The status of forensic anthropology in Europe and South Africa

The Status of Forensic Anthropology in Europe and South Africa: Results of the 2016 FASE Questionnaire on Forensic Anthropology

Zuzana Obertová,[1] Ph.D.; Pascal Adalian,[2] Ph.D.; Eric Baccino,[3] M.D.; Eugenia Cunha,[4] Ph.D.; Hans H. De Boer,[5,6] M.D., Ph.D.; Tony Fracasso,[7] M.D.; Elena Kranioti,[8] M.D., Ph.D.; Philippe Lefévre,[9] Ph.D.; Niels Lynnerup,[10] M.D., Ph.D.; Anja Petaros,[11] M.D., PhD.; Ann Ross,[12] Ph.D.; Maryna Steyn,[13] M.D., Ph.D.; and Cristina Cattaneo,[14] M.D., Ph.D.

[1]Forensic Science Institute Zürich, Zürich, Switzerland.

[2]Professor, UMR 7268, Anthropologie bioculturelle, Droit, Ethique et Santé, Aix Marseille University, CNRS, EFS, ADES, Marseille, France.

[3]Professor, Département de Médecine Légale, CHU Montpellier, Université de Montpellier, Montpellier, France.

[4]Professor, Laboratory of Forensic Anthropology, Centre for Functional Ecology, Department of Life Sciences, University of Coimbra, Coimbra, Portugal.

[5]Netherlands Forensic Institute, The Hague, The Netherlands.

[6]Department of Pathology, Academic Medical Centre, University of Amsterdam, Amsterdam, The Netherlands.

[7]Professor, University Center of Legal Medicine, Geneva University Hospital, Geneva, Switzerland

[8]Edinburgh Unit for Forensic Anthropology, University of Edinburgh, Edinburgh, U.K.

[9]Professor, Laboratory of Anatomy, Biomechanics and Organogenesis [LABO], Forensic Anthropology Unit CP 619, Faculty of Medicine, Universite Libre de Bruxelles, Brussels, Belgium.

[10]Professor, Department of Forensic Medicine, University of Copenhagen, Copenhagen, Denmark.

[11]National Board of Forensic Medicine – Rättsmedicinalverket, Linköping, Sweden.

[12]Professor, NC Human Identification and Forensic Analysis Laboratory, Department of Biological Sciences, NC State University, Raleigh, NC USA.

[13]Professor, Human Variation and Identification Research Unit, School of Anatomical Sciences, Faculty of Health Sciences, University of the Witwatersrand, South Africa.

[14]Professor, Laboratory of Forensic Anthropology and Odontology (LABANOF), University of Milan, Milan, Italy.

ABSTRACT: One of the goals of the Forensic Anthropology Society of Europe (FASE) is to map the existing education and practice opportunities in the field of forensic anthropology in order to support the development of the discipline and to optimize the training courses provided by the Society. To address this goal, an online questionnaire was sent to European and South African practitioners of forensic anthropology and related disciplines in 2016.

The results of the questionnaire showed that the status and roles of forensic anthropologists vary depending on the national legal systems, education, and employment status of the practitioners. Despite the fact that the expertise of forensic anthropologists has been increasingly requested in a variety of investigations and the spectrum of tasks has become broader, including identification of living persons, specialized education in forensic anthropology is still restricted to a few graduate and postgraduate programs in European countries, and to annual FASE courses.

KEYWORDS: forensic science, forensic anthropology, survey, education, practice, identification

The Forensic Anthropology Society of Europe (FASE), established in 2003, brings together students and practitioners in the field of forensic anthropology, forensic medicine, odontology, genetics and other related disciplines. The aim of the Society is to advance the science of forensic anthropology, to work toward common goals and standards, and to promote training and research in forensic anthropology across Europe and worldwide.

One of the goals of FASE is to map the existing education and practice opportunities in the field of forensic anthropology in order to support the development of the discipline and to optimize the training courses provided by the Society. To address this goal, an online questionnaire was developed and sent to European and South African practitioners of forensic anthropology and related disciplines. The responses of the practitioners are summarized and discussed in this paper.

The FASE questionnaire covers a broader range of topics compared to the publication by Kranioti & Paine (1). In this paper, the results of the FASE questionnaire are discussed without mentioning any comparisons to the state of forensic anthropology in the USA, since this has already been done by Kranioti & Paine (1). Rather, the practice in forensic anthropology is compared between the European countries and South Africa, which is a country with approximately the population size of some of the largest European countries such as France, the United Kingdom, Italy, and Spain. In contrast, the USA has more than twice as many inhabitants than the largest European country, Russia. In addition, the only recently increasing involvement (in the past 10-20 years) of physical/biological anthropologists in South Africa in medicolegal investigations also show parallels to the European situation (2).

Some aspects regarding the education and the role of physical/biological anthropologists in the national legal systems of European and non-European countries were also described in The Routledge Handbook of Archaeological Human Remains and Legislation (3), but as the title indicates the focus was historical/archaeological as opposed to forensic contexts. Similarly, Blau & Ubelaker (4) included chapters on the educational background and practical experience of forensic anthropologists in three European countries. These two books primarily describe the role of forensic anthropologists in the assessment of skeletal remains, while the FASE questionnaire includes information on the involvement of forensic

anthropologists in the fast developing area of assessing living individuals in person or on images. Two books discussing the global situation of forensic science (2) and forensic archaeology (5), respectively, touch upon the status of forensic anthropology in the individual countries and regions of the world. However, the major focus of the former is on forensic medicine or other forensic disciplines, and the latter deals predominantly with forensic archaeology.

Materials and Methods

The online questionnaire consisted of four parts (Anthropological Association, Education and Training, Role of Forensic Anthropologists, Assessment of Living Persons) and included 22 questions and sub-questions. The questions were devised by the members of the FASE Board with the aim to learn about the current status of the discipline and the roles and employment opportunities of forensic anthropologist in Europe and South Africa. The questions are listed in the Results section along with the summary of the responses. The questionnaire was developed in Google Forms, which allows for the responses to be directly saved to a Google Sheet.

A link to the questionnaire was sent by email to European and South African practitioners, who are known to be closely linked to biological/physical or forensic anthropology within their respective countries either through their membership in FASE or through personal contacts of the authors. From the 48 European countries, there were 15 (Andorra, Belarus, Bulgaria, Estonia, Gibraltar, Latvia, Liechtenstein, Luxembourg, Macedonia, Moldova, Monaco, Montenegro, San Marino, Serbia, and Vatican City State) for which no suitable contact could be identified.

South Africa has been included for comparative reasons, since as a country, it is developing their forensic anthropology expertise, has a high case load (6) and has approximately the population size of the largest European countries such as France, the United Kingdom, Italy, and Spain. In addition, more than a quarter of the FASE members come from non-European countries and it is the goal of FASE to facilitate scientific cooperation and networking not just within Europe but also globally.

Results

At least one practitioner responded to the questionnaire from the 28/33 European countries and South Africa originally contacted (Figure 1). There was no response from Bosnia & Hercegovina, Cyprus, Czech Republic, Iceland, and Norway.

Forty-five practitioners from 28 European countries (Albania, Austria, Belgium, Croatia, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Kosovo, Lithuania, Malta, The Netherlands, Poland, Portugal, Romania, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, and the United Kingdom) and South Africa responded. From 11 countries there was more than one response (four from The Netherlands, three from Germany and two from France, Greece, Italy, Lithuania, South Africa, Spain, Switzerland, Ukraine, and the United Kingdom, respectively).

Part 1 of the questionnaire queried the existence of Anthropological Associations in the respective countries, with special focus on forensic anthropology.

Q1: Do you have a national association for forensic anthropology?

Of the 29 countries, only five countries reported to have a national association of forensic anthropology: Finland (Suomen forensisen arkeologian ja osteologian seura ry), Italy (Gruppo Italiano di Antropologia e Odontologia Forense), Poland (Polskie Towarzystwo Antropologii Sądowej), Spain (Asociación Española de Antropología y Odontología Forense), and the United Kingdom (British Association for Forensic Anthropology).

Q2: Do you have a national anthropological association?

No anthropological association was reported from Denmark, Finland, Kosovo, Lithuania, Malta, South Africa, Turkey or Ukraine. In four countries with two responders, one of the practitioners replied negatively, while the other positively. The names of the associations in the native languages are listed in Table 1.

Of the 45 responses, three practitioners did not know whether there is an anthropological association in their country. According to the other responders there is an anthropological association in at least one of these countries.

Q2a: If yes: Does this association cover forensic anthropology?

Of the 20 anthropological associations, six covered forensic anthropology (Belgium, Germany, Italy, The Netherlands, Slovakia, and the United Kingdom). Two countries, in which forensic anthropology is not covered in the national anthropological association, have independent national associations for forensic anthropology.

Q3: Do you have other national associations that cover forensic anthropology, such as associations for legal medicine, anatomy, morphology etc.?

Of the 28 European countries, 24 have other national associations that cover forensic anthropology (Table 2). In South Africa, the Anatomical Society of Southern Africa includes the Forensic Anthropology Interest Group (FAIG). In six countries, one of the practitioners responded negatively, while the others positively.

In Part 2, the questions were related to educational and training opportunities and requirements for the specialized field of forensic anthropology.

Q4: Do you have forensic anthropologists in your country?

In six European countries (Albania, Hungary, Kosovo, Malta, Russia, and Ukraine), there are no forensic anthropologists as such, according to the responders.

Q5: What are the prerequisites for practicing as forensic anthropologist?

Of the 23 countries that do have forensic anthropologists, all except for Turkey reported that a university degree is needed to be able to practice as a forensic anthropologist. In Turkey a certification as a forensic expert is required. In eight other countries (Austria, Belgium, France, Germany, Lithuania, Slovakia, Switzerland, and the United Kingdom), a national certification as a forensic/court expert is needed in addition to the University degree.

The responders from Denmark, Italy, Poland, and Slovakia did not specify the type of university degree needed. In Finland, Ireland, South Africa, Switzerland, and the United Kingdom a Master's degree (discipline not specified) is sufficient to practice forensic anthropology. A Master's degree or MD (medical doctor)

degree combined with a specialization in forensic medicine is required in Belgium, Germany, Lithuania, The Netherlands, and Spain. A doctoral degree (PhD) in physical anthropology, forensic anthropology or unspecified discipline is obligatory for practicing forensic anthropology in Austria, Greece, and Portugal. In Croatia, France, Romania, Slovenia, and Sweden a medical degree (MD) with specialization in forensic medicine is mandatory for those preparing forensic anthropological reports .

Q6: *How many practitioners of forensic anthropology do you know of in your country?*

One to three practitioners of forensic anthropology were reported from 13 countries (Austria, Belgium, Croatia, Finland, Greece, Ireland, Lithuania, The Netherlands, Romania, Slovakia, Slovenia, Sweden, and Switzerland). In Denmark, Poland, Portugal, and Turkey there are four to six practitioners of forensic anthropology. The reported numbers of practitioners varied by responder for France, Germany, Italy, Spain, South Africa, and the United Kingdom. For France it was 5 or around 20, for Germany from 4-5 to 10 or 12, for Italy about 10 or 20, for Spain 5, 6 or around 30, for South Africa from about 12 to 20, and for the United Kingdom from about 15 to 25.

Q7: *What is the educational background of practitioners who handle human skeletal remains in the forensic context?*

The educational background of practitioners who handle human skeletal remains in the forensic context varies considerably between countries. In all countries, except for Austria and Finland, medical doctors were reported to handle human skeletal remains in the forensic context. In Croatia, Germany, Poland, Romania, Slovenia, and Sweden, only forensic medical doctors are legally allowed to report on the findings regarding human skeletal remains. In Austria, biologists and anthropologists handle human skeletal remains, while in Finland this is undertaken by anthropologists and archaeologists. Anthropologists handle human skeletal remains in the forensic context in 20 countries, archaeologists in 15, anatomists in 14, and biologists in 12 countries.

The questions in Part 3 targeted the employment opportunities and tasks of forensic anthropologists. In this Part and in Part 4, the responses are divided by the type of specialists who provide expertise as

forensic anthropologists: Group 1, consisting of 11 countries, which reported that only medical doctors specialized in forensic medicine are allowed to perform the tasks of forensic anthropologists (or to report on anthropological findings) within the legal system or where there are no forensic anthropologists per se, with mostly forensic medical doctors taking up the role of forensic anthropologists (Albania, Croatia, France, Hungary, Kosovo, Malta, Romania, Russia, Slovenia, Sweden, and Ukraine), and Group 2, including the remaining 18 countries, where various professionals act as forensic anthropologists (i.e., anthropologists, medical (forensic) doctors, archaeologists, anatomists, and biologists).

Q8: What are the general tasks of forensic anthropologists?

The tasks of forensic anthropologists are summarized in Table 3. When there were more responders from one country, the task description varied to a certain extent among the responders.

The assessment of fully skeletonized human remains is undertaken by forensic anthropologists (or forensic medical doctors who act as forensic anthropologists) in all 28 countries (Albania did not report any specific tasks). In 27 countries, forensic anthropologists are tasked with the assessment of human remains in the laboratory (except in Romania, which belongs to Group 1), and with the assessment of decomposing human remains (except in Austria, which belong to Group 2).

Forensic anthropologists undertake the assessment of human remains on site in 6 countries from Group 1, and in 16 countries from Group 2. Human remains are recovered by forensic anthropologists in 4 countries from Group 1, and in 15 countries from Group 2. Human remains are macerated by forensic anthropologists in 5 countries from Group 1, and in 14 countries from Group 2.

Radiological images are assessed by forensic anthropologists in 4 countries from Group 1, and in 15 countries from Group 2. Forensic anthropologists undertake the assessment of growth and development of living persons in 6 countries from Group 1, and in 12 countries from Group 2, while age estimation and identification of living persons on images/videos is performed by forensic anthropologists in 6 countries from Group 1, and in 12 countries from Group 2.

Other tasks, which were listed as being undertaken by forensic anthropologists, were craniofacial superimposition/facial approximation (Lithuania, The Netherlands, Poland, and the United Kingdom), assessment of body parts (Ireland), histological and biological analyses (The Netherlands, and Russia, respectively), and odontological assessments (Russia).

Q9: How are forensic anthropologists usually employed?

In 20 countries (4 from Group 1, and 16 from Group 2), forensic anthropologists are usually employed by Universities. Forensic anthropologists are also employed by law enforcement agencies (5 countries from Group 1, and 9 from Group 2), by health care institutions (4 countries from Group 1, and three from Group 2) or are self-employed (2 countries from Group 1, and 6 from Group 2). Other employers included coroners (Ireland), judiciary (Malta, and Spain), military (Russia), and commercial forensic companies (the United Kingdom). More than one employment type was reported from 17 countries.

Q10: What is the position of forensic anthropologists in the legal system?

Forensic anthropologists act in various capacities within a single legal system. Forensic anthropologists act as independent experts in 17 countries (Austria, Belgium, Denmark, Germany, Greece, Ireland, Italy, Lithuania, The Netherlands, Poland, Portugal, Slovakia, South Africa, Spain, Switzerland, Turkey, and the United Kingdom). This count excludes nine countries, in which forensic medical doctors act as forensic anthropologists or forensic medical doctors who have the sole mandate when reporting anthropological findings to the judiciary (Croatia, France, Hungary, Kosovo, Malta, Romania, Russia, Slovenia, and Sweden). In 15 countries, forensic anthropologists act as advisors to forensic medical doctors (Belgium, Denmark, Finland, Germany, Greece, Ireland, Italy, Lithuania, the Netherlands, Poland, Slovakia, South Africa, Spain, Switzerland, and the United Kingdom). Forensic anthropologists act as members of forensic teams in 15 out of the 18 countries of Group 1 (except in Denmark, Finland and Germany).

Part 4 focused on the role of forensic anthropologists in the assessment of living persons.

Q11: Are anthropologists involved in the forensic assessment of living persons?

There were 12 negative replies, although in five of these countries assessment of living persons was reported as being the task of forensic anthropologists in Question 8. Overall, six of the countries belong to Group 1 (Albania, Croatia, Kosovo, Malta, Slovenia, and Sweden). In three countries with multiple responders, some responders replied “no”, while others “yes”. In thirteen countries, forensic anthropologists are involved in the forensic assessment of living persons (Austria, Belgium, Denmark, Germany, Greece, Italy, Lithuania, The Netherlands, Poland, Portugal, Slovakia, Switzerland, and the United Kingdom). This count excludes positive replies from four countries, which were reported not to have forensic anthropologists per se (Hungary, Romania, Russia, and Ukraine).

Q11a: If yes, what types of assessments of living persons do anthropologists undertake?

Out of the 13 countries, which responded “yes” to Question 11, ten reported that forensic anthropologists are involved in the assessment of age of unaccompanied minors and nine in the assessment of age of asylum seekers. In four countries (Belgium, Greece, Switzerland, and the United Kingdom), forensic anthropologists assess the age of children in cases of criminal liability, and in Greece and Italy in adoption cases. In Austria, Germany and Italy, forensic anthropologists undertake age assessments in cases of pension requests. Forensic anthropologists are involved in the assessment of torture in Italy and Poland.

Q11b: If yes, what is the role of anthropologists in the assessments of living persons?

In twelve out of the thirteen countries (except in Denmark), forensic anthropologists assess radiographic images of the skeleton for biological age of living persons. In seven countries, forensic anthropologists are also involved in the assessment of dental age (including on orthopantomograms). Age (growth) is assessed by forensic anthropologists metrically in eight countries, and sexual maturation in five countries. In Italy and The Netherlands, forensic anthropologists assess scars. Radiographic images are assessed for trauma, and for pathological changes by forensic anthropologists in six countries (Belgium, Germany, Italy, the Netherlands, Poland, and the United Kingdom).

Q12: What are the fields of expertise of other professionals involved in the forensic assessment of living persons?

Other professionals involved in the forensic assessment of living persons come from forensic medicine/pathology (9 countries from Group 1 (except for Croatia and Slovenia), and 15 from Group 2, except for Finland, Ireland and Turkey), radiology (5 from Group 1, and 14 from Group 2, except for Denmark, Finland, Slovakia, and Switzerland), dentistry/odontology (5 from Group 1, and 14 from Group 2, except for Denmark, Ireland, Lithuania, and Slovakia), general medicine (6 countries from Group 1, and 9 from Group 2), police/law enforcement (4 countries from Group 1, and 9 from Group 2), psychiatry/psychology (5 countries from Group 1, and 5 from Group 2), and social work (Germany, Ireland, Malta, The Netherlands, Spain, and the United Kingdom).

Q13: In case of age assessments, what are the relevant ages for legal cases concerning juveniles?

No response was given by six countries (Albania, Denmark, Finland, Ireland, Kosovo, and Turkey). The responses from the remaining 23 countries are summarized in Table 4 (excluding ages that were reported from less than four countries). In addition to the ages listed in Table 4, in Belgium the age of 19 years, in France the ages of 6 and 10 years, in Germany the age of 20 years, in Romania the ages of 8, 9, 10, 11 and 12 years, and in the United Kingdom the ages of 10 and 12 years are relevant for criminal investigations involving juveniles.

Q14: Who requests the assessments of living persons?

In all but two countries (Finland and Ireland) the assessments of living persons are requested by Courts, Magistrates or lawyers. In 18 countries, the requests for the assessments of living persons are received from the law enforcement (Austria, Finland, France, Germany, Greece, Hungary, Italy, Kosovo, Lithuania, The Netherlands, Poland, Russia, Slovakia, Spain, Sweden, Turkey, Ukraine, and the United Kingdom), and in 11 countries from non-governmental organizations (Austria, France, Germany, Greece, Italy, Malta, The Netherlands, Poland, Romania, Slovakia, and the United Kingdom). In Austria, Germany and Italy, private persons may request the assessments of living persons. There was no response from Ireland.

Q15: Are anthropologists involved in the forensic assessment of living persons on images?

In thirteen countries, forensic anthropologists are involved in the forensic assessment of living persons on images (Austria, Belgium, Denmark, Germany, Italy, Lithuania, The Netherlands, Poland, Portugal, Slovakia, Spain, Turkey, and the United Kingdom). This count excludes positive replies from three countries, which were reported not to have forensic anthropologists per se (Hungary, Russia, and Ukraine). Of the three countries with multiple responders, in two countries two replies were positive and one negative, and in one country two replies were positive and two did not know the answer. There were 12 negative replies, although in three of these countries (all from Group 1) assessment of living persons on images was reported as being the task of forensic anthropologists in Question 8. Overall, seven of the countries belong to Group 1 (Albania, Croatia, France, Kosovo, Romania, Slovenia, and Sweden).

Q15a: If yes, what is the context of the assessments of living persons on images/videos by anthropologists?

In 12 of the 13 countries where forensic anthropologists undertake assessments of living persons on images, the cases involve identification of missing persons (except in Denmark). In ten countries robberies captured on video surveillance cameras (Austria, Belgium, Denmark, Germany, Italy, Poland, Slovakia, Spain, Turkey, and the United Kingdom), and in nine countries child pornography were analyzed. In five countries, the assessment of child pornography includes age estimation of victims, identification of victims and of perpetrators (Germany, Italy, Poland, Turkey, and the United Kingdom), in one country the age estimation and identification of victims (The Netherlands), and in the remaining three countries age estimation of victims (Lithuania, Portugal, Croatia, and Slovakia). Assessments of living persons on images/videos by forensic anthropologists were also reported for cases of terrorism (Denmark, Germany, Italy, Poland, Turkey, and the United Kingdom), and traffic violations (Denmark, Germany, Italy, and Poland). In addition, forensic anthropologists are asked to identify living persons on images/videos showing (suspected) human trafficking/migration (Italy), perpetrators of serious crimes, such as homicides, and grievous bodily harm (Poland and Slovakia), and hooligans (Poland).

Q15b: If yes, what approaches are used by anthropologists for assessments on images/videos?

The responses regarding the approaches for the assessment of living persons on images/videos used by forensic anthropologists are summarized in the first column (Group 2FA) of Table 5. Group 2FA, includes 13 countries where forensic anthropologists are involved in the assessment of living persons on images (Austria, Belgium, Denmark, Germany, Italy, Lithuania, the Netherlands, Poland, Portugal, Slovakia, Spain, Turkey, and the United Kingdom). Morphological analysis of the face and of other body parts is undertaken by forensic anthropologists in twelve out of the 13 countries (except for in The Netherlands, and in Portugal, respectively).

Q16: What are the fields of expertise of other professionals involved in the forensic assessment of living persons on images?

Other professionals involved in the forensic assessment of living persons on images/videos come from forensic medicine/pathology (9 countries from Group 1, except for Albania and Slovenia, and 10 from Group 2FA, except for Belgium, Portugal and Slovakia), dentistry/odontology (4 from Group 1, and 10 from Group 2FA), general medicine (Greece, The Netherlands, Poland, and the United Kingdom), and police/law enforcement (3 countries from Group 1 (Hungary, Russia and Ukraine), and 10 from Group 2FA, except for Austria, Denmark and Portugal). In Poland, experts from virtual engineering, and in Lithuania the Inspector of Journalist Ethics (for cases of pornography) are also involved in the assessment of living persons on images. In five countries (Finland, Greece, Ireland, South Africa, and Switzerland), the assessment of living persons on images is not included in the tasks of forensic anthropologists.

Q17: What approaches do other professionals use for the assessments of living persons on images?

The responses regarding the methods for the assessment of living persons on images/videos used by other professionals are summarized in Table 5. The responses are divided into three groups: Group 2FA (results discussed in Question 15b), Group 1 (as defined earlier), and Group 2OP consisting of the same countries as Group 2FA. Under the Group 2OP the approaches used by other professionals involved in the assessment of living persons on images (in addition to forensic anthropologists) are listed.

Discussion

The responses to the FASE Questionnaire on Forensic Anthropology 2016 provide insights into the organization, education, and tasks of forensic anthropologists within the respective national legal systems of European countries and South Africa.

In the past 15 years of the existence of FASE, forensic anthropology in Europe has undergone rapid development. From the time when there were virtually no forensic anthropologists as such by background (7), there are now Universities, particularly in the UK, but also in Greece, Italy, the Netherlands, Portugal, and Spain, which offer graduate and postgraduate programs in forensic anthropology (1). However, there are still only a handful of opportunities to assist with and to experience the variety of forensic anthropological cases, which is critical for practicing as a forensic anthropologist. This is very different from the situation in South Africa, where the case load is very high, generating many opportunities to gain experience.

In both Europe and South Africa, a University degree (Master, MD or PhD) is needed to be able to practice as a forensic anthropologist. Despite the limited number of education programs for forensic anthropologists, there seems to be a shift from anthropological tasks being the domain of medical doctors to increasingly interdisciplinary teamwork. Although forensic medical doctors are involved in the assessment of skeletal human remains in almost all countries, in at least seven countries, listed by Kranioti & Paine (1) as countries where skeletal human remains were assessed solely by forensic pathologists, forensic anthropologists are now reported to do so as well. In addition, the numbers of forensic anthropologists within individual countries seem to be increasing. When comparing the data from Kranioti & Paine (1) with the present results, the number of forensic anthropologists increased in seven European countries (Denmark, Finland, Germany, Italy, Portugal, Spain, and Turkey).

The number of forensic anthropology practitioners (regardless of profession) was loosely associated with the population size of the respective country: countries with two to 20 million inhabitants reported up to three practitioners (except for Denmark and Portugal with four to six practitioners), while countries with a population of over 55 million (including South Africa) reported up to 20 practitioners, except for Germany and Turkey (two of the largest countries), which listed only four to 12 practitioners (Figure 1). Apart from

anthropologists and medical doctors, a variety of professionals are reported to handle human skeletal remains in forensic contexts including archaeologists, anatomists, and biologists, which is country dependent. This finding is in accordance with the situation reported by Kranioti & Paine (1).

Forensic anthropologists are employed by universities in two thirds of the surveyed countries. When forensic medical doctors act as forensic anthropologists, they are less likely to be employed by a University, but are more likely to be employed by health care institutions in their respective countries. In approximately half of the countries, forensic anthropologists and forensic medical doctors are employed by law enforcement agencies. In one third of the countries, forensic anthropologists are self-employed. The employment opportunities seem to have changed in comparison to Kranioti & Paine (1), who concluded that "the vast majority of them [forensic anthropologists] remain limited to freelance activities…"(p.1).

In most European countries and in South Africa, forensic anthropologists act as independent experts within the national legal system. They are also commonly reported to act as advisors to forensic medical doctors/pathologists and being members of forensic teams. One of the concerns is that in many countries a certification as a forensic expert in forensic anthropology is not required, therefore the expertise may vary massively based on the educational background and experience. FASE has been offering two levels of certification for forensic anthropology practitioners since 2013 that should be encouraged in order to practice. The advantage of FASE certification is that it is open to individuals from all countries.

Although the primary role of forensic anthropologists is the assessment of skeletal remains, in more than half of the countries, forensic anthropologists are involved in the assessment of living persons (both in person and on images). In comparison, forensic medical doctors (acting as forensic anthropologists) are less likely to be involved in the recovery of human remains and in the assessment of radiographs than forensic anthropologists. As opposed to Europe, forensic anthropologists in South Africa are not involved in the assessment of living persons.

In more than half of the surveyed European countries, forensic anthropologists are involved in the age estimation of asylum seekers, unaccompanied minors, adopted children or juveniles in criminal cases. In

the age estimation cases, the most common methods used by the forensic anthropologists is the assessment of radiographs of the skeleton or the dentition. In Belgium, Germany, Italy, the Netherlands, Poland, and the United Kingdom, forensic anthropologists also assess radiographic images for signs of trauma, and for pathological changes. The spectrum of tasks seems to expand with forensic anthropologists being increasingly involved in the assessment of living persons, and in the evaluation of skeletal trauma, which is related to their proficiency in assessing the outputs of various imaging modalities.

There seems to be little national and international agreement regarding the standards and procedures and the training necessary to practice in this area of expertise among the different parties. Although the need for anthropological knowledge in cases of age estimation or trauma assessment (from both cultural and pathological aspects) of the living, as well as in cases of age estimation and identification of persons on images and videos, seem to be increasingly acknowledged, there is little national and international agreement regarding the standards and procedures and the training necessary to practice in this area. With the increasing use of medical imaging techniques, digital photography, and video surveillance systems this field of expertise is prone to grow and timely establishment of standards and best practice guidelines (for instance the Best Practice Manual for Facial Image Comparisons proposed by ENFSI (8) or Steyn et al. 2018 (9)) along with specific training opportunities for forensic anthropologists and related professionals are essential.

Considering that there were differences in responses among the practitioners from the same country, the information exchange among the practitioners on both the national and the international level needs to be improved. This may be facilitated by the creation of national associations or working groups on forensic anthropology, which are rare in the European countries so far. On the international (not just European) level, FASE facilitates meetings, courses and working groups regarding various topics in forensic anthropology and thus assists in this regard.

There seems to be little knowledge about the existence of research opportunities within and between countries. For instance, the number of modern identified collections, which provide a wealth of

opportunities for research and training in forensic anthropology, has increased substantially worldwide but at the time of this survey the information about these collections has been limited to a few publications.

Although not part of the questionnaire, the scientific progress and overall status of forensic anthropology in the individual countries is reflected in the publication activity. We searched Pubmed (search terms "forensic anthropology" plus "country", excluding publications dealing solely with genetics) for publications in the last 5 years in the participating European countries and South Africa and set the findings in relation to the reported number of practitioners of forensic anthropology (Figure 2). There seems to be a positive association between the reported number of practitioners of forensic anthropology and the number of publications in the field, although there are countries where the scientific output in international journals listed in Pubmed is higher (such as Portugal and Greece) or lower (such as the UK and Germany) than expected based on the number of practitioners of forensic anthropology in the country.

The limitations of the questionnaire are threefold: first, the results and discussion are based on the responses of a selective sample of practitioners (known to the authors as being active in the field and willing to respond to the questionnaire), second, the differences in the perception of who is a forensic anthropologist – a medical forensic doctor performing the anthropological tasks or indeed a specifically trained forensic anthropologist may have affected the responses, and third, the questionnaire was undertaken in 2016 so the reality of forensic anthropology in the countries may have changed in the past two years. For example, Hungary is listed here as being a country without forensic anthropologists, but since then one practitioner has been FASE certified.

In conclusion, the status and roles of forensic anthropologists in the European countries and South Africa vary depending on the national legal system of the country, education and employment status of the practitioners. Despite the fact that the expertise of forensic anthropologists has been increasingly requested in a variety of forensic investigations and the spectrum of tasks has become broader, especially regarding the expertise in the identification of living persons, well-structured specialized education in forensic anthropology is still restricted to a few graduate and postgraduate programs in the UK and in some countries of Southern Europe, and to the annual courses organized by FASE. As such the responses to the

FASE Questionnaire provide valuable information on the current status of the discipline of forensic anthropology, particularly regarding the field-specific educational and working opportunities (and limitations), and allow for targeted development and facilitation of strategies to promote best practice and training needs on the national and international level for students and practitioners of forensic anthropology.

Acknowledgements

We are grateful to all responders for sharing their knowledge. Thank you for your time and effort: Dr. Alexey Abramov, Dr. Mandi Alblas, Assoc. Professor Dr. Radoslav Beňuš, Professor Dame Sue Black, Professor Dr. Miguel C. Botella López, Dr. Ozgur Bulut, Dr. Bridget Ellul, Dr. René Gapert, R.R.R. Gerretsen, Mike Groen, Professor Dr. Rimantas Jankauskas, Dr. Giedrius Kisielius, Dr. Dorota Lorkiewicz-Muszyńska, Professor Dr. George Maat, Professor Dr. Laurent Martrille, Dr. Vadym Molchanov, Assoc. Professor Dr. Konstantinos Moraitis, Professor Dr. José L. Prieto, Professor Dr. Luca Sìneo, Dr. Katharina Sjölin, Dr. Martin Trautmann, Dr. Tanya Uldin, Professor Dr. Marcel A. Verhoff, and all responders who did not wish to be acknowledged by name.

References

1. Kranioti EF, Paine RR. Forensic anthropology in Europe: an assessment of current status and application. J Anthropol Sci 2011;89:71–92.

2. Ubelaker D, editor. The global practice of forensic science. Chichester, U.K.: John Wiley & Sons, 2015.

3. Márquez-Grant N, Linda Fibiger L, editors. The Routledge handbook of archaeological human remains and legislation. An international guide to laws and practice in the excavation and treatment of archaeological human remains. London, U.K./New York, NY: Routledge, 2011.

4. Blau S, Ubelaker D, editors. Handbook of forensic anthropology and archaeology. 2nd ed. New York, NY/London, U.K.: Routledge, 2016.

5. Groen MWJ, Márquez-Grant N, Janaway RC, editors. Forensic archaeology: a global perspective. New York, NY: John Wiley & Sons, 2015.

6. L'Abbé EN, Steyn M. The establishment and advancement of forensic anthropology in South Africa. In: Dirkmaat DC, editor. A companion to forensic anthropology. New York, NY: Wiley-Blackwell, 2012;626–38.

7. Brickley MB, Ferllini R. Forensic anthropology: developments in two continents. In: Brickley MB, Ferllini R, editors. Forensic anthropology: case studies from Europe. Springfield, IL: Charles C. Thomas, 2007;3–18.

8. European Network of Forensic Science Institutes (ENFSI). Best practice manual for facial image comparison (ENFSI-BPM-DI-01), 2018; http://enfsi.eu/wp-content/uploads/2017/06/ENFSI-BPM-DI-01.pdf (accessed November 18, 2018).

9. Steyn M, Pretorius M, Briers N, Bacci N, Johnson A, Houlton TMR. Forensic facial comparison in South Africa: state of the science. Forensic Sci Int 2018;287:190–4.

TABLE 1—*List of countries with a national anthropological association (given in native languages).*

Country	**Name of the national anthropological association**
Austria	Anthropologische Gesellschaft Wien
Belgium	Société Royale Belge d'Anthropologie et de Préhistoire
Croatia	Hrvatko Antropološko Društvo
France	Société d'anthropologie de Paris
Germany	Gesellschaft für Anthropologie (GfA)
Greece	Ελληνική Ανθρωπολογική Εταιρεία
Hungary	Magyar Kulturális Antropológiai Társaság (MAKAT)
Ireland	Anthropological Association of Ireland
Italy	Associazione Antropologica Italiana (AAI)
The Netherlands	Nederlandse Vereniging voor Fysische Antropologie (NVFA)
Poland	Polskie Towarzystwo Antropologiczne (PTA)
Portugal	Associação Portuguesa de Antropologia
Romania	Societatea Academica de Antropologie
Russia	Ассоциация антропологов и этнологов России
Slovakia	Slovenská antropologická spoločnosť pri SAV
Slovenia	Društvo antropologov Slovenije
Spain	Sociedad Española de Antropología Física
Sweden	Sveriges antropologförbund
Switzerland	Schweizerische Gesellschaft für Anthropologie (SGA)
the United Kingdom	Royal Anthropological Institute (RAI)

TABLE 2—*List of countries with national associations that cover forensic anthropology (given in native languages).*

Country	**Name of other national association(s) that cover forensic anthropology**
Belgium	Société Royale de Médecine Légale de Belgique
Denmark	Dansk Selskab for Retsmedicin
Finland	Suomen oikeuslääketieteellinen yhdistys
France	Société Française de Médecine Légale
Germany	Deutsche Gesellschaft für Rechtsmedizin
Greece	Ελληνική Εταιρεία Ιατροδικαστικής και Ιατροδικαστικών Επιστημών
Hungary	Magyar Igazságügyi Orvosok Társasága
Ireland	Medico-Legal Society of Ireland
Italy	Gruppo Italiano di Patologia Forense
Kosovo	Asociacioni Kosovar i Shkencave Forenzike (AKSHF)
Lithuania	Lietuvos morfologų draugija
The Netherlands	Nederlandse Anatomen Vereniging
Poland	Polskie Towarzysto Medycyny Sądowej i Kryminalistyki (PTMSiK)
Portugal	Associação de Ciências Forenses
Romania	Societatea de Medicina Legala din Romania
Russia	Ассоциация судебно-медицинских экспертов
Slovakia	Slovenská súdnolekárska spoločnosť Slovenskej lekárskej spoločnosti
Slovenia	Inštitut za sodno medicino
South Africa	Anatomical Society of Southern Africa (ASSA)
Spain	Sociedad Anatómica Española; Sociedad Española de Medicina Legal
Sweden	Rättsmedicinalverket
Switzerland	Schweizerische Gesellschaft für Rechtsmedizin
Turkey	Adli Bilimciler Dernegi
Ukraine	Асоціація судових медиків України(АСМУ)

United Kingdom	British Association for Human Identification; British Association for Forensic Odontology; British Association for Forensic Medicine; British Association of Biological Anthropology and Osteoarchaeology (BABAO); International Association of Forensic Radiographers (IAFR); Anatomical Society

TABLE 3—*The tasks of forensic anthropologists within the respective national legal systems. *Albania: did not specify any tasks*

Task	**Group 1***	**Group 2**
Assessment of fully skeletonised human remains	Croatia, France, Hungary, Kosovo, Malta, Romania, Russia, Slovenia, Sweden, Ukraine	Austria, Belgium, Denmark, Finland, Germany, Greece, Ireland, Italy, Lithuania, The Netherlands, Poland, Portugal, Slovakia, South Africa, Spain, Switzerland, Turkey, the United Kingdom
Assessment of decomposing human remains	Croatia, France, Hungary, Kosovo, Malta, Romania, Russia, Slovenia, Sweden, Ukraine	Belgium, Denmark, Finland, Germany, Greece, Ireland, Italy, Lithuania, The Netherlands, Poland, Portugal, Slovakia, South Africa, Spain, Switzerland, Turkey, the United Kingdom
Maceration of remains	Croatia, Hungary, Kosovo, Russia, Sweden	Belgium, Denmark, Finland, Germany, Greece, Italy, Lithuania, The Netherlands, Poland, Portugal, South Africa, Spain, Switzerland, the United Kingdom
Assessment of human remains on site	France, Kosovo, Malta, Romania, Slovenia, Sweden	Austria, Belgium, Denmark, Finland, Germany, Greece, Ireland, Italy, The Netherlands, Poland, Portugal, South Africa, Spain, Switzerland, Turkey, the United Kingdom
Recovery of human remains	France, Kosovo, Slovenia, Sweden	Austria, Belgium, Denmark, Finland, Germany, Greece, Italy, The Netherlands, Poland, Portugal, South Africa, Spain, Switzerland, Turkey, the United Kingdom
Assessment of human remains in the laboratory	Croatia, France, Hungary, Kosovo, Malta, Russia, Slovenia, Sweden, Ukraine	Austria, Belgium, Denmark, Finland, Germany, Greece, Ireland, Italy, Lithuania, The Netherlands, Poland, Portugal, Slovakia, South Africa, Spain, Switzerland, Turkey, the United Kingdom
Assessment of radiographs	France, Russia, Sweden, Ukraine	Austria, Belgium, Denmark, Finland, Greece, Ireland, Italy, Lithuania, The Netherlands, Poland, Portugal, South Africa, Spain, Switzerland, the United Kingdom

Assessment of growth and development of living persons	France, Hungary, Romania, Russia, Sweden, Ukraine	Austria, Belgium, Germany, Greece, Italy, Lithuania, The Netherlands, Poland, Portugal, Slovakia, Spain, the United Kingdom
Assessment of images/videos for age assessment and identification	Croatia, France, Hungary, Russia, Sweden, Ukraine	Austria, Denmark, Germany, Italy, Lithuania, The Netherlands, Poland, Portugal, Slovakia, Spain, Turkey, the United Kingdom

TABLE 4—*The relevant ages addressed in legal cases where age assessment of living persons is required by country.*

Country/Age (years)	**13**	**14**	**15**	**16**	**17**	**18**	**21**
Austria		Yes				Yes	
Belgium			Yes	Yes	Yes	Yes	
Croatia						Yes	
France	Yes		Yes	Yes		Yes	
Germany	Yes	Yes			Yes	Yes	Yes
Greece				Yes	Yes	Yes	
Hungary		Yes	Yes	Yes	Yes	Yes	
Italy				Yes	Yes	Yes	
Lithuania	Yes	Yes			Yes		
Malta		Yes		Yes		Yes	
The Netherlands			Yes			Yes	
Poland			Yes	Yes		Yes	Yes
Portugal		Yes		Yes		Yes	
Romania	Yes	Yes					
Russia		Yes		Yes			
Slovakia						Yes	
Slovenia						Yes	
South Africa				Yes		Yes	
Spain		Yes				Yes	Yes
Sweden			Yes			Yes	Yes
Switzerland		Yes				Yes	Yes
Ukraine		Yes		Yes			
United Kingdom				Yes		Yes	Yes

TABLE 5—*The approaches used by forensic anthropologists and other professionals for the assessment of living persons on images/videos by country.*

Approach	**Group 2FA**	**Group 1**	**Group 2OP**
Morphological analysis of the face	Austria, Belgium, Denmark, Germany, Italy, Lithuania, Poland, Portugal, Slovakia, Spain, Turkey, the United Kingdom	France, Hungary, Malta, Russia, Sweden	Germany, Italy, Lithuania, The Netherlands, Poland, Portugal, Spain, Turkey, the United Kingdom
Metric analysis of the face	Austria, Belgium, Germany, Italy, Poland, Portugal, Slovakia, Spain, Turkey, the United Kingdom	Hungary, Russia, Ukraine	Belgium, Germany, Italy, The Netherlands, Poland, Portugal, Spain, Turkey, the United Kingdom
Morphological analysis of the dentition	Austria, Denmark, Germany, Italy, Lithuania, The Netherlands, Poland, Slovakia, Spain, the United Kingdom	Hungary, Malta, Russia, Sweden, Ukraine	Austria, Belgium, Denmark, Germany, Italy, The Netherlands, Poland, Spain, the United Kingdom
Assessment of sexual maturity	Germany, Italy, Lithuania, The Netherlands, Poland, Slovakia, Spain	Croatia, Hungary, Sweden	Germany, Italy, Lithuania, The Netherlands, Poland, Spain, the United Kingdom
Morphological analysis of body parts (e.g., hands)	Austria, Belgium, Denmark, Germany, Italy, Lithuania, The Netherlands, Poland, Slovakia, Spain, Turkey, the United Kingdom	Croatia, Malta, Russia, Sweden	Austria, Germany, Italy, Lithuania, Poland, Spain, the United Kingdom
Body height estimation	Austria, Belgium, Denmark, Germany, Italy, The Netherlands, Poland, Slovakia, Spain, Turkey	Malta, Russia, Sweden, Ukraine	Belgium, Germany, Italy, The Netherlands, Poland, Slovakia, Turkey, the United Kingdom
Gait analysis	Belgium, Denmark, Germany, Italy, Poland, Slovakia	Russia, Sweden	Belgium, Germany, Poland, the United Kingdom
Superimposition	Denmark, Germany, Italy, Lithuania, The Netherlands, Poland, Slovakia, Spain, Turkey, the United Kingdom	Croatia, Hungary, Russia, Sweden, Ukraine	Belgium, Germany, Italy, Poland, Spain, the United Kingdom
2D/3D comparisons	Belgium, Denmark, Germany, Italy, Poland, Slovakia, Spain, Turkey, the United Kingdom	Russia, Ukraine	Belgium, Germany, Italy, The Netherlands, Poland, Turkey, the United Kingdom

Figure Legends

FIG. 1—*Map of the European countries included in the FASE Questionnaire (red: no suitable contact, white: no response, green: at least one response).*

FIG. 2—*Reported number of forensic anthropology by population size of the respective countries.*

FIG. 3—*Number of publications in forensic anthropology (Pubmed search, 2013-2018) by the number of practitioners of forensic anthropology in the country.*


Journal of Forensic Sciences

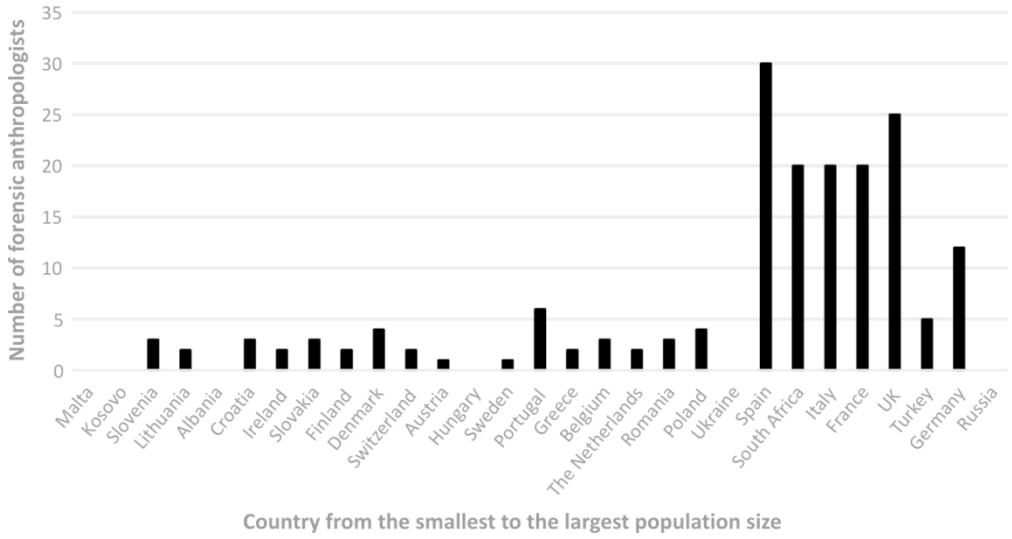

FIG. 2-Reported number of forensic anthropology by population size of the respective countries.

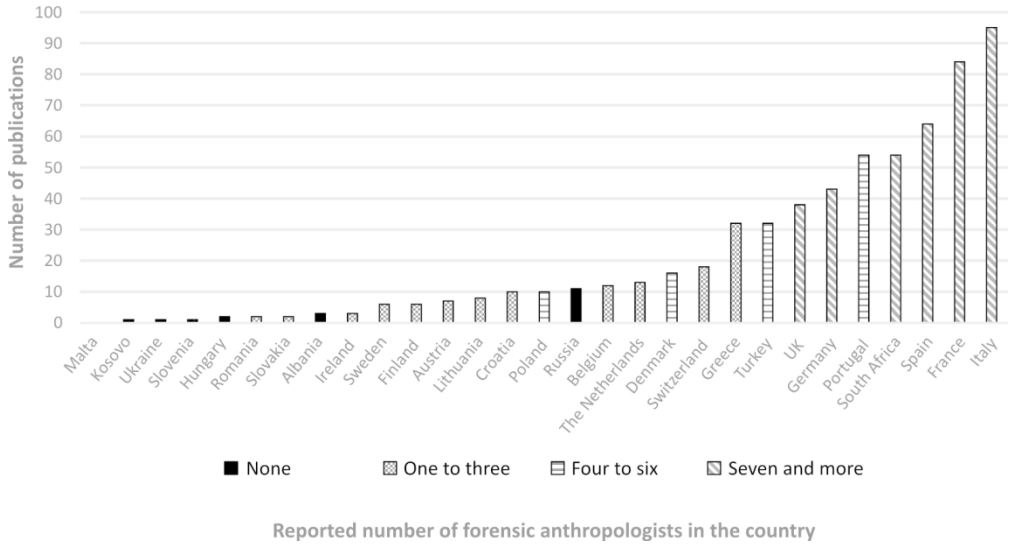

FIG. 3-Number of publications in forensic anthropology (Pubmed search, 2013-2018) by the number of practitioners of forensic anthropology in the country.