic medical research in primary forensic care in the Netherlands (Amsterdam municipal or community health service and Radboud University Nijmegen/IJsselland municipal or community health service) resulted in 91 publications* in books and various journals from 2004 to 2012, as shown in the table below (Table 4). In the same period, forensic medical research carried out by the Netherlands Forensic Institute resulted in 82 publications.

Table 4 Publications relating to forensic medical research

Publications in	Forensic medical research in primary care	Netherlands Forensic Institute (Forensic Medical Research)
Manual	1 (1 %)	1 (1 %)
Protocol	1 (1 %)	
Book	10 (11%)	3 (4 %)
Chapter in book	18 (20%)	24 (29%)
Dissertation	2 (2 %)	
Netherlands Journal of Medicine	6 (7 %)	10 (12%)
Medisch Contact	3 (3 %)	
Huisarts en Wetenschap	8 (9 %)	
Nederlands Juristenblad	2 (2 %)	
Patient Care	3 (3 %)	
Tijdschrift voor gezondheidswetenschappen	2 (2 %)	
J Forensic Legal Med	5 (5 %)	
J Forensic Science	2 (2 %)	1 (1 %)

* Searches were carried out in PubMED for relevant publications of all members of staff of the institutes in question. Articles by several employees of the same institution were only counted once. The institutes also provided a list of publications that cannot be found in PubMED. The contents of both lists were added together to give a total number of publications per institute. Only those articles/ books that were published between January 2004 and October 2012 were included. Book reprints were not counted.

Forensic Science Int		4 (5 %)
Emergency Radiology		2 (2 %)
Eur J Pediatrics		4 (5 %)
Pediatr Radiol		7 (9 %)
Forensic Sci Med Pathol		5 (6 %)
Other[a]	28 (32%)	21 (26%)
Total	91	82

[a] The category "Other" contains items published in journals that occurred only once in the total list of publications

In the Netherlands, research in forensic technology (including relevant forensic biological research) often generates publications in non-forensic journals. In the period from 2004 to 2012, the Department for Forensic Molecular Biology at Erasmus MC, for example, published 95 articles in scientific journals and books. During the same period, the Forensic Laboratory for DNA Research published 54 scientific articles (Table 5).

Table 5 Publications relating to forensic technical research

Publications in	FMB EMC	FLDO LUMC
Forensic Sci Int	2 (2 %)	6 (11%)
Hum Genet	5 (5 %)	1 (2 %)
PLOS Genetics	2 (2 %)	1 (2 %)
Forensic Sci Int: Genet	10 (11)	7 (12%)
Investig Genet	6 (6%)	
Proc Natl Acad Sci USA	2 (2%)	
J Hum Genet	2 (2%)	
Am J Hum Genet	8 (8%)	4 (7%)
Int J Legal Med	10 (11%)	3 (5%)
Mol Biol Evol	8 (8%)	2 (4%)
Eur J Hum Genet	6 (6%)	3 (5%)
Curr Biol	5 (5%)	
Hum Mutat	2 (2%)	2 (4%)
Hum Mol Genet	2 (2%)	2 (4%)
Ann Hum Genet	2 (2%)	1 (2 %)
Mol Ecol	2 (2%)	2 (4%)
Genetics	1 (1%)	2 (4%)
Other[a]	20 (23%)	18 (34%)
Total	95	54

[a] The category "Other" contains items published in journals that occurred only once in the total list of publications.

Also during that period, the Netherlands Forensic Institute's research in forensic biology, forensic toxicology, and forensic anthropology generated 74 publications. Twenty-two percent of these articles were published in Forensic

Science International, fifteen percent in Forensic Science International: Genetics, and five percent in the International Journal of Legal Medicine. These publications also included six entire books (8%) and seven chapters in books (9%).

The Department of Forensic Molecular Biology at Erasmus MC published articles in journals such as Nature, Nature Reviews Genetics, and the Proceedings of the National Academy of Sciences of the USA, in the "Other publications" category. The Forensic Laboratory for DNA Research, for instance, published articles in Science, PLOS ONE, and Nature Reviews Genetics. These make up part of the 34 percent of "other publications".

Annex I

Funding the recommended measures

The level of financial resources required to fund the new postgraduate programme in forensic medicine (via a yet to be established government fund) will depend on the number of student places involved. The Committee estimates that the 10-20 student places needed to effectively compensate for the numbers of forensic physicians expected to leave the profession will cost EUR 350,000 to EUR 700,000 per year, for a period of at least ten years.[163]

The development of forensic medical research will depend on the creation of an earmarked financial incentive. The cost of this, over a period of four years, is estimated at EUR 1.3 million. EUR 0.3 million of this amount is intended for the establishment of an academic collaborative centre. These funds are needed for the appointment and support of a coordinator, who will facilitate consultation, knowledge exchange and knowledge transfer, as well as developing internal and external communications (via a website, newsletters, and the like). This budget will also be used to fund small-scale research projects, and research internships for forensic physicians (trainee or otherwise). In addition, EUR 1 million is needed to set up a research programme within a four-year time frame. This sum could, for example, be used to fund three PhD studies (costing a total of EUR 0.9 million) and a number of smaller and shorter research projects.

However, when it comes to the funding of forensic medical procedures and of quality assessment and promotion, it is more difficult to identify the exact resources required. At the moment, these procedures are partially (sometimes indirectly) reimbursed by the Ministry of Security and Justice.

Annex **J**

List of abbreviations

ACFS	Amsterdam Centre for Forensic Studies
aios	residents in training to become specialists
AMC	Academic Medical Center
AM(H)K	Advice and Reporting Centre on Child Abuse and Neglect (and Domestic Violence)
BIG	Individual Health Care Professions Act
BZK	Ministry of the Interior and Kingdom Relations
CanMeds	Canadian Medical Education Directives for Specialists
CBS	Statistics Netherlands
CBRN	Chemical, Biological, Radioactive and/or Nuclear
CGS	College of Medical Specialisms
EBRO	Evidence-based guideline development
EHRM	European Court of Human Rights
EVRM	European Convention on Human Rights
FARR	Forensic Physicians Rotterdam/Rhine Delta
FGCN	Forensic Genomics Consortium Netherlands
FLDO	Forensic Laboratory for DNA Research
FMB	Department of Forensic Molecular Biology
FMG	Forensic Medical Society
FMMU	Utrecht Society for Forensic Medicine
FMO	Forensic medical examination

FO	Forensic Investigation
FPA	Forensic psychiatric wards
FPK	Forensic psychiatric clinics
FPKM	Forensic Medical Child Abuse Center
GGD	Municipal or community health service
GGZ	Mental health care service
HKZ	Harmonisation of Quality Review in Health Care and Welfare
IGZ	Netherlands Health Care Inspectorate
KNGF	Royal Dutch Society for Physical Therapy
KNMG	Royal Dutch Medical Association
KNOV	Royal Dutch Organisation of Midwives
LUMC	Leiden University Medical Center
M&G	Public Health Medicine
MUMC	Maastricht University Medical Centre
NFI	Netherlands Forensic Institute
NFU	Dutch Federation of University Medical Centers
NHG	Dutch College of General Practitioners
NHS	National Health Service
NIFP	Netherlands Institute of Forensic Psychiatry and Psychology
NIOS	Netherlands Institute of Sports Medicine
NIVEL	Netherlands Institute for Health Services Research
NMT	Dutch Dental Association
NODO	Further investigations to establish the cause of death
NRGD	Netherlands Register of Court Experts
NRI	National Criminal Intelligence Service
NSPOH	Netherlands School of Public and Occupational Health
NVIC	National Poisons Information Centre
NVK	Dutch Pediatric Association
NVOG	Dutch Society for Obstetrics and Gynecology
NVSHA	Netherlands Society of Emergency Physicians
NVvP	Dutch Pathological Society
NVT	Dutch Society for Trauma Surgery
NWO	Netherlands Organisation for Scientific Research
NZa	Dutch Healthcare Authority
OvJ	Public Prosecutor
PI	Penal Institution
PIJ	Placement in a judicial institution for juvenile offenders
POP	Personal development plan

RGO	Advisory Committee on Health Research
SEH	Accident and Emergency Department
SGRC	Specialists in Public Health Medicine Registration Committee
STR	Short Tandem Repeat
TBS	Measure of Detention Under Hospital Order
TMFI	The Maastricht Forensic Institute
UMC	University Medical Center
UMCG	University Medical Center Groningen
UvA	University of Amsterdam
UU	Utrecht University
Verenso	Dutch Association of Elderly Care Physicians and Social Geriatricians
V&J	Ministry of Security and Justice
VU	VU University Amsterdam
VUmc	VU University Medical Center Amsterdam
VVAK	Association for child abuse counsellors
VWS	Ministry of Health, Welfare and Sport
WGBO	Medical Treatment Agreements Act
WHO	World Health Organization
WODC	Research and Documentation Centre
ZonMw	The Netherlands Organisation for Health Research and Development

Health Council of the Netherlands

Advisory Reports

The Health Council's task is to advise ministers and parliament on issues in the field of public health. Most of the advisory opinions that the Council produces every year are prepared at the request of one of the ministers.

In addition, the Health Council issues unsolicited advice that has an 'alerting' function. In some cases, such an alerting report leads to a minister requesting further advice on the subject.

Areas of activity

Optimum healthcare
What is the optimum result of cure and care in view of the risks and opportunities?

Prevention
Which forms of prevention can help realise significant health benefits?

Healthy nutrition
Which foods promote good health and which carry certain health risks?

Environmental health
Which environmental influences could have a positive or negative effect on health?

Healthy working conditions
How can employees be protected against working conditions that could harm their health?

Innovation and the knowledge infrastructure
Before we can harvest knowledge in the field of healthcare, we first need to ensure that the right seeds are sown.

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