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CONTENTS

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EDITORIAL

Medico-legal death investigation – multiple methods to achieve the same objective

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Unlike other branches of medicine – which follow the same principles of practice world over – medico-legal death investigation is one of the most diverse and varied aspects related to the practice of medicine in general, and forensic medicine in particular.

Within the basic inquisitorial and adversarial legal systems, a wide variety of medico-legal systems (MLS) exist: the magisterial, coronial, police and medical examiner systems. All countries have some procedure for investigating deaths which cannot be certified by a physician. The objective is to investigate the deaths and to determine the circumstances viz., homicide, suicide, accident, natural or undetermined. The lead investigator and depth of this investigation varies considerably. Some countries focus only on those with obvious criminal or negligence aspects. Others investigate nearly every death which occurs outside a hospital or in which a physician is not in attendance at the time of death. Therefore, the autopsy rate varies considerably. For example, the medico-legal autopsy rate in Australia is 16% of all deaths while it is only 1-2% in Belgium. The degree of autopsy also varies, with some countries preferring external examinations unless circumstances dictate otherwise, while others perform full autopsies on nearly all medico-legal cases. Training also varies, with some countries such as Sri Lanka, requiring extensive courses in forensic medicine for all undergraduate medical students, while others make such courses optional, concentrating training at the postgraduate level. The autopsies may be conducted by full-time board-certified forensic pathologists with many years of training and experience to general physicians with little or no forensic experience or training. The decision-making authority on the need for an autopsy, can it be challenged or objected to by the next-of-kin, can the decision maker be sued, are some of the other issues that arise.

Way back in 1959, a discussion which took place at the London Hospital Medical College on the medico-legal procedure following death in unusual circumstances has been published in the Medico-Legal Journal. Dr. Milton Helpern, Chief Medical Examiner, New York City, Mr. A. L. Nixon, Procurator-Fiscal, City of Aberdeen and Sir Bentley Purchase, H.M. Coroner for the Northern District, County of London have represented the USA, Scotland and England respectively[1]. At the onset, the chairman Dr. F. E. Camps, Head, Department of Forensic Medicine, the London Hospital Medical College, opened the discussion with the following statement. "It seemed a good opportunity to try to elucidate for those of you who are a little muddled as to what exactly these various systems mean, how they work and how efficient they are".

In July 1977, a special issue of Forensic Science consisting of 86 pages authored by Voight, Wecht and Eckert comparing medico-Legal systems in 22 countries in Europe has been published[2]. In 2006 Randy Hanzlick has published a book, on systems and procedures of death investigation in the USA[3].

A paucity of literature that describes the MLS covering a wider geographical area exists. To fill this void – and since we feel that the statement of Dr. Camps is still true today as it was 63 years ago – this special issue of the SLJFMSL incorporates the MLS of all the inhabited continents of the world. Since this is the first one of its kind, we encourage readers from around the world, with differing MLS will contribute to further issues.

Detailed descriptions of the medico-legal system are given for Australia, Belgium, Brazil, Canada, England and Wales, Hong Kong, Netherlands, New Zealand, Poland, Scotland, South Africa, Sri Lanka and the Nordic countries comprising of Denmark, Sweden, Norway and Finland. A significant cross section of the different systems has been illustrated by these contributions.

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Medico-Legal Death Investigation Systems – Australia

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ABSTRACT

Australia's medico-legal death investigation system is overseen by coroners who are independent judicial officers. Deaths reportable to coroners are prescribed in legislation which is broadly similar throughout Australia's six states and two territories. Coronial investigations are inquisitorial in nature and make important contributions to death prevention and public health. Coroners are assisted in the discharge of their responsibilities by specialist pathologists who form the medical arm of the death investigation process. This paper will outline the current system of medico-legal death investigation throughout Australia with the State of Victoria serving as an exemplar of the system around the country.

Keywords: Autopsy; coroners; legislation; pathologists; preliminary examination.

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INTRODUCTION

As a Commonwealth jurisdiction the medico-legal death investigation system in each of Australia's six states and 2 territories[1] is overseen by Coroners akin to the system in England and Wales from which it was inherited on settlement. While in the 18th and early 19th century Coroners could come from various 'walks of life', today in Australia Coroners are judicial officers appointed by the Governor in Counsel which to all intents and purposes means the jurisdiction's Attorney General (the state or territory's chief law officer). Coroners are all legal practitioners that have the status of a Judge and are independent of government, police and other agencies. In some jurisdictions the Coroners Court is a branch of the Magistrate's Court or Local Courts while in others the Coroners Court is its own separate and distinct branch within the Court hierarchy. Coronial legislation varies slightly from State to State but is broadly similar across all states and territories and governs the duties and responsibilities of coroners in respect of a death.

THE CORONERS COURT AND LEGISLATION

The Coroners' jurisdiction is predominantly focused on fact gathering and the strict rules of evidence pertaining to criminal and civil jurisdictions do not necessarily apply, a feature of inquests that perhaps explains that a Coroner has no criminal or civil jurisdiction.[2] They cannot find a person guilty of a criminal offence and cannot commit a person for trial. In addition, the information they uncover cannot be used in evidence, in that form, in any civil proceedings by any party.

Today the Coroners' Court remains perhaps one of the only non-adversarial Courts in the Anglo-Australian (English) legal system. The Coroners in presiding over their 'Inquest' is a true inquisitor. The scope and nature of their enquiry is for them to set within their legislative powers and as a result arguably there are no 'parties' before the Coroner.

A striking feature of modern Coroners Law within Australia has been the inclusion of specific reference to the purpose and role of the jurisdiction beyond the requirement to find the facts regarding a reportable death. In addition legislative reform has imposed an obligation on Coroners to take into account cultural factors and considerations when exercising their powers.[3]
An example of the explicit public health and safety purpose of the jurisdiction can be found in the preamble to the 2008 Coroners Act (Vic.) which states:

> *'The coronial system of Victoria plays an important role in Victorian society. That role*

involves the independent investigation of deaths and fires for the purpose of finding the causes of those deaths and fires and to contribute to the reduction of the number of preventable deaths and fires and the promotion of public health and safety and the administration of justice.'

And further in section 1(c) that the purposes of the Act is:
'to contribute to the reduction of the number of preventable deaths and fires through the findings of the investigation of deaths and fires, and the making of recommendations, by Coroners ……'

While a Coroner has no power to enforce change or exercise any public health function there are two main ways in which Coroners in Australia support public health and death prevention activities. The first of these relates to the wider promulgation of Coroners 'Findings' and 'Recommendations' than the simple production of a legal finding. For example, the Victorian Coroners Act 2008 places a direct obligation on Coroners to publish inquest findings, comments and recommendations and directs that this publication must be made on the Internet. Section 73 (1) stating:

'Unless otherwise ordered by a Coroner, the findings, comments and recommendations made following an inquest must be published on the Internet in accordance with the rules.'

The second way in which the Australian Coroners Jurisdiction contributes to public health and safety is through its engagement with and support for the National Coronial Information System[4] which provides a repository of the results of death investigations that can be utilised by policymakers, researchers and death investigators to support their work.

Death reportability criteria across Australia are outlined in legislation and include obligations to report deaths that are the result of accident or injury, homicide, suicide, not obviously natural, following or as the result of a medical procedure (with the definition varying slightly across the country), deaths in custody (or formal care), of unknown cause, simply unexpected or where no Medical Certificate of Cause of Death (MCCD) is available. The main responsibilities of coroners in respect of a reported death include determination of identity and the cause of death and in some cases elaboration of the circumstances surrounding a death. Importantly it is the Coroner rather than the forensic pathologist who determines the 'manner of death'.

To assist coroners in the discharge of their responsibilities the medical arm of the death investigation process is undertaken by specialist pathologists, most of whom are forensically trained. Hospital-type autopsies (those requiring the consent of the next of kin) for clinical purposes are an increasing rarity and many hospital dissection facilities have been decommissioned in recent times. Medico-legal death investigations are undertaken in purpose-built facilities, many co-located with coroner offices, situated in capital cities and, in the case of Australia's most populous state New South Wales, larger regional centres. In practice this means that in Australia the vast majority of medico-legal death investigations for Coroners are undertaken by full time forensic pathologists as State or Territory Government employees rather than by hospital based clinical/anatomical/histopathologists. These medical services for the Coroner are provided at no cost to the family of the deceased person regardless of the scope or depth of the examination performed. As a result of this central government funding of forensic pathology services the range of tests and examinations undertaken is dependent on the medical and legal needs rather than on fiscal availability of resources. It is now increasingly common in Australia for post mortem CT scans and toxicology testing to be undertaken in the majority of reported deaths. The reliance on State and Territory based Centres or Institutes rather than local hospital facilities also creates economies of scale that permits these facilities to employ forensic Odontologist and Anthropologists on a full or part time basis and to similarly engage sub-specialist pathologists (neuro-pathologists, cardiac pathologists, paediatric patho-logists etc.) to assist with more specialised case work.

In this paper, the state of Victoria will serve as an exemplar of the system in place across the country.

THE VICTORIAN INSTITUTE OF FORENSIC MEDICINE (VIFM)

The VIFM is a statutory agency within the Victorian government's justice portfolio. It was founded in 1988 with a mission to provide high-quality forensic medical and scientific services to the coroner, justice system, health system and the community more broadly. The VIFM's services include medico-legal death investigation, clinical forensic medicine (but not custodial medicine), forensic toxicology, molecular biology and histology, tissue banking (the Donor Tissue Bank of Victoria is a business unit of the VIFM), and it is home to Monash University's Department of Forensic Medicine in association with which many of its teaching, training and research activities are delivered.

DEATHS IN THE STATE OF VICTORIA

Of the approximately 42,000 deaths occurring annually in Victoria (population ca. 6 m), about 16% are reported to the coroner. The spectrum of death types has remained similar over the years with about half of all deaths ultimately found to be from natural causes. Of

those deaths not reported to the coroner, the physician providing or overseeing the care of the deceased individual in life completes a medical certificate of cause of death (MCCD) which is forwarded to the state's registry of births deaths and marriages (RBDM). The RBDM undertakes a limited medical review of all MCCD's and annually approximately 500 of those cases are subsequently referred to the coroner for review due to possible irregularities or errors in the stated cause of death.

For those deaths falling under the remit of the coroner's legislation across the State (including Victorian residents dying overseas), the body is transferred to the Victorian Institute of Forensic Medicine (VIFM) in Melbourne for medical investigation. There is no formal requirement for the fact of death to be confirmed prior to transfer, but a statement to that effect is in most circumstances completed by attending medical or paramedical emergency personnel.

EARLY PROCESSES FOLLOWING A DEATH

The Coroners Act (2008) introduced a process called Preliminary Examination in which authority is granted to a medical investigator (usually the pathologist) to conduct certain procedures (in a process akin to a medical triage). These examinations do not require prior approval of the Coroner but must not involve a dissection of the body. The results of the 'Preliminary Examination' are presented to the Coroner to put them in the best position to determine the most appropriate form of death investigation, including whether an autopsy should be performed.

When a death is reported to the coroner, the office receiving that report is called the Coronial Admissions and Enquiries (CAE) office, a department of the VIFM acting under delegated authority of the coroner. The CAE is predominantly staffed by nurses, many with experience in intensive care or accident and emergency practice assisted by a team of specially trained medico-legal executive assistants. It is the responsibility of these staff to collect the relevant information about the death, and to engage with the next of kin to apprise them of the coronial process, uncover any concerns they may have about the death, seek their views regarding possible autopsy, assist in viewings of the body in some circumstances (especially for identification purposes), and finally to confirm the family's preferred funeral director prior to discharge from the VIFM mortuary.

The types of information normally sought by and provided to the CAE include a police summary of circumstances, a report by hospital treating clinicians (a medical deposition), reports by attending ambulance officers, and where relevant the full medical records held by hospital of general practitioners. Occasionally reports by other agencies including work safety inspectors, Fire investigators, and civil aviation accident investigation experts may also be sought. In the case of a death potentially associated with criminal activity (suspicious death), investigating police (usually specialist units such as the Homicide Squad, Major Collision Investigation Unit, or the Arson and Explosives Squad) may submit a request for urgent autopsy for consideration by the coroner to assist in the early phase of their investigation.

The CAE is also the first point of contact for hospital organ transplantation coordinators where the next of kin express a wish for organ donation (either on their own initiative where there has been no recorded objection to the procedure by the deceased in life or in accordance with the deceased's previously expressed wishes), usually in cases of brain death being treated in intensive care units. The CAE also houses the VIFM's identification unit, staffed by anthropologists and forensic dentists who review all identifications for reliability and facilitate dental or molecular investigations in those cases where scientific means of identification are required such as decomposed or fragmented remains.

In any event, the body is transported from the scene or hospital by a government contracted transport service to the VIFM where, if the case is not deemed suspicious, it is subject to the Preliminary Examination' process. The deceased is photographed dressed and undressed, identification labels attached, and a blood sample is obtained (by blind puncture of the inguinal region).[5] In every case a full-body CT scan is then obtained as part of the admission procedure. An overnight quantitative toxicology analysis for over 350 drugs is undertaken on the admission blood sample. The CAE provides the reviewing (or 'duty') pathologist with information gathered as part of its initial enquiries in respect of a death and this often supplemented by hospital clinical record extracts (digital or in paper form), general practitioner records, and an external examination of the body. The CT scan is assessed by the duty pathologist (with referral for specialist radiological interpretation if necessary), and a summary of all information gathered in this initial phase is prepared by the pathologist for presentation to the coroner in a daily morning meeting. Approximately 20-25 cases are discussed at this meeting.

The preliminary examination process has two important outcomes (in addition to the confirmation of identity) which are provided to the coroner in the form of advice: the cause (and by implication in most circumstances, manner) of death, and the most appropriate form of medical investigation in the circumstances; normally autopsy (to the extent deemed necessary by the

pathologist) or a visual inspection (so-called Inspection and Report).

With these preliminary examination findings the coroner then makes a decision regarding the type of medical examination[6] which will be authorised and this is conveyed to next of kin by CAE staff. If the coroner makes an order that an autopsy is necessary, this procedure cannot be performed until a further 48 hrs has elapsed to enable the family time to formally object to the decision, unless this right is waived by them. If an objection is raised, the same coroner reconsiders the issue in the light of the family's expressed views and any further available information. If it is determined that the original decision to perform an autopsy will stand, and the family are unwavering in their objection, the case may be considered by the highest judicial authority in the state, the Supreme Court. In every one of the 10 or so cases considered by the Supreme Court under this current legislation the family's objection has been upheld, usually on the basis that the case was 'not suspicious' and there would be no public benefit in conducting autopsy, even if a precise cause of death was otherwise unobtainable.

DEATH INVESTIGATION PROCEDURES

The practice of medico-legal death investigation in Victoria is constantly evolving. In those circumstances where the death is not considered suspicious by police, where no concerns have been raised by next of kin or treating clinicians, where a coroner determines that that an autopsy would unnecessarily exacerbate familial grief and it is considered that no public benefit would likely accrue from the procedure, and in the face of familial objection to autopsy it would be very unusual for an autopsy to be performed. This has highlighted the critical importance of properly medically informed information provision to families in the early phase of the death investigation process to enable them to understand the potential detrimental consequences (to the grieving process, or to the family's understanding of its medical history) of their decisions in respect of a death. In any event, currently about 53% of all case admissions to the VIFM do not undergo an internal examination. Discussions with government and the Coroners office are currently underway which may result in the necessary legislative amendments to allow pathologists to complete a MCCD in appropriate (non-suspicious, natural deaths) cases. This would thus provide a third possible outcome for daily coroner-pathologist meeting: autopsy, inspection and report, or MCCD.

If it is determined that no autopsy of the body is to be performed the pathologist will conduct a detailed external examination of the body, request photographs if necessary and prepare a report outlining the circumstances of the death, the medical history if obtainable, and the medical cause of death. Occasionally toxicology analysis will also be performed on the admission sample of blood although the definitive results of this analysis will not normally be available until after the cause of death has been registered.

If an autopsy is to be performed it will normally occur between 3 days and a week after admission and be performed by a forensic pathologist or specialist trainee (registrar) assisted by a forensic technician. Specimens and samples obtained during the procedure include histology blocks (normally about 15-20 from each case), toxicology samples (normally blood, urine, vitreous humour, stomach contents, liver, and hair), microbiology samples (for bacteriology and virology), molecular biology samples (for example head of femur for identification purposes), implanted cardiac devices for interrogation, and other specimens as necessary including for metabolic, biochemical and serologic analysis. After reconstruction and if no further testing is required, the body is normally ready for release to funeral directors later that day.

In the case of a suspicious death, the autopsy will normally be performed in a separate /isolated room with attending police officers in an adjacent viewing area able to observe the procedure from behind glass and communicate with the pathologist by intercom. In addition to the pathologist and technician those present in the autopsy suite may also include a police photographer and specialist crime scene scientist/investigators with expertise in such fields as ballistics or explosives. Investigating police often make specific requests of the case pathologist including obtaining fingernail scrapings, trace evidence analysis, sexual assault sampling (using a sealed, individually numbered pre-packed kit designed for the purpose), and particular/targeted photographs. Normally at the end of the case the pathologist will present the findings and their conclusions to the police and a discussion will ensue about what further information or testing is required.

In a minority of suspicious cases the pathologist may have attended the scene prior to the autopsy, usually at the request of investigators to provide a provisional cause of death, an approximate time since death, or to help police decide if a death actually was suspicious.

AFTER THE AUTOPSY

Preliminary/provisional information obtained from the autopsy is provided by the case pathologist or CAE staff to police and family members on request. A comprehensive report on the medical investigation is normally provided to the Coroner's office within three

months of the autopsy but may take considerably longer (up to 6 months) if specialised toxicological analyses or neuropathological examinations are necessary. Once the body has been released from the Institute, engagement with family members about medical matters (including potentially heritable conditions diagnosed at autopsy) is handed to a team of Family Health nurses (FHN) whose role is to explain the autopsy findings in understandable terms, arrange for family follow up with general practitioners or specialised cardiac genetic services, and on occasions facilitate face to face meetings where the pathologist and FHN nurses can explain the findings and any potential consequences in detail.

From a coronial perspective, once the case report is provided to the coroner by the VIFM, it is passed to the coroners' registry whose role is collate the necessary information to enable the coroner to discharge his or her responsibilities in respect of the death. These may require the gathering of further information and statements from witnesses such as treating clinicians. In a small number of cases (around 5%) a formal inquest (courtroom hearing) is convened, but in the majority the coroner issues what is called a chambers finding which details the circumstances, cause and occasionally manner of death. Such findings can vary considerably in their detail and complexity depending on the issues in the particular case and individual coroners have dedicated registry personnel and lawyers to assist them in this task. For formal inquests where there may be a number of interested parties, each with legal representation, the coroner often engages the services of a barrister to assist in the preparation for and conduct of the hearing, as well as the writing of the finding and recommendations.

In criminal matters, the coronial investigation is frequently paused to allow the matter to proceed through the courts by way of committal hearing and trial. Occasionally, particularly in homicide cases the coroner will recommence the investigation after all criminal proceedings have been completed. In the case of a guilty verdict, the subsequent coronial investigation is usually a perfunctory affair. However, in the case of a not guilty verdict, particularly where no other suspect is in prospect, the coronial inquest into the death can be a mechanism to explore matters relevant to the death which were outside the often narrowly defined matters at issue in a criminal trial. The decision to undertake such a further exploration of the death is for the Coroner alone. Traditionally they have been reluctant to exercise this power with legislative amendment being sought to enable Coroners to exercise their discretion not to enquire further. This situation arose because of the wider inquest powers to hear evidence that was not admissible in the criminal proceedings a situation that could have reduced the standing of the criminal trial process in the eyes of the community.

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[1] There is no Federal Coroners jurisdiction in Australia and all medico-legal death investigation services and facilities are State and Territory based.

[2] Coroners can send their findings to the Office of Public Prosecutions for consideration if they believe that a criminal offence may have been committed.

[3] When exercising a function under this act, a person should have regard, as far as possible in the circumstances, to the following—

(a) that the death of a family member, friend or community member is distressing, and distressed persons may require referral for professional support or other support; and

(b) that unnecessarily lengthy or protracted coronial investigations may exacerbate the distress of family, friends and others affected by the death; and

(c) that different cultures have different beliefs and practices surrounding death that should, where appropriate, be respected.

[4] "The National Coronial Information System (NCIS) is a secure database of information on deaths reported to a coroner in Australia and New Zealand. The NCIS contains data on almost 400,000 cases investigated by a coroner. Data includes demographic information on the deceased, contextual details on the nature of the fatality and searchable medico-legal case reports including the coronial finding, autopsy and toxicology report and police notification of death.

The database is available to coroners to assist investigations and appropriate access is available on application for research or monitoring projects." https://www.ncis.org.au/about-us/

[5] If the case is considered suspicious; it is placed into a body bag which is sealed with a numbered security tag and the bag is not opened until the time of autopsy in the presence of the pathologist and attending police.

[6] Autopsy, limited autopsy or external examination.

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Medico-Legal Death Investigation Systems – Belgium

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ABSTRACT

The Belgian criminal justice system, and hence its death investigation system, is based on the French Code Napoléon from 1808. It is characterized by an inquisitory (secret) nature being mostly led by an investigating judge. Most deaths are certified (so-called Model IIIc) by general physicians with very limited forensic knowledge or experience. There are no legal restrictions as to which physician can certify any death. Only when the nature of death is considered 'suspicious' or 'violent' by these physicians, the public prosecutor will ask for a more in-depth investigation by a doctor trained in forensic medicine. If necessary, a forensic autopsy will be commissioned by an investigating judge who investigates both *à charge et à décharge*. Overall, the autopsy rate (forensic and clinical) is low in Belgium (estimated up to 1-2% of +/- 110,000 annual deaths).

Residency training and specialization in forensic medicine takes 5 years and the candidates are trained both in clinical forensic medicine and forensic pathology (regulated by the Ministerial Decree of February 27th 2002).

Keywords: Code Napoléon; court of assizes; investigating judge; inquisitory; Model IIIc.

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After its independence in 1830, the new Belgian state adopted Napoléon's *Code d'instruction criminelle* from 1808 as its own Code of Criminal Procedure (*Wetboek van Strafvordering – Code d'instruction Criminelle*). To date, the criminal investigation and prosecution system has changed little from its origins more than two centuries ago. It still has a pronounced inquisitorial (secret) character in which a judge plays an active role in investigating the facts of the case and thus being distinct from the adversarial system in which the role of the judge/court is primarily that of an impartial referee between the prosecution and the defense.

In Belgium, when confronted with the death of any person, a medical doctor is required to formally establish that the person is deceased and has to complete the death certificate ('model IIIC' or 'model IIID' for children below the age of 1) before the Officer of the Civil Registry can provide an authorization for burial or cremation (article 77 Civil Code). There are no legal restrictions as to the qualification(s) of the medical doctor who completes the death certificate. Even more, in Belgium any medical doctor can certify any death. Neither training in death certification of legal medicine nor an independent professional position with regard to the deceased person is a prerequisite. The medical disciplinary body (Order of Physicians) only gives some deontological advice with respect to death certification and stipulates that this should be done 'with the utmost care'.

The Model IIIC death certificate consists of a part that has legal implications, and a part that only serves statistical purposes. The legal part of the death certificate has one important 'tick-box' where the medical doctor's opinion is asked as to whether there is any 'medico-legal objection against burial or cremation'. The nature of these 'objections' is specified in a footnote: 'death is possibly or certainly caused by an external factor'. The medical disciplinary body states that 'if there is any doubt [as to a natural death] in the mind of the medical doctor' a medico-legal objection should be expressed. The physician who completes this death certificate will also make an administrative decision as to the manner of death: homicide, accident, suicide, natural, or undetermined. We often see major discrepancies between the administrative cause of death and the appreciation of 'medico-legal objection' on the one hand due to the lack of forensic knowledge by general physicians and on the other hand a tendency by some physicians 'not to cause additional burden or

grief to the family by ticking the medico-legal objection box'.

If no medico-legal objections are mentioned and there is a request for cremation, a second, independent, medical opinion is required (Decree of January 16th 2004). An independent, so-called 'sworn' medical doctor, appointed by the Civil Registry, has to certify the absence of signs of a violent or suspicious death. These sworn medical doctors are however again often family physicians without any forensic training. If the sworn doctor can't certify the absence of signs of violent or suspicious death the Officer of the Civil Registry has to inform the Public Prosecutor's Office (*Procureur des Konings – Procureur du Roi*) and he is not allowed to issue a permission for burial or cremation.

In Belgium, approximately 110,000 deaths occur per year. It is estimated that less than 1-2% of these deaths are investigated by full (clinical or forensic) autopsy[1].

A continued decline in the clinical autopsy rate is seen, whereas the forensic autopsy rate remains stable. Recently, medical specialists in forensic medicine have been authorized to also perform clinical autopsies[2].

When a medico-legal objection is made by the initial medical doctor, the Officer of the Civil Registry is again not allowed to issue permission for burial or cremation and again has to inform the Public Prosecutor's Office of a suspicious death (article 81 of the Civil Code).

In a first step, the Public Prosecutor has the possibility to commission 'one or two physicians' to inform his office about 'the cause of death and the state of the body' (article 44 of the Criminal Code). In the past any physician could be commissioned by the Public Prosecutor; however recently the Criminal Code stipulates that this examination should be performed by a physician who is registered in the National Register for Court Experts (Law of April 10th 2014). Mostly, these physicians are forensic medicine specialists working in an academic forensic institute.

Experts included in the National Register are now permanently sworn as court experts. Beforehand, the forensic expert is expected to mention the legal oath explicitly in every report: "I swear that I will fulfill my mission in good conscience, conscientiously and honestly" (*"Ik zweer dat ik mijn opdracht naar eer en geweten, nauwgezet en eerlijk zal vervullen" - "Je jure de remplir ma mission en honneur et conscience, avec exactitude et probité").* If not mentioned, the forensic report would be declared null and void.

The medical examination regarding 'the state of the body' is in this stage limited to an external examination, not a full autopsy and thus establishing 'the cause of death' is often not more than an educated guess. There is no formal intention by the Prosecutor's Office to establish a cause of death; the purpose of this external examination is, from the Prosecutor's point of view, mostly to rule out (or confirm) that a third party could have played a role in the death of that person. This legal point of view often conflicts with the point of view of a forensic doctor.

When interference by a third party resulted in death cannot be ruled out, the public prosecutor can ask for the initiation of a judicial inquiry. This implies that the public prosecutor has to (temporarily) hand over the investigation to a so-called investigating judge (*onderzoeksrechter – juge d'instruction*). This investigating judge, in contrast to the public prosecutor, is a neutral magistrate who will investigate the case either incriminating or exculpatory (*à charge et à décharge*) and assumes an active, leading role in the inquiry.

The investigating judge will commission a forensic doctor, registered in the National Register for Court Experts, who can accompany the investigation judge while visiting the crime scene (*plaatsafstapping – descente sur lieu*) and to subsequently perform an (internal) autopsy. Once the decision to perform a forensic autopsy is taken by the investigating judge, the next of kin (or any other involved party) cannot oppose this decision.

In Belgium, the medical specialization of 'forensic medicine' can result either from a five-year residency in forensic medicine (Ministerial Decree of February 27th 2002) or an eight-year residency (five years in pathology and three years in forensic medicine). The statute of a commissioned forensic doctor is that of a 'medical advisor to the legal authority' and the observations he or she makes during the autopsy (or any other examination) are considered 'authentic' and 'a legal source of information'. The investigating judge cannot ignore the observations made by the forensic doctor, but is not bound by the conclusions made in the forensic medical report.

In Belgium, the forensic doctor is not the authority determining the manner of death since he is not allowed to make conclusions that are part of the legal domain or that are considered legal qualifications. The manner of death is thus established at the end of the judicial inquiry by the appropriate legal authority.

A somewhat unique feature of the Belgian legal system is the existence of a 'reconstruction' (*wedersamenstelling - reconstitution*). The reconstruction can have a technical character, where technical medical aspects can be tested, or a more formal character, where a suspect gives his version of the facts and these are formally

acted in a *proces-verbal*. This version can then be compared to the forensic findings. The reconstruction is led by the investigating judge and is held in the presence of the Public Prosecutor's Office, the suspect's defense counsel, and civil parties. The forensic pathologist often plays an important role in this part of the judicial inquiry because here he can present his findings to all involved parties. Usually, the reconstruction will be photographed and filmed and a summary of the observations acted in a *proces-verbal*. It is important that suspects initially present and portray their version of the facts and that they are subsequently confronted with medical and technical findings that support or question their statements.

In Belgium's judicial system, the court of assizes (*hof van assisen - cour d'assises*) is the trial court that hears the most serious offenses, namely crimes qualified as murder and manslaughter and lethal terrorist acts. Crimes of this nature are punishable by imprisonment that can be up to a lifelong sentence. No appeal is possible against the decision of an assize court. Only in the case of procedural error(s), after a decision of the Court of Cassation (*Hof van Cassatie - Cour de Cassation)*, another trial before another court of assizes can be granted.

Each of Belgium's 10 provinces has an assizes court. These are the only courts in Belgium that hold jury trials. As such the court of assizes will be composed of three judges and twelve jury members (jurors). The jurors are randomly chosen from the Belgian federal election rolls. Some restrictions apply however. Serving on an assizes jury is regarded as a civil responsibility and a legal obligation; as a result, a potential juror can only be discharged from their jury duty if there are valid grounds. The jury acts as the sole assessor of the facts, but the penalty is decided together with the judges. Article 150 of the Belgian Constitution stipulates the procedure of trial by jury. The courts of assizes are not permanent courts, for each new trial a new court of assizes will be put together. The trial is held orally and during the hearings the witnesses and the evidence will be reviewed. The senior judge plays an active leading role in this type of trial and assumes the role of an investigating judge. In this phase (forensic) experts, who were involved during the preliminary investigation of the case, will be heard. The forensic doctor for example will always be present to explain his findings and to allow cross-examination by the involved parties.

In principle, the hearings are open to the general public. If however, the court considers that public disclosure would pose a threat to the public order or morality, it may arrange for a hearing or the entire trial to take place behind closed doors.

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Medico-Legal Death Investigation Systems – Brazil

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ABSTRACT

Investigation of death differs between countries and whether deaths are natural or unnatural. This article aims to describe the investigation of both natural and unnatural deaths in Brazil, a federation formed by 26 states plus the federal district. Although the Brazilian states are self-governing, death investigation follows some standardised processes throughout the country. Some deaths require little to no investigation, such as natural deaths that occur under the supervision of a medical doctor; in these cases, the body can be released directly to the funeral services. Other deaths are investigated more thoroughly, such as suspicious deaths and unidentified bodies. Such cases usually involve more parties, such as the Military Police, the Judicial Police, Forensic Experts, Prosecutors, and a Judge. Reports from forensic experts, such as forensic pathologists, forensic toxicologists, and crime scene investigators, are compiled together with other documents within the inquiry process and are critical to the success of the investigation. The forensic experts normally work in the medico-legal institutes or in the criminalistics institutes and they may or may not be part of the judicial police force, depending on the state; in some states, they are part of another institution called the Scientific Police. A crucial step in the process of death investigation is the chain of custody, which has evolved greatly in Brazil in the past few years. However, the investigation process may still take years to be completed due to the lack of resources and investment in the involved parties, especially the police forces.

Keywords: Brazil; Death investigation; Forensic experts; Forensic Pathologist; Legal Medicine

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INTRODUCTION

Brazil, which is the 5th largest country in the world, is located in the South American continent. It is a federation consisting of 26 states plus the federal district, where its capital, Brasília, is located. Each of the 26 states are self-governing and have their own laws, but they must comply with specific laws established by the federal government, especially the constitution. For this reason, even though death investigation follows some standard processes throughout the country, some procedures may differ in different states, as well as the organisational structure of the entities involved in the investigation. This article aims to describe the investigation of natural and unnatural deaths in Brazil.

GENERAL ASPECTS OF NATURAL DEATH INVESTIGATION

Brazil's population is estimated to be over 214 million. Between 2016 and 2019, the average death rate in the country was almost 1,350,000 per year, of which, around 970,000 died in health institutions, such as hospitals[1]. Whenever there is a confirmed death, it is mandatory that a death certificate (DC) is issued by a physician; each DC has a unique identifying number and can only be obtained from the Federal Ministry of Health. If the death occurs in provinces/regions with no physician available, the DC may be issued by a notary in the presence of two people that witnessed or ratified the death[2,3].

In case death occurred under the supervision of a physician, with the patient either in a health institution or at home, the body must be released directly to the funeral services[4]. In a second scenario, death may happen in the absence of a physician and with no signs of violence. In this case, the Ministry of Health, through the Death Verification Service (DVS), must confirm the death. The body may either be released directly to the DVS or the service may come to where the body is; after

death is confirmed, the DC is expedited and the body is then sent to the funeral services. The DVS may conduct either an external examination or autopsy, and they may be assisted by complementary laboratory investigations. Not all municipalities in Brazil have DVS, and in circumstances where there is no DVS at the location of death, the nearest physician, preferably from the Brazilian National Health System, would be responsible for verifying the death; exceptionally, a physician nominated by the Secretary/Ministry of Health or any other physician may confirm the death[4].

In any circumstance, the body can only be buried or cremated after the DC is finalised and sent to all relevant parties (such as notaries and relevant Secretaries/Ministries)[2,3].

UNNATURAL OR VIOLENT DEATH INVESTIGATION

Different types of institutions are involved in investigation of unnatural deaths (a.k.a violent deaths) in Brazil (Fig. 1). The process starts with the Military Police, who often visit the scene; they are important especially in the preservation of the scene and keeping the crime scene investigators safe whenever they arrive. This can also be done by the Judicial Police[5].

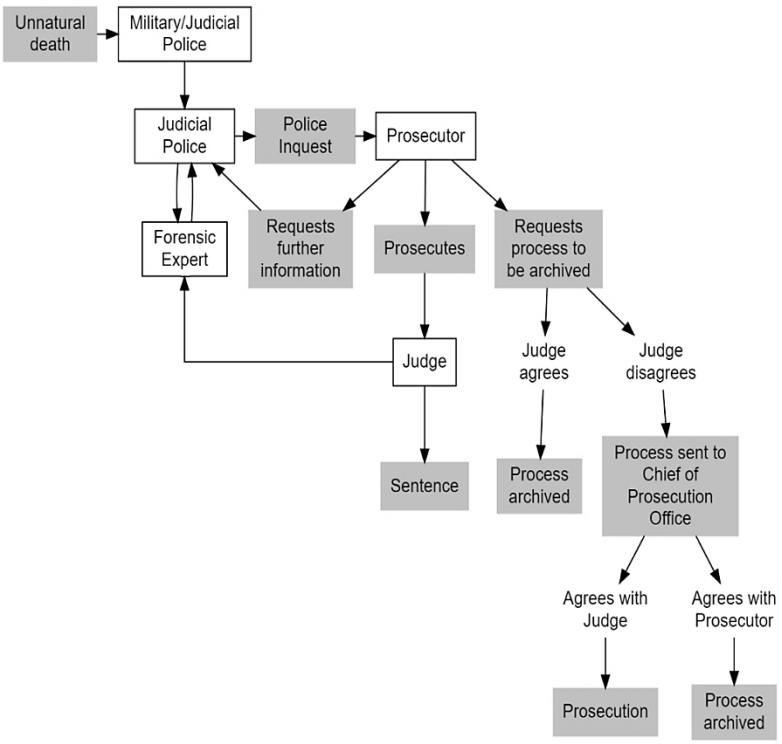

Figure 1: Simplified representation of unnatural death investigation in Brazil

Alongside, the Chief of Judicial Police triggers a process called "Police Inquest", which aims to identify suspects, enquire witnesses, collect evidence, and request forensic reports. At the end of this stage, the Chief of Judicial Police must produce a document, which includes every report produced from evidence and interviews. This document also contains the verdict of the Chief of Judicial Police with regards to the death and its circumstances (e.g., cause and authorship). This document must be completed within 30 days, unless the suspect is kept in custody during the course of investigation, in which case the Police Inquest must be completed sooner[5,6]. Although this time limit is established by law, in reality, it is rare for the Police Inquest to finish within this deadline due to the high workload and lack of resources.

For all cases of unnatural deaths or in case the body is in a state of decomposition, the deceased should be sent to the Medico-Legal Institute (MLI) or similar institution for autopsy by a Forensic Pathologist who, in Brazil, is part of a team called "Forensic Experts". All unnatural deaths need to be investigated in the MLIs because these are all potentially suspicious violent deaths, considering the fact that signs of violence are not always clear (for example, in cases of poisoning). Deaths from natural causes may also be sent to the MLI in cases where the decedent needs to be identified (by fingerprinting or DNA, for example). In instances where the municipality does not have an MLI, the cause of death may be investigated by a local physician or any other professional nominated by a Judge or Chief of Judicial Police[4].

The Chief of Judicial Police is responsible for requesting the post-mortem examination in addition to any other forensic examinations needed. The MLI, where post-mortem examinations are undertaken, are most often managed by the secretaries of public safety of each federative state. These states are free to structure and organise the MLIs. Consequently, in some states, the MLI is part of the Judicial Police, whilst in other states they are directly under the Department of Public Safety of that state. In this last scenario, the MLI may be part of another type of police called Scientific Police, which is completely independent from the Judicial Police, although they work together[7]. Figure 2 shows how the forensic institutions are organised in each state.

Figure 2: Organisation of Institutes involved in investigation of violent deaths in each Brazilian Federative State and the Federal District.

If the external lesions are adequate for the determination of the cause of death by the MLI, or if there is no crime to be investigated, the external post-mortem examination alone may suffice for unnatural deaths. However, in general, full post-mortem examinations are undertaken. Post-mortem examinations can only be done after 6 hours of death, unless Forensic Experts are confident that it may be done earlier[6].

Complementary examinations may be requested by the Forensic Pathologist, by the Chief of Judicial Police, or by the Judge in the course of investigation or after the Police Inquest is over. These may be produced by specific laboratories which may or may not be part of the MLI. Due to the size of the country and its federative structure, the MLI and associated institutions may be organised in different ways (Fig. 2). In numerous states, the MLIs are structured in two sub-sections, the imaging section and the pathology and histology Section, whilst other states include a toxicology laboratory within the MLI's organogram. Most of the other departments from where reports may be requested during the investigation process are part of the criminalistics institutes (CI), and all states have one or more of them. The CIs are where other Forensic Experts work and are responsible for assisting in the investigation; examples of these departments are ballistics, fingerprinting, and chemistry[7]. Some examinations are more often requested, such as blood alcohol concentration and drug analyses in biological samples, DNA, and fingerprinting; others are less often performed, such as carbon monoxide determination in blood and gunshot residue analyses.

Once the Police Inquest is complete, it is sent to the Prosecutor, who has three options: (a) to ask the Chief of Judicial Police for more information; (b) to prosecute the suspect; or (c) to ask for the process to be archived[8]. Archiving the Police Inquest may happen due to different reasons, such as lack of evidence that could justify triggering the prosecution. In case the prosecution chooses to archive the process, the Judge must ratify the decision. If they disagree with process discontinuation, the Chief of Prosecution Office must evaluate the case and either order the suspect's prosecution or archive the process (and, in this case, the Judge must comply)[8]. If the suspect is prosecuted, the process continues until the trial, where the verdict is established either by the Judge or by a Jury; the latter happens only if someone intentionally caused the death[8].

Just like for natural deaths, the body can only be buried or cremated after the DC is issued and sent to all relevant parties (such as notaries and relevant Secretaries/Ministries). Additionally, in cases where the body is examined by the MLI, cremation is only possible after authorisation by a Judge[2,3].

This overall procedure of unnatural death investigation may be conducted at state or federal levels. Each state has their own Judicial Police and Brazil has its own Judicial Police for federal crimes, called Federal Police (FP). This is an institution that is similar to the Federal Bureau of Investigation (FBI) in the USA. The FP is completely separated and independent from the Judicial Police for each state, which are also independent from each other. The Judicial Police in each state is responsible for investigating deaths in general, whilst the FP is responsible for dealing with specific deaths, such as cases (a) involving native Brazilians, (b) committed in Brazil's territorial sea, in the air, on borders, or within federal assets, (c) committed against or by specific people and under specific circumstances, such as federal civil servants during work[9]. Federal Forensic Experts, including Pathologists are placed within the organogram of the FP, therefore, just like for Forensic Experts in some states, they are part of the police force. The judicial system in Brazil is also distributed across different states and the federation, each one with their own personnel that deal with specific cases, similar to the police.

In order to improve effectiveness, it is common for police departments to be specialised in larger urban areas; in these areas, unnatural deaths may be investigated by the so-called "Homicide Police Department" or other specific Police Departments, such as "Traffic Police Department", if death occurred as consequence of a traffic event. The same occurs with judges, who may be specialised in judging specific crimes. In small areas, police departments and judges are normally not specialised.

FORENSIC PROFESSIONALS AND CHAIN OF CUSTODY IN BRAZIL

In Brazil, forensic professionals are, in most states, called "Forensic Experts". They are generally hired as "Forensic Experts" to then be trained and allocated to specific departments, depending on the Institution's needs and the professional's background and skills. For instance, if a chemist applies for a Forensic Expert position, they may be assigned to the forensic chemistry laboratory or in a department where they can be trained to develop new compatible skills, such as CSI or fingerprinting. In general, anyone with any higher education degree can apply for a crime expert position, as long as they are a Brazilian citizen and after they pass a number of exams testing specific knowledge and pass physical and psychological tests; in many cases, the curriculum vitae of the candidate is also taken into consideration. Only candidates who are best ranked are hired. Forensic Pathologists need to go through the same process; however, a degree in medicine is required.

Forensic Experts from different departments may be involved in death investigation, such as ballistics, fingerprinting, toxicology, DNA, CSI, document examination, etc. Whenever an examination is requested from an expert, a final report must be issued within 10 days, unless an extension is requested under exceptional circumstances[6]. Similarly in Police Inquest, it is common for this deadline to be extended due to lack of resources, especially personnel. Data from 2013 show that Brazil has 7,429 Forensic Experts and Forensic Pathologists, a number 5-fold lower than what the Brazilian forensic institutions agree would be ideal for the country[7].

Despite the low number of Forensic Experts, Brazil has developed much in death investigation in the past years. One of the reasons could be the regulation of the chain of custody, established by the Law number 13,964/2019[10]. This law created the Custody Centre, where all evidence must be stored and monitored. It also established steps of the chain of custody that must be maintained by all forensic institutes, from identification of evidence to their disposal. This is still in the implementation phase with different states being in different stages.

CONCLUSION

This paper discusses the process of natural and unnatural death investigation in Brazil. It is a complex process that involves different parties, including the Secretaries/Ministry of Health, Secretaries/Ministry of Public Safety, and the Judicial System. The Secretaries/Ministry of Health are responsible for the inspection, regulation, and notification of deaths; the Secretaries/Ministry of Public Safety are responsible for making sure evidence is collected and analysed, and that suspects are sent to court to ensure justice. The process of death investigation has evolved recently with new legislation. However, in many cases the investigation may take years to be completed, resulting in a sense of impunity for wrongdoers.

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Medico-Legal Death Investigation Systems – Canada

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ABSTRACT

Death investigations within Canada are conducted at a provincial or territorial level, with medico-legal systems being either Coroner or Medical Examiner based. Each province or territory has defined legislation which guides the death investigation process. Despite similar frameworks, great variation exists in the implementation of the legislation. This paper will outline death investigation systems within Canada, including the legislative framework for each system. An overview of forensic pathology facilities as well as educational programs in forensic pathology training will also be provided.

Keywords: Coroner; death investigation; forensic pathology; medical education; Medical Examiner.

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INTRODUCTION

Death investigations within Canada are conducted at a provincial or territorial level, with medico-legal systems being either Coroner or Medical Examiner based. Before continuing with a description of these systems within Canada, it is necessary to provide several fundamental definitions which apply to death investigation within the Canadian context. These definitions are as follows: a medical examiner is a physician with specialty training and recognized certification in anatomical or general pathology, and (usually) subspecialty training and certification in forensic pathology. Some jurisdictions appoint non-pathology trained physicians as medical examiners; however those medical examiners must defer cases requiring a postmortem examination to a medical examiner with pathology certification. The medical examiner is responsible for overseeing the entire death investigation process and may delegate investigative aspects to others (such as a medico-legal investigator which is described below). A coroner is an individual who is responsible for death investigation and are usually appointed. A coroner may seek the expertise of a pathologist to determine the cause of death, but ultimately the coroner certifies the cause and manner of death. Most coroners in Canada are laypersons with no training in medicine. Some provinces (such as Quebec) appoint coroners with a background in law. Other provinces (Ontario and Prince Edward Island) require coroners to be medically trained and registered physicians. Essentially all death investigation systems in Canada aim to answer the so called 'five questions', which is what they will be collectively referred to as in this paper. These five questions are 'who' (the identity of the deceased), 'when' (date and time of death), 'where' (location of death), 'how' (the medical cause of death), and 'by what means' (manner of death). Recognized manners of death in Canada are homicide, suicide, accidental, natural and undetermined. Finally, the term 'medico-legal investigator' also known as 'medical examiners investigator' or 'medical investigator' refers to individuals with prior training and experience in nursing, paramedical work, or as prior police officers. These individuals will assist medical examiners in collecting data (mostly surrounding history, scene and circumstances) for their investigation. The investigators are also usually the liaison person between next of kin and the medico-legal system investigating a death.

Each province or territory has defined legislation which guides the death investigation process (see reference section for links to each legislative document). Certain types of deaths which require medico-legal investigation by a coroner or medical examiner are defined within the legislation, as is the authority to investigate. When such a death occurs, typically the police, attending physicians, nursing home staff and-or first responders will report the death to the relevant

death investigation authority, who will triage the case, decide whether the death should be investigated as per legislation, and if so, will take charge of the investigation. Autopsy/postmortem examinations may be conducted as part of a death investigation, and consent from next of kin is not legally required. There is no national death investigation system[1]. Canada collects data regarding death including the cause of death and demographic details in the Canadian Coroner and Medical Examiner Database[2].

Coronial systems originated from the original British coronial system, and are in place in Yukon Territory, Northwest Territories, Nunavut, British Columbia, Saskatchewan, Ontario, Quebec, New Brunswick and Prince Edward Island. Medical Examiner systems (originating from the model in the United States) are in place within Alberta, Manitoba, Nova Scotia, and Newfoundland and Labrador.

YUKON TERRITORY

The Yukon Coroner's service is a lay coroner-based system which conducts death investigations as well as inquests. The Chief Coroner is based in Whitehorse and appoints community-based coroners throughout the territory. Legislation guiding death investigation is within the *Coroners Act*[3]. Community based coroners are alerted to certain types of deaths defined under the act, and a determination is made if a coronial investigation is required. Community based coroners collect data regarding the history, scene and circumstances, and determine whether a postmortem examination is required, or whether the cause and manner of death can be certified without an examination. As there are no forensic pathology units within the territory, cases deemed to require an autopsy are transported to British Columbia, where pathologists conduct an autopsy and provide the report to the coroner.

Inquests are conducted within the territory under section 41 of the *Coroners Act.* Inquests are heard by a six-member jury who are to determine answers to the five questions. Recommendations may be provided at the conclusion of the inquest.

NORTHWEST TERRITORIES

Death investigation in the Northwest Territories (NWT) functions under a lay coronial system, with the Chief Coroner appointing community Coroners, in similar fashion to the Yukon Territory. The service is guided by the *Coroners Act*[4]. Unnatural, unexpected, unexplained or unattended deaths are investigated by the coroner's service. As there is no forensic pathology service within the territory, decedents are transported and examined by pathologists working in the Medical Examiner system in the province of Alberta (see below). Inquests are conducted by the Chief Coroner and a six-person jury to answer the five questions. The inquest functions to reveal the facts surrounding the death, and recommendations may be made to prevent similar deaths.

NUNAVUT

Death investigation in Nunavut is conducted in a similar fashion to the other territories, with a lay Coroner system lead by the Chief Coroner who appoints investigating coroners dispersed throughout the territory. The guiding legislation is the *Coroner Act*[5]. Coroner's investigations are conducted in all sudden, unnatural, unexpected, unattended and unexplained deaths in the Territory. If a postmortem examination is required, the decedent is transported to Ontario for examination. Fact finding inquests are conducted with a view to answer the five questions. Recommendations can be made to prevent similar deaths.

BRITISH COLUMBIA

The coroner service of British Columbia is led by the Chief Coroner (currently a lawyer), and functions under the *Coroners Act*[6], with a scope of practice defined in the *Coroners Regulation*[7]. The service investigates all unnatural, sudden and unexpected, unexplained or unattended deaths in the province, which includes all deaths of individuals under 19 years of age. Investigations seek to answer the five questions. Autopsy examinations are conducted by pathologists in various hospitals throughout the province.

Inquests are conducted as fact findings proceedings, with recommendations to improve public safety and prevent death in similar circumstances. Death Review Panels function as inquests which examine groups of deaths with similar factors[8].

ALBERTA

A medical examiner system is in place within Alberta, known as the Office of the Chief Medical Examiner (OCME). The legislative framework is codified within the *Fatality Inquiries Act*[9]. Investigations aim to answer the five questions. Reported deaths are triaged by 'medical examiner investigators', who (in the urban centers) attend scenes of death and collect information regarding the history and circumstances of the death; this role is delegated to RCMP officers in more remote/rural areas. This information is provided to the assigned medical examiner in the case, who may conduct a postmortem examination, and determines the cause and manner of death at the conclusion of their investigation. The Chief Medical Examiner is required to be a forensic pathologist. Previously, rural

medical examiners (usually non-pathology trained physicians) investigated deaths in more remote regions. In the event an autopsy examination was required, the case would be referred to a medical examiner with pathology certification. Rural medical examiners are currently not utilized, and all cases are referred to central mortuaries in Edmonton or Calgary and are examined by medical examiners in those locations with expertise in forensic pathology.

Fatality Inquiries are conducted in certain deaths and are led by the Fatality Review Board (consisting of a lawyer, a physician and a lay person). Much like coroners inquests, the aim is to objectively address the five questions of a case, and possibly provide recommendations to prevent similar deaths.

SASKATCHEWAN

Death investigation in Saskatchewan is a lay coroner-based system led by the Chief Coroner of Saskatchewan, and functions under legislation comprised of *The Coroners Act (1999)* and *The Coroners Regulations (2000)*[10]. All sudden, unexpected and unnatural deaths are investigated, with appointed coroners being dispersed throughout the province. Forensic pathologists are contracted to conduct postmortem examinations in cases requiring such examination as determined by the investigating coroner.

Fact finding coroners inquests are conducted before a six-person jury. Certain types of deaths require a mandatory inquest (such as those in custody), whereas others are discretionary. Inquests aim to answer the five questions and can provide recommendations to prevent similar deaths.

MANITOBA

Death investigation in Manitoba is conducted in a medical examiner system under *The Manitoba Fatality Inquiries Act*[11]. The Act outlines the types of deaths to be reported to the medical examiner and provides the Chief Medical Examiner the authority for the investigation of all unexpected and violent deaths occurring within the province. Medical doctors throughout the province are appointed as Medical Examiners and carry out death investigations on behalf of the Chief Medical Examiner's Office and are assisted in their investigation by medical examiner's investigators or police officers. Postmortem examinations are conducted by Medical Examiners (qualified forensic pathologists) in Winnipeg.

The Chief Medical Examiner may call an inquest if they feel the general public will benefit from the information made public during such a hearing. Inquests are heard in provincial court in front of a judge, with a Crown Attorney representing the public interest, and may or may not include a lawyer to represent next of kin and cross-examine witnesses. Inquests examine the facts surrounding cause and manner of death, and recommendations may be given by the judge at the conclusion of the hearing.

ONTARIO

Death investigation in Ontario is conducted under a Coronial system (Office of the Chief Coroner or OCC) with all coroners (including the Chief Coroner) being trained physicians. The legislative framework is within the *Coroners Act*[12], which includes guidance as to what types of deaths are to be investigated. These include deaths that occur suddenly and unexpectedly, deaths at a construction or mining site, deaths while in police custody or while a person is incarcerated in a correctional facility, deaths when the use of force by a police officer (or related official) is the cause of death, and deaths that appear to be the result of an accident, suicide or homicide. Investigating coroners respond to and investigate reportable deaths. Investigating coroners are supervised by Regional Supervising Coroners. In cases requiring postmortem examination, the decedent is referred one of several units that are under the auspices of the Ontario Forensic Pathology Service (OFPS)[13], which is a separate entity but guided under the *Coroners Act*. Pathologists conducting examinations for the OFPS must be on a register maintained by the Chief Forensic Pathologist, with all suspicious or criminal cases being examined by 'Category A' pathologists who must be certified forensic pathologists (similar to 'Home Office' registered pathologists in the United Kingdom). Non-criminal cases may be conducted by other pathologists on the register (including those without forensic pathology qualifications but experience in autopsy pathology). The OFPS maintains a robust peer review/quality review process of examined cases. Of note, the first forensic pathology training program in Canada was established within the OFPS in Toronto (see below).

Conclusions regarding the cause of death as well as the type of examination performed are collaborative between the OFPS and the OCC. Investigating Coroners and/or the Regional Supervising Coroners are responsible for determining the manner of death.

Inquests are conducted as either mandatory inquest in certain types of deaths, or discretionary inquests which are at the discretion of the Coroner[14]. A jury of five is present at inquests, where the objective facts of a death are presented. As in other jurisdictions, the 'five questions' are addressed. Recommendations to prevent similar future deaths may be made at the conclusion of the inquest.

QUEBEC

Death investigation in Quebec is based on a legal (ie. Lawyer based) coronial system. The legislative framework is codified within the *Coroners Act*[15]. Coroners work under the supervision of the appointed Chief Coroner and Deputy Chief Coroners. Most cases requiring postmortem examination are sent to designated hospitals and conducted by (non-forensic) pathologists, whereas criminal and suspicious cases are referred to the 'Laboratoire de sciences judiciaires et de médecine légale' based in Montreal and examined by forensic pathologists. Inquests are ordered by the Chief Coroner in cases which have public interest. Information regarding the 'five questions' is addressed, and recommendations may be made.

NEW BRUNSWICK

A lay coronial system is in place in New Brunswick with the legislative component being codified in the *Coroners Act*[16]. As with many jurisdictions, investigations aim to answer the 'five questions. Regional coroners investigate reportable deaths and are under the supervision of the Chief Coroner and the Deputy Chiefs. Postmortem examinations are conducted in local hospitals, largely by non-forensic trained pathologists. Inquests may be conducted by the Chief Coroner, Deputy Chief Coroner or regional coroners. Certain deaths are required to undergo a mandatory inquest, including when a worker dies as a result of an accident occurring in the course of their employment, at or in, a woodland operation, sawmill, lumber processing plant, food processing plant, fish processing plant, construction project site, mining plant or mine, including a pit or quarry. Recommendations may be made to prevent similar deaths.

PRINCE EDWARD ISLAND

Coroners in Prince Edward Island (PEI) are medical doctors who are under the direction of the Chief Coroner, and work under the *Coroners Act*[17]. Deaths to be investigated are defined within the act, and investigations aim to answer the 'five questions'. Non-criminal postmortem examinations are conducted in hospitals by non-forensic trained pathologists, whereas criminal or suspicious cases are examined in neighboring Halifax (province of Nova Scotia). Legislation regarding inquests is also within the act, including which cases require a mandatory inquest. The *Coroners Act* provides guidance as to the format of inquests, including the requirement for a six-person jury who attempt to answer the 'five questions' by examining the facts of the case. Recommendations may be provided at the end of an inquest.

NOVA SCOTIA

The Nova Scotia Medical Examiner Service is responsible for determining the cause and manner of death in circumstances that are defined in the *Fatality Investigations Act*[18]. This act includes authority to the medical examiner to conduct an investigation, with a view to resolve the five questions. Medical Examiners investigate deaths throughout the province and are supported by medico-legal investigators. Autopsy examinations are conducted in a central mortuary in Halifax.

Death Review Committees review the facts and circumstances of one or more deaths and may provide recommendations to prevent similar deaths. Several types of committees exist.

NEWFOUNDLAND AND LABRADOR

The medico-legal investigation of death in Newfoundland and Labrador is based on a medical examiner system led by the Chief Medical Examiner, with legislation codified in the *Fatalities Investigations Act*. All medical examiners are physicians and are assisted by appointed medical investigators. Autopsy examinations on non-criminal/non-suspicious cases are conducted by hospital pathologists throughout the province, and forensic pathologists based in St. John's conduct examinations on suspicious deaths, homicides and paediatric deaths.

Death Review Committees review the facts and circumstances of one or more deaths and may provide recommendations to prevent similar deaths and may also suggest that a public inquiry be held in some deaths (such as those with impact on public safety). Committee members are selected by the Lieutenant-Governor in Council, and always include the Chief Medical Examiner. Several types of committees exist (such as those reviewing child deaths).

FORENSIC PATHOLOGY TRAINING IN CANADA

Forensic pathology was recognized as a subspecialty of anatomical pathology in Canada in 2003. The first training program in Canada was established in 2008 in Toronto (now known as the Provincial Forensic Pathology Unit) and is still currently active. The Toronto program also accepts trainees from abroad and is actively involved in forensic pathology capacity development. Subsequently, other programs within Canada have come to fruition in Ottawa, Hamilton (now closed), and Edmonton. All programs in Canada must be university affiliated, accredited by the Royal College of Physicians of Canada, and have a designated budget separate from the service budget. All programs in Canada are one year in length where the trainee is

immersed in and responsible for postmortem examinations and death investigations under supervision. There is also a didactic component to the training. The end of training is marked by a written examination and certification by the Royal College of Physicians of Canada.

Prior to 2008 there was no accredited program of forensic pathology training within Canada[20], and most certified forensic pathologists originated from the United Kingdom or the United States or were Canadian trained physicians with postgraduate forensic pathology training in the United States or the United Kingdom, or by 'grandfathering' of hospital-based pathologists who maintained a medico-legal autopsy practice over several years.

MEDICO-LEGAL FACILITIES IN CANADA

Most medico-legal postmortem examinations in Canada are conducted in hospitals, some of which have designated forensic pathology units for such practices. Many facilities are inadequate or outdated for contemporary forensic pathology practice. Designated facilities for medico-legal autopsy currently exist in Alberta (Edmonton and Calgary), Toronto, Montreal and Halifax. The medical examiner's office in Manitoba operates from a hospital mortuary with a designated space for medico-legal autopsies. The only facility to have computer tomography access (as well as medical resonance imaging) is based in the Toronto facility.

CONCLUDING REMARKS

Just under half of all death investigation systems in Canada are medical examiner based, where individuals with postgraduate training in anatomical or general pathology, in addition to forensic pathology, lead death investigations. The remaining systems are coronial based.

Despite similarities among systems, great variation exists in framework and implementation of the legislation[1]. There are no national standards of practice, no national training scheme or certification for coroners (which is a statutory role), no defined performance outcome measurement, no defined workload measures, and no nationally defined quality management guidelines or programs[21]. Types of cases investigated, qualifications of death investigators, and autopsy rates also vary greatly among the provinces and territories.

Regardless of differences that may exist in the framework and practice of death investigation systems, there are three fundamental principles of a modern, well-developed, public death investigation system: service, research and education. Adherence to these principles allows for robust investigations that benefit public health and safety as well as justice (service), advances knowledge of forensic pathology and forensic sciences (research) and promotes intellectual stimulation and long-term longevity of the specialty (education). The credibility of any system relates to the extent to which they develop these three principles.

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Medico-Legal Death Investigation Systems – England & Wales

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ABSTRACT

Suspicious unexpected death is one of the worst events that a family will experience. To allow closure there is the need to identify any underlying medical causes of death. This requires thorough investigation to exclude unnatural causes of death. Death investigations within England and Wales are conducted at local authority level, with the medico-legal systems being a combination of Coroner and Medical Examiner. Post-mortem examinations were carried out on 39% of all deaths reported to the coroner in 2020, with the medico-legal dissection rate for England and Wales being around 13%. Death investigation in England and Wales remained relatively unchanged for decades, but the system has experienced comprehensive revisions allowing a system that is less fragmented with clear supervisory and leadership responsibilities. This paper will outline the death investigation systems, including the legislative framework, key players and their symbiosis.

Keywords: Coroner; death investigation; forensic pathologist; inquest; medical examiner.

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INTRODUCTION

Historical background to medico-legal investigation

The first historical record of medico-legal investigation originate from China as recorded in Tz'u Sung's textbook 'Hsi yüan chi lu' (The Washing Away of Wrongs) in 1247 CE. It served as an instruction manual for medico-legal death investigations. The first reported autopsy or post-mortem is that of Julius Caesar in 44 BCE[1].

Although research and learning into medico-legal death investigations have evolved since then, only recently has this been recognised as an independent discipline within medicine[2].

Medico-legal death investigations in England underwent progression and development independently from its European counterparts. The Coronial system in England was officially established in 1194 with knights mainly taking up the role of a coroner, originally as a form of tax gatherer[2]. Coroners are independent judicial officials who are in charge of examining the causes of fatalities. In early days, coroners were elected by freeholders and the role was said to be carried out for life. Along with conducting inquests or death investigations, coroners were also tasked with administrative duties and generating revenue for the Crown. It was common for coroners and sheriffs (executive arm of judiciary) to work together at the time. However, coroners had more powers (even above sheriffs) and this power imbalance made working together quite difficult for these two professions. Eventually, the job of a coroner became restricted to death investigations and dead bodies.

The Local Government Act of 1888 replaced general election of coroners with appointment by local authorities. Further legislative reforms in 1926 made it mandatory for an individual to have at least 5 years of experience working as a medical practitioner or a lawyer in order to become a coroner[1].

There are a total of approximately 98 coroners covering 109 areas in England and Wales. This roughly follows the borders created by local authority districts. Officers are hired by coroners to help them conduct their investigations[3].

Today, homicide investigations are led by a Senior Investigating Officer (SIO), who ensures appointment of relevant staff for the investigation process and formulate appropriate search strategies. The investigative team also consists of three Detective Inspectors, out of which two will lead core teams and

the third will head the intelligence unit/Major Incident Rooms (MIR).

A Crime Scene Manager (CSM) will be present to oversee crime scene examination process. They may also be required to give evidence in court. The Police Search Advisor (POLSA) team works under both SIO and CSM. The primary role of POLSA is to undertake scene search operations. Any forensic evidence present is recovered by Scenes of Crime Officers (SOCO) who are well trained in collection and recovery process and is up to date with latest crime scene processing protocols.

UK AND LAWS RELATED TO DEATH INVESTIGATION

The United Kingdom consists of England, Wales, Scotland and Northern Ireland. The population of UK as estimated by mid-2020 was 67.1 million with 669,000 deaths recorded and being the most in a mid-year reference period since 1986[4].

The countries were initially governed by the Parliament of United Kingdom and Northern Ireland. However, devolution acts from 1998, followed by the Government of Wales Act (2006) split the governance and legislative systems into 3 – England and Wales, Scotland and Northern Ireland. In 1935, the first Metropolitan Police Laboratory came into existence. In 1996, it was renamed as the Forensic Science Service (FSS) that covered England and Wales. The FSS ran into serious financial difficulty causing its closure in 2012 and its role was taken up by private forensic science service providers.

Medico-legal death investigation in England and Wales usually follow one of the three pathways listed below:

- Death (anticipated) that occurs as a result of poor health and the doctor is able to issue a Medical Certificate of Cause of Death (MCCD)
- Death where the doctor is unable to issue MCCD either because they did not treat the deceased recently or because the death was unexpected. The case will then be forwarded to the coroner. The scene of death may be attended by police along with an officer from the coroner's office and initial investigation may be conducted. If initial investigations suggest no third-party involvement and the absence of any suspicion surrounding the death, then the coroner may continue with the investigation. At this stage, the coroner may enlist the help of police officers and may also appoint a histopathologist (non-forensic) to carry out an autopsy to determine the cause of death.
- If the outcome of the initial investigations suggests suspicion surrounding the death, the police then take on the lead role in the investigation. The coroner, in discussion with the police appoints a forensic pathologist (Home office registered) to conduct a post-mortem examination.

Forensic and non-forensic post-mortem examinations are quite different. This means that any error during the initial investigation leading to a 'non-suspicious death' conclusion will result in a non-forensic autopsy, which may lead to missing or overlooking a potential homicide.

THE DIFFERENT JURISDICTIONS AND TERRITORIES AND THEIR SUBTLE DIFFERENCES

The United Kingdom has around 48 police forces - 43 territorial police forces in England and Wales (39- England, 4- Wales), national polices forces for both Scotland and Northern Ireland and three specialist forces – Civil Nuclear Constabulary, British Transport Police and the Ministry of Defence Police[5]. Police forces in the UK work under a governmental department called the 'Home Office' that coordinates and operates a range of centralised departments, one of which is the National Crime Agency (NCA). The NCA acts as a list holder of experts in various fields which may help in crime investigation. But the police forces present in the United Kingdom may have their own preferred experts who may be contacted based on the advice of the Scientific Support Manager (SSM) in the force.

LEGISLATION AND MEDICO-LEGAL SYSTEM IN ENGLAND AND WALES

The coroner system in England and Wales is headed by a Chief Coroner and guided by the Coroners and Justice Act 2009. According to Section 5 of the act, coroner investigations are undertaken to ascertain the identity of the deceased, the circumstances surrounding the individual's death (how, when and where) and to gather any relevant details required to register a death certificate[3].

In England and Wales, the Crime Scene Manager is required to notify the Coroner's Office when there is a deceased individual found in their respective jurisdiction. According to the Coroners (Investigations) Regulations 2013, a Coroner will also have the option to conduct coronial inquiries outside of their jurisdiction if required[3].

REPORTING A DEATH

All deaths in England and Wales must be registered. However, the coroner only has a duty to investigate certain deaths. The coroner's duty to investigate arises only when the coroner has reason to believe that the death is violent, unnatural, the cause of death is unknown or occurs in custody or in state detention.

Where a death is from natural causes (for example, from a naturally occurring disease) in most cases that death will not need to be reported to the coroner. The coroner is informed of a death in the following circumstances[6,7]:

- where the deceased was not treated by a doctor during their last illness
- where the deceased was not treated by a doctor for the illness he died from within the last 14 days leading up to death
- of children and young people under 18, even if due to natural causes.
- within 24 hours of admission to hospital
- that may be linked to medical treatment, surgery or anaesthetic
- that may be linked to an accident, however long ago it happened
- that may be linked to drugs or medications, whether prescribed or illicit
- where there is a possibility that the person took his own life
- where there are suspicious circumstances or history of violence
- that may be linked to the person's occupation, for example if they have been exposed to asbestos
- of people in custody or detained under the Mental Health Act, even if due to natural causes
- due to some unusual illnesses including hepatitis and tuberculosis.

The coroner has the authority to permit any action around the removal and examination process of the body found and is usually present during the post-mortem examination. The coroner needs to be informed about the exhibits taken during the process, and provided a list of names and contact details of those who attend the examination. They may also nominate the mortuary and the pathologist for the post-mortem examination. The Coroner also has a duty to liaise (through Coroners Liaisons Officers) with the next of kin and law enforcement officials regarding the release of the body and any delays to this process if further post-mortem examination is required.

INQUEST

An inquest can be defined as a legal inquiry conducted to identify the cause and circumstances around a death[3]. Inquests may be held in the presence of a jury or otherwise. According to Rule 8 of the Coroners (Inquest) Rules 2013, inquests should be completed within six months of a Coroner first being made aware of a death or as soon as practically possible.

An interim death certificate should be obtained during the inquest so that the registrar of death can be notified. The final death certificate may be obtained once the inquest is over.

Inquest conclusions

Once the inquest is complete, the following verdicts or conclusions are usually reached (please note that this list is not exhaustive)[3]:

- Natural cause
- Accident
- Industrial disease
- Abortion (attempted or self-induced)
- Drug dependency/drug abuse
- Lawful or unlawful killing
- Suicide
- Open verdict (insufficient evidence to reach any other verdict)

In 2020, 30,936 inquest conclusions were recorded. Twenty four percent of inquests recorded an outcome of death by accident / misadventure, 12% by natural causes, 14% suicide and 10% unclassified conclusions[8].

KEY PLAYERS & THE SYMBIOSIS

Apart from the coroner, other professionals also play an important role in the death investigation process:

The Medical examiner

In April 2019 a non-statutory medical examiner system was introduced, and in 2021 the statutory footing was in the form of a white paper which included provisions for medical examiners. The medical examiner offices are now established in NHS trusts namely East of England, London, Midlands, North East and Yorkshire, North West, South East, South West and Wales. During 2021/22, the role of these offices was extended to include all non-coronial deaths[9].

The purpose of the medical examiner system is to:

- provide greater safeguards for the public by ensuring proper scrutiny of all non-coronial deaths
- ensure the appropriate direction of deaths to the coroner
- provide a better service for the bereaved and an opportunity for them to raise any concerns to a doctor not involved in the care of the deceased
- improve the quality of death certification
- improve the quality of mortality data.

The Forensic Pathologist

The Forensic pathologists (Home Office registered) play a vital role in forming forensic examination strategies. The pathologist may advise the Senior Investigating

Officer on a number of matters including (but not limited to)[10]:

- Providing advice on the transport of the body to the mortuary
- Assisting in victim identification
- Assessing previous health of the victim
- Determining the circumstances surrounding the death of the victim
- Estimating time of death
- Assisting in the decision-making process, where required

A post-mortem examination usually takes place within 2-3 days after death, although sometimes, this may be less than 24 hours. The role of the forensic pathologist, however, does not end with the post-mortem examination. The forensic pathologist may be required to liaise with the investigation team and the Crown Prosecution Service (CPS) throughout the investigation process.

The Police

Primary roles of the police force in a medico-legal death investigation include:

- Crime investigation and
- Case referral to the CPS

Once the police have been informed of a sudden, unexpected or unexplained death and necessary details have been collected (location of the body, details of the caller etc), the next step is the deployment of personnel to the scene, preserving life and securing the scene. Death should not be assumed unless clear evidence (that can be interpreted by a non-medical person) is present.

If the death is thought to be suspicious, further tasks are undertaken such as collection of evidence, intelligence checks, evaluation of third-party involvement, witness identification etc. If death is not considered to be suspicious, then a doctor (who attended to the deceased within the last 14 days of death) may provide an MCCD and police investigation will no longer be required.

Crown Prosecution Service (CPS)

The Crown Prosecution Service is a governmental body that deals with the prosecution of criminal cases in England and Wales that have been investigated by the police and other related organizations.

Duties of CPS in death investigations include:

- Determining which cases need to be taken to court
- Assessing charges in complex cases and advising police, particularly during the early stages of the investigation process
- Preparing and presenting cases
- Providing victims and witnesses with advice, information and support

The prosecutors must be independent and fair and follow the Code of Crown for Prosecutors. According to this code, prosecutors must have sufficient evidence to try the individual(s) and the prosecution should be in the interest of the public[11].

Others

Where necessary, the SIO should seek the expertise of other specialists such as[10]:

- Toxicologists
- Anthropologists
- Entomologists
- Odontologists
- Ballistics experts
- Other pathological disciplines (neuropathologists or paediatricians)

CONCLUDING REMARKS

In 2020 in England and Wales, there were 607,922 deaths of which 205,438 were referred to the coroner. Of those, 79,357 resulted in post-mortem examinations, 31,991 in inquests and 239 with a jury[7]. While medico-legal dissection is an important tool in modern death investigation, England and Wales can learn from other judications in the UK with considerably lower post-mortem examination rates[12]. The death investigation and certification process in England and Wales remained relatively unchanged for over 50 years, but the system has experienced comprehensive revisions allowing a system that is less fragmented with clearer supervisory and leadership responsibilities. This allowed for the creation of the coroner post that leads the jurisdiction and for local medical examiners to help with the death certification scheme.

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Medico-Legal Death Investigation Systems – Hong Kong

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ABSTRACT

The medico-legal investigation system in Hong Kong is a derivative of the British Coroner's system. Local needs led to some modifications that are different. Hong Kong introduced a schedule of twenty circumstances where death is reportable to the Coroner.

Keywords: Meeting next-of-kin; reportable deaths; waiver of autopsies.

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HISTORICAL BACKGROUND

Hong Kong was ruled by the British from 1841. As the British authority established its hold and control, the laws of Britain were effectively replicated in Hong Kong. Similarly beginning with the Coroners Act 1887, the HK Coroners Ordinance was promulgated. The introduction of this Coroners Ordinance in 1888 to Hong Kong was unwelcome by the local Chinese population who still held a huge suspicion on the merits of Western medicine. It did not help that along with the introduction of the Coroners Ordinance was the introduction of the practice of a post-mortem examination. This resistance remained until the outbreak of bubonic plague in Hong Kong in 1894. Where a death was suspected to be due to plague, personal items and even lodgings had to be sanitized and, in some instances, burnt. A post-mortem examination showing that death was not due to plague became a useful and practical way of saving precious personal belongings. Hence, slowly the practice of post-mortem examination took root in Hong Kong. Subsequent new Coroners Acts were followed by new Coroners Ordinance in Hong Kong, the last version being Hong Kong Coroners Ordinance 1989.

LEGAL REFORM

The Hong Kong Law Reform Commission initiated a review and reform of the work of the Coroner in Hong Kong, publishing its recommendations in the late1980's[1]. Despite the general acceptance of the recommendations, the proposal did not see enactment until the handover of Hong Kong to China in 1997. A new Coroners Ordinance 1997 was passed and came into effect in 1998. This Ordinance remains in effect to this day. Several key changes were made and are:-

A. The creation of a Schedule of Reportable Deaths
B. The duty to report such deaths should be imposed on the police, the Registrar of Births and Deaths and the doctor certifying the death.
C. The publication of an annual report[3].

Significantly, the proposal for the Coroner's office to have its own independent team of death investigators was rejected and this investigative role remains with the Hong Kong Police Force.

CURRENT LEGISLATION

This is the Coroners Ordinance, Cap 504 Laws of Hong Kong. Under this legislation the Coroners are appointed judicial officers empowered under the Ordinance to:-

a. Investigate deaths
b. Order autopsies
c. Issue burial or cremation orders
d. Provide causes of death after an investigation to the Registrar of Death
e. Hold inquests and issue riders if appropriate

SCHEDULE OF REPORTABLE DEATHS

There are twenty circumstances of death that are reportable to the Coroner and it is included under Part 1 Schedule 1 of the Coroners Ordinance Cap 504 Laws of Hong Kong[2] (Fig. 1). Failure to report a death is punishable by a fine or even a short prison sentence although no such penalty had been ordered to date.

Appendix I – The 20 Categories of Reportable Deaths

- Death the medical cause of which is uncertain
- Sudden / unattended death, except where a person has been diagnosed before death with a terminal illness
- Death caused by an accident or injury
- Death caused by crime
- Death caused by an anaesthetic or under the influence of a general anaesthetic or which occurred within 24 hours of the administering of anaesthetic
- Death caused by a surgical operation or within 48 hours after a surgical operation
- Death caused by an occupational disease or directly / indirectly connected with present or previous occupation
- Still birth
- Maternal death
- Deaths caused by septicaemia with unknown primary cause
- Suicide
- Death in official custody
- Where death occurred during discharge of duty of an officer having statutory powers of arrest or detention
- Death in the premises of a Government department any public officer of which has statutory powers of arrest or detention
- Death of certain mental patients (as defined by law) in a hospital or in a mental hospital
- Death in a private care home
- Death caused by homicide
- Death caused by a drug or poison
- Death caused by ill-treatment, starvation or neglect
- Death which occurred outside Hong Kong where the body of the person in brought into Hong Kong.

Figure 1: Twenty circumstances of death which are reportable to the Coroner

MEDICOLEGAL INVESTIGATION

All deaths are reported to the Coroner either by registered medical practitioners or the Hong Kong Police who are first responders to persons who have died outside a hospital. Very rarely, they may be reported to the Coroner by the Registrar of Births and Deaths upon receiving a questionable medical certificate of the cause of death. Reportable deaths in hospitals will be managed by anatomical pathologists whereas deaths outside hospitals will be managed by forensic pathologists.

Interviews with the next-of-kin are held for every reportable death in Hong Kong. This practice originated from one of necessity as medical doctors were fluent in the local dialects and could converse with the next-of-kin without the need of translators but were also fluent in English and can report to the Coroner the essential information and findings. This interview has continued to this day and has proven to be a great opportunity to discuss the circumstances of death as well as the views of the next-of-kin towards an autopsy as well as their preferences for burial or cremations. In 2022, cremations are preferred and represent over 90% for all deaths in Hong Kong.

ATTITUDES TOWARDS AUTOPSIES

In most cases, next-of-kin do not want an autopsy. This is particularly true for elderly deceased individuals with histories of chronic illnesses. Next-of-kin are now entitled to file an application for waiver of the autopsy requirement to the Coroner. The role of the attending pathologist is to provide the Coroner with relevant medical histories and findings as well as a professional recommendation for or against an autopsy. Specifically, the pathologist is asked to inform the Coroner if a "plausible" cause of death can be found without an autopsy. The Coroner will then have to consider the preliminary findings of the police and decide on the need for an autopsy. Increasingly, next-of-kin have taken to requesting to have an audience with the Coroner to express their personal views to him/her. This has become possible because following the return of Hong Kong to China, most judicial officers are now fluently bilingual. It has however meant that the workload on the Coroner has increased because such meetings are time consuming and emotionally taxing.

The autopsy rate for reportable deaths has slowly but steadily declined (Table 1).

Table 1: No. of deaths, public inquests and autopsies conducted (1981-2020)

Year	Total Annual Deaths	Reportable Deaths (% of Total)	No. of autopsies (% of reportable deaths)	No. of public inquests (% of reportable deaths)
1981*	24978	5854 (23.4)	n/a	245 (4.2)
1986*	26030	5777 (22.2)	n/a	224 (3.9)
1990@	29021	6949 (23.9)	4986 (71.8)	n/a
1995@	30894	7214 (23.4)	5260 (72.9)	n/a
2000#	33907	7852 (23.2)	4685 (59.7)	184 (2.3)
2005#	38683	9506 (24.6)	3951 (41.6)	189 (1.9)
2010#	42705	9999 (23.4)	4261 (42.6)	172 (1.7)
2015#	46757	10767 (23%)	3419 (31.8)	100 (0.93)
2020#	50853	12680 (24.9)	3184 (25.1)	74 (0.58)

**Data from Law Reform Report, @data from Coroners Annual Report, #data from Coroners Annual Report.*

AUTOPSIES

All medico-legal autopsies are performed by pathologists in Hong Kong at public mortuaries or hospital mortuaries. Medico-legal autopsies are free-of-charge, paid for by the public purse. Any additional tests including histology, microbiology, virology, and even molecular biology are free and performed as indicated and at the discretion of the pathologist concerned. Toxicology is performed on selected cases and the analysis provided again free of charge by the Forensic Division of the Government Laboratory.

AUTOPSY REPORTS

The Coroners Ordinance dictates that the autopsy report on reportable deaths can only be released to the Coroner with a copy going to the Commissioner of Police. The Coroner has the discretion to then release the report to interested parties.

INQUESTS

Open public inquests are held in only a small percentage of cases (Table 1). Such inquests are mandatory for all deaths under custody where it is also held together with a jury. For all inquests, the hearing is open to the public and press. Parties may be represented by lawyers at their own expense. In Hong Kong, inquests can be quite lengthy.

VERDICTS

The Coroner's Inquest in Hong Kong is styled as an inquiry with fact finding as its primary goal and is legally obliged to warn against self-incrimination by witnesses. Verdicts commonly include:-

a. Death due to natural cause
b. Death due to an accident
c. Death due to suicide
d. Death due to unlawful killing
e. Death due to justifiable killing
f. Open verdict

Where the inquest verdict is death due to unlawful killing, there is no naming of an individual and the case will be referred to the Department of Justice for consideration of criminal proceedings.

In many cases where the death may be ruled to be due to natural causes or an accident, the parties are free to use the evidence obtained through the inquest for further civil proceedings or in cases involving healthcare professionals for disciplinary hearings.

Figure 2 shows the flow as a death works its way through the Coroner's procedures.

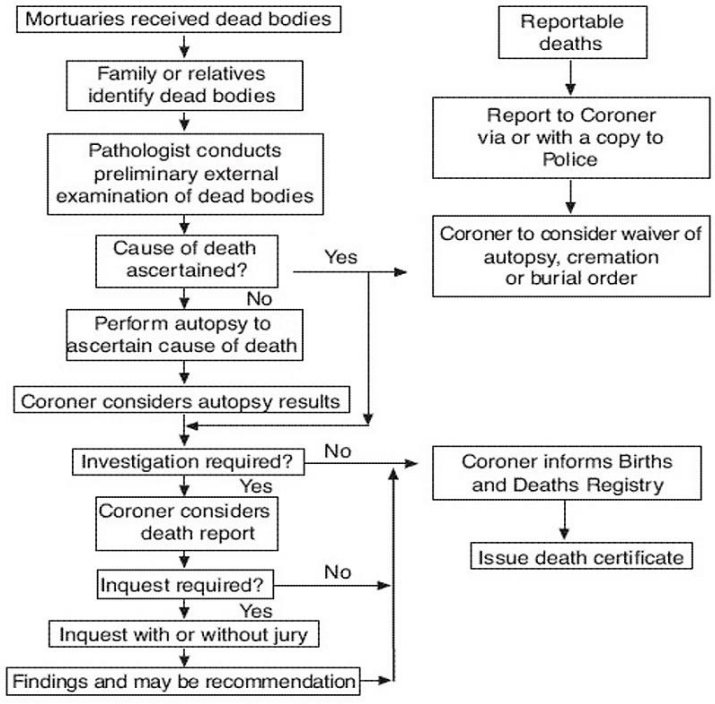

Figure 2: The flow as a death works its way through the Coroner's procedures

THE FUTURE

Hong Kong is just at the verge of introducing the use of post-mortem CT imaging at one of its public mortuaries. It remains to be seen what the impact will be. It is likely that this will lead to a further decline in the traditional autopsy.

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Medico-Legal Death Investigation Systems – The Netherlands

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ABSTRACT

In the European Union (EU), and thus in the Netherlands, human rights are subject to the Universal Declaration of Human Rights (1948), the instruments of the international human rights framework, the Treaty of the European Union (art. 2, 3, 6 and 21) and the EU Charter of Fundamental Rights, including the European Convention on Human Rights, which is monitored by the European Court of Human Rights. According to Article 2 of the Convention on Human Rights, the right to life must be protected. As a result countries have criminal law to judge criminal activities like murder and manslaughter. The Dutch criminal justice system and its medico-legal death investigation system follow the so-called Romano-Germanic legal system, which is founded on codified statutes and ordinances. In the Netherlands three different groups of medical doctors are involved in post-mortem investigation, depending on the manner of death, being: the *attending physician*, the *forensic physician* and the *forensic pathologist*. If there is a (possible) unnatural death with a criminal offense, the public prosecutor (or the examining magistrate) will formally seize the body and require a forensic autopsy. This occurs at the stage of preliminary criminal investigation under the authority and lead of the public prosecutor, whereas the police chief is the practical leading investigator. At this stage the role of the examining magistrate is also to monitor the lawful application of investigative powers, the progress of the investigation and to prepare the preliminary investigation for further investigation by the court. As of the final sentence of the court, the public prosecutor or the suspect can appeal. The Court of Law issues a ruling at the end of the handling of a criminal case. Subsequently, appeal in cassation to the Supreme Court is possible when there have been demonstrable procedural errors or new facts have emerged which may affect the case and the earlier ruling. The Supreme Court is the final stage of the legal process.

Keywords: Criminal justice; legal system; Netherlands; public prosecutor, Romano-Germanic legal system; unnatural death

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ARTICLE

In January 2022 the population of Netherlands was about 17 million with a growth in yearly death rate from 75,929 deaths in 1950 up to 170,839 deaths in 2021 (approximately 3,252 deaths weekly). The increase in deaths is the result of the steady growth and an increase in the population of inhabitants and a decline in birth rates in the Netherlands. The Dutch criminal justice system and its medico-legal death investigation system follow the Romano-Germanic legal system, where codified statutes and ordinances rule the land. In the European Union (EU), and thus in the Netherlands, human rights are subject to the Universal Declaration of Human Rights (1948), the instruments of the international human rights framework, the Treaty of the European Union (art. 2, 3, 6 and 21) and the EU Charter of Fundamental Rights, including the European Convention on Human Rights, which is monitored by the European Court of Human Rights. Due to Article 2 of the Convention on Human Rights, the right to life must be protected. This article also states that any one's life should be taken into account and that the state has an obligation to investigate possible criminal offences. Countries have criminal law for this purpose and to judge criminal activities like murder and manslaughter. In the Netherlands there are 4 locations in Dutch legislation where information about death is mentioned. These are[1,2,3,4]: the *'Wet op de Lijkbezorging, WLB', the 'besluit op de Lijkbezorging', the Civil Code and the 'Wet op de orgaandonatie, WOD'*. The 'WLB' exists since 1991 and is the follow up of the

'*Begrafeniswet van 1869'*. Surprisingly the definition of 'death' is not mentioned in Dutch legislation. However the 'WLB' describes the definition of 'a corpse' as the body of a dead person or a stillborn after 24 weeks of gestation (art. 2 lid 1 a and b WLB). Due to 'WLB' (art. 4 WLB), this body must undergo an external examination ('uitwendige lijkschouw') after death. It is dependent on the cause or manner of death which medical doctor will be involved at this point. The following options are applicable[1,2,3,4]:

a certain natural death: the attending physician (a general practitioner, other medical doctor or medical specialist) will perform the external examination and fills in the death certificate (art. 7 and art. 12 WLB). The death certificate consists of two forms, named the A form (article 7 of the Law of Funeral Services) with identification data of the deceased person and the B form (article 12a of the Law of Funeral Services) on which the possible cause of death is mentioned for the benefit of the National Bureau of Statistics.

an (possible) unnatural death: a forensic physician of a regional forensic medicine department (also known as *'gemeentelijk lijkschouwer'*) must be deployed to perform an extensive investigation, in close cooperation with the police and a public prosecutor. Forensic physicians *('gemeentelijk lijkschouwers, art. 3 WLB'*) are appointed by mayors and aldermen, which illustrates that external examination of the dead (*'the lijkscho*uw') is not a criminal proceeding. Forensic physicians work at local centers in different parts of the Netherlands (in total 22 GGD's) or in private constructions and can be contacted anytime of the day on any day. After investigation by the forensic physician which includes *external examination of the corpse* (and if necessary limited sampling for toxicologic screening or DNA investigation-prostatic fluid/sperm investigation), *analysis of the medical history* of the deceased, *scene investigation* and *interpretation of police investigation*, the possible cause of death is given and manner of death can be concluded as:

- a natural death, which means that no further investigation is required and the body is given to relatives for burial or cremation (art. 11 WLB). If relatives wish a clinical autopsy on the body, written permission is necessary, followed by a clinical autopsy by a surgical pathologist in a hospital.
- a (possible) unnatural death. This conclusion must be reported by the forensic physician to a public prosecutor (art. 10 WLB).

The public prosecutor will decide the follow up. If there is;

- no (suspicious) criminal offense after thorough investigation by the forensic physician, the public prosecutor will stop further investigation and the body is given to relatives for burial or cremation (art. 11 WLB).
- a (possible) unnatural death with a criminal offense, the public prosecutor (or the examining magistrate) will formally seize the body and require a forensic autopsy. The nomination of the forensic pathologist is done by the public prosecutor [in case of a NRGD (Netherlands Register of Court Experts)-registered professional] or by the examining magistrate (if the professional has no NRGD registration). Relatives are informed that a forensic autopsy will occur, but no permission is requested, as the body is seized. The forensic physician will provide the forensic pathologist with the forensic medical report, which gives the forensic pathologist insight about the findings prior to autopsy, including external examination findings by the forensic physician, scene information and medical history. In the Netherlands forensic pathologist do not frequently visit the scene.

A forensic autopsy in the Netherlands is performed by independent privatized senior forensic pathologists or by forensic physicians or forensic pathologists working at the Netherlands Forensic Institute. Forensic pathologists completed a 5 years medical specialist training as surgical pathologist, followed by sub-specialization in forensic pathology of two years. They are registered in at least three medical and judicial registers (BIG, RGS and NRGD), which means that they are obligated to follow both medical and judicial training and courses to maintain their expertise. The NRGD is independent and guarantees and promotes the input of forensic experts in the legal process.

A forensic autopsy by a forensic pathologist in the Netherlands is a complete and extensive external and internal examination of the human body or part of it, including sampling for further investigations and histopathological investigation of internal organs. The external examination which was earlier performed by the forensic physician at the scene or in a mortuary, will be repeated/extended during forensic autopsy by the forensic pathologist, with description and interpretation of injuries, extensive external and internal sampling for histology, toxicology, DNA-prostatic fluid/sperm and other investigations and identification (if necessary). Internal examination is performed with standard investigation of thoracic, abdominal, pelvic, skull, neck and back dissection and if necessary dissection of other

regions of the body, followed by histologic examination of sampled tissues. Extensive investigation of external and internal anogenital area is also performed, and if necessary completed with histopathologic investigation of these structures. Additional toxicological, neuropathological, microbiological, ophthalmo pathological and metabolic investigations are requested if necessary.

Extensive photography is a standard element of forensic autopsy in the Netherlands. The forensic autopsy is performed by guidelines issued by the Dutch Association of Pathology and conforms to international standards. The quality of a forensic autopsy is ensured and monitored by external committees using ISO standards and by visitation from the medical-scientific professional association of pathologists.

The results of a forensic autopsy are produced in an autopsy report. In this report the forensic pathologist provide: extensive description and explanation of external and internal injuries, description of internal organs, anogenital findings, diagnosis of diseases, sampling data, results and interpretation of additional investigations and the determined cause of death (if found). If necessary and possible the forensic pathologist can further explain the earlier suggested manner of death stated by the forensic physician, after additional information is obtained from the police, the public prosecutor or clinical medical experts. The forensic pathology report is intended for the public prosecutor who is the applicant for the forensic autopsy. A copy of the report is sent to the senior police officer who is leading the investigation.

PEDIATRIC FORENSIC PATHOLOGY

Byard and Krous mention pediatric forensic pathology as a sub-specialization of forensic pathology dealing with cases involving children[5]. As pediatric cases represent only a very small proportion of forensic autopsies, most forensic pathologists have very limited experience in this area, which results in quality issues when pediatric forensic cases are investigated by them[5]. It is very important to have the knowledge and experience in differentiating natural diseases, congenital abnormalities and resuscitation artefacts from real traumatic injuries, which is very different compared with the investigation of adults. Misunderstanding can lead to misdiagnosis with detrimental consequences. A pediatric forensic pathologist would have the knowledge to evaluate and interpret autopsy findings and medical history findings regarding the manner of death in pediatric cases. Literature analysis helps in differentiating between accidental and non-accidental injuries and give probability statements which are very useful in the legal process. Even the description and interpretation of signs of child abuse and anogenital traumatic lesions due to sexual abuse, need handling by a pediatric forensic pathologist who has exposure on this field. Recruiting medical doctors for pediatric forensic pathology is seen by Byard and Krous and by us as an increasingly serious problem due to the heavy workload and complexity of these cases which are frequently high profile with enormous media exposure and stress[5]. In the Netherlands only two certified senior pediatric forensic pathologists have performed about 90% of all pediatric forensic autopsies for the Netherlands during a 15 years period (2005-2020), using (inter)national guidelines and protocols.

LEGAL FORENSIC PROCEDURE IN THE NETHERLANDS

The preliminary criminal investigation starts from the point the public prosecutor is involved and seizes the corpse. This is under the authority of the public prosecutor whereas the police chief is the practical leading investigator. The public prosecutor is however the overall leader at this stage of postmortem investigation. The examining magistrate also has a role at this stage in monitoring the lawful application of investigative powers, monitoring the progress of the investigation and preparing the preliminary investigation for further investigation by court. The role of the public prosecutor ends at this level of investigation and the main person involved at this stage is the judge of the criminal court. Rules about the preliminary criminal investigation and the following court investigation are included in the Code of Criminal Procedures (‘*Wetboek van Strafvordering*’). From the final sentence of the court, the public prosecutor or the suspect can appeal in a Court of Law within fourteen days after final statement in court. The Court of Law judge is named counselor and the public prosecutor is called Attorney General. Finally, the Court of Law issues a ruling which indicates the end of the handling of a criminal case. After this, appeal in cassation to the Supreme Court is possible.

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Medico-Legal Death Investigation Systems – New Zealand

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ABSTRACT

The majority of deaths in New Zealand do not require an investigation and the death certificate is signed by the local medical doctor. For deaths that are not able to be signed by the local doctor or the death has occurred in circumstances outlined by the Coroner's Act 2006 referral to the Coroner is required. Coronial death investigation in New Zealand follows the British model with the coroner being legally trained but has evolved to meet New Zealand's cultural obligations.

New Zealand's unique mix of ethnicities and its legal and cultural obligations under the Treaty of Waitangi introduces some challenges to the coronial system, in particular how coronial and forensic post-mortems are managed and conducted. These challenges include viewings, objections to post-mortems, and the returning of post-mortem samples and specimens to families. The Coroner's Act specifically states the coroners must consider minimising the distress and offence to the family in deciding whether or not to authorise a post-mortem.

Post-mortems are conducted by both coronial and forensic pathologists with services delivered by a mixture of both private and public service providers. Forensic science services are provided a separate government entity while the death investigation is conducted by the police as New Zealand does not have specialist medical death investigators.

Keywords: Coroner; cultural obligations; Māori; New Zealand; post-mortems

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BACKGROUND

New Zealand is composed of two main islands and situated in the Pacific Ocean. It has a population of just over 5 million and is a diverse multicultural society composed Europeans (70%), Māori (17%), Polynesians (8%), Asians (16%) and other ethnicities[1]. Note that some persons identify with more than one ethnicity.

Research suggests that eastern Polynesians settled in New Zealand between 1250 and 133 AD[2]. Over the centuries they developed into a culture that we now know as Māori. Europeans did not start to settle in New Zealand until after Captain James Cook visited in 1769. Following unrest between the European settlers and Māori the Treaty of Waitangi was signed between the British Crown and Māori in 1840 which established rights for Māori and also British sovereignty over all of New Zealand. Today the Treaty of Waitangi forms an integral part of New Zealand legislation and aims to provide equity for Māori.

Given New Zealand's strong historical and constitutional links with Britain it is no surprise that New Zealand adopted the British style coronial death investigation system refining it to recognise New Zealand's multicultural society.

CORONIAL PROCESS

Approximately 34,500 deaths occur per annum in New Zealand[1]. For the majority of these the general practitioner, or another medical doctor who cared for the deceased, will sign the death certificate. If the body is to be cremated the death certificate is first reviewed by a medical referee (another doctor) to confirm that it has been filled out correctly and that there are no outstanding issues which need to be addressed. If there are no issues, the body can be cremated. However, if there are issues or inconsistencies, the certifying doctor may be asked to either review the death certificate, or they may refer the death to the coroner. In case of burial there is no requirement for the death certificate to be reviewed by the medical referee.

The Coroner's Act 2006 outlines the deaths that must be referred to the coroner. These include deaths which are without known cause, self-inflicted, unnatural, violent, the result of a medical procedure/anaesthetic, medically unexpected, maternal deaths and in official custody or care. Approximately 5000 deaths per year are referred to the coroner who on average accepts jurisdiction of approximately 3,500 deaths[3]. Of those deaths undergoing post-mortem examination 52% are due to natural causes. Between 2007 and 2018 there was an average of 68 homicides per annum although in 2019 this had increased to 129[4].

Coroners are government-appointed lawyers who should have held a practising certificate as a barrister or solicitor for at least 5 years. There are currently 25 coroners (17 full-time) including a Chief and Deputy Chief Coroner. The coroner has overall responsibility and authority for the investigation of death of a person, and for reporting of the findings. The New Zealand Police are considered agents of the coroner and conduct all inquiries and investigations on their behalf.

The National Initial Investigation Office (NIIO) is a 24/7 service and is the first point of contact for all deaths referred to the coroner. NIIO provides support to the coroner on duty and coordinates the initial coronial process. If is not accepted, the body is released back to the family/whānau.

Deaths that are referred are reviewed by the coroner on duty to determine whether an inquiry into the death is required. If the decision is that it is required, the coroner will decide whether or not to direct a post-mortem examination. If decision is that a post-mortem examination is required the scope of the examination, whether it will be full (three cavity), limited (confined to a region) or a lesser (external) would be decided. In making this decision the coroner must consider a range of factors including[5]:

1) *The desirability of minimising the distress to people who, by reason of their ethnic origins, social attitudes or customs or spiritual beliefs, customarily require bodies to be available to family members as soon as possible after death and*
2) *The desirability of minimising the causing of offence to people who, by reason of their ethnic origins, social attitudes or customs or spiritual beliefs, find post-mortems of bodies offensive*

To assist with this decision the coroner has the option of seeking the opinion of the forensic pathologist as to the scope of the post-mortem examination via a process known as a preliminary examination. This allows the pathologist to review the known facts of the case, conduct an external examination, review medical records and conduct radiological imaging. Rapid toxicology is not permitted. On the basis of this information the pathologist provides to the coroner their opinion as to the scope of the post-mortem examination required to determine the cause of death. However the coroner may completely dispense with a post mortem examination and release the deceased back to the family/whānau without any form of formal medical examination but still investigate the death.

Under the Coroners Act 2006, the family/whānau has the right to object to a post-mortem examination. If the coroner, despite the objection, decides to proceed with a post-mortem examination, then the family/whānau has the right to challenge the decision in High Court. To date a High Court judicial review has not occurred. Objections are not uncommon especially from Māori who are culturally opposed to full post-mortem examinations but are more accepting of a lesser examination.

SCENE

New Zealand does not have dedicated medical death investigators. All death investigations are conducted by the national police service which has specialist branches (e.g.: fingerprints, scene examination, criminal investigation branch). The latter is tasked with investigating homicides and suspicious deaths.

If a death is deemed to be a homicide or suspicious then the police will contact the forensic pathologist for advice (by telephone, or requesting the forensic pathologist to attend the scene). It is not unusual for a forensic pathologist to attend the scene of a homicide or suspicious death, depending upon the distance. A forensic scientist will also be called to conduct a thorough scene examination which may take some days. The forensic pathologist has a key input into this part of the investigation.

If the death is considered to be due to natural causes, the police will call the deceased's doctor to sign the death certificate and/or to verify the death. If the deceased's doctor is not willing to sign the death certificate, the death is referred to the coroner.

FORENSIC PATHOLOGY SERVICES

Most coronial post-mortem examinations are full examinations. External examinations constitute approximately 10% of all coronial post-mortem examinations, although there is an increasing tendency and desire to utilise this option. Post-mortem examinations limited to a single region of the body are rare.

Very few non-coronial post mortem examinations are performed. Majority of these are hospital perinatal post

mortems. Hospital post mortems of adults (deaths not referred to the coroner) are extremely rare and in Auckland (population 1.5 million) constitute only 3 to 5 cases per year.

Nationally, forensic pathology services are distributed over four service providers. These are a mixture of private and public services, with all being contracted to the Ministry of Justice. Governance is provided by separate multi-agency clinical and operational governance groups, with an overarching strategic governance group. These committees are composed of Police, Ministry of Justice, operation managers, mortuary technicians, forensic pathologists, and forensic scientists.

Four forensic pathology centres are scattered throughout New Zealand with the Auckland and Palmerston North centres forming the Northern Forensic Pathology Service and the Christchurch forensic pathology service servicing the South Island for all forensic cases. Each of these centres is staffed by full-time forensic pathologists. Auckland, Palmerston North and Christchurch provide dedicated forensic pathology training, and are all accredited for forensic pathology training with The Royal College of Pathologists of Australasia. In smaller metropolitan centres the local hospital pathologists conduct the coronial post-mortem examinations, except in complex and suspicious deaths, and homicides, which are referred to the nearest forensic pathology centre.

The only forensic facility in New Zealand with a dedicated CT scanner is the Department of Forensic Pathology in Auckland. Other forensic departments and mortuaries throughout New Zealand, all being based in a hospital environment, utilise the local hospital radiology service on an ad hoc basis. Post-mortem CT examinations in these centres are therefore performed in only highly selected cases such as homicides, suspicious deaths, diving accidents and infant deaths.

POST-MORTEM EXAMINATION

The forensic pathologist is not permitted to examine the deceased, or talk to the family, without the authority of the coroner. Until authority is received and/or a request for an opinion as to the scope of the examination is received no involvement of the pathologist can occur. The duration between the receipt of the deceased at the mortuary and the receipt of the coroner's authority/direction is variable depending on the complexity of the discussions between the coroner and the family as to the need for a post mortem examination. In the majority of cases this is reasonably straight forward and there is minimal delay (approximately 24 hours). However, on occasion there can be an appreciable delay especially if there is conflict between the views of the family and the forensic pathologist. The final decision as to the scope of the examination rests with the coroner.

Upon receipt of direction for post-mortem examination, in Auckland at least, a post mortem CT scan is done which is reviewed by the forensic pathologist prior to commencing the post mortem examination. Medical records are electronically accessible and reviewed. If a full post mortem has been authorised, a full external and three-cavity internal examination is performed. All post-mortem examinations are fully photographed and undertaken with the assistance of a forensic mortuary technician. At the conclusion of the examination the coroner is informed of the provisional cause of death and which post mortem samples have been retained.

In homicides and suspicious deaths, the post-mortem examination is attended by a police photographer, officer in-charge of the body (to receive all the exhibits) and a senior police officer. Two mortuary technicians are also in attendance; one to assist with evisceration and the other to document all post-mortem exhibits and samples.

Forensic pathologists have a close working relationship with the Cardiac Inherited Disease Group based in Auckland which is a multiagency team which will review referred case with suspicion of channelopathy, cardiomyopathy or other possible inherited cardiovascular disorder. This group will organise genetic testing of the deceased and contact and review the deceased's family with regards to performing genetic testing as required. Referrals from the forensic pathologists to this service have helped save many lives.

JUDICIAL PROCESS

The final detailed written report of the pathologist is issued to the coroner stating the cause of death. Similar to the English coronial system, the manner of death is decided by the coroner and not the forensic pathologist.

The majority of coronial investigations do not result in a formal inquest. Most are either "signed off" or are "chambers hearings by papers" where the coroner will decide upon the cause of death and make any subsequent recommendations based on documentation alone. Formal inquests are very infrequent and it is very rare for forensic pathologist to be called to an inquest.

UNIQUE CHARACTERISTICS OF FORENSIC PATHOLOGY PRACTICE IN NEW ZEALAND

The Treaty of Waitangi is New Zealand's foundation document in which a partnership was established between Māori and the then British Empire in 1840. It is partially based upon this document that New

Zealand's laws and government are determined. The Coroners Act 2006 recognises the Treaty and the cultural requirements of Māori, and the cultural and religious expectations and requirements of all ethnicities, and as such determines elements of forensic pathology practice in New Zealand.

Following the death of a loved one (tūpāpaku) Māori culture requires the family/whānau to stay with the deceased until the funeral (tangi) can be held and the deceased's spirit has departed from Cape Reinga (northern most point of the North Island). This cultural requirement may cause practical difficulties when the death has been referred to the coroner and the body taken to a mortuary (sometimes some distance away) where family/whānau cannot be with the tupāpaku. Most, if not all, mortuaries have facilities for families/whānau to stay overnight should they wish to. They can do so, with the coroner's permission, at least to view and possibly be with the deceased for a short period of time. While not the perfect solution this does allow the families/whānau to be at least be in the same building as the tupāpaku until such time a decision is made whether or not to conduct a post mortem examination. Where homicide is suspected viewings are not permitted prior to the post-mortem.

In deciding whether or not to conduct a post-mortem examination, the coroner must consider the impact of the post mortem examination on the family/whānau, including any undue distress or grief and whether or not this outweighs the benefits of a post-mortem examination. This is situation is most prevalent in infant deaths where the family/whānau is extremely distressed, and for cultural reasons not uncommonly objects to a post-mortem examination. In these situations forensic pathologists may be directed to perform an external examination and post-mortem CT only with no internal examination. If there is overwhelming and uncompromising objection to autopsy, coupled with a desire to have the infant returned to the whānau as soon as possible, the coroner may release the body to the whānau without any form of medical examination, including radiological study, if satisfied that there are no suspicious circumstances. This practice, and the intent of the Act, conflicts with what is deemed to be best forensic pathology practice, and thus can sometimes result in rigorous but respectful discussion. There is no doubt that balancing the cultural, legal and medical requirements in an individual case can, at times, be challenging for the coroner and others involved in the process.

The Coroner's Act also recognises that in order to meet cultural and religious requirements the deceased should be released soon to the family/whānau, and as such gives the Coroner the provision to order an immediate post-mortem examination. This can be ordered solely on the basis that the deceased is an infant. The directing of an immediate post mortem examination means that the coronial post-mortem examination may need to be conducted during the weekend so that the family/whānau can continue with the tangi.

All samples retained at autopsy must be accurately documented and the coroner informed. Any retained tissue larger than a standard histological cassette requires the consent of the coroner. Under the Coroner's Act the coroner must inform the family/whānau exactly what tissue/fluid has been retained by the pathologist. This legal requirement is a disincentive to the traditional practice of a stock jar of retained post-mortem tissue. At the conclusion of the coronial investigation the family has the right to request return of all tissue and fluids that have not been consumed in testing, including all DNA specimens, microscopic slides and blocks. If the coroner authorises the return of such post-mortem samples then the pathologist must oblige. In order to fulfil this requirement the accurate tracking of all post-mortem samples is critical and it must be done without error. Return of post-mortem specimens usually occurs 6-12 months following the post-mortem examination but may even occur years later. These cultural and legal requirements make a subsequent case review somewhat problematic. Approximately 40% of post-mortem samples that are returned to families/whānau are subsequently returned to the originating forensic department as families/whānau had not fully appreciated what would be returned to them and no longer wish to retain them.

Post-mortem organ and tissue donation is rare in NZ. It is permitted by the Coroners Act but only with the agreement of the family. Multi-agency work is currently underway to develop a new process to facilitate this.

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Medico-Legal Death Investigation Systems – The Nordic Countries

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ABSTRACT

The systems for medico-legal death investigation in the Nordic countries are similar, but there are some variations in the theme. In three countries, when the physician who establishes the death of a person calls the police, the police will themselves decide whether to proceed with a post mortem examination (PME), while Denmark has an institution staffed by physicians who will attend a medico-legal inquest in all cases, where the police is in doubt. The forensic pathologists who perform PMEs work for national authorities in Finland and Sweden and university institutes in Denmark. In Norway, PMEs are mostly performed by full-time forensic pathologists and by part-time forensic pathologists working as hospital pathologists. The PME includes histology, toxicology and genetics, except in Denmark where toxicology and genetics are to be ordered by the police. PMCT is the standard in all forensic autopsies in Denmark. However, in the other countries it is the standard in the major centres, but optional and rarely done in others. The four countries differ in detail but are very similar at basic level. This has been proven for example in Disaster Victim Identification operations such as the Thai Tsunami, where the Danish, Finnish, Norwegian and Swedish teams functioned as the "Nordic Team."

Keywords: Crime scene investigation; death investigation; forensic autopsy; medico-legal inquest

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INTRODUCTION

Medico-legal death investigations start before the case reaches the medico-legal community. In order to perform medico-legal death investigations relevant cases need to be identified from the total deaths, of which most are deaths from natural causes of which only a few warrant the attention of the forensic pathologist.

We report the death investigation systems in the four Nordic countries – Denmark including the Faroe Island and Greenland, Finland including the Åland Islands, Norway and Sweden. The medico-legal systems of the four countries differ to some extent but have a common background based in history since two countries gained full independence 120 years ago or less – Norway in 1905 and Finland in 1917. On the other hand, there has for centuries been a strong interaction between these countries. For example during the Thai Tsunami the four countries were grouped as "The Nordic Countries" being able to exchange personnel at short notice, knowing each other well and working to more or less identical standards. In this paper we will present the Danish system and how the other four countries differ.

THE CONFIRMATION OF DEATH AND THE TRIAGE OF DEAD PERSONS

The handling of deaths in Denmark is governed by the Health Law[1], up to and including both the clinical and the medico-legal autopsies. When a person is assumed dead, a physician, or in some cases a nurse, will confirm it according to the two types of death, "heart death", which is the routine method and involves establishing cardiac and respiratory arrest or "brain death", which requires a carotid angiography to show lack of cerebral circulation. It is then up to a physician to decide whether the death falls within article 179 of the Health Law and must therefore be reported to the police. Deaths must be reported if they are due to – or there is suspicion of – homicide, suicide or accident, if the person was found dead, if the death was not expected from a medical point of view, if there is suspicion of

medical malpractice, if the person died in a prison or other form of detention or if there is suspicion of an occupational disease. The latter is purely administrative since the administration of those deaths is handled by the Labour Market Insurance (LMI). If the death does not warrant reporting to the police, which occurs in about 80% of cases, or if the police decline a medico-legal inquest, the physician must then conduct the inquest (Ligsyn), which is distinct from the medico-legal inquest. It is includes observing certain signs of death(at least one), confirming the identity of the diseased and stating the cause and manner of death. This information is entered into the death certificate. The physician, be it a General Practitioner (GP) or a hospital physician can then with the permission of the relatives, request a clinical autopsy. However, currently they are rarely done.

Handling of deaths in Finland is governed by the Act on the Investigation of the Cause of Death[2]. External examination must be performed by the physician to confirm identity of the diseased and to document death. Permanent changes in the body due to death must be registered, and manner and cause of death must be resolved. External examination and completion of death certificate should be by a physician who knows the deceased person's medical history. The police has to be informed when a physician suspects/witnesses that (1) death is due to a crime, suicide, accident, (2) death is sudden without medical reasons, (3) the cause of death is possibly an occupational disease, (4) the cause of death is possibly due to medical treatment (5) a person dies under special circumstances such as in custody, in prison, during involuntary treatment or during military service, (6) there is suspicion that the cause of death could be poisoning or if (7) the deceased person has not been under medical treatment for his or her last illness. Police investigation and external forensic examination are to be performed in all above-mentioned deaths.

The Norwegian system of handling a death is very similar to the Danish, but with some minor differences[3-4]. The physician is required to decide if death can be considered non-natural, and thereby warrants reporting to the police. The police would then decide whether medico-legal autopsy should be performed or not. If not, the body is referred to the reporting GP or physician who can refer the body to the funeral company. The physician must write a death certificate in all such cases. If the police decide that further examination is not needed, the family, and the deceased's physician can request a hospital or clinical autopsy. There are no LMI requested autopsies in Norway.

In Sweden, the handling of deceased is constituted through a number of laws and regulations of which the Autopsy Act[5] is the most important. In general, Swedish law is in accordance with other Nordic countries with regard to cases that must be reported to the judicial system. However, there are a few exemptions, mainly due to the more generally held regulatory language with fewer given settings under which the death has occurred.

Cases according to the Autopsy Act where the physician (often in general practice) is obliged to report to the police are, when there is;

- suspicion of crime
- suspicion of a possible wrongdoing or malpractice within health care.
- an obvious external factor – or there *may* have been such a factor – causing the death, and further investigation is called for to gain knowledge of environmental, occupational or traffic safety elements, *or* of some similar interest.
- need to establish the identity of the individual (eg., severe decomposition).

Hence, it is not formally regulated that deaths of individuals in custody nor deaths that occur during military service must be handled by governmental agencies. Moreover, if a death is suspected to have been caused by an occupationally contracted disease, the law permits the case to be investigated by the judicial system (and not by the LMI as in Denmark).

Other laws and regulations exist that further breaks down and exemplifies what is constituted by the Autopsy Act. Among the cases exemplified are deaths when there is knowledge or obvious signs of substance and/or alcohol abuse, sudden unexpected death in infancy or when the manner of death appears to be other than natural (i.e. obvious suicide, homicide or accident – or when it cannot be determined).

THE MEDICO-LEGAL INQUEST

If death is reported to the police, they will decide whether it is necessary to perform a medicolegal inquest. Some cases are closed over the telephone, if the police after consultation with the Danish Patient Safety Authority (DPSA) finds that death is not suspicious. Approximately one third of reported cases belong to this group and are returned to the GP or hospital physician for death certification. When there is suspicion of homicide or suicide there must be a medico-legal inquest. But in all the other cases mentioned above the police may decline. Such cases are for example where persons are known to have a well-known severe illness and when the death is expected by the physician, or if death is due to an accident that has happened long ago and where there is no one that can be held legally responsible for the death, such as falls of elderly persons at home, resulting in a fracture of the

femoral neck complicated by pneumonia at a later date, all on the condition that the police has closed the case. The medico-legal inquest is as the name implies performed by a physician from the DPSA, previously the District Medical officer and a representative of the police. The latter are working full-time handling deaths, not only attending the medico-legal inquests but collecting police records, talking to relatives, the GP, and other relevant parties, such as the dentist in identification cases and ambulance or pre-hospital medics. They are thus experienced in the legal and practical aspects of the handling of the deceased. The physician from the DPSA is a specialist in community medicine but some also have a background as pathologists or even forensic pathologist. The decision whether to proceed with a medico-legal autopsy/PM lies exclusively with the police, but in the vast majority of cases the parties are in agreement.

When the death is reported to the police after the Finnish law[2], external forensic examination is to be performed by the police, and they can ask for help from a physician (or forensic pathologist). The police must request forensic autopsy in cases where after the police investigation and external investigation of the body, the cause of death is still unknown, in unnatural deaths, if there is a suspicion of a crime, and in all the other sudden and unexpected deaths. Besides the police, are court or a National Institute for Health and Welfare (THL) able to decide whether a forensic autopsy is to be performed. Permission from the next-of-kin is not required to perform a forensic autopsy in Finland.

When a non-natural death is reported to the police in Norway, the police will either request a medico-legal autopsy or decline it, and just return the case to the GP or physician[6]. In some cases a clinical autopsy will be performed. There is no institution like the DPSA to consult in Norway, and there is no system with a medico-legal inquest before an autopsy. The police decide mostly without any consultation of medical expertise. Only in a few cases they will contact the forensic institution and discuss the case before they decide to request a medico-legal autopsy or not. Thus, most cases reported to the police will lead to a forensic autopsy. However, there are also financial considerations, as the transportation costs are very high, due to the long driving distances in Norway. Six hours of driving is not uncommon in western Norway to transport a body from the scene to the forensic institution.

In Sweden, the police decide whether to continue a forensic investigation of a reported death or not. The police is obliged to consult with a forensic pathologist before they decide not to investigate further, but still has the final say regardless of what advice they might receive. In practice, very few of elderly who pass away in the aftermath of a minor trauma, for example due to acute pneumonia following a hip fracture from a fall, undergo a forensic autopsy although there is an underlying external factor. This has been studied several times[7-8], but it is still quite unknown if this phenomenon is due to underreporting of those cases to the police, if it is the police that decide not to investigate further, or just an unspoken social consensus of what to use tax funds for.

A forensic investigation might consist of only an external examination of the dead body (comparable to the Danish "ligsyn") or a full forensic autopsy, including external and internal examination with possibility of toxicological analyses of body fluids, histological samples and – in some cases – genetic analyses.

THE MEDICO-LEGAL POST-MORTEM EXAMINATION

The total number of medico-legal autopsies in Denmark was 1330 in 2021 in a population of 5,800,000 and 57,000 deaths. Autopsy is not obligatory in suicides or accidents where the history is clear and there are no legal consequences, such as traffic accidents involving only the deceased or falls at home, when there is no suspicion of foul play. If it is decided to conduct an autopsy, the relatives of the deceased must be informed of the decision and the rules governing procedure, including the possibility of referral to court. This happens rarely and the police will only go to court in cases where they are convinced that the court will decide in their favour. The timescale for court proceedings is extremely short, for obvious reasons, and there is always the possibility for the police to proceed with the autopsy if there is a risk of *periculum in mora* (danger in delay).

After making the decision to conduct an autopsy the body is transported to one of the three Institutes of Forensic Medicine in Denmark. Copenhagen serving Zeeland and the islands to the south, Aarhus serving Northern Jutland and Odense serving Southern Jutland and Funen. Health Law states that the legal autopsy must be performed by a qualified pathologist i.e. the Chief Forensic pathologist or her/his deputy, or if a junior forensic pathologist takes over the autopsy, it must be supervised by the Chief Forensic Pathologist or her/his deputy. The report must be signed by two pathologists of which one of them is the supervising senior pathologist. The report is then sent to the police/LMI and can only be released to the relatives of the deceased at the discretion of the police.

The legal autopsy in Denmark is performed according to a circular from the Ministry of Justice issued in 1995 and written by the three Chief Forensic Pathologists and Professors of Forensic Medicine[9]. Therefore the

procedure is the same no matter which institute is conducting the autopsy. Additionally the quality assurance programmes of the three institutes are very similar and ensure a high and consistent standard of work. The methods used are described in international textbooks[10]. Before the autopsy a whole-body Post-mortem CT-scan (PMCT) is performed.

The institutes of pathology are university institutes of the universities of Copenhagen, Aarhus and Southern Denmark. They are obliged by law to maintain such institutes and guarantee the quality of autopsies and independence of the police, who request and pay for the autopsies.

Finland has about 55,000 annual deaths. The forensic autopsy rate in Finland is now about 16%[11]. In 2009, a political decision was made to abolish the provincial governments, and the medico-legal administration had to be reorganized. It was decided to establish a national organization that was located at the *Terveyden ja hyvinvoinnin laitos* (THL, which means National Institute for Health and Welfare in Finnish). The act on cause of investigation was changed in 2009 making the THL the authority responsible for performing forensic autopsies[2]. THL is centralized in five regional forensic centers which are localized in five university hospital districts. Each center has a THL Forensic Medicine Unit and a University Department of Forensic Medicine. Forensic pathologists working at THL perform most of the forensic autopsies (~80%). The forensic pathologists at the THL guide medical doctors and the police in the death investigation and control the death certificates which are completed by the medical doctors in their respective districts.

In Finland, the government finances forensic autopsies, and these do not compete with other costs. The police are responsible for paying for cadaver transport, but this cost is refunded to the police by the government's central administration[2].

In Norway, approximately 2200 medico-legal autopsies are performed yearly, in a population of 5,400,000. With a death rate of 40,500 per year, the medico-legal autopsies are performed on about 5% of the total number of deaths. In some cases, a medico-legal autopsy is mandatory. This is in case of traffic accidents and all suspected non-natural deaths in children. In addition, in all cases of homicide, and in most cases of suicides and accidents, the police will request a medico-legal autopsy. The relatives of the deceased must be informed of the decision to have an autopsy. The relatives can oppose this. However the police make the decision and no cases goes to court for decision.

There are five forensic centres in Norway: in Stavanger, Bergen, Oslo, Trondheim and Tromsø. In some places, autopsies are performed by university professors in forensic medicine, and in other places by well-trained hospital pathologists.

There is no formal training to qualify as a forensic pathologist in Norway. There is also no need for formal qualifications in the health law. The performing forensic examiners are, however, mostly specialists in histopathology, with long experience in forensic cases. In most cases a single pathologist performs the autopsy. However, all cases of homicides or cases that are bound to end up in court, are autopsied by two pathologists who will write a single report to the police. The report from the autopsy is similar in all forensic centres, and the autopsy is performed in the same way. In Oslo, the largest centre, all bodies are CT scanned before autopsy. The possibility of having a full body scan is available also in the other centres in Norway but it must be performed in a hospital radiology department. CT scans are performed in increasing number in many different cases of non-natural deaths.

In Sweden, about 6,000 forensic autopsies are performed each year- out of a national death toll of around 90,000-95,000 cases annually. The number of clinical autopsies performed within the health care system is much lower.

The organization of forensic pathology in Sweden differs from the other Nordic countries. The National Board of Forensic Medicine (Rättsmedicinalverket, RMV) is a tax funded state agency that underlies the Ministry of Justice. It is spread out on six units nationally, corresponding to the nearest regional police districts. There are affiliations to universities through, for example, adjunct professors, but all practicing forensic pathologists, residents, attendings and senior attendings are first and foremost government officials within RMV.

All correspondence is between the police and RMV, and the conclusions of the autopsy report can only be released to the next of kin or others at the discretion of the police and after a confidentiality check. It is the police that request and pay for the autopsies, as well as facilitate the transport of the deceased to and from the nearest RMV unit.

Within the RMV, there are also forensic odontologists and geneticists who collaborate closely with forensic pathologists in disaster victim identification missions (DVI) as well as in everyday case work that involve identification or (if determined helpful) mapping of genetic heart diseases. In recent years, RMV has enhanced its competence within forensic anthropology and has also, through the regulation letter from the Ministry of Justice, received the outspoken mission to perform scientific research.

CRIME SCENE INVESTIGATION

If the police require a forensic pathologist to attend a crime scene investigation (CSI) the pathologist on call in the district in question will attend. The CSI is done as teamwork comprising of investigators from the local police, forensic scientists from the National Forensic Science Centre and a senior pathologist or a junior pathologist under supervision. The forensic pathologist will write the death certificate as well on behalf of the Danish Patient Safety Authority. At the subsequent autopsy the forensic technicians from the National Forensic Science Centre will assist in taking photos, samples, fingerprints and giving expert advice in cases involving fire, firearms etc.

In earlier times in Finland a forensic pathologist routinely used to participate in crime scene investigations, at least in Southern Finland. The police are allowed to perform external forensic examination in connection with CSI, but they can request help from a physician (or forensic pathologist).

In Norway, there is no formal full time (24/7) on call service for the forensic pathologist to be called to a crime scene investigation. However, during ordinary working hours, the police will call a forensic pathologist who performs autopsies during daytime, and request assistance. This will usually solve the police's problem, as many forensic pathologists are willing to go to the scene. At the scene a forensic pathologist will assist the police in sampling for DNA, measure body temperature, remove vitreous for time of death determination and in addition will assist the police in different matters and discussions. Since there are only very few forensic pathologists, it is difficult to have a formal night and day on call service. In some cases, therefore, the police's request may be turned down. If that is the case, the pathologist will discuss the case and instruct the police to take extra photos from the scene. Long distances in Norway, perhaps including ferry transportation, may also be a problem, as it will sometimes take many hours to get the pathologist to the scene. The number of homicides yearly in Norway is about 30 (approx. 0.5 homicides per 100,000 inhabitants per year). Stabbing is the most common method of homicide in Norway, while the number of gunshot wound homicides is below 10 per cent.

In Sweden, when forensic detectives in charge of an obvious or suspected crime scene call, a forensic pathologist from their closest RMV unit will attend on site. Subsequently, in the autopsy suite, the forensic pathologist and technicians will assist the police with practical matters such as collecting trace evidence and reference materials.

SUPPLEMENTARY INVESTIGATIONS

In addition to the macroscopic examination of the body, microscopic examination is performed on selected organs by the forensic pathologist, and samples for toxicology and forensic and clinical genetics are secured during autopsy. Toxicologic and forensic genetics investigations are ordered in relevant cases. The procedure varies, and in some cases it is ordered after consultation with the police while in other cases it is ordered by the pathologist. However, the police can then cancel it within three days. In addition, there is a possibility of calling forensic odontologists and anthropologists if identification is an issue or if the body is partly or wholly skeletonised.

The procedures for performing a forensic autopsy are standardized in Finland after international standards[12]. In many departments, it is possible to perform computed tomography prior to the forensic autopsy. Supplementary investigations to confirm the cause of death are performed using forensic toxicology analyses for specific drugs and other chemicals, histopathological investigations including a neuropathological examination of the central nervous system when necessary; microbiological analyses; biochemical and metabolic analyses and DNA-analyses for diagnostic or identification purposes.

There exist small differences between the forensic centres in Norway in the amount of tissue samples taken to be prepared for histology. In some places, all internal organs are examined histologically, in other places only selected tissue specimens are examined. In contrast to Denmark, a full toxicological screening is performed, usually in both blood and urine, in all medico-legally examined cases. Forensic genetics are performed in selected cases, for instance in suspected genetic heart disease, and in criminal cases. Forensic genetics and forensic odontology services are readily available and are performed in cases of unknown identity.

The forensic pathologists in Sweden work independently when it comes to deciding on what supplementary investigations should be performed in a case, such as a CT scan, or what and if any toxicological and/or genetic analyses should be undertaken. The Autopsy Act only allows for the supplementary investigations that are necessary to determine the cause of death. Therefore this demands restraint from the forensic pathologist, for example when it comes to the extent of histological tissue sampling or genetic mapping.

In all RMV units, it is possible to perform a CT-scan prior to autopsy. As of today (2022), only one unit (Stockholm) owns a scanner. In the other five units

examination is conducted at a cost by the nearest department of radiology, usually within a university hospital. Thus, it is impossible to scan every forensic case prior to autopsy due to logistical and financial limitations. Plans for the future include purchase of own scanners by each unit to complement to all forensic autopsies.

CONCLUSION

The system for medico-legal death investigation in the Nordic countries is favoured by a generally homogenous population, and the institutes or departments have made provision for relatives of all faiths to bid farewell to their loved ones, irrespectively of their creed and assist in whatever special requirements are needed. On the other hand, it is not possible to deviate from the legal regulations of medico-legal death investigation due to demands on a religious background, which has also been accepted.

The systems are similar, and the training and tradition makes assistance between nations easy. In three of the countries, when the physician who establishes the death of a person calls the police, they will themselves decide how to proceed with a PME. Only Denmark has an institution staffed by physicians who will attend a medico-legal inquest in all cases, where the police is in doubt. The forensic pathologists who perform the PMEs work for national authorities in Finland and Sweden, university institutes in Denmark while in Norway, due to its geographical challenges PMEs are performed by full-time forensic pathologists in the capital Oslo and by part-time forensic pathologists working for the health authorities in their region as hospital pathologists. In most nations the PME includes histology, toxicology and genetics. However, in Denmark the latter two are to be ordered by the police after consultation. PMCT is standard in all forensic autopsies in Denmark while in the other nations this is standard in the major centres but optional and rarely done in others.

Even though the four nations differ in detail, they are very similar in the way they work, which is exemplified in the DVI operations such as the Thai Tsunami, where we were not Danish, Finnish, Norwegian nor Swedish, but the Nordic Team.

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Medico-Legal Death Investigation Systems – Poland

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ABSTRACT

In Poland a legal death can only be declared by a physician and they are the first link in the chain of medico-legal death investigation. It is usually a general practitioner or an emergency care practitioner. It can also be a medical doctor working in the hospital where the death occurred. Under Polish Code of Criminal Procedure, if it is suspected that death has been caused by criminal means, an external examination of the body at the place of its discovery and a forensic autopsy shall be performed. This suspicion is the only statutory prerequisite for forensic autopsy. In accordance with the Code, if the suspicion arises, these procedures are obligatory; however, they cannot be performed without the existing suspicion. The decision whether to deploy them is taken solely by the state prosecutor conducting the investigation. In accordance with the law, forensic autopsies are performed by a physician, "when practicable, a forensic pathologist". Sadly, the availability of forensic pathologists in Poland is not large and autopsies are often conducted by a medical doctor who does not have this specialty. The scope of autopsy is not regulated by any laws, the physician always opens three main body cavities: the head, rib cage and abdomen with pelvis. Additionally, if need be, other areas may be opened. A forensic autopsy report consists of a formal section and a description of the actions performed. Finally, it outlines conclusions concerning the possible cause of death and other circumstances. The report is sent to the state prosecutor, who may decide to share it with the family of the deceased. Following the forensic autopsy, the state prosecutor issues a permission for burial of the body, which authorizes the physician to issue a document stating death and enables the family to collect the body for burial.

Keywords: Code of criminal procedure; external examination; forensic autopsy; medico-legal death investigation; Poland.

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Poland is a country located in Central Europe, with an area of 321,696 km^2 (120,733 sq mi), nearly 5 times bigger than Sri Lanka. Poland is the fifth-most populous member state of the European Union and has a population of over 38 million, almost 2 times larger than Sri Lanka's. Before the COVID-19 pandemic, an average of 400,000 deaths per year occurred in Poland, but in 2020-2021 this number rose to approximately 500,000 deaths per year. Only about 10,000 of these cases undergo forensic autopsy per year. They include mostly suicides – mainly hanging (approx. 5,000 per year), victims of accidents – mainly road traffic accidents (approx. 2,500 per year), while homicides are much less common (approx. 600 per year). The latter mostly encompass deaths caused by head injuries inflicted with blunt objects (typically a fist, shod foot, stick, brick, stone) or torso injuries inflicted with sharp instruments (typically a knife). Deaths caused by shooting are even less common; they mostly include firearm accidents during hunting or suicides by persons legally owning firearms. Homicides with the use of firearms happen very rarely (approx. 20 per year). Polish population is highly homogenous. Most of us belong to the Roman Catholic faith and religion plays an important role in the life of many Poles, especially in smaller towns and in the rural areas of the country. However, since the Catholic Church does not impose any strict rules concerning interment (e.g., there are no regulations describing the time required for the burial to occur following death, the type of burial allowed – both typical earth grave and cremation are allowed, exhumation is not prohibited etc.), it does not impact death investigation in any way.

Under Polish Code of Criminal Procedure[1], if it is suspected that death has been caused by criminal means, an external examination of the body at the place of its discovery and a forensic autopsy shall be performed[2]. This suspicion is the only statutory

prerequisite for forensic autopsy. In accordance with the Code, if the suspicion arises, these procedures are obligatory; however, they cannot be performed without the existing suspicion. The procedures in question are aimed not only at identifying the cause of death, but also at discovering all the other circumstances relevant to the case. The decision whether to deploy them is taken solely by the state prosecutor conducting the investigation. A mere suspicion that death has been caused by criminal means obliges the state prosecutor to order an external examination of the body at the place of its discovery and a forensic autopsy. The state prosecutor's decision is final and cannot be appealed. If the suspicion that the death has been caused by criminal means occurs after the burial of the body, the state prosecutor shall order an exhumation, regardless of the time elapsed, and a forensic autopsy. The state prosecutor shall also order a forensic autopsy in cases where it is suspected that death has been caused by criminal means and a clinical autopsy had been performed or forensic autopsy had been performed, but the procedures were not in line with the Polish criminal procedure, e.g., the forensic autopsy was duly performed, but it took place in a foreign country. The state prosecutor may only waive the autopsy on condition that the forensic pathologist duly proves in their opinion that it would serve no purpose in the given circumstances, e.g., it would be futile to order a forensic autopsy to reveal a recent myocardial infarction in a body exhumed 5 years after death. However, the detection of a basilar skull fracture in such a body is quite feasible. Issues other than the suspicion that death has been caused by criminal means, for instance an occurrence of a mass casualty incident, are not important in the decision-making process regarding autopsy, from the point of view of the Code. Of course, autopsies will be performed in the case of an aviation accident with a hundred casualties, but not because it was a mass casualty incident. They will be ordered since, at this stage of investigation, it is not possible to rule out that the accident was caused by a crime. All the same, in the case of an avalanche that buried a hundred victims, autopsies may not be necessary, as the deaths were caused by a natural phenomenon. Nevertheless, in the latter situation an external examination of the body at the place of its discovery and forensic autopsies can also be ordered. Their first aim is then the correct identification of the bodies, because requesting identification procedures in line with Interpol requirements (using primary identifiers) is possible in Poland only after initiating criminal proceedings. Apart from launching criminal proceedings, the only other possibility would be to do a visual identification of the bodies, which of course is not always possible and feasible. In such situations the law is circumvented by adopting an assumption that there may have been a crime committed (e.g., somebody triggered an avalanche) and formally the proceedings are in line with the Code. This was also the reason why creating a DVI team in Poland required, in the first place, establishing procedures enabling a lawful cooperation of the state prosecutor, the police and forensic medicine experts as well as other specialists from different fields.

A legal death can only be declared by a physician and they are the first link in the chain of medico-legal death investigation[3,4]. It is usually a general practitioner or an emergency care practitioner. It can also be a medical doctor working in the hospital where the death occurred. Typically, death is declared based on early certain signs of death, late signs of death, or injuries preventing survival. In hospital conditions, when a need to remove organs for transplantation arises, declaring death is a more complex issue involving multiple procedures aimed at investigating brainstem function.

The physician declares death and if: 1) they do not have sufficient grounds to suspect that the death was caused by criminal means, 2) there have not been sufficient grounds to suspect a suicide, and 3) the identity of the body is known, they issue a document stating death, required for the issuance of an official death certificate by a competent civil office, which is necessary for the organization of burial of the body or its cremation and burial of the ashes. If the death happened in hospital (and as long as the above three conditions apply), it is possible to perform a clinical autopsy to determine the cause of death and to issue a document stating death at a later time. Since such autopsies are not compulsory in any situation, because the cause of death is usually known and families of the deceased are typically opposed to autopsies, their number is low. A private clinical autopsy can also be performed in any case of death (as long as all the above-mentioned conditions apply), commissioned by the family of the deceased. However, the number of such autopsies is limited to one-off cases. In theory, Polish regulations also allow for the performance of an administrative-sanitary autopsy in cases where the deceased person was diagnosed with or suspected of having a contagious disease (provided that the above three conditions apply). However, in practice such autopsies are never performed.

On the other hand, if any of the three above mentioned conditions is not met, i.e., if: 1) the physician declaring death has sufficient grounds to suspect that the death was caused by criminal means, 2) there have been sufficient grounds to suspect a suicide, or 3) it is impossible to identify the body, they are obliged to notify the police. In this is the case, the physician does not issue a document stating death – it will be done at a later time by a different medical doctor. The police may also arrive at the place where body was discovered when notified by other persons or institutions (e.g., when the death occurred in a public place). After such

information is received, an investigation team is dispatched to the scene.

The state prosecutor shall be in charge of the investigation team – they shall be notified by the police, however, depending on the region of Poland and even local practices, the external examination of the body at the place of its discovery is often conducted by the police without their presence. Besides a scene of the crime officer, the investigation team should also include a physician – as provided in the relevant regulations: "when practicable, a forensic pathologist". Unfortunately, the availability of forensic pathologists is low and the team is often joined by a medical doctor who does not have this specialty, which happens especially outside large cities, or sometimes the team is not joined by a medical doctor at all. Thus, the quality of such external examination is not up to expected standard.

Apart from external examination of the body itself, the investigation team also explores the place of its discovery. The examination should be conducted without delay to avoid the risk of potential evidence being destroyed. The state prosecutor in charge of the team is responsible for supervising all the performed procedures, but they, together with scene of the crime officer and forensic pathologist, are not the first to arrive at the scene. They are usually preceded by police officers, who ought to properly secure the site from unauthorized access. It is particularly important when the examination is performed in a public place. However, in practice, it is not always the case. The scene is often imperfectly secured and can be accessed by unauthorized persons (due to lack of screens or unwillingness to put them up). In such circumstances forensic pathologists and scene of the crime officers are subjected to unwelcome attention from passersby.

After taking a photographic and written record, the scene of the crime officer secures the evidence. Although these steps are clearly their responsibility, they are assisted by forensic pathologists, especially in case of biological evidence. It is worth mentioning that scene of the crime officers in Poland are usually highly skilled and knowledgeable about the types of materials that should be collected at the scene and the means of securing them.

The next step involves the forensic pathologist, who commences the external examination by describing in detail the location of the body, its clothes and possible signs of soiling or damage. The following step involves describing signs of death and examining postvital reactions, which allow to determine time since death. Next, the forensic pathologist describes general characteristics of the body and proceeds to report bodily injuries. During the examination it is vital to determine whether there are any injuries present, to identify them and to establish whether they involve areas responsible for vital functions and whether they may be related to the death. Finally, time of death should be determined and, if possible, a likely cause of death, as well as possible involvement of third parties and advisability of forensic autopsy.

It should be noted that if during the external examination of the body at the place of its discovery the forensic pathologist finds no evidence of the involvement of third parties in the death and if other circumstances (examination of the scene, interrogation of witnesses) do not arouse any doubts, the state prosecutor present at the scene may decide that they do not suspect a criminal cause of death and release the body to the family for burial. However, the body is usually transported to the local department of forensic medicine and kept in a morgue refrigerator until the state prosecutor decides on further action in the case. The time for taking this decision is not legally determined in any way. The decision is typically announced promptly, but sometimes it takes many days.

If, after all the required procedures had been deployed, the state prosecutor still suspects a criminal cause of death, they order a forensic autopsy. Such autopsies are often superfluous, since prosecutors prefer to request one as a safety precaution than to be later accused of groundlessly waiving it – this is simply a safer choice for them.

In accordance with the law, such autopsies are performed by a physician, "when practicable, a forensic pathologist". Sadly, as already mentioned before, the availability of forensic pathologists in Poland is not large and autopsies are often conducted by a medical doctor who does not have this specialty. The quality of such autopsies is not up to expected standard. According to the law, the state prosecutor should be present during the autopsy. In practice, it is not always the case, although nowadays state prosecutors attend forensic autopsies more often than in the past. Moreover, if need arises, the autopsy can be joined by a scene of the crime officer, who takes photos, necessary samples (e.g., swabs collected from under fingernails), fingerprints, etc.

The scope of autopsy is not regulated by any laws, the physician always opens three main body cavities: the head, rib cage and abdomen with pelvis. Additionally, if need be, other areas may be opened, for instance paranasal sinuses, inner ear, vertebral column, joints, soft tissues in relevant places etc.[5-8]. The choice of autopsy scope is usually left to the physician, although formally the state prosecutor may determine it at their own discretion. Similarly, the choice of materials to be

collected for additional tests is usually left to the physician, although formally the state prosecutor also has the power to make it. The cost of forensic autopsy is normally fixed and does not depend on the scope of examination nor the type of collected materials. It is covered by the ordering party, i.e., the state prosecutor.

The situation is different with regards to ordering tests of the collected material, which incur extra costs. Every single test translates into additional expense for the state prosecutor. Fortunately, the prosecutor typically, but not always, trusts the physician in this matter and orders the suggested tests. Only three departments of forensic medicine in Poland offer the possibility to perform medical imaging (PMCT scanning) prior to the actual forensic autopsy, consequently these procedures are not very popular and the state prosecutor does not insist on them, to avoid additional costs.

A forensic autopsy report consists of a formal section and a description of the actions performed. The former includes information about the autopsied body, date of autopsy, name of institution ordering the autopsy, case file reference number, name of the physician and persons present at the autopsy, as well as data concerning the circumstances of death (or, alternatively, medical record data, if the death happened in hospital). The latter contains an actual description of the body given in order of the steps performed and a description of all organs, as well as traumatic, pathological, and postmortem lesions. Next, the document enumerates the materials collected at the scene for further testing and the means of securing these materials. Finally, it outlines conclusions concerning the possible cause of death and other circumstances. The report is sent to the state prosecutor, who may decide to share it with the family of the deceased. They may also disclose selected information from the report to the media.

Following the forensic autopsy, the state prosecutor issues a permission for burial of the body, which authorizes the physician to issue a document stating death and enables the family to collect the body for burial.

Second look autopsy is not customarily performed in Poland, although after releasing the body to the family it is by all means possible. Nor is it customary for the forensic pathologist hired by the family to participate in the forensic autopsy. However, in exceptional cases, the family of the deceased wishes to attend the autopsy.

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Medico-Legal Death Investigation Systems – Scotland

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ABSTRACT

Scotland although part of the United Kingdom (UK) has a separate legal system. The death investigation process in Scotland is unique, not only in the UK, but also when compared to many other countries around the World. The uniqueness includes having the requirement of corroborated reports, thorough police investigations before autopsy, the ability to avoid dissection autopsies, a focus on the detection of criminality & negligence and greater privacy for the deceased's family. In this article we expand and describe the process of Death Investigation in Scotland.

Key words: Corroboration; death investigation; procurator fiscal; Scotland; view and grant

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Scotland is part of the United Kingdom (UK) of Great Britain. Due to historical reasons each country within the UK has different legal systems and traditions. The procedure for the investigation of deaths is different with slightly different emphases in each of the countries of the UK. This article will focus on the death investigation system in Scotland.

Scotland is a country that is situated in the north of the UK and has a population of around 5.5 million people. There are on average around 58,000 deaths per year. When an individual dies, in around 80 % of cases, a certified medical practitioner will issue a death certificate when the cause of death can be identified to the best of their knowledge or belief. However, in around 20% of cases, on average around 12,000 deaths per year, the death will be considered "reportable" and the Procurator Fiscal is required to be notified of the death. The Procurator Fiscal is a lawyer and civil servant appointed by the Lord Advocate. The Lord Advocate being the chief public prosecutor for Scotland and the Head of the Crown Office and Procurator Fiscal Service (COPFS), the organisation that carries out prosecutions in the name of the Lord Advocate. The investigation of deaths in Scotland are carried out by a specialist unit of the COPFS, the Scottish Fatalities Investigation Unit (SFIU). The SFIU is further split in to 3 areas that cover different parts of the country, SFIU North, SFIU West and SFIU East.

The Procurator Fiscal has a different role in the death investigation process to that of a coroner or medical examiner in other countries around the world. Commonly the role of the coroner or medical examiner is to determine the identity of the deceased and how, when and where they came by their death. In Scotland the Procurator Fiscals main focus in the death investigation process is the detection of criminality and negligence. As previously mentioned, there are certain types and categories of death that are considered "reportable" to the Procurator Fiscal. These are a) unnatural deaths (such as homicide, suicide, drug related deaths and deaths whilst at work), b) natural deaths (natural causes where the cause cannot be initially identified by a medical practitioner, death due to neglect/fault, certain child deaths, deaths under medical care or deaths from notifiable industrial/infectious diseases (such as diseases related to exposure to asbestos at work), c) deaths in legal custody (including police custody and lawful imprisonment).

Once the Procurator Fiscal has been notified of a death, they may take the following actions a) decide a death can be certified with no further action; b) consent to a hospital post-mortem (where death is thought to be natural but more accurate certification of death is required), in this case the family may refuse to give consent for the autopsy to be carried out, unlike in medico-legal autopsies; c) request a police report (in this case the police are acting as investigative agents of the Procurator Fiscal and the investigation will be carried out even if it is suspected that there is no criminality involved in the death). In the cases of a police report, it would usually be expected that the police investigation and subsequent reporting would be

followed by an autopsy; d) a medico-legal autopsy (carried out by a forensic pathologist). Once reported to the Procurator Fiscal the body of a deceased cannot be released for burial or cremation until authorised by the Procurator Fiscal, this is usually after the death certificate has been finalised but may be longer in cases of homicide and in cases where additional investigations are required.

In around 70 % of the deaths reported to the Procurator Fiscal a medico-legal autopsy is carried out by a forensic pathologist. In Scotland forensic pathology services are funded by the Scottish Government (via the COPFS) and are found at the Universities of Glasgow (est. 1893, Dundee (est. 1898), Aberdeen (est. 1839) and Edinburgh (est. 1806). In most cases reported to the Procurator Fiscal the Police will have completed a comprehensive report, the exception usually being homicide investigations. This allows the Procurator Fiscal to make informed decisions about the type of autopsy that may need to be carried out. Scotland is unique in that a "View and Grant" autopsy may be carried out. In this case the pathologist, in consultation and agreement with the Procurator Fiscal, may decide that the medical records and the Police investigations allow the cause of death to be determined without dissection of the deceased. In this scenario only a thorough external examination of the body by a forensic pathologist is required rather than dissection. The view and grant procedure does allow limited incisions to be made to allow samples to be taken for toxicological analysis. If on external examination of the deceased the death becomes suspicious then the forensic pathologist can proceed to a full (dissection) autopsy. The variety of cases that may be covered by view and grant autopsies include suicidal hangings, road traffic fatalities (where no criminal prosecution is expected) and unexplained deaths that were witnessed (such as a heart attack at a sporting event). Around 15 % of the deaths that are sent for autopsy by the Procurator Fiscal are completed as "view and grant" investigations. In Scotland due to the option of a view and grant autopsy it is not currently possible to use other non-invasive autopsy techniques such as magnetic resonance imaging (MRI) or computerized tomography (CT) scanning to ascertain the cause of death, techniques that have become more common around the world. If it is decided that a full dissection autopsy is required the there are two options in Scotland, that of a "single doctor" or "double doctor" (corroborated) autopsy. In criminal cases in Scotland, it is a legal requirement that all crucial facts are corroborated. This is in place as a legal safeguard to reduce the likelihood of a miscarriage of justice. Double doctor autopsies are carried out when there is an expectation that criminal proceedings will follow the determination of the cause of death. The use of a double doctor autopsy does not stop a defence autopsy being carried out, and there have been some debates in the field that a defence autopsy would corroborate the pathological facts. The defence autopsy could just be a difference in interpretation of those facts but still a corroboration of pathological findings meaning that corroborated autopsies would not be required. In a double doctor autopsy, both forensic pathologists will be present. Usually, one will perform the dissection and the other will take notes, with both forensic pathologists being equally responsible for the autopsy, neither being considered more senior than the other. Following a double doctor autopsy usually a joint report is prepared and agreed. If the pathologists do not agree on the facts, then separate reports can be completed and submitted to the Procurator Fiscal. This does not commonly occur and is discouraged as this practice would weaken any potential prosecution. However, this may act as another safeguard to potential miscarriages of justice. Another advantage to the corroborated pathology reports is that they allow, and even require, the discussion of findings prior to the production of the final report, reducing the chance of a critical or important finding being missed. In the criminal justice system in Scotland corroborated reports are also required in criminal cases by other professionals such as police officers, forensic toxicologists, and other forensic scientists. Following the completion of the Procurator Fiscals investigation and the certification of death the Procurator Fiscal has three options for further action. They can 1) take no further action; 2) prepare a criminal prosecution; 3) prepare a fatal accident inquiry (FAI).

In Scotland, unlike in England and Wales there are a limited number of public hearings into deaths. The only public hearings in relation to deaths that occur in Scotland are those that require a FAI. FAIs were first introduced into Scots law by the Fatal Accidents Inquiry Scotland Act (1895) and are now covered by the "Enquiries into Fatal Accidents and Sudden Deaths etc. (Scotland) Act 2016 Act". FAIs are a judicial process overseen by a Sheriff (usually a judge assigned to work in a specific court). This purpose of which is to establish the circumstances of a death and consider what steps may be taken to prevent other deaths or injuries in similar circumstances. Unlike in other legal jurisdictions FAIs are never held with a jury as the tryer of facts, only a Sheriff. The role of the FAI is investigative and they do not establish criminal or civil liability. There are around 60 FAIs per year in Scotland and are only required in specific circumstances; a death at work, a death in legal custody or at the direction of the Lord Advocate where it is in public interest. Since 2016 the Lord Advocate can order an FAI in cases where the death of a Scottish resident has occurred outside of Scotland, such as deaths of service personnel or death abroad. In these cases, the Lord Advocate must believe there are additional questions that have not been answered by other inquiries. The evidence, and the calling of witnesses in an FAI is led by the Procurator Fiscal.

However, like in coroner's inquests (as it is known in other legal jurisdictions around the world) other interested parties (such as the family or employer) can also be represented and ask questions of the witnesses that have been called.

In the 80% of cases that are not covered by the Procurator Fiscal there is an additional layer of auditing of the causes of deaths on death certificates. Research had found that there was a lack of quality and accuracy in the cause of death given on death certificates. For this reason, the Death Certification Review Service (DCRS) was setup in 2015 to review the cause of death in approximately 12% of randomly selected deaths that were not reported to the Procurator Fiscal. The death certification can also be reviewed by the DCRS at the request of the family. The aim of DCRS is to ensure the death is recorded accurately. In 2020 around 20 % of randomly selected cases were considered "not in order" and required changes (this may be the correction of an administrative error (such as a spelling mistake) or a clinical error (such as an incorrect cause of death or a cause of death that is too vague).

The death investigation process in Scotland is unique not only in the UK but also to many other places around the World. The uniqueness includes having the requirement of a corroborated report, thorough investigations before autopsy, the ability to avoid dissection autopsies, a focus on the detection of criminality & negligence and greater privacy for the deceased's family. No countries death investigation system is perfect, but knowledge of the other systems of death investigations around the world allows the chance for reflection and potential improvement.

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Medico-Legal Death Investigation Systems – South Africa

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ABSTRACT

South Africa (SA) is a developing nation with a heavily burdened and under-resourced medico-legal death investigative system. The medico-legal death investigative system in SA resembles aspects of the medical examiner and coronial systems yet maintains characteristics unique to the South African environment and legal practice. In this article, we discuss the procedures followed in medico-legal death investigations in SA.

Keywords: Death investigation; developing nation; forensics; medico-legal; South Africa.

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INTRODUCTION

Death investigation and criminal justice systems in Sub-Saharan Africa commonly resemble medico-legal systems of the three dominant colonial powers during the 19th Century – the French, British and Portuguese[1,2]. Most of West Africa, East Africa and southern Africa have medico-legal investigative systems that resemble the British coronial systems that have shifted towards law enforcement led investigations in recent years[1]. The medico-legal systems in most of central Africa, and parts of West Africa (for example Angola, Cape Verde, Guinea-Bissau and Mozambique) resemble Portuguese and French systems[2,3]. In these systems, judicial police in conjunction with state prosecutors lead death investigations and request autopsies[1]. The focus of this article will be medico-legal death investigations in South Africa (SA).

SA is a geographically and demographically diverse country that is situated at the southernmost tip of Africa. The country spans 1,219,602 km^2 and is home to more than 59 million people[3,4]. SA is a developing nation burdened with high levels of unemployment, poverty, inequality and violent crime. Between 2010-2018, unnatural (or non-natural) deaths constituted approximately 9-11.9% of the annual deaths registered in the country[7]. SA annually reports the highest murder rate in Africa, with the city of Cape Town most affected over the 2021/2022 period, with a murder rate of 63 per 100 000 people[4]. Unsurprisingly, this has led to a heavily burdened death investigative system that lacks sufficient resources, funding or qualified forensic experts needed to combat high caseloads[5,6].

THE HISTORICAL CONTEXT OF MEDICO-LEGAL DEATH INVESTIGATIONS IN SOUTH AFRICA

Understanding medico-legal death investigative processes in SA requires insight into the historical and socio-political developments in the country over the previous 100 years. The Cape Colony in SA was settled by the Dutch East India Company in 1652 and later in 1795 by Britain. This led to the establishment of the Roman-Dutch legal system, which became the basis of common law that is still practiced in SA[4]. During British colonial rule, all suspicious deaths were investigated within the framework of the British coroner system, although it is worth noting that the office of "coroner" was never formally established in SA. Instead, death investigations were conducted by "district surgeons" and medical doctors until the establishment of the Union of South Africa (1910). During this period, medico-legal death investigations were led by law enforcement officers with the help of district surgeons or forensic pathologists[1].

The rise of Apartheid (1948) saw the organisation of state mortuaries under the jurisdiction and management of the South African Police Services (SAPS). All staff working at state mortuaries (with the exception of medical doctors and forensic pathologists)

were in the employ of the SAPS[4]. While medical doctors and forensic pathologists were appointed by state health authorities, police officers were closely involved in medico-legal investigations and often facilitated at autopsies. This was particularly contentious in light of increasingly harsh policing in response to civil unrest in the 1970's-1980's and the associated rise of deaths of political activists in police detention[6]. The integrity and the objectivity of medico-legal death investigations in SA were called into question – especially in especially in cases where police actions or inactions were implicated in deaths[4,6].

By the early 1990's several forensic pathologists began to advocate for the re-organisation of the medico-legal system to enable independent, scientific and professional investigations of death[4]. Subsequent to the end of Apartheid (1993) a number of cases were identified where the state police were implicated in deaths of political activists and detainees. This led to recommendations that an independent Forensic Pathology Service (FPS) be established to enable a complementary, yet independent medico-legal investigative process.

In 2004, the *National Health Act* (Act 61 of 2003) came into effect - with provisions that provincial health departments were to assume responsibility for providing a Forensic Pathology Service (FPS). By 2006, all medico-legal death investigation services were transferred from the SAPS to provincial health authorities across all nine provinces in SA. Provincial Directorates or Divisions of Forensic Pathology Service were established to provide the physical infrastructure and resources needed to render medico-legal death investigations[7]. The involvement of SAPS in death investigations was limited to securing death scenes and conducting the criminal investigation including identification and collection of any physical evidence (not associated with the body).

THE CURRENT STATE OF MEDICO-LEGAL DEATH INVESTIGATION IN SOUTH AFRICA

Medico-legal investigations of death in SA involve three independent but unified arms: medical (FPS), criminal (SAPS) and judicial (Department of Justice). The *Inquests Act* 58 of 1959 (amended 1996)[9] stipulates that all unnatural deaths are to be investigated by the SAPS under the auspices of the magistrate. Under this act, it is obligatory for every person who has reason to believe that another person has died of other than natural causes, to report this to the police, who in turn are obliged to investigate the circumstances of this death[8]. Unnatural deaths are defined in the Regulations Regarding the Rendering of Forensic Pathology Services (promulgated in 2008 in terms of the *National Health Act* of 2004)[11] and the *Health Professions Act* (Act 56 of 1974) to include: deaths that are the result of external or chemical influence(s); deaths due to conditions, which would otherwise constitute natural cause(s), but where acts of omission or commission may have caused or contributed to the death; sudden and unexpected (or unexplained) deaths where the cause thereof is not apparent; deaths during surgical/anaesthetic procedures or due to any complications related to diagnostic, therapeutic or palliative treatment.

If the body of a person who has allegedly died from unnatural causes is available, it shall be examined by a district surgeon or medical practitioner to establish the cause of death, as outlined in the *Inquests Act*[8]. The purpose of the inquest is to determine the cause of death; ascertain the date/time of death; determine whether the death was due to an act of omission or commission; and to establish the deceased's identity. In the investigation of unnatural deaths, consent from the next-of-kin is not required to conduct an autopsy or to retain any specimens that may aid in determining the cause of death[4]. While there are no official budgetary allocations per forensic case, limited operational budgets in each province and mortuary severely limit the resources that forensic medical practitioners are able to access.

The Regulations for the Rendering of Forensic Pathology Services (2008)[11] state that only specifically appointed medical practitioners may conduct post-mortem examinations. These medical practitioners may be qualified forensic pathologists, registrars (residents, or forensic pathologists-in-training), or medical officers (or contracted private practitioners). Forensic pathologists are authorised to attend death scenes to obtain any information that may be relevant to the circumstances surrounding a possible unnatural death – this is aligned with duties of a medical examiner. This may even include questioning any witnesses, taking photographs, taking a medical history, assuming custody of evidence found on or in the body (such as drug paraphernalia and/or medication). Forensic Officers are employed as forensic pathology assistants and they play a critical role in medico-legal investigations. Forensic Officers are mandated to collect remains and evidence at the death scene, take photographs, interview witnesses and assist forensic pathologists during autopsy. The Health Professionals Council of South Africa (HPCSA) is a regulatory body that regulates the registration of all medical professionals, ranging from emergency service personnel to psychiatrists and forensic pathologists. Currently, forensic officers are not required to register with a regulatory body. The absence of standardised criteria for training, registration or employment of Forensic Officers has hampered inter-provincial consistency in medico-legal death investigative procedures.

While the forensic medical practitioner is tasked with determining the cause of death, establishing the manner of death falls within the mandate of a presiding judicial officer or magistrate in the employ of the Department of Justice (DOJ)[6]. If requested by the magistrate, a medical practitioner may provide an opinion on the manner of death[6]. When the causes and/or circumstances surrounding death are unclear and where criminal actions are not immediately apparent, the National Prosecuting Authority (NPA) will present the docket (case) to the inquest magistrate for further consideration. This may culminate in a "paper inquest" (involving an administrative decision taken by the magistrate) or a "formal" inquest (comprising legal proceedings in an open court, providing all interested parties with an opportunity to be involved-with or without legal representation)[4].

CONCLUSION

Medico-legal death investigations in SA have changed through time. Perhaps the most notable change has been the transfer of medico-legal death investigations from the control of the Department of Justice and the South African Police Services to the Department of Health. Despite this, the mandate of the forensic medical practitioner has remained consistent-determining the cause of death, mechanism of death, decedents identity (where possible) and time of death. The SAPS undertake criminal investigations of suspected unnatural deaths, and the court, on reviewing all the relevant information makes a finding as to the manner of death. One may argue that the statutory obligations of FPS as outlined in the Regulations for the Rendering of Forensic Pathology Services has led to the beginnings of a hybrid medico-legal system resembling both the coronial and medical examiner systems.

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Medico-Legal Death Investigation Systems – Sri Lanka

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ABSTRACT

Sri Lanka's death investigation system has originated from the British coroner system and it is currently provisioned mainly by the Code of Criminal Procedure Act No. 15 of 1979. The death inquirers - magistrates and inquirers into sudden death - are empowered to carry out inquests in sudden and unnatural deaths to ascertain cause and manner of death. Autopsies are performed by qualified medical officers upon the request of death inquirers. Maternal deaths, although not specified in the Code of Criminal Procedure, undergo mandatory autopsies. In the face of mass disasters in recent history; including the 2004 tsunami, 2019 Easter bombing and COVID-19 pandemic, Sri Lanka adapted the regulations to overcome the medico-legal challenges in the management of the deceased.

Keywords: Autopsy; COVID-19; inquiry into sudden death; maternal deaths; Sri Lanka

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INTRODUCTION

Sri Lanka inherits the death investigation system from its former colonial ruler, the British, who ruled the island nation from 1815 to 1948. As is the case with many other British colonies in Asia, Sri Lanka adapted and continued the British system with a few changes after independence.

INQUIRY INTO SUDDEN DEATH

The Code of Criminal Procedure Act No. 15 of 1979 enforces the investigation of the death in Sri Lanka to certify the cause and manner of unnatural deaths. Before the enactment of this act, the death investigation of the country was performed under the provisions of the Criminal Procedure Code of 1883 and then the Administration of Justice Law of 1973. The provisions of Code of Criminal Procedure Act No. 15 of 1979 empower death inquires - magistrates and inquirers into sudden death (ISD) - the latter of whom are colloquially called 'coroners' – to conduct the inquiry into all unnatural deaths (accidents, suicides and homicides) and when the cause of death is not known. Magistrates are lawyers with magisterial powers within their jurisdiction who are appointed by the Judicial Service Commission. On the other hand, ISDs are appointed by the Ministry of Justice for a specified area and require a minimal educational qualification of passing the General Certificate of Education (Advanced Level) in any subject stream[1,2].

When a death inquirer receives information of a person committing suicide, killed by animal, machinery or by accident, died suddenly or of unknown causes, they shall immediately proceed to the place where the body of the deceased is and conduct an inquiry. Then he or she shall draw up a report on apparent cause of death, describing injuries on the dead body, as in his or her opinion may relate to the cause of death and manner of how such injuries have been inflicted. This report is then signed and forwarded to the supervising magistrate. In cases of suspected homicide, deaths in custody (police, armed forces, detention homes, correctional facilities, prisons), mental hospitals and leprosy hospitals, the magistrate of the local magistrate court is required to hold the inquiry[2]. Apart from the above, hospital doctors request an inquest in deaths where cause of death is not ascertained, deaths due to medical, surgical or anaesthetic procedures or immediately afterwards, deaths following administration of vaccines, blood, blood products or a drug, alleged medical negligence, deaths due to animal bites, rabies or tetanus and deaths due to suspicious circumstances[3]. In addition to hospital doctors and administrators, Grama Niladhari officers (administrative officers of subdivisions of a district), police, security forces, emergency services and members of the public can report the deaths to inquirers[4].

An inquiry is held at a place open to the public. However death inquirers hold the power to exclude the public from an inquiry on special grounds. An inquirer can summon any person, including medical personnel, to give evidence or produce any relevant document for the inquiry. They usually summon and record the evidence of the investigating police officer, relatives and other interested parties of the deceased and eyewitnesses to the incident. If such a summoned person fails to appear, refuses to give evidence or fails to produce any documents, they can be charged with contempt of court and fined and/or imprisoned up to 3 months[2]. Following the conclusion of the inquiry, the inquirer issues the inquirers certificate of death stating the cause and manner of death, or, if not ascertained, an open verdict. This certificate, which is required for the disposal of the body, is presented by the next-of-kin to the Registrar of deaths in the area within five days to register the death[4].

Births and Deaths Registration Act provisions the registering and disposing of dead bodies in local settings where a death registrar issues a certificate of death once he is notified of the death. Such a body cannot be moved outside this designated area for disposal unless written permission is obtained. Furthermore a Grama Niladhari officer or a police officer of the area can inform about a death, including cause, to a registrar. A cause of death for a deceased individual can also be provided by a medical practitioner, who had attended last illness of the deceased. When a superintendent of an estate receives information of a death occurring in the estate, he shall verify the information and authorize the disposal of the body within the estate[5].

AUTOPSY

The death inquirer is empowered to call upon a medical officer to conduct an autopsy and submit a report as to the cause of death. The minimum legal requirement of such medical officers is the basic medical degree (MBBS) and to be registered with the Sri Lanka Medical Council. In the past, the majority of post mortem examinations were done by medical officers with only an undergraduate knowledge of forensic medicine. However, most autopsies in Sri Lanka are now conducted by medical officers with post graduate qualifications (Diploma in Legal Medicine, Master in Forensic Medicine or Doctorate in Forensic Medicine), those in the post graduate training or under the direct supervision of a board certified consultant. Post graduate training is conducted by, both, board certified specialists attached to departments of forensic medicine in universities (senior lecturers and professors) and the department of health (consultant judicial medical officers). If the dead body is already buried, the exhumation for the purpose of an autopsy should be authorized by a magistrate[1,2].

During the inquest procedure, the body of the deceased belongs to the state and the relatives of the deceased cannot object to the inquest procedure. The relatives are handed over the custody of the dead body only after the inquirer releases the body following the conclusion of the inquest. The method of disposal and to whom the body is released are decided by the inquirer. Autopsied bodies are usually buried, in case the need of a second autopsy arises. However relatives can opt for requesting for a cremation where any suspicions related to the circumstances of the death are excluded.

Consent from the next of kin is not required for obtaining biological samples during the autopsy to ascertain the cause of death. However, for the preservation of specimens for academic purposes and in non-forensic autopsies conducted for disease diagnosis and research purposes, the consent of the next of kin is required[6]. In Sri Lanka, a country of Buddhist majority, many people consider it a meritorious act to donate the organs of their loved ones. Therefore, faculties of medicine in Sri Lankan universities house many museums of human specimens received from the generous relatives of the deceased, which is rarely seen in other countries. In the Faculty of Medicine, University of Peradeniya, the departments of Forensic Medicine, Pathology and Anatomy house four museums with over 1250 specimens.

SPECIAL SITUATIONS

1. Deaths that occurred during combat between the armed forces of Sri Lanka and the Liberation Tigers of Tamil Eelam (LTTE) terrorists were not subject to an inquest or post mortem examination. However, it was necessary if deaths occurred due to accident, suicide or homicide.

2. Maternal deaths – even though maternal deaths are not specified as requiring an inquest in the Code of Criminal Procedure, since 2008 it is mandatory to conduct a post-mortem examination in all maternal deaths. A representative of the hospital unit where the maternal death had occurred should participate in the post-mortem. In addition to the inquiring magistrate, copies of the post-mortem report are forwarded to, and used at the confidential maternal death enquiry[7].

3. Mass disasters - The death investigation system in Sri Lanka was not suitable for mass disaster situations, which was made apparent following the tsunami disaster in December 2004 which killed over 40,000 people in Sri Lanka. During the acute phase or the first week following the disaster, the identification of the dead was of utmost importance. However, once hospital morgue

facilities were saturated, the putrefying bodies of the dead were sent directly to mass burial grounds, bypassing hospitals, without proper record keeping or inquest procedure. There had been cases of some dead bodies being inquired more than once while the majority never underwent an inquiry. In the secondary phase or the second week and beyond, a local and international public outcry arose for the identification of the victims, which led to time consuming exhumation, identification and documentation of many victims[8,9]. The Tsunami (Special Provisions) Act No. 16 of 2005 was enacted in June 2006 to enable those who were missing for six months since the Tsunami, to be presumed as dead and to be issued a death certificate[10].

4. On Easter Sunday of 2019, Sri Lanka faced a series of coordinated terrorist attacks in the form of suicide bomb explosions in several churches, luxury hotels, and a guest house, killing 276 people. A team of consultant judicial medical officers, forensic odontologists, dental surgeons, post-graduate trainees in forensic medicine, photographers and technicians were mobilized for the management of the fatalities. This team undertook the laborious process of identifying and autopsying the deceased under a blanket magisterial order instead of the usual practice of one order for each death. The body fragments which were not identified underwent analysis at the Government Analyst's Department for DNA fingerprinting. The relatives of the deceased were issued death certificates following completion of the autopsies[11].

5. The COVID-19 pandemic saw several regulations being implemented throughout its timeline for investigation and disposal of COVID deaths in Sri Lanka. Early in the pandemic, in April 2020, due to the uncertainty of transmission of the virus from dead bodies, it was decided that all diagnosed COVID-19 positive deaths should be disposed by early cremation. In suspected cases of criminality a full or partial autopsy to be conducted by the senior most forensic pathologist and disposed by cremation. If not previously diagnosed, post mortem sampling of tracheal aspirate and lung tissue was done, and if PCR was positive cremation was mandatory[12].

In September 2020, in cases where an autopsy was done, the method of disposal was to be decided by the death inquirer following the consultation with a consultant forensic pathologist[13]. A letter issued by the Director General of Health Services to the Ministry of Justice in June 2021 instructed Judicial Medical Officers to determine the cause of death in COVID PCR-positive deaths occurring at homes, thus needing a post-mortem examination for such cases. The reason for this instruction was described as to streamline the processes of recording the cause of death and the notification of COVID-positive deaths occurring at homes[14]. Later in October 2021, only the dead bodies which were considered infective (PCR or Rapid Antigen Test for COVID-19 positive within 21 days) were disposed according to previous guidelines[15].

With the evolving knowledge on post-mortem diagnosis of COVID-19, a circular was issued in February 2022 stating that post-mortem PCR were not mandatory in all deaths[16]. Following nation-wide vaccination and gradual relaxation of social distancing regulations, the regulation on PCR tests prior to autopsies were further relaxed and to be performed at the discretion of the relevant judicial medical officer, as of March, 2022[17]. With a dwindling number of COVID-19 cases reported each day, Sri Lanka is soon expected to further relax the COVID-specific regulations on management of COVID deaths.

CONCLUSION

Sri Lanka's death investigation system had evolved from its British ancestor and underwent several vital reforms in response to the practical issues encountered in mass disasters in the recent history.

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