

# The Concept of an Optimum Model of Criminal Post-Mortem Diagnostics

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The establishment of the exact time and cause of death plays an important role in criminal investigation and criminal law. In violent deaths, where a suspicion that a criminal offence has been committed arises, investigation often focuses on a specific suspect on the basis of a clearly established time and cause of death, or on the examination of other important circumstances surrounding the death in order to close the circle of alleged suspects. An exact post-mortem diagnosis of the time and cause of death requires multidisciplinary cooperation between the police, who establish relevant circumstances surrounding the death, and a physician, who performs a post-mortem examination of the body. This is why the present paper considers post-mortem diagnostics both as part of criminal differential diagnosis and as part of medical post-mortem diagnostics. The competent and quality performance of post-mortem diagnostics is in many ways affected by organisational and cognitive factors.

This study presents an analysis of legal arrangements governing the work of post-mortem examination services in Germany, Austria, Croatia and Slovenia, and identifies good and bad practices on the basis of professional opinions expressed by experts working in the field of criminal investigation and forensic medicine in comparable countries. Results and findings represent a useful basis for the formulation of a proposal for a new model of post-mortem examination service presented in the last section of this paper. The proposed model provides a basis for achieving qualitative progress in the field of post-mortem diagnostics not only in Slovenia but also in other countries of continental Europe.

**Keywords:** post-mortem examination service, criminal investigation errors, forensic medicine, cognitive factors, organisational factors, suicides, causes of death, fatal accidents, fatalities, medical errors, forensic pathology, criminal differential diagnosis, post-mortem diagnosis

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## 1 Introduction

Death does not merely mark the biological end of life, but also represents a legal category, an event marking the cessation of the legal capacity to hold rights and obligations. Since this is an important legal fact, the death and its cause must be established unequivocally.

In criminal investigation practice, the inspection of sites where bodies were discovered is closely related to criminal offences and similar events. The peculiarity of such inspections lies in the fact that a post-mortem examination represents an integral part of the visit to the crime scene, which is why the quality of an inspection as a whole largely depends on

the physician performing post-mortem examination. Mätzler (2000) finds that the establishment of the cause of death is the most significant contribution that medicine makes to a criminal investigation. In an ideal case, the cooperation between investigators and a physician<sup>2</sup> begins by conducting investigations at the crime scene and continues with an autopsy and a common assessment of autopsy findings that confirm or rebut the alleged causes of death.

Many investigators and physicians called to inspect sites where bodies were discovered lack the necessary knowledge and experience in the field of forensic medicine and criminal post-mortem diagnostics. At the same time, the quality of

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<sup>2</sup> In the continuation of this paper (except in the part analysing the work of police officers and criminal investigators separately) the term "investigator" refers to police officers and criminal investigators, while the term "physician" refers to general practitioners and forensic medicine experts performing post-mortem examinations (except in the part where the analysis of their work distinguishes between the two professions).

their work is often affected by inappropriate organisation of tasks in the police and the healthcare sectors (Dolenc, 1990).

Physicians are often called to inspect a site where a body was discovered while treating their patients in outpatient clinics during regular working hours, and thus rapidly and unequivocally establish the cause of death and eliminate third-party fault. When performing such tasks, physicians frequently lack the time necessary for a thorough examination of the body and for establishing unequivocal and equivocal causes of death. The reason for the lack of physicians' professional competence for performing post-mortem examinations often lies in an inadequate organisation of the service at the state level. This issue has been repeatedly highlighted by forensic medicine experts in Germany (Mätzler, 2000). In his study Mätzler (2000) states that a journalist from the German magazine *Stern* telephoned twenty-two different physicians asking them to list the unequivocal and equivocal signs of death. Only four of the randomly selected physicians were able to respond correctly.

Forensic medicine experts in Slovenia have also highlighted shortcomings related to the performance of post-mortem examination services. They find that in practice, the post-mortem examination governed by the *Rules on the Conditions and Method of the Performance of Post-Mortem Examination Service* (Pravilnik o pogojih in načinu opravljanja mrliško pregledne službe, 1993, 2008) is not implemented in line with the aforementioned Rules and that is vital to improve it. In Slovenia, the post-mortem examination service does not meet all of the requirements from different fields of expertise that initially led to its regulation and organisation. The current situation is also characterised by the indifference of the medical profession, which is why the service lags behind in areas that are considered non-essential, as well as by the lack of interest expressed by persons responsible for the service's funding and operation (Dolenc, 1999).

However, the likelihood for the occurrence of an irreparable professional error when inspecting a site where a body was found does not depend solely on the potential lack of competence or expertise of physicians, as similar issues can also be attributed to investigators.

Professional errors committed by the police and the omission of certain activities or their unprofessional performance, generally have grave repercussions for judicial and other proceedings thus causing irreparable damage. The majority of such tasks constitute unique and unrepeatable activities that cannot be reproduced following a time delay. This is why cases involving criminal offences often go uninvestigated, the work of prosecutors continues to be unsuccessful and perpetrators

remain unpunished, while the combination of the aforementioned issues has a negative effect on the authority of the entire justice system and the rule of law (Rossmo, 2009).

Despite the fact that the regulation of the post-mortem examination service varies in different countries (legal systems), the scientific literature consistently refers to the need for specialisation and knowledge. Wagner (2009) finds that apart from having specialized knowledge, criminal investigators inspecting a site where a body was found must also possess knowledge in different fields, such as ballistics, toxicology, serology, graphology, etc., since it is never possible to anticipate the type of knowledge that would be required in a specific case. When investigating homicides and other violent crimes, practical and intellectual intuition ought to be complemented by the necessary professional and life experience; however, the aforementioned competences are not enough if investigators do not possess abundant knowledge, which must be constantly improved and upgraded. Practical experience and routinely performed tasks do not necessarily yield fruitful results in everyday work of police officers and criminal investigators. The investigation of homicides and other violent crimes is such a demanding field of work that it cannot simply rely on experience and routine (Modly, 1994).

Factors contributing to the occurrence of errors in making a criminal post-mortem diagnosis can be split into two basic groups. The first group consists of cognitive factors, which are related to the lack of knowledge and experience, routine case resolution and other factors shaping the cognitive process of criminal investigators. The second is composed of errors made in the organisation of tasks at the level of investigators and at the level of healthcare management (Rossmo, 2010).

## 2 Most Common Errors in Making a Criminal Post-Mortem Diagnosis

The process of criminal investigation comprises activities related to the search for and identification of a person suspected of committing a criminal offence, as well as activities related to the search for incriminating evidence against the suspect and their successful prosecution before a court (Rossmo, 2009). Each of the aforementioned activities involves special mental operations performed by investigators and cognitive processes typical for criminal investigations. In the initial stages of an investigation, criminal investigators collect and prioritise information obtained while inspecting a crime scene, assess information and data gathered through a sequence of such activities and determine priorities for their future activities. At the stage when a case has already been brought before a court, however, prosecutors have access to carefully selected

and previously prioritised material evidence and statements made by witnesses or victims (Klockars & Mastrofski, 1991). Organisational or cognitive pressures aimed at guaranteeing that an investigation move rapidly from the first to the second stage, thus bringing the case before a court as soon as possible, can cause irreparable errors both at the investigative as well as at the trial stage (Stelfox & Pease, 2005).

Rossmo (2009) believes that every investigator wishes nothing more than to successfully bring a criminal investigation to an end as soon as possible and catch the perpetrator. At the same time, he asks himself what are the reasons for a frequent occurrence of errors both at the investigative and at the trial stage.

**Cognitive factors and cognitive errors** related to the cognitive process in criminal investigations and criminal post-mortem diagnosis represent a complex topic of research. Rossmo (2009) identifies errors in perception and intuition, as well as the problem of “tunnel vision” as the most common cognitive errors.

De Bono (1983) studied **errors in perception** and found that certain errors in thinking occur due to the way in which our brain processes information it receives. These are, therefore, not a result of a lesser ability to think or negligence, but arise from the general laws of thinking leading to such errors.<sup>3</sup> In their analysis of errors in investigators’ perceptions, Kirk and Kingstone (1964) found that material evidence could not be wrong, however, an error may occur due to its interpretation.

When making decisions, people act **intuitively** or **rationally**. Intuitive conduct is automatic and simple. Investigators often apply it when a decision needs to be made rapidly in police operations or when the time for making a decision is limited. Intuition is frequently misjudged as something paranormal that generally causes errors in police investigations. However, when making decisions based on intuition, investigators are at risk to take a wrong decision due to their expe-

<sup>3</sup> When describing such errors, De Bono refers to “monorail” errors, which stem from a single, unilateral link between two concepts (e.g. perpetrators of criminal offences are dangerous to society and must therefore be eliminated from it); “magnitude” errors (quantity is not taken into account, otherwise the conclusion might have been correct: e.g. crime will be stamped out if there are more police on the streets); “misfit” errors (using one characteristic as a basis to infer others: e.g. by “recognising” the clothes and behaviour of a stranger on the street, one believes to have seen a specific person); “must-be” errors (occur due to arrogance and resistance to new ideas); and “miss-out” errors (when only one part of the situation is considered to infer meaning to the entire situation) (Maver, 1986).

rience, emotional state and pressures aimed at a rapid case resolution (Myers, 2002).

According to Rossmo (2006), “**tunnel vision**” is a frequent cause of errors made by investigators and arises from the problem of having a limited range of possibilities. Investigators focus on a single version of events, usually the one for which they are, based on their experience, most convinced to be the right one. The same holds true for their focus on a single suspect and the rejection of alternative theories.

Mätzler (2000) analysed individual examples of errors made by investigators when visiting a site where a body was found and concluded that the reason for such errors is often related to the investigators’ emotional state. An inspection of a site where a body was found is characterised by blood, faeces and smell, which is why criminal investigators are exposed to great physical and psychological strain. It also must be emphasised that witnesses and eyewitnesses are under a great deal of psychological pressure and stress, and that relatives of the deceased are upset, grieved and often have a negative attitude towards investigators, who wish to investigate all circumstances surrounding the death in a professional and accurate manner. These are the main reasons why a visit to a site where a body was discovered is one of the most demanding tasks in the field of criminal investigation.<sup>4</sup>

Fatigue, strain and stress often represent frequent factors contributing to errors in criminal investigation. Rossmo (2010) classified these factors in the category of **organisational pitfalls**.

An efficient and professional investigation into the circumstances surrounding death is the responsibility of the entire police organisation and not merely of an individual investigator in charge of a specific case. This is why Geberth (1996) states that it is vital to provide for a sound coordination of activities, such as evidence gathering, procedural tactics, management of police officers present on the spot, drafting of official forms, authorising overtime, guaranteeing financial means necessary for completing the task, deploying equipment or managing media relations. These activities must be properly managed and cannot rest on the shoulders of a

<sup>4</sup> This was thoroughly analysed by Modly (2001) who found that exposure to critical (traumatic) events, such as shootings, strangulation, hanging and similar instances, sexual offences, especially those involving child victims, may cause specific stress in investigators and consequently provoke their emotional reactions to such events. Modly (2001) also finds that many investigators, who are frequently exposed to such events, abuse alcohol and drugs, are prone to anger and depression, deal with feelings of guilt, anxiety, as well as insomnia and a diminished ability to focus.

single investigator. At the same time, the management system must be flexible and enable the investigator holding a managerial position to pursue different lines of inquiry.

According to Geberth (1996), the concept of “organisational pitfalls” also includes appropriate documentation of all measures and actions carried out by investigators from the initial stages to the closing of an investigation. Any professional and ingenious endeavour carried out by investigators is in vain if it is not properly documented. The widely held view that documentation is an administrative or technical task and not an exercise aimed at preserving gathered evidence for evidentiary purposes is simply erroneous.

An inspection of a site where a body was discovered is most often carried out by police officers and physicians employed in community health centres, and who have the least knowledge in this line of work, which is why the probability for the occurrence of errors is greater. The following paragraphs analyse the most common causes of medical errors committed while examining a body.

When considering medical errors, experts in the field of medicine distinguish **professional errors** and medical oversight from errors relating to **shortcomings and weaknesses in the organisation** of the healthcare sector or healthcare institutions (Jakša, 1998). Medical errors occurring while inspecting a site where a body was discovered are discussed in this context.

In his research into the quality of post-mortem examinations in the Federal Republic of Germany, Madea (1999) tried to identify the most common causes of medical errors occurring in post-mortem examinations. In Germany, competent professional support to investigative bodies in the field of post-mortem examination is supposedly provided by a very limited number of physicians, who are experts in this field. The causes of errors and oversights in post-mortem examinations conducted by physicians are multifaceted, structural and situational both on the side of physicians and on the side of investigative bodies.

Scheib (2004) refers to **situational reasons** for medical errors, which supposedly arise particularly due to “pressures” exerted by the responsible persons or management with the purpose of certifying (establishing) natural death. The quality of a post-mortem examination is also affected by the fact that the examination as such is often made difficult due to objective circumstances, such as poor weather conditions, insufficient number of assistants present during the inspection of the body on the spot, decomposing or overweight bodies and other factors.

Cameron and McGoogan (1981) examined discrepancies between clinical diagnoses made by clinicians (who were familiar with the medical history of the deceased) and autopsy diagnoses. They found that 25% of such diagnoses were erroneous, while 45% of diagnoses were fairly certain.

It is therefore possible to conclude that criminal post-mortem diagnostics is an interdisciplinary field requiring a synergy between findings obtained in criminal investigations and (forensic) medicine. It is thus vital to establish efficient coordination, which guarantees the flow of information and ensures the necessary knowledge in both fields of expertise.

**Cognitive factors** cannot be considered separately from **organisational factors**, which also bear an important impact on the quality of criminal post-mortem diagnostics. In fact, organisational factors often have a direct impact on cognitive ones. Cognitive factors leading to the occurrence of errors can usually be curtailed by establishing an appropriate organisational model (Jevšek, 2014).

### 3 Research

The following section presents the results of an international comparative study aimed at identifying examples of best practices and developing an optimum model of post-mortem examination service involving a minimum level of risk for the occurrence of errors in setting a criminal post-mortem diagnosis.

#### 3.1 Methodology

The study is based on a **comparative analysis** of the regulation of post-mortem examination services in the German federal state of Baden-Württemberg, Austria, Croatia and Slovenia. The analysis focused on the organisation of individual post-mortem examination services in comparable countries and their role in police activities and the healthcare sector. The research looked into the nature and contents of tasks, competences and duties performed by investigators and physicians in the scope of post-mortem examination service.

The decision to compare Slovenia with Austria and Croatia was made because these are neighbouring countries sharing their state borders with Slovenia and have, historically speaking, established close ties with Slovenia. Furthermore, when comparing different fields of scientific research and the way of life, it is possible to observe certain similarities and differences between the three countries, which result from historical and geographical ties.

Germany is considered one of the most developed countries in Europe, both in the field of science as well as in terms of technology. Slovene researchers from different fields of expertise regard Germany as a model boasting the best scientific and technological solutions, the same holds true for activities in the field of police work and healthcare services. This is also one of the reasons for including Germany, a comparable country, in the research study. An analysis of post-mortem examination services' regulation in all German federal states would exceed the scope and framework of the present research. The decision to analyse the post-mortem examination service in the federal state of Baden-Württemberg was made due to the possibility to access data and obtain experts' opinions.

Written materials, legal bases and other necessary data, on the basis of which a **comparative analysis** of the regulation and set-up of the post-mortem examination service in the German federal state of Baden-Württemberg was made, were obtained from the Baden-Württemberg State Criminal Police Office (*Landeskriminalamt*) and the local Police Academy (*Akademie der Polizei Baden-Württemberg*). The necessary materials from Austria were submitted by the Federal Crime Office (*Bundeskriminalamt* – BKA). Data from Croatia were obtained from the national Ministry of the Interior (*Ministarstvo unutrašnjih poslova* – MUP), while data regarding the regulation of post-mortem examination service in Slovenia were acquired from the available legal sources and materials of the Institute of Forensic Medicine at the Faculty of Medicine in Ljubljana. Experts in the field of forensic medicine and criminal investigation from these comparable countries were sent a survey questionnaire (two surveys were conducted in each of the comparable countries, whereby one questionnaire was sent to a representative of forensic medicine and one to the representative of criminal investigation). The aim of the survey was to determine how experts from comparable countries evaluate the adequacy of post-mortem examination service in their respective countries.<sup>5</sup>

<sup>5</sup> Surveys were conducted with Prof. Dr. Burkhard Madeo, director of the Institute of Forensic Medicine at the Bonn University Hospital, Germany; Michael Gerg, senior criminal police superintendent and head of the Criminal Police Inspectorate 1 at the Esslingen Police Directorate, Germany; Prof. Dr. Mario Darok, forensic medicine expert from the Institute of Forensic Medicine in Graz, Austria; Manfred Dörfner, chief inspector at the Criminal Police Command of the Federal State of Carinthia, Austria; Assist. Prof. Dr. Davor Mayer, specialist in forensic medicine at the Institute of Forensic Medicine and Criminology in Zagreb, Croatia; Gojko Markovič, assistant to the director of the "Ivan Vučetić" Forensic Science Centre within the Ministry of the Interior of the Republic of Croatia; Dr.

The field of research related to organisational factors affecting the quality of post-mortem diagnostics in Slovenia and abroad is quite specific. As a result, only a small number of experts deal with this field, which is why the sample of respondents is rather limited. Consequently, the author of this paper decided to conduct a qualitative analysis of the data, which served as the basis for identifying common views, as well as differences opinions, regarding the issue in question.

#### 4 Findings

Results show that **the poorest quality of post-mortem examination service and of criminal post-mortem diagnostics is observed at the local level**. These are similar to those presented by Lee (1994) in his analysis of the quality of inspections conducted at a site where a body was found, which depends on the person performing such an inspection. Lee (1994) also found that the scope of information gathering and trace discovery was substantially smaller in cases where inspections of sites where bodies were discovered by police officers working in local police stations, than in those cases where such inspections were conducted by criminal investigators specialised for the investigation of fatalities. Similarly to Lee's findings (1994), the present research also demonstrates that the smaller scope of investigative tasks conducted by police officers, when compared to those performed by criminal investigators, results from the lack of knowledge and experience, as well as from the fact that police officers are overburdened with other tasks.

**Inadequate organisation of work** in the healthcare sector and the police at the local level does not provide the necessary conditions that would enable multidisciplinary cooperation between investigators and physicians setting criminal post-mortem diagnoses. In their research, Gerg and Baier (2009) presented similar results after analysing the causes of common medical errors occurring during post-mortem examinations in Germany. They found that the causes of such errors are mostly organisational, since physicians are informed about the need to perform a post-mortem examination while conducting their regular work with patients in outpatient clinics. This is why they arrive at a site where a body was discovered very late in the process, perform post-mortem examinations rapidly and carelessly in order to return to their clinics as soon as possible.

Borut Štefančič, specialist in forensic medicine, head of the Autopsy Department at the Institute of Forensic Medicine in Ljubljana, Slovenia; and Darko Delakorda, head of the Homicide and Sexual Offences Division within the General Police Directorate at the Ministry of the Interior of the Republic of Slovenia.

Results of the present research confirm that Slovene physicians also perform their duties related to post-mortem examinations while treating their patients in outpatient clinics. The consequences of such an organisation of work can be observed in the fact that physicians arrive at the site with a significant time delay after receiving information that a body was found or leave the site after having examined the body before the arrival of investigators. When working under time pressures, physicians perform post-mortem examinations hastily, without undressing and examining the body in line with *Professional Instructions Concerning the Performance of Post-Mortem Examination* (Strokovno navodilo za opravljanje mrliškega pregleda, 1993) governing their field of work.

Slovene experts are also of the opinion that state authorities ought to establish professional standards and ensure sufficient numbers of staff in order to enable the smooth functioning of the post-mortem examination service. The state should also provide methods of financing and issue concessions for the performance of these services. In this context, the state should define both the initial education and training, and conditions for maintaining licences. The state ought to supervise the entire project through a control body, which would analyse quality indicators and identify new and better solutions for the performance of post-mortem examination service.

Inadequate organisation of post-mortem examination services is not typical only in the Slovene model, since similar issues were also identified in other countries, whose models were examined in the framework of the international comparative analysis. Experts in Croatia and Germany are facing similar issues at the local level. According to a forensic medicine expert from Germany, the post-mortem examination service at all levels should be performed solely by specialists, such as forensic medicine physicians and criminal investigators, since general practitioners called to perform post-mortem examinations during their regular working hours in outpatient clinics cannot conduct such examinations with sufficient quality.

A solution for the organisation of post-mortem examination services at the local level was identified when analysing the Austrian model. In Austria, a “police physician” is a member of the investigative team inspecting a site where a body was discovered. A police physician is a forensic medicine expert working for the police on the basis of a special contract. Based on the latest amendments to the Criminal Procedure Act, Austria adopted a *Directive Concerning the Uniform Inspections of a Site Where a Body Was Discovered* in 2010 (Richtlinie für eine bundesweite einheitliche Regelung der kriminalpolizeilichen Leichenbeschau im Sinne des & 128 StPO, 2010). In line with this Directive, most sites where bo-

dies are discovered are inspected by specialised criminal investigators and a police physician.

Shortcomings related to the organisation of police work at the local level and the resulting negative impacts of organisational factors on criminal post-mortem diagnostics can be abolished through the specialisation of police work. The specialisation of work in the field of criminal post-mortem diagnostics ensures that tasks are performed by specially trained investigators, who are able to fully commit to the inspection of sites where bodies were found, as they are not scheduled to perform other tasks during such inspections.

All Slovene and foreign experts in the field of forensic medicine and criminal investigation agree that there is a need for specialisation in criminal post-mortem diagnostics.

The analysis also focused on the identification of examples of good practices aimed at decreasing the negative impacts of poor work organisation on the quality of inspections at sites where bodies were discovered performed by police officers at the local level. The *Austrian Directive Concerning the Uniform Inspections of a Site Where a Body Was Discovered* (Richtlinie für eine bundesweite einheitliche Regelung der kriminalpolizeilichen Leichenbeschau im Sinne des & 128 StPO, 2010) contains a catalogue of criminal offences and events resulting in the death of one or several persons. In cases that meet the conditions set forth in the aforementioned catalogue, the inspection of a site where a body was found and the subsequent investigation must be conducted by specialised criminal investigators and a police physician. In line with the contents of the catalogue, the majority of such inspections are, in fact, conducted by criminal investigators and a police physician.

In terms of organisational factors affecting the performance of post-mortem examination services, financial conditions and frameworks identified in individual analysed countries also represent a potential cause of medical errors or wrong post-mortem diagnoses. A demanding inspection of a site where a body was found, which requires a subsequent autopsy and additional complex investigations in order to establish the cause of death, has substantial repercussions for municipal budgets. In this context, research findings are similar to those presented by Madea (1999), who analysed “situational reasons” for medical errors occurring during an inspection of a site where a body was found. In order to cut costs, heads of healthcare institutions often exert pressure on physicians by advising them to avoid ordering expensive tests necessary to establish the exact cause of death.

The analysis of questionnaires completed by investigators and physicians demonstrates that the funding of post-mor-

tem examination services is completely inappropriate, since inspections are charged to the budget of a municipality in which a body was found. Physicians, who are under pressure when deciding whether to impose a financial burden on their own municipal budgets, find it difficult to order an autopsy and other tests necessary to establish the exact cause of death. Results obtained through the analysis of questionnaires confirm the findings presented by Petek-Kos and Košir (1999), who highlighted the issue of financing the post-mortem examination service in Slovenia. Numerous healthcare institutions and physicians in Slovenia perform this service without having concluded their concession agreements with individual municipalities, which represents a significant problem for performing post-mortem examinations and ordering tests necessary for establishing the cause of death.

The issue of financing post-mortem examination services was also identified in Croatia, where the organisation at the local level depends on financial capabilities of individual municipalities, which is problematic, since small municipalities have limited budgets and find it difficult to allocate funds for the remuneration of physicians-coroners. According to an expert in the field of criminal investigation, coroners ought to receive equal remuneration across the state territory, as they perform the same tasks. Instead, the available financial means dictate whether a post-mortem examination will be conducted by a forensic medicine expert or a general practitioner or another medical professional.

The majority of investigators, as well as foreign forensic medicine and criminal investigation experts who participated in the survey, agree that the problem of financing post-mortem examination service can be solved by transferring financing sources from the municipal to the state level.

The analysis of questionnaires sent to investigators and physicians show that a **control system** should be established in order to supervise the professional competence of physicians performing post-mortem examinations and police investigators conducting investigations at a site where a body was found. The lack of control over the work of investigators and physicians was identified as one of the shortcomings in the organisation of post-mortem examination services.

Similarly to research findings obtained by Dolenc (1999), the analysis presented herein also shows that efficient control over the quality of work performed by investigators and physicians is an important mechanism enabling the identification of errors occurring at the stage of making a criminal post-mortem diagnosis. Results obtained through such controls represent an important source of information, which can be used as a basis for upgrading the post-mortem exa-

mination service model. According to an Austrian forensic medicine expert, it is essential to introduce a type of regular control over the professional competence of investigators and physicians working in the field of post-mortem examination.

Control over the competent and lawful performance of police officers' work has partly been established in the Slovene Police. Such control is carried out when there is suspicion that police officers conducted their activities unlawfully or unprofessionally. However, it is not implemented as a permanent form of professional supervision. The author of this paper believes that it would be useful to introduce a type of control over the professional competence of investigators in cases involving lengthy or unsuccessful investigations. He is also of the opinion that such control would prove beneficial in those cases where police officers and criminal investigators concluded that a death was not suspicious.

The quality of work performed by physicians in the field of post-mortem examination service could be controlled by drawing comparisons between diagnoses related to the cause of death established by physicians after examining the body, and diagnoses related to the cause of death established after an autopsy. Results of such controls could be used for physicians' further training in the field of post-mortem examination.

Apart from the above-described organisational factors, the quality of criminal post-mortem diagnostics is also affected by a range of **cognitive factors**.

The international comparative analysis presented herein points to the differences in terms of providing professional and technical knowledge for performing post-mortem examination services. The analysis shows that the system of providing knowledge and skills necessary for performing post-mortem examinations is adequate in some comparable countries, while such a system is characterised by serious deficiencies in other countries. The analysis of data related to the provision of necessary knowledge and skills in the field of post-mortem examination service reveals that this issue has been properly resolved in the German federal state of Baden-Württemberg.

In Baden-Württemberg, the post-mortem examination service may be performed by physicians, who obtained appropriate qualifications after completing their studies in the field of general medicine. This programme includes a period of further education and training which takes a total of 18 months. Physicians must also acquire specific knowledge and skills in the field of criminal investigation and procedural criminal law, such as documenting the crime scene, performing autopsies ordered by the courts and producing expert opini-

ons regarding the cause of death, conducting histological examinations, assessing photographic materials and protecting traces, and producing oral and written expert opinions to be used in courts, etc.

In order to train students for conducting police investigations at a site where a body was found, the curriculum of a study programme preparing students to perform more demanding tasks within the police (undergraduate studies) carried out at the Villingen-Schwenningen Higher Vocational College for the Police in Baden-Württemberg contains a set of topics in the field of criminal investigation and forensic sciences. In the framework of their studies, students also attend lectures in forensic medicine, and those who pursue a career in the investigation of fatalities, attend further specialist training programmes.

In other countries, including Slovenia, subjects related to the investigation of homicides and other violent crimes are presented in a limited number of lessons as part of the general education and training of police officers. Criminal investigators specialising in homicides and other violent crimes obtain and upgrade their knowledge and skills through practical experience, as well as by attending specific seminars and specialised training courses.

Experts in Forensic medicine and criminal investigators from Croatia, Austria and Slovenia agree that the systems of education and training necessary for the quality performance of post-mortem examination service in their respective countries are inadequate. They believe that physicians performing coroners' tasks and criminal investigators specialising in homicides and other violent crimes ought to obtain a licence for conducting their activities, which should be subject to periodic renewal.

Respondents also believe that vocational education and training programmes, as such, do not pay enough attention to criminal post-mortem diagnostics. In addition, they expect a higher number of specialised training programmes and courses focussing on inspections conducted at sites where bodies are discovered. The lack of specialised training programmes and courses was also highlighted by specialised criminal investigators. The majority of criminal investigators believe that physicians and investigators ought to obtain a professional licence for performing post-mortem examinations, which should be subject to periodic renewal. The problem related to the lack of knowledge and experience in the field of criminal post-mortem diagnostics at the local and regional level could be solved by providing an increased number of different types of joint training courses. A joint training course in the field of post-mortem examinations, which would

be attended by both police officers and physicians, should be organised at least once a year. The same goes for a joint training course for specialised criminal investigators and forensic medicine experts. The author believes that such joint training programmes and courses conducted at the local and regional level represent a useful mechanism for establishing and strengthening multidisciplinary cooperation in the field of criminal post-mortem diagnostics.

Poor work organisation, unregulated financing, insufficient education and training are merely some of the organisational factors that are negatively correlated with the lack of knowledge and experience, routinely performed tasks, "tunnel vision", errors in perception and a series of other cognitive factors contributing to increased risks for the occurrence of errors in setting a criminal post-mortem diagnosis. Organisational factors are often closely intertwined with certain **cognitive factors**. Due to their intertwinement and mutual correlation, it is impossible to draw a clear line between the two groups of factors.

## 5 Conclusion

Organisational and cognitive factors affecting the quality of criminal post-mortem diagnosis and thus increasing the risk for the occurrence of errors, were the primary focus of the scientific research presented herein.

Findings obtained within the scope of this research helped the author of this paper to design a new model of post-mortem examination service in Slovenia. Slovene forensic medicine experts and specialists in the field of criminal investigation have been emphasising the inadequacy of the current model of post-mortem examination service for several years. They find that the medical profession as such does not express a clear interest in changing the organisational and financing aspects of post-mortem examination services, as this field of expertise has still not been given enough attention within the healthcare sector. Similarly, the author did not come across any police documents that would contain proposals for modernising the organisation of work in the field of criminal post-mortem diagnostics, with the exception of critical remarks made by criminal investigators dealing with the investigation of homicides and other violent crimes.

*Rules on the Conditions and Method of the Performance of Post-Mortem Examination Service* (Pravilnik o pogojih in načinu opravljanja mrliško pregledne službe, 1993, 2008; henceforth "Rules") and *Professional Instructions Concerning the Performance of Post-Mortem Examination* (Strokovno navodilo za opravljanje mrliškega pregleda, 1993; henceforth

“Professional Instructions”) provide, at least in principle, an **adequate legal and professional** basis in line with which physicians in Slovenia are able to perform quality post-mortem examination service. Physicians’ duties related to the certification of death, the establishment of the cause of death, the notification of competent authorities and the compilation of necessary documentation are clearly defined and harmonised with the high professional standards of forensic medicine.

However, the author of this paper believes that the Rules (1993, 2008) and Professional Instructions (1993) need to be complemented with provisions regulating the organisation of post-mortem examination service in Slovenia at the local and state level, the method of financing, education and vocational training of physicians, and control over the quality of work performed by physicians.

With a view to improve the organisational functionality and efficiency of post-mortem examination services at the local and regional level, the author proposes the establishment of “healthcare districts” and the setting up of offices of “district physicians”. Healthcare districts should encompass geographical areas currently covered by Slovene regional Public Health Institutes.

District physicians should be responsible for organising the performance of post-mortem examination services in the territory covered by an individual healthcare district. District physicians should also organise post-mortem examination service in hospitals operating in individual healthcare districts; supervise the implementation of autopsy-related contracts and agreements with hospitals; keep appropriate records on the performance of post-mortem examination service on the territory covered by individual healthcare districts; manage and issue professional instructions; plan, organise and carry out specialised training courses; perform professional control over post-mortem examination service; and produce statistical reports regarding the causes of death on the territory covered by the healthcare district.

An appropriate number of physicians-coroners – which would depend on the number of inhabitants – should be appointed within individual healthcare districts. They would complete concession agreements in order to perform a post-mortem examination services. Possibilities for introducing “police physicians” in Slovenia, following the example set by the Austrian criminal police, should also be assessed. Police physicians are experts in forensic medicine, who contract with the police allowing them to participate in inspections conducted at sites where bodies were discovered. Physicians should perform their activities during and outside their regu-

lar working hours, i.e. while on duty. General practitioners, who would not sign a concession agreement, should not be able to perform post-mortem examination service.

The method of financing post-mortem examination services should be changed, so that the financing of all activities performed by the service across Slovenia would be covered either by the Ministry of Health or by the Ministry of Finance of the Republic of Slovenia. A system of uniform financial assessment of post-mortem examinations or services applicable to the entire state territory should also be created. This would eliminate financial burdens on municipal budgets, while control over expenditure would be performed by regional Public Health Institutes and district physicians.

Coroners should be authorised to obtain full access to medical records, request information regarding treatment from attending physicians and, where necessary, prohibit access to specific premises and documentation before the arrival of the police or an investigative judge and public prosecutor.

Conditions for acquiring a licence to operate as a physician-coroner and criteria for licence certification, as well as for the obligatory participation in training programmes and courses, should be defined in detail. The Institute of Forensic Medicine in Ljubljana should be authorised to act as a national coordinator of the post-mortem examination service for the entire Slovene territory.

A procedure involving regular “audits” focussing on the quality of work in the field of post-mortem examination services should be introduced in the healthcare sector. In addition, the competent Institute of Forensic Medicine should conduct annual comparative analyses of diagnoses with respect to the cause of death established by coroners and the cause of death established after an autopsy.

The author of this paper also proposes some amendments to the *Catalogue of Criminal Offences and Events* (Katalog kaznivih dejanj in dogodkov, 2012), which defines the criteria and competence for performing inspections at a site where a body was discovered in Slovenia. The aforementioned amendments should regulate the organisation of police work in the field of investigating such sites at the local, regional and state level; education and training of police officers and criminal investigators in the field of criminal post-mortem diagnostics; and the control over the quality of work performed in the field of criminal post-mortem diagnostics.

The amended Catalogue (Katalog kaznivih dejanj in dogodkov, 2012) should also stipulate that criminal investigators working together with physicians-coroners (police physi-

ans) be obliged to inspect the site where a body was found and take over the investigation in the following cases:

1. if there is suspicion that the death occurred as a result of third-party fault or an external factor (e.g. homicide, bodily harm resulting in death, etc.);
2. if there is suspicion that the death resulted from suicide;
3. if the death is a result of an accident;
4. in cases involving the death of infants or children below six years of age;
5. if a foetus is found after approximately 8 weeks of pregnancy, depending on its development (the discovery of a foetus is often related to the termination of pregnancy, spontaneous abortion or premature delivery);
6. if death occurred while a person was in police custody or detention. This also refers to detention and other facilities in which a person was confined at the time of death (prison cells, prison or police vehicles, interrogation rooms, etc.);
7. if body parts, human skeletons or bones are found, except where these are discovered in burial grounds (tombs) unveiled during construction works;
8. if initial measures taken by criminal investigators did not reveal any indications or leads as to the cause of death;
9. if there is suspicion that the death occurred in direct or indirect relation to drugs; and
10. if an unknown or unidentified body was discovered.

Regional units responsible for investigating homicides and other violent crimes, which would employ criminal investigators specialised in homicides and other violent crimes, should also be established. Such a specialisation would mean that the number of criminal investigators working in regional units responsible for investigating homicides and other violent crimes would have to adapt to the issues identified in individual regions. However, an independent unit would not necessarily need to be established in each regional police directorate. General and specific conditions that must be met by criminal investigators specialising in homicides and other violent crimes should also be defined. The same goes for the establishment of criteria and methods for obtaining a licence for the position of criminal investigator specialised in homicides and other violent crimes, and deadlines for licence renewal.

In the context of police training, educational programmes concerning initial measures to be taken when inspecting a site where a body was discovered, which are an integral part of the basic police training, and periodical training programmes for police officers working in individual police stations should be complemented.

A joint training course for police officers working in police stations and physicians-coroners should be organised at

least once a year. In addition, joint training courses for physicians specialising in forensic medicine and criminal investigators specialised in homicides and other violent crimes should be carried out at least twice a year.

A legal act regulating the field of criminal post-mortem diagnostics should contain provisions, which would, at the systemic level, define regular and periodic controls over the quality of investigators' work.

The findings and results of the research presented herein might prove useful for designing models of post-mortem examination services in different countries of continental Europe. The research into the situation in comparable countries served as a basis to identify issues similar to those in Slovenia. In the scope of the research, criminal post-mortem diagnostics was considered as a multidisciplinary field and analysed both in terms of issues identified in the healthcare sector as well as in terms of problems faced by investigators. Consequently, the research results can serve as a useful basis for improving the work of investigators and physicians.

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## Koncept optimalnega modela kriminalistične postmortalne diagnostike

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Določitev natančnega časa in vzroka smrti ima poseben pomen v kriminalistiki in v kazenskem pravu. Pri nasilnih smrtih, kjer gre za sum storitve kaznivega dejanja, se pogostokrat na podlagi natančno ugotovljenega časa in vzroka smrti usmerja preiskava na točno določenega osumljenca kaznivega dejanja ali pa se s pomočjo preverjanja drugih pomembnih okoliščin, v katerih je smrt nastopila, oži krog domnevnih osumlencev. Natančna posmrtna diagnoza časa in vzroka smrti zahteva multidisciplinarno sodelovanje med policijo, ki ugotavlja pomembne okoliščine smrti, in zdravnikom, ki opravlja mrljški pregled trupla. To je razlog, da pričujoči članek obravnava postmortalno diagnostiko kot del kriminalistične diferencialne diagnoze in kot del medicinske posmrtno diagnostike. Na strokovnost in kakovost postmortalne diagnostike v marsičem vplivajo organizacijski in kognitivni dejavniki.

V študiji predstavljamo analizo pravnih ureditev mrljškopregledne službe v Nemčiji, Avstriji, na Hrvaškem in v Sloveniji ter s pomočjo strokovnih stališč ekspertov kriminalistične in sodnomedicinske stroke primerljivih držav identificiramo dobre in slabe prakse. Ugotovitve in spoznanja predstavljajo uporabno osnovo za oblikovanje predloga novega modela mrljškopregledne službe, ki ga predstavljamo v zaključku prispevka. Predlagani model zagotavlja kakovostni napredek na področju postmortalne diagnostike ne samo v Sloveniji pač pa tudi v drugih državah kontinentalne Evrope.

**Ključne besede:** mrljškopregledna služba, kriminalistične preiskovalne napake, sodna medicina, kognitivni dejavniki, organizacijski dejavniki, samomorji, vzroki smrti, smrtne nesreče, smrtne primeri, zdravniške napake, forenzična patologija, kriminalistična diferencialna diagnoza, postmortalna diagnoza

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