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The patient journey: a report of skin cancer care across Europe

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Summary

Background There are poorly documented variations in the journey a skin cancer patient will follow from diagnosis to treatment in the European Union.
Objectives To investigate the possible difficulties or obstacles that a person with a skin malignancy in the European Union may have to overcome in order to receive adequate medical screening and care for his/her condition. In addition, we wished to explore differences in European health systems, which may lead to health inequalities and health inequities within Europe.
Methods Ten European countries took part in this investigation (in alphabetical order): Finland, Germany, Greece, Italy, Malta, Poland, Romania, Spain, the Netherlands and the U.K. The individual participants undertook local and national enquiries within their own country and completed a questionnaire.
Results This exercise has identified important differences in the management of a skin cancer patient, reflecting major disparities in health care between European countries.
Conclusions Further investigation of health disparities and efforts to address health inequalities should lead to improvements in European health care quality and reduction in morbidity from skin cancer.

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Conflicts of interest
M.T. is a speaker for the International Skin College sponsored by Meda. E.S. is a consultant for Spirig, Meda, Almirall, ITM and Leo Pharma. The other authors have no conflicts of interest to declare.

*Other members of the EPIDERM group involved in this study are listed in Appendix 1.

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Skin cancer, with its steadily increasing incidence in caucasian populations, is emerging as an important health issue.[1,2] The number of patients with newly diagnosed skin cancer has risen dramatically in the past decades, leading to a growing demand for efficient health care services to examine suspicious skin lesions and to treat patients. According to the World Health Organization (WHO), the burden of disease due to ultraviolet radiation-related skin cancer for all ages is 310 903 disability adjusted life years for the European WHO region.[3] Most skin cancers are of keratinocyte origin, also referred to as nonmelanoma skin cancers (NMSCs),

comprising basal cell carcinoma (BCC) and squamous cell carcinoma (SCC), with some authors including in this group also precancerous skin lesions called actinic keratosis (AK).

Although mortality from NMSC is low,[4] skin cancers can induce substantial functional and cosmetic morbidity (especially within the head and neck area) and because of their high prevalence they represent a considerable economic burden to national health care systems (NHSs).[4–7] Cutaneous malignant melanomas (CMMs) represent only 5% of total skin cancers, but are responsible for the majority of skin cancer deaths with a disproportionate loss of life in young and middle-aged individuals.[8] CMM is now the second most common cancer in individuals aged 15–34 years in the U.K. and the commonest cause of a cancer-related death in young women.[9] This relatively young age distribution for CMM, with on average 20 years of life lost for each melanoma death,[8] emphasizes the importance of prevention and early detection. If CMM is diagnosed early, while still contained within the skin, surgical excision will be curative. However, CMM has a great propensity for metastasis and metastatic melanoma is resistant to most treatments, with poor outcome at 5 years. Disparities on melanoma incidence and survival have been reported in Europe.[10,11] Compared with Eastern Europe, the mortality/incidence ratios for CMM are low in North-West Europe, despite high incidence rates. This improved survival is likely to be related to earlier detection[11] or to the availability of more optimal treatment.

Health inequalities causing health inequity within Europe are an important issue that is receiving growing attention. People with a lower level of education and a lower socioeconomic class are known to have a higher prevalence of most types of health problems.[12] Health care inequalities between the European countries will also lead to health inequity within the European Union (EU). Health policy-making in the EU is firmly guided by the principle of subsidiarity. The harmonization of national laws is specifically excluded in Article 129 of the EU Treaty.[12] This leads to disparities in health care between the countries as a result of social, financial and scientific differences. Less economically developed and scientifically advanced European countries may offer their citizens reduced access to health services for diagnosis and treatment with less emphasis on health education and disease prevention. In contrast, more economically developed European countries may provide their patients with a variety of benefits including improved health education, easier access to health care, better diagnostic tools and more treatment options, all of which will positively influence outcomes.

It is established that early detection and adequate treatment are of paramount importance to the course and prognosis of a patient with skin cancer, especially CMM. Consequently, less medical provision for skin cancer or inadequate access to such provision may cause not only discomfort and potential disfigurement, but can in some cases threaten a patient's life.

Materials and methods

The EPIDERM project investigating skin cancers across Europe[13] has identified and confirmed variations in skin cancer incidence[14,15] and treatment[16] that exist between the participating centres. These variations may be attributed to inherent differences in the populations under study (for example skin colour, dietary variations, sun exposure practices etc.) but may also reflect diversity between the NHSs in each country.

Our objective was to explore these variations using the EPIDERM consortium to investigate local policies regarding access to health care, diagnosis and treatment for common skin cancers across Europe. We chose to focus on the skin cancer patient and the 'journey' that he or she has to undertake in order to receive a diagnosis and reach the most appropriate treatment. All aspects were examined from the patient's perspective as we were striving to discern all the potential constraints and obstacles a skin cancer patient might face, from diagnosis to treatment.

Partners from the participating countries were asked to provide information on the availability (number) of dermatologists, the referral pathway [direct access or referral via the general practitioner (GP)], the waiting time for appointment (urgent and nonurgent; private and NHS), the need for health insurance, the costs for the patient (private and NHS), the possibility of reimbursement, the availability of different treatment options, the costs (to the patient) of different treatment options, the skin cancer follow-up policy, potential obstacles for the skin cancer patient, within-country variations in practice and the ability (or not) of the patient to buy skin cancer treatments over the counter and effectively self-medicate.

The countries that were involved in this investigation were the EPIDERM Partner countries (in alphabetical order): Finland, Germany, Greece, Italy, Malta, Poland, Spain, the Netherlands and the U.K. Romania also participated in the investigation as we wanted to have information from an additional Eastern European country. The individual participants provided responses following local and national enquiries and each holds complete responsibility for the given answers in the different countries.

Results

Availability of dermatologists

In Table 1, the numbers of dermatologists and GPs are depicted by country as well as the ratio of dermatologists to population and the ratio of dermatologists to GPs.

The first discrepancy between countries was the method for calculating these numbers and allocation of persons considered to be contributory members of the dermatological workforce. For example, in some countries the trainees (residents specializing in dermatology) see patients by themselves and are considered a part of the workforce, while in other countries trainees are not allowed to consult by themselves and therefore their numbers are not included. In the U.K., the British Association of Dermatologists has calculated that 191 trainees in dermatology are equivalent to 40 full-time consultants and thus 120 full-time equivalents (573 trainees) have been added

Table 1 Total number and ratio of dermatologists and general practitioners (GPs) per 100 000 population per country

Country	Number of dermatologists	Dermatologists per 100 000 population	Number of GPs	Ratio of dermatologists to GPs
Finland	192	3·6	3506	1:18
Germany	5314	6·5	43 103	1:8
Greece	1297	11·4	1300	1:1
Italy	5000	8·2	59 000	1:12
Malta	12	3	307	1:26
Poland	2500	6·5	15 000	1:6
Romania	591	2·7	11 000	1:19
Spain (NHS only)	1304	2·9	38 913	1:30
Netherlands	449	2·7	8921	1:20
U.K.	647	1	36 845	1:57

NHS, national health care system. Greece, Malta and U.K. have included specialist trainees. Other countries do not include their trainees because trainees never see the patients independently. Malta has included one higher specialist trainee in dermatology. Greece has included both residents and specialists (GPs and dermatologists), as in Greece trainees examine patients regularly. In the U.K. the total number of dermatologists is calculated as the sum of whole-time equivalent consultant dermatologists. Senior specialist trainees will see patients independently whereas junior trainees will tend to be supervised. The British Association of Dermatologists has calculated that 191 specialist trainees are equivalent to 40 full-time consultants. Romania has included both residents and specialists in dermatology.
Sources: *Finland* Finnish Medical Association. *Germany* Number of actively working physicians in Germany 2010: http://www.bundesaerztekammer.de/specialdownloads/Stat10Abb03.pdf (last accessed 13 April 2012). Number of inhabitants in Germany: approximately 82 million (Statistisches Bundesamt): https://www.destatis.de/DE/ZahlenFakten/ZahlenFakten.html (last accessed 12 April 2012). *Greece* Hellenic Society of Dermatology and Venereology, Hellenic Society of General Practitioners. *Italy* FIMMG, Italian Federation of General Practitioners. *Romania* General population: 21 431 298 at 1 July 2010 (Centrul National de Statistica. *Romania in Cifre*): http://www.insse.ro/cms/files/publicatii/Romania_in%20cifre%202011.pdf (last accessed 20 November 2011). Dermatologists: 591 at 31 December 2010 (Romanian Society of Dermatology): http://www.srd.ro (last accessed 20 November 2011). GPs: 11 000 at 25 March 2011 (Ministry of Health – Romania): http://www.ms.ro (last accessed 20 November 2011). *Spain* Ministry of Health, 2009. 'Offers and needs of the medical specialists in Spain (2008–2025)'. *Netherlands* NIVEL, Nederlands Instituut voor Onderzoek van de Gezondheidszorg: http://www.nivel.nl/ (last accessed 13 April 2012) and personal communication with the Dutch Society of Dermatology and Venereology.

to the 527 existing specialists to arrive at a total number of 647 dermatologists. Furthermore, in the U.K. among the 36 845 GPs there are 1400 GPs with a special interest (GPSIs) in dermatology. These GPs will do at least one clinic per week of only dermatology, some may do more, and thus they are also contributing to the dermatological workforce. The density of dermatologists differed considerably in the different European countries (Table 1). The dermatologists available per 100 000 population range from 1 (U.K.) to 11·4 (Greece), and the ratio between dermatologists and GPs varies from 1:1 (Greece) to 1:57 (U.K.).

Ease of access to a dermatology consultation

Between-country variations relating to a consultation with a dermatologist are presented in Table 2. Direct access to dermatology is only available in Greece and Poland, although in Romania cases considered by the patient to be urgent also have direct access without a referral. In all other countries, a GP referral is needed before a patient can see a dermatologist in the NHS. The NHS consultation prices in hospitals range from no charge to the patient (Malta, Poland, Spain, U.K.) to €27 in Central or University Hospitals in Finland. In Finland, Germany, Greece, Poland and the Netherlands, health insurance is obligatory, whereas in Italy, Malta, Spain and the U.K. it is not required and in Romania it is not needed for emergency cases.

The costs of a consultation in private dermatology also vary significantly between countries. The most expensive private consultations were reported in Italy where the price of a simple first consultation might reach €250 (Table 2).

There are also inequalities in waiting times between the different partner countries. In most cases when a patient is referred by the GP as urgent (or in some countries presents him/herself as an emergency) the medical examination will be scheduled within the same or the next day. In Spain there is a 48–72 h waiting time with the use of teledermatology and the U.K. has the longest waiting time of up to 2 weeks for an urgent appointment. For a standard appointment waiting time also varies. The longest waiting period is in Malta where a patient might wait 2–4 months for a routine appointment and the shortest one is in Romania where a patient referred by a GP, even if not classified as an emergency, is seen on the same day. In Malta and the U.K., when a GP requests that a patient is seen 'soon', there is an intermediate waiting time: in Malta the patient is seen in 1–2 weeks instead of waiting 2–4 months, whereas in the U.K. the maximum waiting time is reduced from 13 weeks to 8 weeks.

In Greece patients can buy any medication, with the exception of strong painkillers/morphine derivatives and antidepressive drugs, without prescription from the pharmacy. In Romania, patients can access some drugs without a prescription if for an 'urgent' problem, whereas in all other countries a medical prescription is necessary to obtain any drug from the

Table 2 Referral pathway to the dermatologist: variations between countries

Country	Route of access to dermatology (NHS)	Costs of first visit (NHS)	Costs private dermatology appointment	Waiting time		Medical insurance	Medication without prescription	Uniformity within country
				Urgent	Nonurgent			
Finland	Referred by GP or private dermatologist or other specialist	€13 (first three visits/year), communal health centres; €27, central/ university hospitals	€60–80	1 week (same day if emergency)	2–6 weeks	Obligatory (national)	N/A	Uniform
Germany	Referred by GP	€10 to a GP every 3 months	Approximately €25–50 (higher prices depending on procedures; e.g. dermoscopy, digital mole mapping)	Same day	Variable	Obligatory	N/A	Differences between the two health systems in Germany. Differences between large cities/small cities and countryside
Greece	Direct access	€5	€30–100	Same day	3–4 weeks	Obligatory	Available all	Differences between large/small cities, among hospitals
Italy	Referred by GP	€18 (free if > 65 years)	€90–250 for first visit and €70–150 for control	Next day	2 months	Not necessary	N/A	Not uniform
Malta	Referred by GP	Patient does not pay	€25–50	Same day	2–4 months (1–2 weeks if 'soon')	Not necessary	N/A	Uniform
Poland	Direct access	Patient does not pay	€25–40	Same day	4 weeks	Obligatory	N/A	Uniform
Romania	Direct access in emergencies + referred by GP	€8·13. However, patient does not pay if referred or emergency	€25–40	Same day	Same day	Not necessary; only for emergencies	Available only if emergency	Uniform
Spain	Referred by GP	Patient does not pay	€50–200 (there are no price limits)	48–72 h with teledermatologist	< 15 days (3–5 days for CMM)	Not necessary	N/A	Differences between small and large cities
Netherlands	Referred by GP	Patient does not pay	Patient does not pay	Same or next day	2–4 weeks	Obligatory	N/A	Uniform
U.K.	Referred by GP	Patient does not pay	£100–200	2 weeks	13 weeks (8 weeks if 'soon')	Not necessary	N/A	No charge for prescription in Scotland

NHS, national health care system; GP, general practitioner; N/A, not available; CMM, cutaneous malignant melanoma.

pharmacy other than drugs listed as over-the-counter drugs, which do not include drugs used for treatment of skin cancer.

There are also within-country variations in health care provisions. In Germany, two distinct health care systems exist with different management of patients, while there are also differences between large and small cities and the countryside. Greece, Italy and Spain also report differences across hospitals and cities whereas the remaining countries report largely homogeneous NHSs.

Availability and costs of diagnosis and skin cancer treatments

The mainstay for skin cancer treatment is surgical excision. In all countries patients may have a skin cancer surgically excised without paying an additional fee for its removal because the NHS or medical insurance policies will cover the actual costs (data not shown). The exception is Greece where some national health insurances do not cover beforehand the surgical and histological costs for excision of a primary tumour of the skin in an ambulatory setting and the patient has to pay prior to the operation and afterwards apply for reimbursement. Classic surgical excisions and use of grafts and flaps are available throughout Europe as well as CMM-specific surgical procedures (wide local excision and sentinel lymph node biopsy) although they are not always performed by dermatologists; in some countries these are performed by plastic or oncology surgeons. Furthermore, Mohs micrographic surgery is not universally available: in Greece, Malta, Poland and Romania (except for some research centres) the Mohs technique is not performed (data not shown).

Diagnostic tools such as dermoscopy and mole mapping are available throughout Europe with the exception of Malta and Poland for mole mapping (Table 3). In most countries, dermoscopy is included in the consultation fee or is offered free. In Germany, a patient with public insurance pays €16 for dermoscopy; in Romania s/he pays €10 but only in private practice; whereas in Italy patients pay €18 before the procedure, but if a skin cancer is confirmed they are ultimately reimbursed. Mole mapping is also free in several countries: in Greece, the price depends on the centre (Papageorgiou Hospital €75); in Italy, patients pay €36 which again is reimbursed if diagnosed with skin cancer; in Germany, all patients with public insurance pay €80; and in Romania, although free in the NHS, the high sum of €585 is charged for mole mapping in private practice.

The nonsurgical treatments cryotherapy and topical 5% imiquimod cream (Aldara®, MEDA, Brussels, Belgium) are available in all countries included in this survey, although the prices paid by the patients vary. Other topical therapies such as diclofenac gel 3% (Solaraze®, Almirall, Barcelona, Spain), 5-fluorouracil cream (Efudix®, MEDA, Brussels, Belgium) and photodynamic therapy (PDT) are available in Europe, but not in all countries. Furthermore, there is no charge to patients in some countries while in others they must contribute to the costs of these treatments. The actual (official) prices of the drugs differ as well (Table 4), reflecting further variation in the costs incurred by the different health systems.

The official indications for these topical skin cancer treatments are broadly equivalent. For example, imiquimod is licensed in all countries for AK and superficial BCC (sBCC), whereas PDT cream (Metvix®, Galderma, France) is licensed for AK, sBCC, *in situ* SCC and usually for nodular BCC as well. In Romania, PDT exists only as a research modality at limited dermatological centres where it is used in clinical trials. In Poland, PDT is not performed, whereas in Malta it is available only in private practice.

Follow-up

Follow-up practices also vary between the participating countries and are summarized in Table 5. In some countries (Finland, Spain) there are national guidelines for CMM follow-up, but not for BCC or SCC. In others (Netherlands, Germany and U.K.) national guidelines exist for all three cancers. Yet other countries (Italy and Malta) report adherence to the American or the U.K. guidelines for CMM. In general, Breslow thickness is the most important factor influencing CMM follow-up in all countries, although the precise protocol varies. For BCC, no follow-up is practised in some countries (Malta, Spain) and for SCC there are many differences between the proposed schedule of follow-up visits proposed in the different countries.

Discussion

This report has several limitations. Firstly, the data were collected from the patient's perspective from physicians practising in the participating countries and not from the national health care authorities. Without the exact prices for reimbursement of the various treatments, we cannot address actual costs of skin cancer to the different health systems. Secondly, we could compare drug prices among the nonsurgical therapies, but the reimbursement cost as well as the true cost of cryotherapy, the most commonly used nonsurgical modality,[16] were difficult to obtain and could not be compared across Europe. Finally, we did not investigate metastasis scenarios despite the importance of these for patient survival, because in several countries (including the U.K., Greece and the Netherlands) metastatic melanoma is in the domain of the oncologists, making it impractical to address this within the framework of this report.

Recently Patricia Garcia-Prieto Chevalier, a melanoma stage IV patient and founder of the Melanoma Independent Community Advisory Board, stated in her talk in the European parliament that: '…many of the existing hurdles confronted by cancer patients in Europe exist because *we have simply forgotten WHY*… Efforts from politicians, pharmaceutical industry and even doctors are focused on HOW, how to reduce the burden on cancer costs, how to find blockbuster drugs faster and bring them to the market quicker, how to enhance overall survival no matter what... If patients are recognized at the centre of the debates and are actually communicated with, we might all just remember WHY?'.

In an attempt to keep the patient centre stage, this report has focused on the skin cancer 'journey' from the perspective

Table 3 Availability and costs of skin cancer diagnosis and nonsurgical treatments per country (national health care systems only)

Country	Dermoscopy	Access and costs of mole mapping	5-Fluorouracil cream	5% imiquimod	Diclofenac	Cryotherapy	Photodynamic therapy
Finland	Included in consultation fee	Included in consultation fee	N/A	€87[a]	€177[a]	Included in consultation fee	Included in consultation fee
Germany[b]	€16	€80	Prescription charge[b]	Prescription charge[b]	Prescription charge[b]	Included in consultation fee	Tube of Metvix® €404·58/€100 per session[b]
Greece	Included in consultation fee	Depending on centre[c]	N/A	Patient does not pay[d]	N/A	€40	Cream free for the patient[d]/session cost depends on centre[c]
Italy	Patient does not pay[e]	Patient does not pay[e]	Galenic form only	Patient does not pay	€36·72[f]	Patient does not pay[f]	Patient does not pay[f]
Malta	Patient does not pay	N/A[g]	€32·87	€62·96	N/A	Patient does not pay	N/A[h]
Poland	Included in consultation fee	N/A	€25	€70	N/A	Patient does not pay	N/A[h]
Romania	Patient does not pay	Patient does not pay[i]	Patient does not pay	€52[j]	N/A	Patient does not pay	Patient does not pay[i]
Spain	Patient does not pay	Patient does not pay	Galenic form only	€112[k]	N/A[l]	Patient does not pay	Patient does not pay[m]
Netherlands[n]	Patient does not pay	Patient does not pay	Patient does not pay	Patient does not pay	Patient does not pay	Patient does not pay	Patient does not pay
U.K.	Patient does not pay	Patient does not pay	Prescription charge[o]	Prescription charge[o]	Prescription charge[o]	Patient does not pay	Patient does not pay

N/A, not available. [a]This is the official pharmacy price of the drug. In Finland the reimbursement from the National Health Insurance is very complicated and depends on many factors and categories. Thus, the reimbursement varies. In addition, if a patient's 'out-of-pocket' medicine expenses in a calendar year exceed the threshold of €672·70, the exceeding part is reimbursed in full. [b]In Germany there are two forms of health insurance: public and private. Dermoscopy, mole mapping and photodynamic therapy are not covered by public insurance and in the nationwide skin cancer screening are covered by private insurance only, whereas 5-fluorouracil cream, 5% imiquimod and diclofenac gel are covered by insurance in both systems. There is also a prescription charge (€5–10), even if the cost of the prescribed substance is covered by insurance. [c]For instance, in Papageorgiou Hospital located in Thessaloniki mole mapping costs €75 and a session of photodynamic therapy costs approximately €40. [d]In Greece with prescription for appropriate indication the patient does not pay. [e]In Italy the patient pays €18 for demoscopy and €36 for mole mapping, but if s/he is diagnosed with skin cancer the money is reimbursed. [f]In Italy these costs apply only for the right indications. Diclofenac and cryotherapy are indicated only for actinic keratosis, whereas photodynamic therapy is indicated for actinic keratosis, superficial basal cell carcinoma and Bowen disease. [g]In Malta, mole mapping is available at a charge of €75 within a private clinic but not at the Department of Dermatology. This service is also available free of charge at this private clinic on referral one day monthly. [h]Available in private practice: in Malta it costs €375 per session and in Poland €200 per session. [i]In Romania mole mapping and photodynamic therapy are available only in few dermatological national health care system research units. [j]In Romania 50% of the price of 5% imiquimod is reimbursed if the patient has medical insurance. [k]Imiquimod 5% is free for those over retirement age in Spain. [l]In Spain diclofenac is not available at the moment, but it has been approved and will be available shortly (by December 2011). [m]In Spain one tube of Metvix® cream costs €233, but is reimbursed to the patient. [n]All approved treatments for skin cancer are paid by the insurance. The patient does not pay for anything directly. [o]In the U.K. (except for Scotland) prescription charge is £7·40 for all prescriptions. There is no prescription charge in Scotland.

Table 4 Differences between countries in official prices of topical drugs for skin cancer treatment

Country	5-fluorouracil cream (Efudix®)	5% imiquimod cream (Aldara®) (one box with 12 sachets)	Diclofenac gel 3% (Solaraze®)	Methyl aminolaevulinate cream (Metvix®) (one tube: 2 g)
Finland	N/A	€87·05	€177·76/100 g	€336·76
Germany	€54·74	€101·61	€72·49/40 g €122·76/90 g	€404·58
Greece	N/A	€62·96	N/A	€330·62
Italy	Galenic form only	€76·56	€36·72/25 g	€387·27
Malta	€32·87	€62·96	N/A	N/A
Poland	€25	€70	N/A	N/A
Romania	€27	€52	N/A	€561
Spain	Galenic form only	€112	N/A	€233
Netherlands	€20·57	€59·99[a]	N/A	€297·75
U.K.	£32·73/40 g	£48·34	£38·30/50 g £76·60/100 g	£238·80

N/A, not available. [a]In the Netherlands Aldara® is not sold as a box of 12 sachets. However, 12 sachets are often prescribed, as the treatment is three times a week for 4 weeks ($3 \times 4 = 12$).

of the patient and has examined differences existing across Europe that might hinder early diagnosis and optimal treatment of skin cancer. This report is an attempt to examine skin cancer care across Europe and it has revealed several important variations despite the limitations stated above. These differences are of critical importance where they relate to the waiting time for an expert skin consultation. Delayed diagnosis may directly impact on outcome for those skin cancers where the only curative treatment is early diagnosis and timely surgical excision. Also influential is the role of the GP in the management of skin cancers in many European countries. Where the waiting time to be seen by a specialist is dependent on an urgent referral by the GP (Finland, Germany, Italy, Malta, Netherlands and U.K.), it becomes critically important that the GP has had sufficient training to recognize skin lesions that are suspicious of CMM or SCC. This requires a level of training that is not reliably achieved in most health services and highlights an area of need. GPs are needed to triage referrals in health care systems where there is a shortage of dermatologically trained specialists. In countries like the U.K. where there are few dermatologists per head of population (U.K.: one dermatologist per 100 000 population; one for every 57 GPs), it may be necessary to invest in dermatological training for GPs. In the U.K. there are 1400 GPSIs in dermatology who have received additional training to try and compensate for this shortage in dermatologists. Despite this increased resource, there is still perceived a need to improve the diagnostic accuracy of GP referrals via the 'urgent' pathway.

There is also considerable variability in the cost and availability of some skin cancer treatments across Europe. In some European countries newer treatments such as PDT are either very expensive for patients (Germany) or not available (Poland and Malta). Similarly, Mohs micrographic surgery, which is the gold standard for optimal treatment of some difficult cases of primary and recurrent BCC and SCC, does not exist in some European countries because of its expense. As predicted, treatment availability and treatment costs are greatly influenced by the financial prosperity of specific countries. This will inevitably produce health inequities across Europe.

Follow-up of the different skin cancers similarly varies between countries. It is assumed there will be survival benefit to patients on a more intensive follow-up schedule or with the use of more sophisticated diagnostic tests, but as yet no comparative study has assessed the cost-effectiveness of the different follow-up schedules.

In conclusion, this report highlights variations in skin cancer management across Europe. This provides a better insight into health disparities, both in the accessibility of specialists and in the provision and costs of treatment. A more detailed study based on data taken directly from the respective NHSs is now needed if we are to appreciate fully the variations between countries and start the work that is needed to overcome these health inequities. Such data will provide better estimates of treatment-related costs and these, together with cost-benefit analyses and an evidence base for treatment choices, should ultimately result in improved strategies against skin cancer.

What's already known about this topic?

- There have been previous publications on health inequalities within Europe as well as articles examining diagnostic tools and therapeutic strategies for skin cancer in major European countries.

What does this study add?

- This is the first multicentre attempt to collect comprehensive information on diagnosis, examination, treatment and costs for a skin cancer patient from 10 European countries, together with the different strategies and protocols followed in these countries.

Table 5 Follow-up guidelines for basal cell carcinoma (BCC), squamous cell carcinoma (SCC) and cutaneous malignant melanoma (CMM) in different European countries

	Skin cancer		
Country	BCC	SCC	MM
Finland	Follow-up appointment 6 months after excision and every 6–12 months up to 2 years (high-risk tumours by dermatologists), and then annually up to 4–5 years in health centres	Follow-up appointment 3 months after excision and every 3–6 months up to 2 years (high-risk tumours by dermatologists)	Finnish guidelines:[17] follow-up every 3–6 months, depending on Breslow thickness; duration of follow-up 2–5 years depending on depth of melanoma + sentinel node status; full skin + lymph node examination at every visit
Germany	German guidelines:[18–20] once yearly for at least 3 years[a]	German guidelines:[18–20] high-risk SCC: every 3 months for 2 years; low-risk SCC: every 6 months for at least 4 years[a]	German guidelines:[18–20] I, < 1 mm: every 6 months (1–5 years), every 12 months (6–10 years); I + II, > 1 mm: every 3 months (1–5 years), every 6–12 months (6–10 years); III [includes all forms of local and regional metastasis. The new AJCC stage IIC (> 4 mm tumour thickness and ulceration) should be followed as for stage III, as the prognosis is similar], every 3 months (1–5 years), every 6 months (6–10 years); IV, individualized[a]
Greece	Follow-up appointment after excision to discuss the histology report	Follow-up appointment after excision to discuss the histology report	Every 3 months for 2 years, then every 6 months for a total of 5 years, although this can be dependent on Breslow thickness
Italy	Follow-up appointment after excision to discuss the histology report + clinical control after 6 months of tumour excision	Follow-up appointment after excision to discuss the histology report + regional nodes echography and chest X-ray + first control after 6 months	Usually every 6 months for 5 years (Breslow thickness, CT–PET body scan, chest X-ray, ecographic evaluation of nodes). American guidelines[21,22b]
Malta	Follow-up appointment after excision to discuss the histology report	Follow-up appointment after excision to discuss the histology report. If multiple AKs and SCCs, follow-up depends on nature of SCC, number of AKs and immunosuppression	U.K. guidelines[23]
Poland	One visit after 1 year	Two visits per year	Usually every 3 months for 3 years (staging and treatment modality)[c]
Romania[24]	Follow-up appointments monthly for 3 months (first appointment includes discussion of the histology report) + follow-up appointments at 3 months for 1 year	Follow-up appointments monthly for 3 months (first appointment includes discussion of the histology report) + follow-up appointments at 3–6 months for the next 3 years	Follow-up appointments monthly for 3 months (first appointment includes discussion of the histology report) + follow-up appointments at 3–6 months for the next 5 years + yearly follow-up appointments
Spain	No routine follow-up[d]	SCC on H-zone: every 4–6 months for 3 years	Spanish Guidelines:[25] stage 0: follow-up every 6 months for the first 3 years; IA: follow-up every 6 months for the first 2 years, then every year for the next 3 years; IB–IIB: follow-up every 4 months for the first year, every 6 months for the next 2 years and yearly until the fifth year. Lymph node sonography performed yearly. IIC–III: follow-up every 4 months for the first 2 years, every 6 months for the next 3 years and yearly afterwards. Lymph node sonography performed yearly, PET performed yearly for the first 3 years and CT yearly afterwards. IV: management depends on the patient

Table 5 Continued

	Skin cancer		
Country	BCC	SCC	MM
Netherlands	One BCC: no follow-up visits necessary; more than one or high-risk BCCs: follow-up once a year. However, frequency is not strictly determined in the Dutch guidelines (depends on the patient, e.g. transplant patients probably seen more often than once a year)	Follow-up for high-risk SCC: 1st year, once every 3 months; 2nd year, once every 4 months; 3rd year, once every 6 months; 4th and 5th years, once a year. Follow-up for low-risk SCC: in the first two years, once every 6 months; 3rd–5th year, once a year	Depends on the Breslow thickness. ≤ 1 mm: one control visit, 1 month after the treatment of the primary melanoma. The patient can than ask questions and be instructed for self-examination. > 1 mm: 1st year, once per 3 months; 2nd year, once per 4 months; 3rd–5th year, once per 6 months. > 2 mm: 6th–10th year: once a year in addition.[e]
U.K.[f]	BAD guidelines:[26] self-monitoring or follow-up by GP for low-risk BCC. Follow-up annually for 3 years within primary or secondary care if high-risk or recurrent BCC or multiple BCC	BAD guidelines:[27] self-monitoring or follow-up by GP for low-risk SCC. High-risk SCC seen every 4–6 months for 2–5 years depending on tumour factors (tumour depth, histological subtype) and patient factors (immunosuppression, recurrent tumour)	U.K. guidelines:[23] stage IA patients should have 2–4 visits over up to 12 months to teach self-examination; stage IB–IIIA, 3-monthly for 3 years, then 6-monthly to 5 years; stage IIIB and IIIC and resected stage IV, 3-monthly for 3 years, then 6-monthly to 5 years, then annually to 10 years; unresectable stage IV, seen according to need

N/A, not available; AJCC, American Joint Committee on cancer; AKs, actinic keratoses; CT, computed tomography; PET, positron emission tomography; BAD British Association of Dermatologists; GP, general practitioner. [a]German guidelines are also available at: http://www.ado-homepage.de). [b]Melanoma staging according to 2009 AJCC staging system.[22] [c]In Poland patients with CMM are treated at the Oncological Hospitals. [d]In Spain dermatologists train patients to self-examine. [e]In the Netherlands thin melanomas require one control visit once per month after treatment of the first melanoma. [f]In the U.K. dermatologists train patients to self-examine and follow-up practices vary slightly in different centres. Most thin melanomas are followed for 1–2 years, whereas thicker melanomas are followed for 5 years and metastatic melanoma for up to 10 years.

References

1 de Vries E, Bray F, Coebergh JWW *et al.* Changing epidemiology of malignant cutaneous melanoma in Europe 1969–1997: rising trends in incidence and mortality, but recent stabilisations in Western Europe and decreases in Scandinavia. *Int J Cancer* 2003; **107**:119–26.

2 Trakatelli M, Ulrich C, del Marmol V *et al.* Epidemiology of nonmelanoma skin cancer (NMSC) in Europe: accurate and comparable data are needed for effective public health monitoring and interventions. *Br J Dermatol* 2007; **156** (Suppl. 3):1–7.

3 Lucas R, McMichael T, Smith W *et al. Solar Ultraviolet Radiation. Global Burden of Disease from Solar Ultraviolet Radiation*. Environmental Burden of Disease Series No. 13. Geneva: World Health Organization, 2006.

4 Housman TS, Feldman SR, Williford PM *et al.* Skin cancer is among the most costly of all cancers to treat for the Medicare population. *J Am Acad Dermatol* 2003; **48**:425–9.

5 Boyle P, Dore JF, Autier P *et al.* Cancer of the skin: a forgotten problem in Europe. *Ann Oncol* 2004; **15**:5–6.

6 Reyes-Ortiz CA, Goodwin JS, Freeman JL. The effect of socioeconomic factors on incidence, stage at diagnosis and survival of cutaneous melanoma. *Med Sci Monit* 2005; **11**:RA163–72.

7 Mudigonda T, Pearce DJ, Yentzer BA *et al.* The economic impact of non-melanoma skin cancer: a review. *J Natl Compr Canc Netw* 2010; **8**:888–96.

8 Cancer Research UK. *Skin Cancer – Survival Statistics*. 2009. Available at: http://info.cancerresearchuk.org/cancerstats/types/skin/survival/ (last accessed 12 April 2012).

9 ISD Scotland. *Cancer Statistics. Skin Cancer*. 2010. Available at: http://www.isdscotland.org/Health-Topics/Cancer/Cancer-Statistics/ (last accessed 13 April 2012).

10 de Vries E, Boniol M, Dore JF *et al.* and EUROCARE Working Group. Lower incidence rates but thicker melanomas in Eastern Europe before 1992: a comparison with Western Europe. *Eur J Cancer* 2004; **40**:1045–52.

11 Mackenbach JP. *Health Inequalities: Europe in Profile. An Independent, Expert Report Commissioned by the UK Presidency of the EU*. 2006. Available at: http://ec.europa.eu/health/ph_determinants/socio_economics/documents/ev_060302_rd06_en.pdf (last accessed 12 April 2012).

12 Jakubowski E, Busse R. *Health Care Systems in the EU. A Comparative Study*. 1998. Available at: http://www.europarl.europa.eu/workingpapers/saco/pdf/101_en.pdf (last accessed 12 April 2012).

13 de Vries E, Trakatelli M, Kalabalikis D *et al.* Known and potential new risk factors for skin cancer in European populations: a multicentre case–control study. *Br J Dermatol* 2012; **167** (Suppl. 2):1–13.

14 de Vries E, Micallef R, Brewster DH *et al.* Population-based estimates of the occurrence of multiple vs first primary basal cell carcinomas in 4 European regions. *Arch Dermatol* 2012; **148**:347–54.

15 Karim-Kos HE, de Vries E, Soerjomataram I *et al.* Recent trends of cancer in Europe: a combined approach of incidence, survival and mortality for 17 cancer sites since the 1990s. *Eur J Cancer* 2008; **44**:1345–89.

16 Ferrandiz L, Ruiz-de-Casas A, Trakatelli M *et al.* Assessing physicians' preferences on skin cancer treatment in Europe. *Br J Dermatol* 2012; **167** (Suppl. 2):29–35.

17 Working group set up by the Finnish Medical Society Duodecim and the Chirurgi Plastici Fenniae. *Melanoma. Current Care Summary*. 2012. Available at: http://www.kaypahoito.fi/web/kh/suositukset/naytaartikkeli/tunnus/ccs00017 (last accessed 12 April 2012).

18 Hauschild A, Breuninger H, Kaufman R *et al.* Short German guidelines: basal cell carcinoma. *J Dtsch Dermatol Ges* 2008; **6** (Suppl. 1):S2–4.

19 Breuninger H, Bootz F, Hauschild A *et al.* Short German guidelines: squamous cell carcinoma. *J Dtsch Dermatol Ges* 2008; **6** (Suppl. 1):S5–8.

20 Garbe C, Schadendorf D, Stolz W *et al.* Short German guidelines: malignant melanoma. *J Dtsch Dermatol Ges* 2008; **6** (Suppl. 1):S9–14.

21 Bichakjian CK, Halpern AC, Johnson TM *et al.* Guidelines of care for the management of primary cutaneous melanoma. *J Am Acad Dermatol* 2011; **65**:1032–47.

22 Balch C, Gershenwald J, Soong SJ. Final version of 2009 AJCC melanoma staging and classification. *J Clin Oncol* 2009; **27**:6199–206.

23 Marsden JR, Newton-Bishop JA, Burrows L *et al.* Revised U.K. guidelines for the management of cutaneous melanoma 2010. *Br J Dermatol* 2010; **163**:238–56.

24 Ministry of Health (Romania). *Guidelines for Dermato-venereologic Diseases*. Available at: http://www.ms.ro/?pag=181&pg=2 (last accessed 12 April 2012).

25 de la Cruz Merino L, Moreno-Ramirez D, Ferrandiz Pulido L *et al. Guia de Diagnóstico y Tratamiento del Melanoma*. Seville: Hospital Virgen Macarena, 2009.

26 Telfer NR, Colver GB, Morton CA. Guidelines for the management of basal cell carcinoma. *Br J Dermatol* 2008; **159**:35–48.

27 Motley RJ, Preston PW, Lawrence CM. *Multi-professional Guidelines for the Management of the Patient with Primary Cutaneous Squamous Cell Carcinoma*. 2009. Available at: http://www.bad.org.uk/Portals/_Bad/Guidelines/Clinical%20Guidelines/SCC%20Guidelines%20Final%20Aug%2009.pdf (last accessed 13 April 2012).

Appendix 1

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