

# 5 Dermatology

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HC Williams

## 1 Summary

### Introduction

This chapter sets out the major issues which health service purchasers need to consider in specifying services for people with skin problems. Skin disease is very common, affecting around one-quarter to one-third of the population. Apart from being the largest organ in the body, the skin has a vital social function and relatively minor skin complaints often cause more anguish to people than other more serious medical disorders. With the exception of melanoma skin cancer, the majority of skin diseases are not life threatening. However it is the product of this morbidity multiplied by the high prevalence of skin disease which results in a large burden of disease in absolute terms. Small changes in health policy could have large health and financial implications simply because they affect so many people.

### Increase in future demand

Demand for dermatological services is likely to increase over the next decade for the following reasons.

- 1 **There is a large iceberg of unmet dermatological need** Previous surveys have suggested that approximately one-quarter of the population has a skin problem which could benefit from medical care, yet about 80% do not seek medical help. With increased public and professional awareness of effective treatment this submerged sector of the population is likely to surface and place heavy demands on the current system.
- 2 **The prevalence of some of the commonest skin diseases is increasing** Three of the commonest and most costly skin diseases, viz skin cancer (a Health of the Nation target), atopic eczema and venous ulcers are becoming more common and are set to consume a higher proportion of scarce resources within future health services budgets.
- 3 **The distinction between skin disease and 'cosmetic' skin problems is unclear** Even a small reduction in the threshold of what the public and health professionals regard as a skin complaint worthy of medical attention could lead to a large increase in future dermatology service requirements. The division between what constitutes reasonable need (e.g. somebody worried that a mole may be cancerous) and demand (e.g. somebody requesting removal of an 'ugly' mole) is especially blurred in dermatology.

### **Over 1000 skin diseases**

Making generalizations about the need for dermatology services is difficult with such a vast range of disorders. Fortunately around 70% of the dermatological workload in primary and secondary care in the UK is currently taken up by just nine categories of skin disorders and effective treatments are available at low cost for the majority of these. The disorders covered include:

- skin cancer
- acne
- atopic eczema
- psoriasis
- viral warts
- other infective skin disorders
- benign tumours and vascular lesions
- leg ulceration
- contact dermatitis and other eczemas.

### **Priorities in ensuring a quality future service**

Most people with skin diseases can be treated in the community but some will always require specialist services because of diagnostic difficulties or disease severity. Many skin diseases, especially skin cancer, are theoretically preventable but prevention programmes have not yet been evaluated adequately. There is reasonably good evidence to support the effectiveness of most treatments used for the common skin disease sub-categories. Less is known about the differential health gain of specialists versus generalists in the diagnosis and treatment of common skin diseases. The diagnosis and surgical removal of skin cancer is best carried out by, or with the involvement, of dermatologists. Retention of a central core of hospital-based dermatological medical and nursing expertise is essential and there is considerable scope for improving and expanding links between specialist and community services to provide seamless care for patients and for developing strategies aimed at disease prevention. Three models of health care are considered in this chapter in relation to dermatology services.

- 1 The current system which offers the least flexibility to predicted future trends in need and demand.
- 2 A model where dermatologists conduct community 'outreach' clinics; an approach of unproven benefit to patients which would require a costly four-fold increase in dermatologists.
- 3 A hybrid model consisting of hospital-based dermatology assessment centres, community-based treatment centres run by dermatology nurses accountable to district dermatology liaison teams and shared care clinics for common chronic skin diseases seen in primary care. This model offers the most flexibility and potential health gain building on local skills for a modest investment.

Despite the magnitude of skin disease morbidity in the general population, health services research for dermatological disorders has been minimal. Urgent research into the prevalence, incidence and cost of skin diseases is required in order to formulate public health strategies to respond to the impending crisis of increased demand for services. Public involvement in distinguishing between need and demand is crucial and this may vary considerably throughout the UK according to the demographic mix of the population.

## 2 Introduction and statement of the problem

### General approach

The main purpose of this chapter is to help health care purchasers to develop purchasing plans for dermatology based on epidemiological data. Attempting to cover the entire range of a thousand or so dermatological diseases is akin to trying to cover the whole of general medicine in a single chapter. Each of the sub-categories of skin disease mentioned here merits a chapter in its own right because of the high prevalence and economic importance of each of these disease groups. However dermatology services have traditionally been considered as a single group and an attempt will be made to provide an overview of skin diseases in general at the expense of some loss of detail for individual skin diseases. Despite the high prevalence of skin disease no NHS reports have ever been commissioned for skin disease and the inclusion of skin disease in this volume is to be welcomed as a promising start.

### What is dermatology?

Dermatology is the study of the skin and associated structures such as hair and nails. The skin is not a simple inert covering but a sensitive dynamic boundary between ourselves and the outside world. Its functions include defence against infections and infestations, protection against irritants, ultraviolet radiation and trauma. The skin is essential for controlling water and heat loss and it is an important sensory organ which distinguishes pain, touch, itching and heat and cold. Vitamin D is synthesized in the skin. The skin is also an important organ of social and sexual contact. Perhaps the greatest disability of all is to be unwelcome and to have no confidence in one's appearance. In addition to the epidermis and dermis, the skin contains other structures including hair, blood vessels, nerves, sweat and sebaceous glands, all of which can become involved separately or in combination to produce a wide range of skin diseases such as alopecia, vasculitis, generalized pruritus, hyperhidrosis and acne. Skin failure is as worthy of medical attention as cardiac or renal failure and encompasses all of the functions described above.<sup>1</sup>

### Why is dermatology important?

Skin disease which might benefit from medical care is very common, affecting around 22.5–33% of the population at any one time.<sup>2,3</sup> Historically there has been a tendency to trivialize skin disease within the medical profession and accord it a low priority in research programmes. However the public and those involved in primary care have a very different view. The psychological effects of relatively minor skin complaints can often cause more distress to the public than other more serious medical disorders.<sup>1</sup>

Whilst it is true that most skin diseases are not life threatening the product of high disease prevalence and low morbidity still results in a large burden of disease in absolute terms. Minor changes in health policy such as campaigns to increase public awareness of the potential dangers of pigmented lesions, have large health and financial implications simply because they affect so many people. In addition several important skin diseases such as skin cancer,<sup>4</sup> venous ulcers<sup>5</sup> and atopic eczema<sup>6</sup> are becoming more common and these are set to consume a higher proportion of scarce resources in future health services budgets.

Although skin disease is very common, only a fraction of people with skin conditions currently seek medical help. Even so skin conditions were the fourth most common reason for people consulting with general practitioners (GPs) in England and Wales in 1991/92,<sup>7</sup> accounting for at least 1500 consultations per 10 000 person-years at risk. Skin conditions comprise 4.4% of all medical outpatient activity<sup>8</sup> and around

1.6% of all hospital bed occupancy.<sup>9</sup> Skin disease accounts for 0.46% of all deaths at all ages from all causes.<sup>10</sup> Melanoma skin cancer alone accounted for 1142 deaths in England and Wales in 1992;<sup>10</sup> one-half of whom were in younger economically active age groups. Skin disease is one of the commonest reasons for injury and disablement benefit and spells of certified incapacity to work in the UK.<sup>11,12</sup> Total direct NHS expenditure for diseases of the skin and subcutaneous tissues in 1994 (excluding outpatient consultations) was estimated to be around £617 million, approximately 2% of total NHS health expenditure.

### **Where does skin disease begin and general medicine end?**

Because the skin is a large and visible organ which is in direct contact with the outside environment, it has been possible to observe and describe a vast range of disease reaction patterns affecting the skin, hair and nails. Unlike most other medical specialties which usually cite around 50 diseases, dermatology has a complement of between 1000 to 2000 conditions.<sup>13</sup> Most of the major systemic diseases (e.g. infectious, vascular and connective tissue diseases) have manifestations which frequently affect the skin and, conversely, skin failure (e.g. caused by a severe drug reaction) has many systemic effects ranging from dehydration to heart failure, septicaemia and death. The division into what should be considered purely as a 'skin disease' is necessarily arbitrary.

### **The problem of defining need**

The accepted definition of need as 'the population's ability to benefit from health care'<sup>14</sup> is not helpful in distinguishing between genuine medical need and demand that is not needed within dermatology. People who do not like the cosmetic appearance of a facial mole or a large seborrhoeic wart certainly 'benefit from health care' and express a high degree of satisfaction when such lesions are removed within the NHS. Although some might feel that such procedures should not be performed within the NHS, the concept of what constitutes a 'dis-ease' is largely couched in social terms and it is essential that both purchasers and providers are aware of the public's perception of what constitutes dermatological need and demand. Twenty years ago many cases of acne were ignored despite effective treatment being available as acne was considered to be relatively minor by physicians. The key issue is for physicians, purchasers and members of the public to work together closely in order to develop clearer guidelines as to what should constitute reasonable need for NHS dermatology services so that a system can be developed which is both fair and explicit. Because of the subtle ways in which skin diseases affect individuals and society, definition of dermatological need is best viewed as a corporate process<sup>14,15</sup> which should be reviewed periodically to incorporate developments in treatment and social attitudes towards the skin.

### **Why should further research concern purchasers?**

Some of the recommendations in this chapter refer to the urgent need for research in estimating the need, supply and demand of dermatology health requirements in the UK. Although this may not at first appear to fall within the remit of purchasers covering limited geographical areas, without such vital and up-to-date information it is impossible to formulate an appropriate purchasing strategy. Simple epidemiological studies of skin disease conducted at a regional level are basic requirements of health care which could be built into purchasing contracts. Without such evidence-based health technology the potential for wastage of health care services is large.

## Classification of skin diseases

The rationale for classification of skin disease<sup>16</sup> is currently a mixture of symptom-based terms such as 'general pruritus', purely descriptive terms such as 'papuloerythroderma' (literally meaning protruding spots on a red background), terms of anatomical distribution (e.g. leg ulcer), terms which refer to the pathology as seen on histological examination (e.g. histiocytoma), immunological staining pattern (e.g. linear IgA disease), genetic terms (e.g. X-linked ichthyosis), terms which utilize elements of disability (e.g. hand dermatitis) and uppermost on the nosological hierarchy, terms which imply a cause (e.g. vinyl chloride disease or herpes simplex).

## Methods of skin disease classification

### *International Classification for Diseases version 9*

The important ICD 9 codes for skin diseases<sup>17</sup> are listed in Appendix I. A very detailed alphabetical list of over 3000 dermatological categories found in ICD 9 has been published by Alexander and Shrank.<sup>18</sup> Cutaneous manifestations have been described in almost all diseases which affect human populations. Appendix I should therefore be viewed as a minimum list which identifies the most important and common skin diseases.

The usefulness of the ICD 9 chapter on diseases of the skin and subcutaneous tissues is discussed in more detail in Appendix I. It is at best only a very crude indicator of skin disease. The problems encountered with nebulous disease codes and exclusion of important skin complaints such as skin cancer and localized infections and the inappropriate inclusion of some 'surgical' disorders such as finger abscess make regional comparisons of common skin diseases difficult.

The system does not distinguish the serious from the trivial and it does not permit separation of conditions which may or may not benefit from available health care.

### *International Classification for Diseases version 10*

Relevant codes are outlined in Appendix I. The ICD 10 chapter for diseases of the skin and subcutaneous tissues<sup>19-20</sup> contains a more comprehensive listing of relevant skin diseases than ICD 9 (L00 to L99), and exclusions to this section are clearly listed in the handbook.<sup>20</sup> Many rare skin diseases are listed in great detail, whereas the listings for the commonest disease groupings may be less useful in operative terms. Anomalies exist, such as the classification of atopic dermatitis (one of the commonest reasons for consultation) into many categories of obscure clinical significance (L20.0 Besnier's prurigo – a term used in some European countries which is synonymous with atopic dermatitis; L20.8 Other atopic dermatitis: flexural, infantile and intrinsic and L20.9 Atopic dermatitis unspecified). In contradistinction basal and squamous cell carcinoma of the skin, the commonest forms of cancer to affect the UK population, are not differentiated (both C44) but are separated by site codes.

### *Diagnosis-related classifications*

The British Association of Dermatology (BAD) has formed a diagnostic coding group<sup>21</sup> in conjunction with the clinical terms project of the NHS centre for coding and classification (Read Codes).<sup>22</sup> The result of this endeavour is a very detailed, comprehensive hierarchical classification structure for skin diseases designed by dermatologists for use by UK dermatologists. The disease classifications are logically ordered and sub-categories are based on aetiology and anatomical site. This coding index also offers the opportunity for

revision and updating at frequent intervals and it should be possible in the future to cross-map the BAD diagnostic codes to ICD 10 via Read Codes. The BAD diagnostic coding index is primarily intended for use by dermatologists and it is perhaps too detailed for use in primary care e.g. acne alone has 35 different categories.

In addition to the BAD coding index a detailed lexicon of dermatological terms has been allocated to ICD 10 codes, in conjunction with the International League for Dermatological Societies (of which the BAD is a member). This is yet to be published partly because the authors are awaiting confirmation of appropriateness of ICD 10 codes from the statistical division of the WHO (A Shrank, personal written communication, December 1994). The new lexicon of dermatological terms should represent a considerable improvement over ICD 9 for those seeking more comprehensive dermatology data from international data sources which use ICD classifications.

#### *Other diagnostic coding systems*

The four national morbidity surveys from general practice have utilized the Royal College of General Practitioner's diagnostic codes for skin disease.<sup>5</sup> These are broadly similar to ICD 9 codes with an added advantage of including disease severity status.

### **Summary**

- Dermatology covers a wide range of over 1000 disorders affecting the skin, hair and nails.
- Skin disease is common and consumes a significant amount of NHS resources.
- Since the causes of many skin diseases are unknown, current methods of classifying skin disease are a hybrid of systems based on symptoms, signs, pathology, anatomical site, mode of inheritance and aetiology.
- The ICD 9 codes for 'diseases of the skin and subcutaneous tissues' are of limited use but those categories highlighted in Appendix I are likely to cover the nine most common disease sub-categories.
- ICD 10 codes for 'diseases of the skin and subcutaneous tissues' are more comprehensive than ICD 9 but they still do not include some common skin infections, infestations and benign and malignant skin tumours, which form a large portion of dermatological workload.
- The BAD diagnostic coding index is likely to be a useful tool for recording diagnosis of skin conditions seen by specialists.

### **3 Sub-categories**

The following skin diseases are dealt with in full because:

- they are common
- collectively they account for around 70% of consultations in primary and secondary care<sup>23-27</sup>
- some data on the prevalence and effectiveness of services for these sub-categories are available
- the categories may correspond to purchasers' targets such as skin cancer.<sup>4</sup>

The diseases discussed are:

- skin cancer (including melanoma)
- acne
- atopic eczema
- psoriasis
- viral warts
- other infective skin conditions
- benign tumours and vascular lesions
- leg ulceration
- contact dermatitis and other eczemas.

Two potential problems exist with the proposed sub-categories:

- 1 Oversimplification is a danger to purchasers and consideration needs to be given to further diagnostic groups and severity gradings within these sub-categories. For example the sub-category 'skin cancer' includes several types of neoplasm ranging from very benign slow-growing lesions such as carcinoma *in situ*, to metastatic melanoma which is invariably fatal. Similarly acne can range from a physiological disorder of excessive greasiness of the skin with a few comedones (blackheads), to a severe nodulocystic process resulting in extensive permanent scarring and severe psychological disability. The corollary is that a patient with severe acne might be seen more quickly than someone with carcinoma *in situ* under the appropriate circumstances.<sup>28</sup>
- 2 In considering the sub-categories it is important to be aware that services for some skin diseases included in the remaining 30% of 'other disorders' seen by health practitioners are also important. Some common skin disorders such as urticaria and vitiligo fall into this group. Also within this group are rare but extremely disabling or fatal conditions such as epidermolysis bullosa (an inherited blistering disorder), life-threatening drug reactions and other immunobullous disorders such as pemphigus which virtually always require some form of specialist intervention.

## 4 Prevalence and incidence

### Prevalence

#### *Special surveys*

#### Self-reported skin disease

In 1986 the Proprietary Association of Great Britain commissioned a detailed nationwide survey of 1217 adults and the parents of 342 children to determine how people in the UK manage minor ailments and some chronic recurring illness.<sup>29</sup>

Skin complaints were the most common ailment reported in the last two weeks, affecting 25% of 6009 adult 'ailments' and 36% of 806 child 'ailments'.

In addition to estimating the age and sex-specific incidence of skin complaints over a two-week period (Table II.1), the study provides a useful estimate of the proportion of skin complaints that are not considered by the public to be sufficiently severe to seek medical care and the potential service implication should that threshold change. For example of the 291 people complaining of acne/spots/greasy skin; 47% took no action, 34% used or bought an over the counter (OTC) preparation and 12% used medicines prescribed by a doctor, the remaining 7% using home remedies.

Similar proportions of self-reported skin disease in the last two weeks have been recorded in two earlier studies.<sup>30,31</sup> A survey in Gothenburg, Sweden of 20 000 randomly chosen residents aged 20–65 years found that 27% of females and 25% of males reported symptoms of skin disease in the last 12 months.<sup>32</sup>

### Examined skin disease

Only one study in the UK has ever estimated the prevalence of skin diseases in the general population according to some form of physical examination. In 1975 Rea *et al.* sent a questionnaire on skin symptoms to a stratified sample of 2180 adults in Lambeth, London.<sup>2</sup> All positive respondents and one-fifth of those responding negatively were then interviewed and examined at home by a team of seven doctors and 11 nurses trained in the recognition of common skin disorders. Only exposed skin (face, scalp, neck, forearms, hands, knees and lower legs) was examined and the overall response rate was 90.5%. Because of difficulties in agreeing on objective criteria for skin disease severity, skin disease was classified into trivial (not justifying medical attention), moderate (justifying medical attention) and severe (needing early medical attention because of severe symptoms or risk of progression) based upon the judgement of the examiner. Medical need in this study was therefore defined as those people, who, in the opinion of a team of four dermatologists, three GPs and 11 nurses, had a skin condition 'justifying medical attention'. Such a normative definition is probably an unstable one, depending upon prevailing medical opinion, accuracy of diagnosis and knowledge of effective treatment. There is some evidence in this study that the dermatologists were more likely to categorize conditions as moderate/severe when compared with the other observers. The key findings of this study were as follows.

- The overall proportion of the population found to have any form of skin disease was 55% (95% confidence intervals 49.6 to 61.3%).
- The overall proportion considered to have skin disease worthy of medical care (i.e. moderate or severe) was 22.5% (95% confidence intervals 17.8 to 27.2%).

The breakdown according to broad diagnostic group by sex is summarized in Table 1.

The group containing tumours and naevi has the highest overall prevalence (20.5%) but 90% were considered as trivial by the examiners. In the eczema group on the other hand, with an overall prevalence of 9%, more than two-thirds were graded as moderate/severe so that the highest prevalence of conditions justifying medical care fell into this group (6.1%). The prevalence of skin disease according to severity and age group (children were not included in this study) is shown in Table II.2. Clear age trends emerge for specific disease groupings e.g. acne and warts in younger age groups, although age, sex and social class trends were not found when all forms of skin disease were considered together since several conditions had trends in opposite directions.

Usage of medical care was also recorded in this study (Table II.3). The key findings were that:

- of those with moderate/severe skin disease, only 24% made use of any medical service in the past six months
- a further 30% used self-medication
- around 20% of those with moderate/severe conditions had consulted their GP and 7% had been referred for specialist help
- medical usage was still considerable for those with trivial skin disease with 10% using medical services and 33% self-medicating.



**Table 1:** Prevalence of examined skin disease expressed as rates for 1000 in a survey of 2180 adults in Lambeth<sup>2</sup>

Skin condition	Both sexes		Male		Female	
	All grades	Mod-erate and severe	All grades	Mod-erate and severe	All grades	Mod-erate and severe
Tumours and vascular lesions	204.7	14.1	141.9	0.6	264.1	26.8
Eczema	90.1	61.2	99.5	80.2	81.1	43.4
Acne	85.9	34.6	109.0	34.5	64.1	34.7
Scaly dermatoses	84.7	28.7	118.3	39.2	53.0	18.9
Scalp and hair disorders	82.1	13.6	79.0	7.9	95.0	18.9
Prurigo and allied conditions	82.1	38.9	60.8	16.9	95.0	59.6
Erythematous and other dermatoses	75.0	21.4	30.9	20.8	116.8	22.0
Infective and parasitic conditions	46.0	6.7	48.2	10.9	43.9	2.8
Warts	34.3	1.5	35.9	–	32.8	2.8
Nail disorders	33.0	18.8	23.9	12.5	41.8	24.8
Psoriasis	15.8	5.8	24.4	3.7	7.7	7.7
Mouth and tongue disorders	8.9	0.7	15.4	–	2.7	1.3
Chronic ulcer	1.7	–	3.5	–	–	–
Any skin condition	554.7 (495.9– 613.5)	225.0 (178.2– 271.8)	479.1 (399.7– 558.5)	213.0 (164.4– 279.6)	606.7 (520.0– 693.3)	236.0 (170.1– 301.9)

Despite the large number of observers, limited nature of the skin examinations and ambiguous definition of medical need, this important study suggests that:

- skin conditions that may benefit from medical care are extremely common in the community
- most sufferers do not seek medical help.

Given the scarcity of epidemiological data on skin disease within the UK, mention should also be made of another detailed cross-sectional study of skin diseases contained within the first US Health and Nutrition Examination Survey (NHANES).<sup>3</sup>

This study was conducted on a representative population sample of 20 749 persons aged one to 74 years from 65 primary sampling units throughout the US during 1971–74 and included a detailed structured skin examination by 101 dermatologists. Clinical findings were backed by laboratory investigations such as mycology culture and skin biopsy where possible. The following indicate that significant skin pathology is common.

- Nearly one-third (312.4 per 1000 population) had one or more significant skin conditions which was considered by the dermatologist to be worthy of evaluation by a physician at least once (Table III.1).
- The prevalence of significant skin pathology increased rapidly with age (Figure III.1) from 142.3 per 1000 children aged 1–5 years to 362.0 per 1000 youths age 1–17 years and to 365.2 per 1000 young adults aged 18–24 years, due primarily to the increase in acne at puberty.

- After a slight decline at age 25–34 years the prevalence of skin pathology again increases steadily reflecting the increase in chronic diseases such as psoriasis, vitiligo, malignant and benign tumours, actinic and seborrhoeic keratoses.
- In this study significant skin pathology was slightly commoner in males (Table III.2).
- An additional 12.5% of the population were deemed to have a skin condition that was clinically inactive at the time of examination.

Minor degrees of skin disease or abnormalities were also recorded by the dermatologists for each disease group and these are shown in Table III.3. There was a considerable mismatch between what the dermatologists considered to represent medical need and the population's concerns.

- Nearly one-third (31%) of persons with significant skin pathology diagnosed by the dermatologists expressed concern about these specific skin conditions, whereas nearly 18% of those who complained about their skin conditions were not considered as serious by the dermatologists.

The following findings were found in relation to disability and handicap.

- Skin conditions were reported to limit activity in 10.5 per 1000 of the population aged 1–74 years, or 9% of those persons with such skin conditions.
- About 10% of those persons with skin complaints considered the condition to be a handicap to their employment or housework and 1% considered themselves severely handicapped.
- About one-third (33%) of those persons with skin conditions indicated that the condition(s) was a handicap in their social relations.
- The dermatological examiner rated more than two-thirds of those persons with skin complaints as disfigured to some extent from the condition and about one-fifth of those were rated moderately or severely disfigured.
- More than half of those persons with skin complaints reported some overall discomfort from the condition such as itching or burning.
- An estimated 62.8 per 1000 US population (or 56% of those with skin complaints) indicated that the conditions were recurrent, with 49% active in the preceding seven to 12 months.

The following outlines findings for sub-optimal care.

- Only one-fifth of those with significant skin pathology were considered by the dermatologist to be receiving optimal care.
- Of the remaining 81% who were not receiving optimal care nearly all (94%) could, in the judgement of the survey dermatologists, be improved with more expert care (84% in pre-school children to 96% among the elderly).
- Nearly one-fourth (23.9%) of adults aged 18–74 years of age with significant skin pathology indicated that their condition might have been caused or worsened by occupational exposures.

The following information was found on medical advice.

- About one-half of the US population aged 1–74 years of age with skin complaints had not sought medical advice for the problem.
- Males were more likely than females to not seek medical advice (56 compared with 44% respectively).
- Nearly 15% were given inadequate medical advice in the view of the dermatologist in those who received medical advice.
- About 6% did not co-operate with the doctors they had consulted.

To minimize examiner variability in this study the 101 dermatologist examiners underwent a training period and findings were recorded on a structured form. Even so there was considerable variation between these dermatologists in the degree to which they recorded banal lesions such as freckles and normal variations. Age-adjusted prevalence rates of significant skin pathology ranged from zero to 90.4% according to the examiner, the average being 31.2%. The range in the proportion expressing complaints about skin conditions to the examiner was from 0 to 70.8%, the average being 11.4%. The study is therefore limited by the wide variation in what the 101 dermatologist examiners considered as need and physicians' views might have changed since the early 1970s. Given the predominantly private care system in the US, it is also possible that US dermatologists had a lower threshold than UK dermatologists for what skin conditions might benefit from medical intervention. Nevertheless the study provides us with the most detailed account of skin pathology and its relation to disability and health-seeking behaviour to date. Population surveys in other European countries have indicated a similar high prevalence of skin disease in the community.<sup>33–35</sup>

### Summary of prevalence studies of skin diseases in general

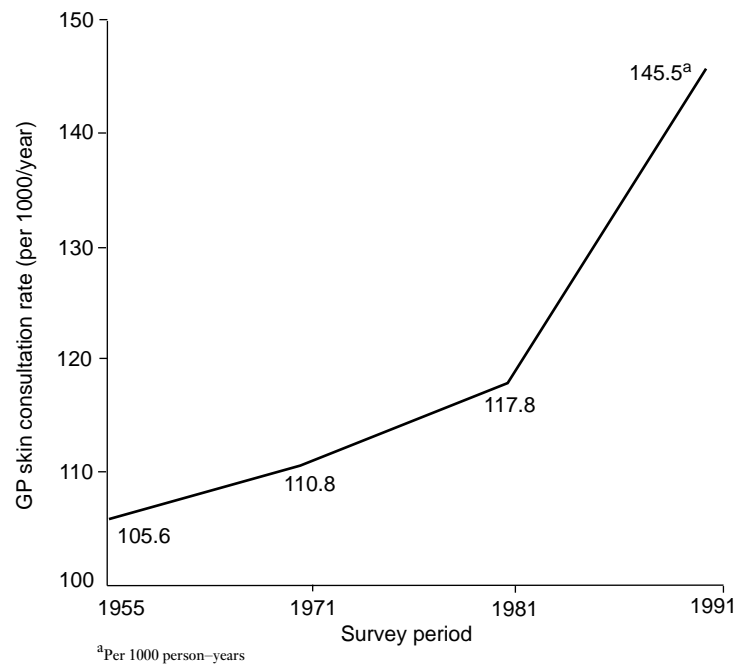
- There are no recent population studies on the need, supply and demand for skin care in the UK.
- Studies conducted in the UK and US 20 years ago suggest that skin disease is very common, affecting around one-quarter to one-third of the population at any one time.
- Around 10% of those with skin disease report that the condition seriously interferes with their activities.
- Only 20% of those with a skin condition which might benefit from medical care sought medical help in the UK.
- Around 10% of those with trivial skin conditions also seek medical help.
- Region of residence, sex, age, social class, ethnic group, skin type, occupation and leisure activities are all important determinants of skin disease prevalence in the UK.
- Generalizations about the determinants of the entire range of skin diseases are limited because subgroups may exhibit trends in opposite directions.

#### *Routinely collected data*

#### **Morbidity statistics**

Most morbidity data refer to those who seek medical help in the primary care setting. With the exception of a few conditions such as cellulitis where incidence and demand are closely related, the extent to which routine morbidity data reflect demand or genuine dermatological need is unclear. Despite these limitations routine statistics such as the four morbidity surveys from general practice<sup>5,7,36,37</sup> are useful in that they provide us with an estimate of the magnitude and determinants of those who seek medical care. Data validity is discussed in Appendix IV. Patient consulting rates in general practice for diseases of the skin and subcutaneous tissues have steadily increased over the last 40 years as shown in Figure 1, although some of these changes could be due to differences in the age structure of the populations studied.<sup>5,7</sup>

In the second general practice morbidity survey of 1970–72<sup>37</sup> diseases of the skin and subcutaneous tissues were among the top eight reasons for people seeking help, accounting for 6.5% of patient contact. The referral rate for specialist opinion for those who contacted their GP because of a skin problem was 4.5 per 100. A more detailed social class analysis revealed very little difference in consultation rates between social classes defined by occupation and marital status. Benign skin neoplasms had a higher standardized patient



**Figure 1:** Increase in consulting rates in general practice for diseases of the skin and subcutaneous tissue over the last 40 years.

Source: Data obtained from the four general practitioner morbidity surveys.<sup>5,7,36,37</sup>

consultation ratio in the non-manual classes (especially men) and in manual classes for women. There was little evidence to support differences in urban and rural consultation rates.

In the third 1981/82 morbidity survey<sup>5</sup> diseases of the skin and subcutaneous tissues were one of the ten most common diagnoses made in general practice. Around 6% of all GP diagnoses made in the RCGP study involved the skin and 5% of these were referred for specialist opinion, a similar proportion to other specialties.

Data from the fourth national morbidity study<sup>7</sup> by GPs in England and Wales (1991/92) show that about 15% of the population per year seek advice regarding conditions relating to the skin or subcutaneous tissues (the fourth commonest reason for seeking GP advice). These estimates are to be viewed as a minimum since they exclude those consulting for skin neoplasms and some skin infections such as herpes simplex. The average number of consultations per person-year for each skin condition was 1.26. Approximately 3.5%, 7.6% and 4.9% of people consulted their GP each year because of skin infections, inflammatory skin conditions and 'other diseases of the skin and subcutaneous tissues' respectively. Around 2% of the population consulted about eczema/dermatitis and 0.75% for psoriasis.

Although none of the skin conditions seen in this survey were considered life threatening, only one-quarter of the skin conditions were considered by GPs to be minor in severity (defined as commonly treated without recourse to medical advice or requiring no specific treatment). This survey covered around half a million people in 60 practices in England and Wales and had a bias towards larger, computerized practices with younger principals. Around 4.2% of those with a skin complaint were referred for specialist opinion from the survey practices. When compared with the 1981/82 survey there was a 24% increase in consultation rates for those aged five to 14/15 years of age and a 16% increase for those aged 15/16 to 24 years of age, compared with a 8% and 7% increase for all diseases within each age group.<sup>38</sup> Table 2 shows

age-specific consultation rates for diseases of the skin and subcutaneous tissues (excluding skin tumours and some infections) for 1991/92.<sup>7</sup> Highest consultation rates are found in the very young, followed by a decline and subsequent smaller peak in the 16–24 year age group. Consultation rates remain lower throughout adulthood except for a more progressive increase with increasing age above 65.

**Table 2:** Patients consulting GPs for diseases of the skin and subcutaneous tissues of minor and intermediate severity in 1991/92 expressed as rates per 10000 person–years at risk<sup>7</sup>

Chapter XII	Total	Age							
		0–4	5–15	16–24	25–44	45–64	65–74	75–84	85+
Total	1455	2715	1418	1697	1288	1177	1387	1472	1613
Intermediate	1100	2295	1014	1339	950	852	1044	1110	1235
Minor	455	602	498	477	421	407	451	473	506

### Mortality and skin disease

Overall mortality is relatively low for skin diseases, accounting for at least 2578 deaths in 1992 (or 0.46% of deaths from all causes and all ages).<sup>10</sup> Melanoma skin cancer alone accounted for a total of 1142 deaths in England and Wales in 1992 (565 male and 577 female), with 48% occurring in economically active adults.<sup>10</sup> Other malignant neoplasms of the skin (basal cell carcinoma, squamous cell carcinoma and cutaneous lymphoma) accounted for 298 male deaths and 222 female deaths in 1992. Six deaths were recorded for 'benign' neoplasms of the skin in 1992.<sup>10</sup>

Mortality from skin diseases other than skin cancer has increased slightly over the last ten years. In 1991 there were 240 male deaths due to diseases of the skin and subcutaneous tissues and 688 female deaths; a 20% relative increase when compared with 1988.<sup>39</sup> Chronic ulcer of the skin accounted for two-thirds of the female deaths (an increase of 19% from 386 deaths in 1990 mainly due to women aged 80 and over).<sup>39</sup>

### Pharmaceutical services

In the 1992 Health Survey for England<sup>40</sup> skin disease was the sixth commonest reason for issuing a prescription, yet it represented one of the lowest cost per items when compared with other prescribed medicines, with an average gross ingredient cost of £4.49 compared with £8.15 for respiratory disorders and £13.47 for gastrointestinal disorders.

In 1993 total prescription costs for dermatology (all items included in *BNF* Chapter 13) amounted to £143.6 million (Prescription Pricing Authority, written communication, 1994). This compares with OTC sales of skin and acne preparations of £138.8 million in 1993.<sup>29</sup> Over-the-counter sales of skin and acne preparations represented an 18.2% increase compared with 1992, due mainly to OTC treatments for vaginal thrush and topical acyclovir for cold sores (K Fitzsimons, Proprietary Association of Great Britain, written communication, 1994).

### Summary of routinely available data on prevalence and costs of skin disease

- About 15% of the population consult their GP each year because of a skin complaint.
- General practice consultation rates for diseases of the skin increase with age and are slightly higher for females.
- GP consultation rates also probably vary with other factors such as ethnic group, skin type and social class. Summary statistics for skin diseases as a whole may obscure these trends.

- Consultation rates for skin disease in general practice have probably increased over the last 20 years both in absolute and relative terms.
- About 5% of those who seek help from their GP are referred for further specialist advice.
- Mortality from skin diseases is low, accounting for 2578 deaths in 1992, or 0.46% of deaths from all causes at all ages.
- Over-the-counter sales for skin preparations accounted for £138.8 million in 1993, or 11.8% of total OTC sales.

#### *Incidence data*

Unfortunately no population-based studies on the incidence of examined skin disease considered as a whole have been conducted. Incidence data are available for some skin disease sub-categories such as new diagnoses of melanoma and these are discussed below. Many skin diseases such as psoriasis are chronic and persistent and their impact may be estimated reasonably well from cross-sectional prevalence studies such as those outlined on pages 267–271.

Many infectious skin diseases such as impetigo, on the other hand, are transient and incident data are required to assess their importance. In the absence of appropriate population studies, GP morbidity statistics provide us with some information on demand incidence for these transient disorders.<sup>7</sup> Although it is likely that all cases of impetigo presenting to doctors represent medical need, it is not known how many resort to self-treatment in the community. Some skin diseases are both chronic and intermittent (e.g. atopic eczema) and other measures such as the one-year period prevalence are the most appropriate measure of disease burden.

## **Common skin disease groupings**

### *Skin cancer*

Skin cancer has become a Health of the Nation target 'to halt the year-on-year increase in the incidence of skin cancer by 2005'.<sup>4</sup> The term skin cancer usually refers to three main diseases:

- 1 malignant melanoma
- 2 basal cell carcinoma
- 3 squamous cell carcinoma.

The last two are often considered jointly as non-melanoma skin cancer. Other forms of cancer such as cutaneous T-cell lymphoma also affect the skin and, although they are comparatively rare, can be miserable conditions which require specialist care. Melanoma, basal cell and squamous cell carcinoma are discussed in more detail in Appendices V and VI.

Key points for skin cancer in general are:

- halting the year-on-year increase in the incidence of skin by 2005 is a Health of the Nation target
- because of the long latent period between exposure and disease, the overall incidence of both melanoma and non-melanoma skin cancer will probably continue to increase for the next 30 years
- skin cancer is largely preventable.

### Melanoma skin cancer

- Melanoma is a comparatively rare but potentially lethal tumour, accounting for 1265 deaths in the UK in 1992.<sup>41</sup>
- The incidence and mortality of melanoma has increased substantially over the last 30 years.
- Melanoma incidence increases with age but it also affects proportionately more economically active people than other cancers.
- Risk factors for melanoma include increased number of moles, atypical moles, episodes of severe sunburn, fair skin type, red or blonde hair, tendency to freckle and a positive family history.
- Melanoma is almost twice as common in females than in males in the UK, with 2722 and 1716 newly registered cases in 1988 for females and males respectively.
- Early diagnosis and surgical removal of a thin (<1.5 mm) melanoma is usually curative.

### Non-melanoma skin cancer

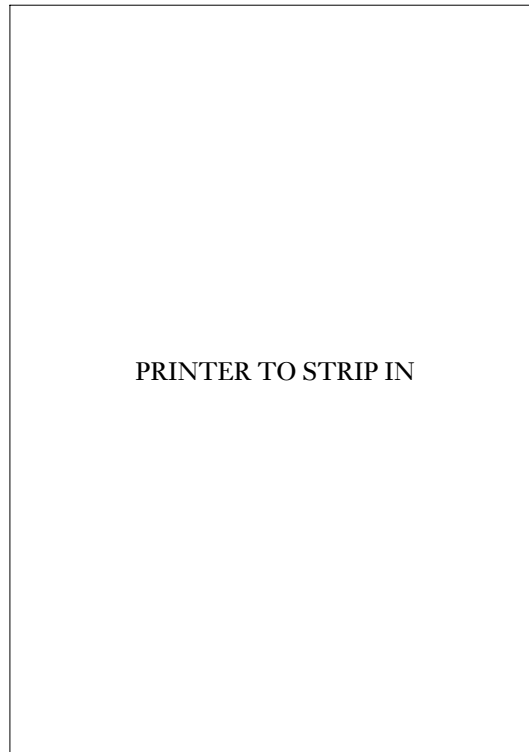
- Non-melanoma skin cancer is the commonest cancer in the UK, affecting around 2% of people over the age of 60.
- The incidence of non-melanoma skin cancer has increased substantially over the last 20 years but it is difficult to say how much of this change is due to increased registration.
- Non-melanoma skin cancer registrations show considerable regional variation throughout the UK.
- The incidence of non-melanoma skin cancer rises sharply with age, with most tumours occurring above the age of 60.
- The incidence of non-melanoma skin cancer is likely to increase with an increasingly ageing population.
- Subjects with one non-melanoma cancer are at high risk of developing further new lesions.
- Deaths from non-melanoma skin cancer are uncommon, amounting to 486 deaths in 1992 in the UK.

### Acne

Acne refers to a group of disorders characterized by abnormalities of the sebaceous glands. Although over 40 types of acne have been described,<sup>21</sup> acne vulgaris, which commonly affects teenagers and acne rosacea which typically affects adults form the bulk of this disease subgroup. Because of the lack of data for acne variants such as acne rosacea, only acne vulgaris is discussed in more detail in Appendix VII.

The key points on the prevalence of acne are:

- prevalence surveys must take acne severity into account because minor degrees of acne are almost universal in teenage years
- acne which is deemed as clinically significant by physicians affects around 1% to 14% of teenagers
- although considered to be a 'teenage' disease acne continues to affect around 3.5% of those aged 25 to 34 years
- severe acne with cysts and scarring affects around 0.6% to 1.4% of young adults
- acne forms a considerable burden of psychological misery in the population (Figure 2)
- recent surveys suggest that there might have been a shift in the distribution of acne severity towards the milder end over the last 20 years, perhaps due to better treatment.



**Figure 2:** Despite trivialization of skin disease, it can have a devastating effect on peoples' lives. Acne is just one example where social stigmatization is still common. Would this man's appearance influence your decision to employ him?

(Photograph reproduced with written permission from the subject.)

### *Atopic eczema*

Atopic eczema (or 'childhood eczema') is an inflammatory skin disorder characterized by itching, involvement of the skin creases and onset in early life and is discussed in Appendix VIII. Key points on the prevalence of atopic eczema are:

- atopic eczema currently affects between 5% to 20% of children by the age of seven in the UK
- the intractable itch of atopic eczema causes sleep loss and misery to children and disruption to family life
- although eczema prevalence is higher in childhood, adults may form the bulk of cases when entire populations are considered
- atopic eczema is commoner in wealthier families and in Afro-Caribbean children for reasons which are not clear at present
- past studies suggest that there may be considerable regional variation in eczema prevalence throughout the UK
- there is reasonable evidence to suggest that the prevalence of atopic eczema has increased substantially over the last 30 years for reasons which are unclear.



### *Psoriasis*

Psoriasis is a chronic inflammatory skin disorder characterized by red scaly areas which commonly affect the knees, elbows, lower back and scalp and is discussed in more detail in Appendix IX.

The key points of prevalence studies suggest:

- the prevalence of psoriasis in the general population is around 1% to 3%
- between one- and two-thirds of psoriasis sufferers have clinically significant disease according to physicians
- psoriasis exhibits a bimodal age distribution with a first peak in early adulthood and a smaller peak in later life
- psoriasis tends to be a chronic condition.

### *Viral warts*

Viral warts are discussed further in Appendix X.

The key points of prevalence studies are:

- viral warts affect between 4% to 5% of children in the UK aged 11 to 16
- the Lambeth study found that 3.5% of adults aged 25–34 years also had viral warts
- around 60% to 90% of warts clear spontaneously within two years
- there is considerable regional variation in wart prevalence in the UK with highest rates in Northern districts
- wart prevalence is also less in children born to parents with non-manual occupations and in smaller families
- warts may be less common in children from ethnic groups other than white European.

### *Other infective disorders*

This category refers to a miscellaneous range of other bacterial, viral and fungal infections which are discussed further in Appendix XI.

The key points of prevalence studies are:

- taken as a whole, prevalence rates for this category range from 4.6% to 9.3%
- these point prevalence rates probably underestimate the true burden of skin infections by a considerable degree, since most are transient
- at least 4% of the population consulted their GP for a skin infection other than warts in 1993/94
- the age distribution of skin infections differs according to the infectious agent and clinical pattern
- impetigo and scalp ringworm usually affect children, boils peak in young adulthood and chronic fungal infections are common in older adults
- fungal infection of the toe webs (athletes' foot) may affect 3.9% of the population
- certain occupational groups working in wet conditions are more prone to fungal infections of the feet and toenails.

### *Benign tumours and vascular lesions*

This sub-category refers to a range of cutaneous lesions which either cause discomfort or concern because of the need to exclude malignant or premalignant disease and they are discussed further in Appendix XII.

The key points of prevalence studies are:

- white adults usually have between 40 to 60 moles on their body
- small changes in public anxiety about moles can have large service implications
- prevalence surveys conducted by physicians suggest that around 1.4% to 5.1% of the population have a benign skin tumour which may warrant medical attention
- the prevalence of benign tumours and precancerous lesions shows a striking increase with age from 2% in children to 13% in those aged 65–74 years
- solar keratoses are premalignant skin lesions which affect around 23% of those aged over 65
- the risk of malignant transformation of solar keratoses is probably less than 1% per year and 10% to 27% remit spontaneously
- port wine stains are permanent vascular malformations which are usually found on the face. They occur in around two to four of every 1000 live births
- the psychological consequences of port wine lesions can be devastating for the sufferer.

### *Leg ulcers*

Leg ulceration may be due to a range of disorders from squamous cell carcinoma through to sickle cell disease, diabetes and rheumatoid arthritis. In the UK the commonest causes are venous disease, arterial disease or a mixture of both. These are discussed more fully in Appendix XIII.

The key points of prevalence studies are:

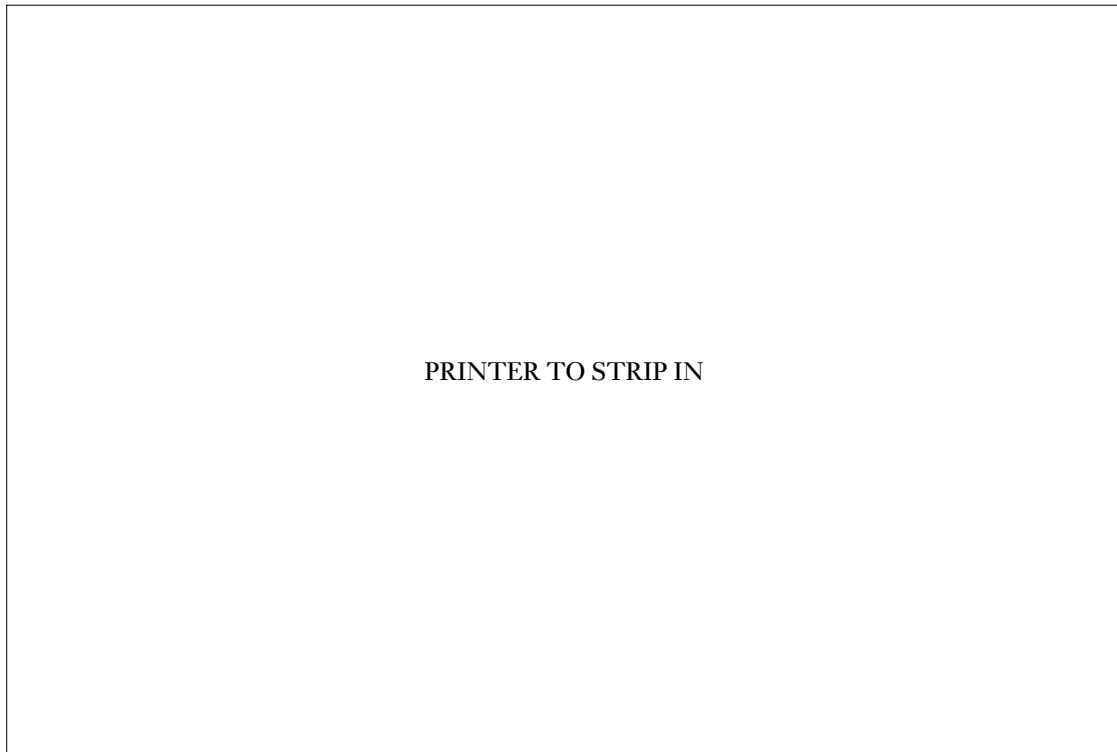
- leg ulcers may occur for a number of reasons but venous (70%) or arterial disease (10%) or both (20%) are the commonest causes in the UK
- venous leg ulcers affect around 0.1% to 2% of the population
- the prevalence of leg ulcers increases with increasing age
- leg ulcers are an important cause of pain and morbidity in the elderly and consume a large proportion of nursing time
- approximately one-half to two-thirds of venous ulcers recur within a year
- the proportion of people with leg ulcers is likely to rise considerably in the future because of an increasingly ageing population.

### *Contact dermatitis and other eczemas*

These are discussed in Appendix XIV.

The key points of prevalence studies are:

- in the UK the term eczema usually refers to an endogenous process whereas dermatitis usually denotes a contact factor such as exposure to irritants or specific allergens
- the prevalence of contact dermatitis and endogenous eczemas (other than atopic eczema) is around 9% in the UK
- one large US survey has suggested that about one-quarter of cases in this subgroup are clinically significant
- hand dermatitis can be crippling and lead to permanent disability and loss of earnings (Figure 3)
- certain occupations pose high risks for individuals to develop contact dermatitis
- eczema and contact dermatitis account for 84% to 90% of occupational skin disease.



**Figure 3:** The hand that cannot work. Hand eczema can be crippling and lead to permanent disability and loss of earnings.

#### *Other important skin diseases*

These are discussed in Appendix XV.

The key points from prevalence studies are:

- because of the heterogenous nature of this remaining group of skin diseases there will be a temptation to allocate it with a low priority, yet skin conditions in this group still affect around 3.9 million people in the UK
- included in this group are rare but potentially fatal skin disorders such as blistering diseases, lymphoma and severe cutaneous drug reactions
- other common skin disorders such as vitiligo and urticaria are included in this group
- because skin disease is so common, around 7% of the population will have more than one skin disease (or around one-quarter of those with significant skin disease).

## 5 Services available

### Introduction

People with skin problems require a range of health services from simple advice to specialist investigation and management. The most usual routes of help currently in use are summarized in the flow chart (Figure 4). The estimated number of people using current dermatology health services at various entry points for a population of 100 000 over a one-year period is summarized in Box 1.

**Box 1:** A guide to the number of persons per 100 000 per year using dermatology services

• Number with a skin complaint	=	25000 (at least 25% of total population) <sup>29</sup>
• Number who will self-treat	=	7500 (30% of those with skin complaint) <sup>2</sup>
• Number who will seek advice from GP	=	14550 <sup>a</sup> (15% of total population or 19% of all GP consultations) <sup>7</sup>
• Number referred on to dermatologist	=	1162 (8% of those attending their GP for skin problems, or 1.2% of the total population) <sup>42</sup>
• Number admitted to hospital	=	24 to 31 (2% to 3% of all new dermatology referrals) <sup>43</sup>
• Number of deaths due to skin disease	=	5 <sup>b</sup> (0.4% of all new dermatology referrals) <sup>10</sup>

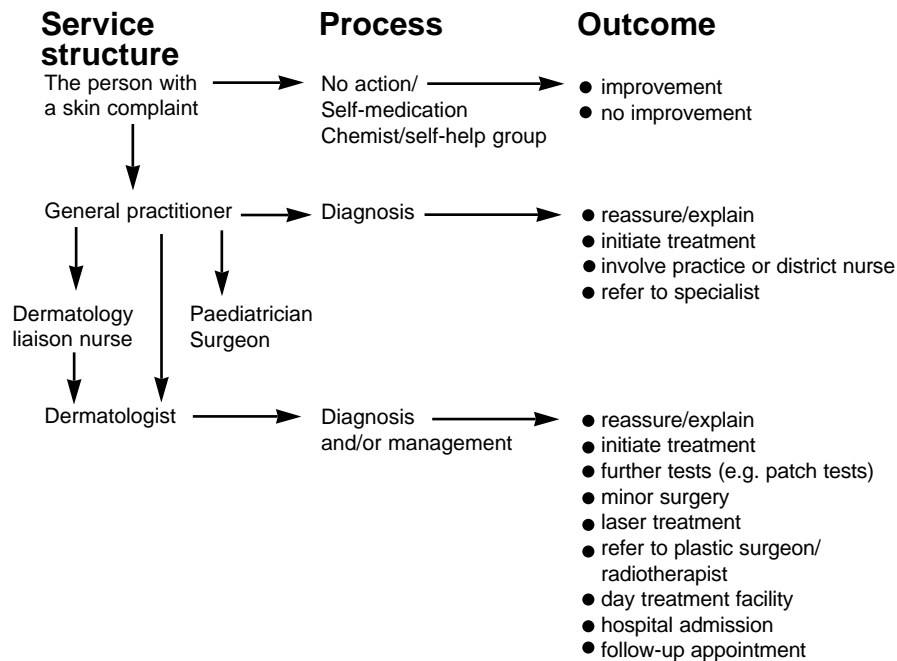
<sup>a</sup> Excludes skin neoplasms, viral warts, herpes simplex and scabies.

<sup>b</sup> Includes people dying from cellulitis, chronic ulcer of the skin and severe drug reactions who might not have been admitted under a dermatologist's care.

### Self-help

Although self-help and self-medication are not traditionally regarded as a health service, the range and availability of OTC skin products is an important element in the equation of balancing need, supply and demand. Around 30% of those with a skin complaint decide to self-medicate and this proportion is similar for trivial and moderate to severe disease.<sup>2</sup> Many effective skin treatments are available OTC such as 1% hydrocortisone for mild eczema, topical acyclovir cream for cold sores, topical benzoyl peroxide for acne and numerous anti-fungal preparations and wart removers.

Pharmacists occupy a key role in advising the public on the use of these products but whether this advice is beneficial or whether it simply delays appropriate medical consultation has not been studied adequately in the UK.<sup>44</sup> Self-help groups such as the National Eczema Society, Psoriasis Association and Acne Support Group are well organized and are a useful source of advice to those with mainly chronic skin diseases. They have recently joined forces to form a Skin Care Campaign to increase public and government awareness regarding skin disease.<sup>45</sup>



**Figure 4:** Routes of help currently available for a person with a skin complaint. Other routes of help such as referral to occupational health doctors, other specialists, attendances at the A and E department and contact with practice or hospital nurses are also used occasionally.

## Primary care

The majority of those with a skin complaint who seek medical help are treated by their GP. In addition to making a diagnosis and prescribing medication, treatment may well include simple reassurance or explanation and advice. The GP contract in April 1990 introduced payment for minor surgical procedures and many GPs now conduct their own minor surgery for benign and sometimes malignant skin lesions.

Around 6–8% of all GP diagnoses involve the skin.<sup>26,46</sup> The most recent GP morbidity statistics<sup>7</sup> suggest that 1455 people per 10 000 person–years at risk (approximately 15% per year) consult their GP because of a skin condition (excluding benign and malignant skin neoplasms and some skin infections). Despite this only one in ten GPs has received special training in dermatology and most of those who had no training wished they had.<sup>47</sup> A more recent study of 456 GPs in Avon found that most were willing to shoulder more of the dermatological burden, yet 57% said they had little interest in the subject and had not attended any dermatology teaching since qualifying.<sup>48</sup> The average ‘block’ allocated to dermatology undergraduate training is less than 40 hours and in some centres dermatology is entirely optional. In a recent survey of 165 UK GPs 97% felt that undergraduate training in dermatology was essential and that more time should be allocated to the subject.<sup>49</sup> Some GPs gain further experience working as clinical assistants in dermatology and some have undergone further training leading to a diploma in dermatology qualification. General practitioners interested in skin care have recently formed a primary care dermatology society.<sup>50</sup>

Practice nurses and district nurses are involved to a variable extent in the treatment of skin diseases, with up to 50% of their time employed in administering dressings for leg ulcers. In a recent survey 33% of 800 practice nurses reported that they saw five to ten patients with skin disease each week but less than 7% felt that they had the knowledge to deal with them.<sup>47</sup>

The range of skin disorders seen in general practice is similar to that in the general population, with the nine sub-categories mentioned in this report accounting for the majority of consultations.<sup>5,26</sup> A greater proportion of incident diseases such as skin infections (e.g. impetigo, herpes simplex and viral exanthems) are commoner in general practice settings than in secondary care.<sup>5,7</sup>

## Use of specialist services

### *Outpatients*

Most specialist dermatology activity is concentrated in the outpatient department. Persistent waiting list problems occur<sup>51</sup> and overbooking of clinics to expedite long waits by patients distressed by their skin condition and to accommodate emergency referrals such as acute drug eruptions and skin infections is common. Currently there are only 312 dermatologists throughout the UK, providing a ratio of 1 per 217 000 members of the population;<sup>7</sup> the lowest specialist ratio throughout the EU by a factor of around three (Table 3). The ratio of specialists to the population is generally much lower throughout all specialties within the UK than elsewhere in the EU, although the ratio of dermatologists to population in the UK in 1992 (1 : 217 000) is still quite low compared with other comparable specialties such as ENT (1 : 128 000), ophthalmology (1 : 115 000) and general medicine (1 : 41 000).<sup>52</sup> In 1990 there were 537 worked outpatient sessions per dermatology consultant in the UK compared with 149 sessions per general medicine consultant.<sup>8</sup> Diagnosing skin disease takes time to learn and constant practice to refine and dermatologists spend a period of around ten years training, although this period will be reduced when the Calman proposals for training are introduced.

**Table 3:** Ratio of dermatologists to population in Europe<sup>47</sup>

Country	Total	Ratio/population
France	2800	1 : 20 400
Italy	2900	1 : 20 000
Belgium	450	1 : 22 000
Greece	400	1 : 25 000
West Germany	1600	1 : 39 000
Spain	900	1 : 43 000
Portugal	300	1 : 44 700
Denmark	100	1 : 50 000
The Netherlands	300	1 : 80 000
UK	312	1 : 200 000

### *What does the specialist do?*

In addition to diagnosis, explanation and treatment in routine clinics which can be accomplished without recourse to further investigations in most patients,<sup>51</sup> the dermatologist offers a range of services. Most teaching centres run clinics which specialize in contact dermatitis and industrial skin diseases and a patch-testing service, paediatric dermatology, pigmented lesions, supervision of ultraviolet light treatment and combined plastic surgery/radiotherapy clinics for skin tumours.

Other clinics which reflect the special interest of local dermatologists may also exist in some areas, such as those which deal with vulval conditions, somatic disorders, eczema, blistering disorders and laser clinics. Dermatological surgery is performed by all dermatologists and services may range from diagnostic biopsy to

more complicated surgical techniques for skin tumours. Some forms of immediate surgical procedure (excision, biopsy, cryotherapy, curettage and cautery) are conducted in around a third of new patients.<sup>51</sup> Some centres also offer laser treatment for vascular lesions.

Assessment and removal of tumours is a major part (40%) of the specialist's workload and dermatological surgery is recognized by the Royal College of Surgeons of London as an important part of the practice of dermatology. All dermatologists are trained in removal of tumours with repair by a variety of closure techniques involving simple closure, skin grafts and skin flaps. Some dermatologists have been trained in advanced surgical techniques such as Mohs micrographic surgery, which is not practised by plastic surgeons and has the lowest recurrence rates of all procedures for removal of skin cancers.<sup>53</sup> Dermatologists work closely with a range of other specialists such as plastic surgeons and radiotherapists for skin tumours and also with paediatricians in genetic disorders and chronic skin diseases in childhood such as atopic eczema. The dermatologist also undertakes an important role in educational activities which includes teaching medical students, pharmacy students, nurses, postgraduates and GPs. Some dermatologists have conducted 'outreach' clinics in the community but a recent survey by BAD has indicated that dermatologists see, on average, only ten patients per session against the BAD recommended figure of 12 to 24.

Despite the vast range of dermatological disorders that a dermatologist may encounter the majority of disorders encountered in the outpatient department are covered within the subgroups mentioned in this chapter.<sup>13,51,54</sup> Around 12% of referrals were considered inappropriate by dermatologists in a West Midlands study.<sup>51</sup> Another study in Leicester showed that even a senior house officer with three months training in dermatology considered that 26% of 490 consecutive referrals were probably unnecessary<sup>55</sup> and that 75% of these unnecessary referrals belonged to just seven disease categories (warts, eczema, naevi, basal cell carcinoma, acne, psoriasis and seborrhoeic warts).

Age-specific attendance rates are more common in female patients and also increase with increasing age (Table 4). Other studies such as the Oxford Regional study have recorded a similar excess of female and older patients.<sup>24</sup> Of 3678 referrals to dermatology (8.1% of all outpatient referrals), 42.7% of these were males and 57.3% female. Age- and sex-specific referral rates for Oxford are shown in Figure 5. In nearly two-thirds of referrals the GP expected the patient to be treated or taken over by the specialist (Table 5).

**Table 4:** Age-specific attendance rates per 1000 population for new patients attending dermatology clinics in West Midlands in November 1988<sup>51</sup>

Age (years)	0-4	5-14	15-29	30-44	45-64	65-74	75+	Total
Male	6.7	6.6	7.6	6.6	7.6	12.1	13.9	7.8
Female	5.2	9.9	12.7	10.7	11.5	10.4	10.9	10.9
Total	6.0	8.2	10.1	8.6	9.5	11.1	11.9	9.3

**Table 5:** Main reasons for a GP to refer a patient for specialist dermatology advice in the Oxford Region<sup>24</sup>

Diagnosis/ investigation (%)	Advice only (%)	Treatment/ management (%)	Second opinion/ reassurance (%)	Other (%)
26.4	13.5	63	2.2	0.2

Private referrals accounted for 21.2% of referrals to dermatology in this region and these were spread fairly evenly across age groups. Another retrospective national survey of a clinical caseload of 217 private hospitals in England and Wales recorded 28 706 consultations for the 1992/93 financial year for diseases of the skin and subcutaneous tissues (excluding plastic surgery), or 4.2% of all procedures carried out in private hospitals.<sup>56</sup> This represents a three-fold rise in private dermatology episodes when compared with 1981 data,

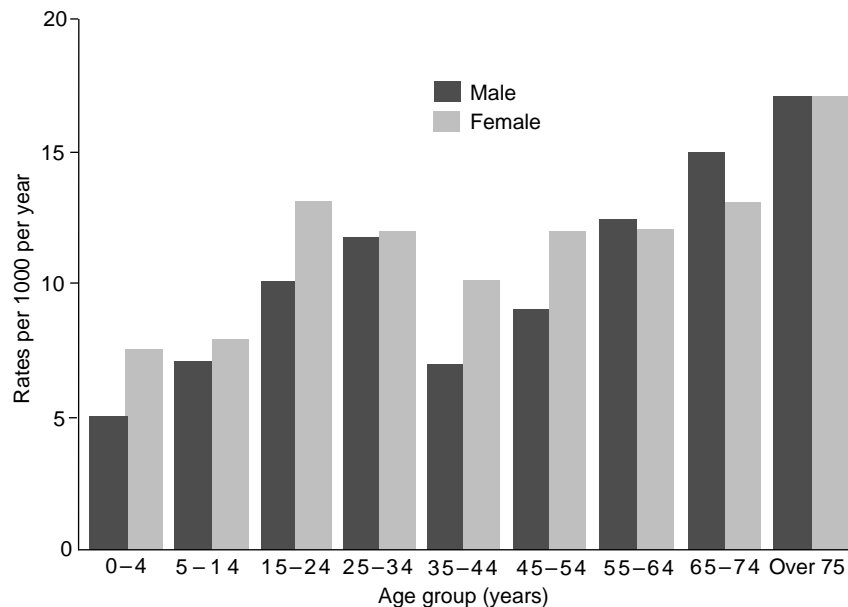


Figure 5: Age- and sex-specific outpatient referrals for dermatology in the Oxford Region in 1992<sup>24</sup>

whereas all medical and surgical procedures taken as a whole rose approximately two-fold. It is difficult to state whether this increase in private dermatology truly reflects individual's desire to pay for skin care treatment since most of these private episodes were paid by insurance schemes but the figures provide us with some idea of the magnitude of dermatology services in the private sector.

#### *How much does the specialist do?*

In the year ending 31 March 1994 the attendance rate for dermatology referrals in the whole of the UK was 11.62 per 1000 population (Statistical Information Unit, Trent Regional Health Authority, 1995). The number of dermatology referrals per year in the UK has increased by 150 282 (33%) over the past three years, representing a change in referral rate from 9.4 to 12.5 per 1000 over the same period.<sup>42</sup> Referral rates in different regions varied slightly in the year ending March 1994 from 10.55 in North West Region to 12.95 in South Thames (Table 6). A further 22.48 per 1000 population were given follow-up appointments, giving an overall new/follow-up ratio of approximately 1 : 2. Around 6% of newly referred patients did not keep their appointments.

These numbers probably underestimate a dermatologist's workload by around 10% as they do not include ward referrals and consultations with staff members.<sup>54</sup> Private outpatient consultations accounted for an overall 0.5% of all new and follow-up dermatology patients seen in the UK in 1990,<sup>8</sup> compared to 0.3% of total general surgery and general medicine activity. This proportion of private activity shows considerable regional variation from 0.2% in Yorkshire to 2.6% in North West Thames.<sup>57</sup>

These figures probably underestimate the current private dermatology activity carried out by recently opened laser clinics and GPs with some training in dermatology.

Although 30% to 40% of new dermatology outpatients undergo some form of minor surgical procedure, these have only recently been recorded by hospitals.<sup>52</sup> Similarly other activities such as dressings and attendance for PUVA are not recorded in routinely published hospital statistics.



**Table 6:** Consultant outpatient activity for dermatology in the UK in the year ending March 31 1994 by new NHS regions.

Region (new NHS regional offices)	Population (000) <sup>a</sup>	Referral attend- ances	Rate per 1000 population	Consultant initiated attend- ances <sup>b</sup>	Rate per 1000 population	Total GP written referral requests	Rate per 1000 population
North West	6935	73194	10.55	126809	18.29	86283	12.44
North East and Yorkshire	6314	74039	11.73	187026	29.62	77508	12.28
Trent	4777	57062	11.95	129946	27.20	51715	10.83
Anglia and Oxford	5325	54812	10.29	97076	18.23	60788	11.42
North Thames	6892	87635	12.72	151459	21.98	92803	13.47
South Thames	6809	88196	12.95	144877	21.28	100509	14.76
South West	6397	72432	11.32	156511	24.47	76254	11.92
West Midlands	5294	56723	10.71	95881	18.11	56397	10.65
Special HAs	–	2361	–	6042	–	2295	–
UK	48743	566454	11.62	1095627	22.48	604552	12.40

<sup>a</sup> 1994 Mid-year population (1991 projection).

<sup>b</sup> Consultant initiated attendances means follow-up visits initiated by a consultant.

### *Variations in referral rates*

In the third GP morbidity survey, regional referral rates for dermatology varied from 3.1 to 12.2% of all those seen.<sup>5</sup> The overall rates in this survey are lower than for the rest of the UK probably because of the unrepresentative nature of the GPs selected for this survey. The study does however suggest a considerable variation in referral rates by GPs. Severity of skin disease does not appear to be a major determinant of referrals, since 8.1% of serious and 6.5% of trivial ones were sent to hospital in the 1981/82 study.<sup>5</sup> Referral rates for individual districts within the Trent Region also vary considerably from 4.92 to 17.7 per 1000 in 1994 (Statistical Information Unit, Trent Regional Health Authority 1995), although less variation is seen within each district with time (Table 7). Small area referral rates for new patients in the Bristol District for 1991 to 1994 also show a wider variation in referral rates, ranging from 9.5 to 49.1 outpatient attendances per 1000 population (C Kennedy, personal written communication, 1994). There was a strong relationship between referral rates and accessibility to hospital services in this small area study.

There is some evidence to suggest that much of the regional variation in referral rates may be governed by established patterns of care such as number of available consultants rather than reflecting any special dermatological need related to the demographic constitution of the local population. A study by Roland and Morris failed to show any relationship between referral rates for dermatology services and medical need as suggested by standardized mortality ratios or mean number of prescriptions issued by GPs (standardized regression coefficient of 0.1).<sup>58</sup> It is possible that mortality ratios are not a suitable surrogate measure for dermatological need. A strong relationship between dermatology referral rates and the number of dermatology consultants per 100 000 population was present however (standardized regression coefficient of 0.82,  $p < 0.001$ ). Given that skin diseases are undertreated and that treatments for many skin diseases are

**Table 7:** General practitioner written referral requests for dermatology per 1000 population for the districts within Trent Region over the last seven years. (Data kindly supplied by the Statistical Information Unit, Trent Regional Health Authority)

District	1988	1989	1990	1991	1992	1993	1994
North Derbyshire	10.07	11.01	11.70	9.88	10.62	9.14	10.09
South Derbyshire	10.21	11.07	11.07	9.17	8.96	8.42	10.39
Leicestershire	8.98	9.33	9.33	8.80	8.34	8.26	4.92
North Lincolnshire	7.91	7.44	7.44	6.86	9.11	10.06	9.99
South Lincolnshire	7.42	7.65	7.65	7.55	7.98	8.39	9.05
Bassetlaw	6.58	6.25	6.25	5.80	–	–	12.71
Central Nottinghamshire	9.38	11.80	11.80	11.72	–	–	11.52
North Nottinghamshire					11.17	12.02	
Nottingham	14.25	11.55	11.55	8.94	12.48	10.83	10.07
Barnsley	10.99	9.42	9.42	9.54	11.37	13.72	17.71
Doncaster	12.20	13.53	13.53	11.49	13.20	14.85	17.20
Rotherdam	10.90	11.94	11.94	10.54	9.45	11.09	12.65
Sheffield	12.66	19.61	19.61	17.12	10.81	8.13	14.93
Trent	10.52	11.37	11.37	10.23	11.11	10.91	10.67

effective, another interpretation of between-practice variations in referral rates is that of simple rationing according to individual practice priorities.

#### *Secular trends in dermatology specialist workload*

Data from the first three GP morbidity surveys suggest that dermatology referral rates have increased substantially over the last 40 years.<sup>5,7</sup> More recent data suggest that this trend has been accentuated with a 33% rise in the dermatology referral rate for the UK in 1993/94 (12.5 per 1000) when compared with 1990/91 (9.4 per 1000).<sup>42</sup> Reasons for this increasing secular trend in dermatology referrals have not been studied adequately but probably include an increase in public demand for specialist referral and an increased willingness to refer by GPs. New outpatient attendances for Amersham and High Wycombe<sup>13</sup> rose by 62% in the 20 years from 1958 to 1988, thought mainly to be due to an increasing proportion of moles, keratoses and skin tumours. In another study of new dermatology outpatients in South East Scotland increases of 29% and 28% were noted between 1981 and 1988 for new and follow-up patients respectively.<sup>59</sup> This was accounted for largely by rises of 173% and 106% in benign and malignant tumours respectively, with a concomitant 98% increase in surgical procedures. This increase in pigmented lesions coincided with national campaigns which encouraged the early diagnosis of malignant melanoma. The population increase in the same period was 1.5%. Others have noted similar changes in workload because of pigmented lesions.<sup>60-62</sup>

#### *Role of the dermatology nurse*

The dermatology specialist nurse is a vital person in the provision of dermatology services.<sup>63,64</sup> Dermatology specialist nurses provide a range of services including leg ulcer assessment, assistance with patch testing, counselling for chronic skin diseases, practical instruction in using skin treatments, support groups (e.g. healed ulcer group) and day treatment facilities for ultraviolet light therapy or topical applications (e.g. dithranol therapy for psoriasis) as well as the traditional role of providing a secure and accepted environment for the care of dermatology inpatients. Some centres employ dermatology liaison nurses to

provide a link between the hospital based specialist and the community in an attempt to foster continuing care.<sup>65</sup> Since 1988 in addition to a 20% decrease in dermatological beds, 35% of dermatology consultants have lost the services of trained dermatological nurses.<sup>47</sup>

### *Inpatient services*

Hospital inpatient statistics show that 82 950 hospital discharges/deaths in the UK in 1985, or 1.6% of all admissions, were due to diseases of the skin and subcutaneous tissue (ICD 9 codes 680–709 which exclude skin cancer and lymphoma).<sup>9</sup> This number of admissions has shown a steady increase from 68 980 in 1979, despite a 20% reduction in dermatology beds.<sup>9,47</sup> In the financial year 1993/94 there were 109 806 ordinary admissions for diseases of the skin and subcutaneous tissue (excluding infections and tumours of the skin), or 1.4% of all ordinary admissions for the UK.<sup>66</sup> Many such patients were cared for by non-dermatologists since only about one-quarter of these inpatient episodes were for inflammatory dermatoses, the rest being made up from disorders such as cellulitis, pilonidal sinus, leg ulceration etc. Diseases of the skin accounted for 1.4% of all inpatient bed days in 1993/94 and the mean and median duration of stay was 10.6 and three days respectively.<sup>66</sup> In 1994 there were 2900 patients awaiting admission for a dermatological disorder in the UK, with 14.4% waiting between six to 11 months and 5.2% waiting 12 months or longer (Statistical Information Unit, Trent Regional Health Authority). Day cases (e.g. those attending for a skin operation) have only recently been recorded fully, but even in 1993/94 diseases of the skin and subcutaneous tissues accounted for 84 597 day case episodes (or 4.0% of all day case episodes).<sup>66</sup>

A detailed study of inpatient workload in the Oxford region using linked data for 1976 to 1985 showed that age-specific admission rates were considerably higher in people aged over 50 years.<sup>43</sup> Age-specific admission rates declined over time in those aged below 70 years but increased above this age. Unlike most other medical specialties, length of patient's stay did not decrease substantially over the ten years and most inpatient work consisted of treatment of people with psoriasis, eczema and leg ulcers. Although overall inpatient admission rates were roughly the same over the ten years, new dermatology outpatients rose by 41% in that same period suggesting that innovations in dermatology practice had been greater for those in an ambulatory setting than those requiring prolonged inpatient care.

## **Costs of services**

### *Direct costs to the NHS*

The only study that has attempted to estimate the direct costs of skin disease to the NHS was conducted by the Office of Health Economics in 1970.<sup>67</sup> They estimated that at least £50 million (or 2.9% of total NHS expenditure) was spent in direct costs on skin disease (£12.8 million on hospital inpatient costs, £6 million on dermatology outpatients, £12.2 million on general practice and £18.3 million by the pharmaceutical service). Skin conditions took up just over 1% of hospital inpatient expenditure but accounted for 7% and 9% respectively of the costs of general practice and prescribed medicines. There is no clear evidence that advances in medical technology have altered the amount or the nature of direct expenditure on dermatological services. In 1994 the direct costs of treating diseases of the skin and subcutaneous tissue were estimated as £617 million (Office of Health Economics, personal communication) still only 2% of total NHS direct costs (Table 8) despite many more expensive drugs being available. Costs for outpatient consultations (the bulk of a dermatologist's work) are excluded from these estimates because of the variation in methods of costing. Benton's study of dermatology services estimated the cost of a single outpatient visit as £4.30 in 1983, compared to £106 for one day as an inpatient.<sup>54</sup> Current methods for costing dermatology outpatient consultations vary between regions and are often based on simple formulae such as total staff and overhead

costs divided by the number of new and follow-up patients based on the previous year's contracted figures. At University Hospital Nottingham, the charge to fundholding practices for first and subsequent visits to the dermatology department was £53 and £27 respectively (T Foan, personal communication, December 1994).

**Table 8:** Breakdown of direct NHS costs for diseases of the skin and subcutaneous tissues for 1994. Overall costs for dermatology outpatient activity are not available

Nature of direct costs to NHS	Cost (£ million)
GP consultations <sup>a</sup>	155
Hospital inpatients	245
Drug costs <sup>b</sup>	175
Drug dispensing costs	42
Total	617

<sup>a</sup> Derived from the fourth national GP morbidity study.<sup>7</sup>

<sup>b</sup> Refers to all prescriptions included in the *BNF* chapter on skin diseases. Although dermatology accounts for a large amount of NHS activity, it accounted for only 2% of NHS expenditure in 1994.

Source: R Chew, Office of Health Economics, personal communication, 1994

As a specialty dermatology incurs a relatively low average drug bill when compared with other hospital disciplines.<sup>68</sup>

#### *Indirect costs*

Perhaps the most useful sources of estimating the magnitude of indirect costs of loss of productivity due to skin disease are sickness absence and Industrial Injuries Fund statistics. In 1970 0.3 million spells of work absence were attributed to skin disease, or over 7 million working days lost in 1970/71.<sup>12</sup> Despite this more recent data suggest that the spells of absence attributed to skin disease have declined through the last 20 years possibly due to improved working practices and the introduction of topical corticosteroids and antibiotics.<sup>11,12</sup>

Diseases of the skin were still amongst the top 14 reasons for spells of certified incapacity due to sickness in 1992/93 accounting for 10 000 out of a total of 606 000 claims for men in those years.<sup>11</sup> Extrapolation of these figures to 1996 may not be appropriate due to recent changes in classifications of incapacity to work. Skin diseases were also cited as one of the most common reasons for injury and disablement benefit in the period 1977 to 1983.<sup>12</sup>

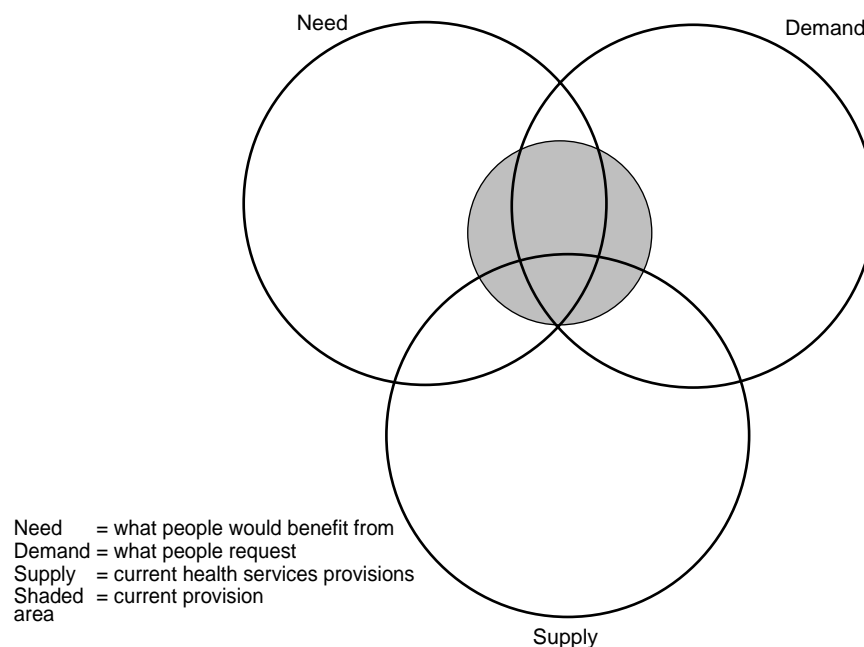
#### *Personal disability/handicap of skin disease and additional costs*

The 1989 General Household Survey estimated that 16 per 1000 persons were affected by a longstanding skin disorder (i.e. those covered by ICD 9 Chapter XII) sufficiently to limit their activities.<sup>69</sup> Another survey of disability amongst 14 000 adults conducted in the mid 1980s found that 1% of complaints causing disability in private households and 2% in communal establishments were due to skin disease.<sup>70</sup> In the US HANES-1 study skin conditions were reported to limit activity in 10.5 per 1000 of the population aged 1–74 years, or 9% of those persons with such skin conditions.<sup>3</sup> About 10% of those with skin complaints considered the condition to be a handicap to their employment or housework and one-third (33%) indicated a handicap in their social relations as a result of skin disease. Quantification of such disability in monetary terms has not been evaluated. In addition to disability and handicap some chronic skin diseases such as atopic eczema also incur considerable additional direct costs to families, such as purchasing of moisturizers and special soaps, extra laundry expenses and extra cotton clothing and bedding. The Lothian atopic dermatitis

study estimated these costs to patients to range from £0 to £70 per two months (median £3.00) compared with health service costs ranging from £0 to £61 (median £7.50) per two months.<sup>71</sup>

### Relationship between need, supply and demand

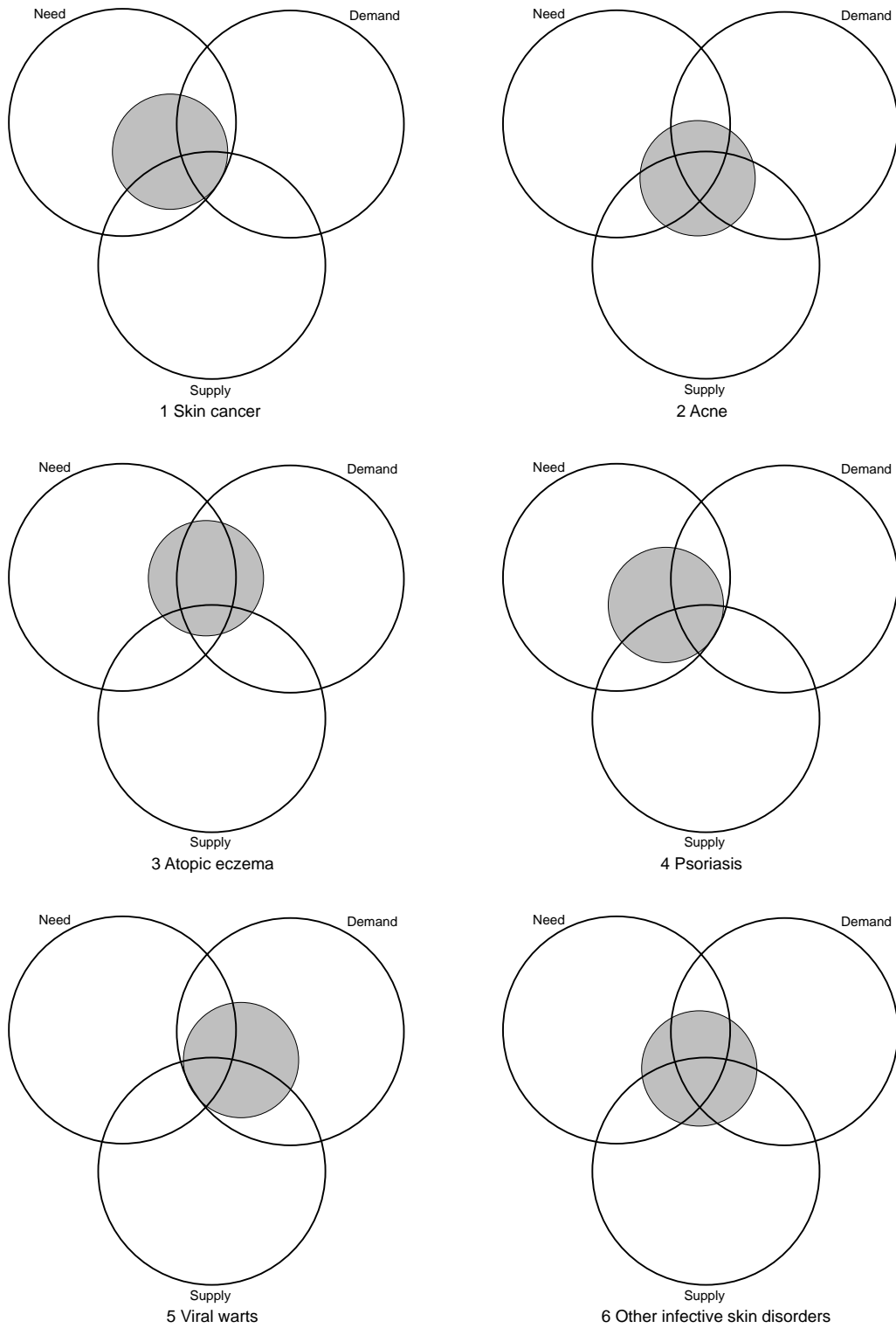
This is summarized in the form of Venn diagrams<sup>14</sup> for skin disease as a whole and for disease sub-categories (Figures 6 and 7).



**Figure 6:** A schematic representation of the relationship between the need, supply and demand for dermatological health care for skin disease as a whole.

These representations are intended only as a visual guide given the limitations in current data on the relationship between the three categories of need, supply and demand for skin disease and the limited nature of defining need in such a normative way. Different patterns are seen for different subgroups. For skin cancer much disease amenable to treatment (need) is not asked for (demand), and would probably outstrip current supply if it were identified. Many benign tumours on the other hand, may not represent medical need in the eyes of physicians but are demanded by people and only dealt with to some degree, possibly at the expense of more urgent priorities such as a patient distressed with an inflammatory rash. If one defines medical need as the ability to benefit from medical care, then even people with benign tumours such as seborrhoeic warts, which may be unsightly or catch in clothing, will certainly benefit from medical care such as cryotherapy or curettage, again illustrating the need for providing explicit corporate definitions of dermatological need.

Generalizations for the whole of skin disease are difficult since different sub-categories for skin disease may have different service requirements. The summary in Table 9 provides a rough guide. It is reasonable to summarize the whole of skin disease as a service where the core pattern of services is good for most major disease groupings, but allowances need to be made for lack of recent data. In particular, demand for treatment of benign skin tumours has increased and is likely to continue increasing with a better informed population empowered by the patient's charter. Overall, there is considerable unmet need, and some services are demanded which probably do not require supply.



**Figure 7:** The relationship between the need, supply and demand of health care services for the main sub-categories of skin disease.

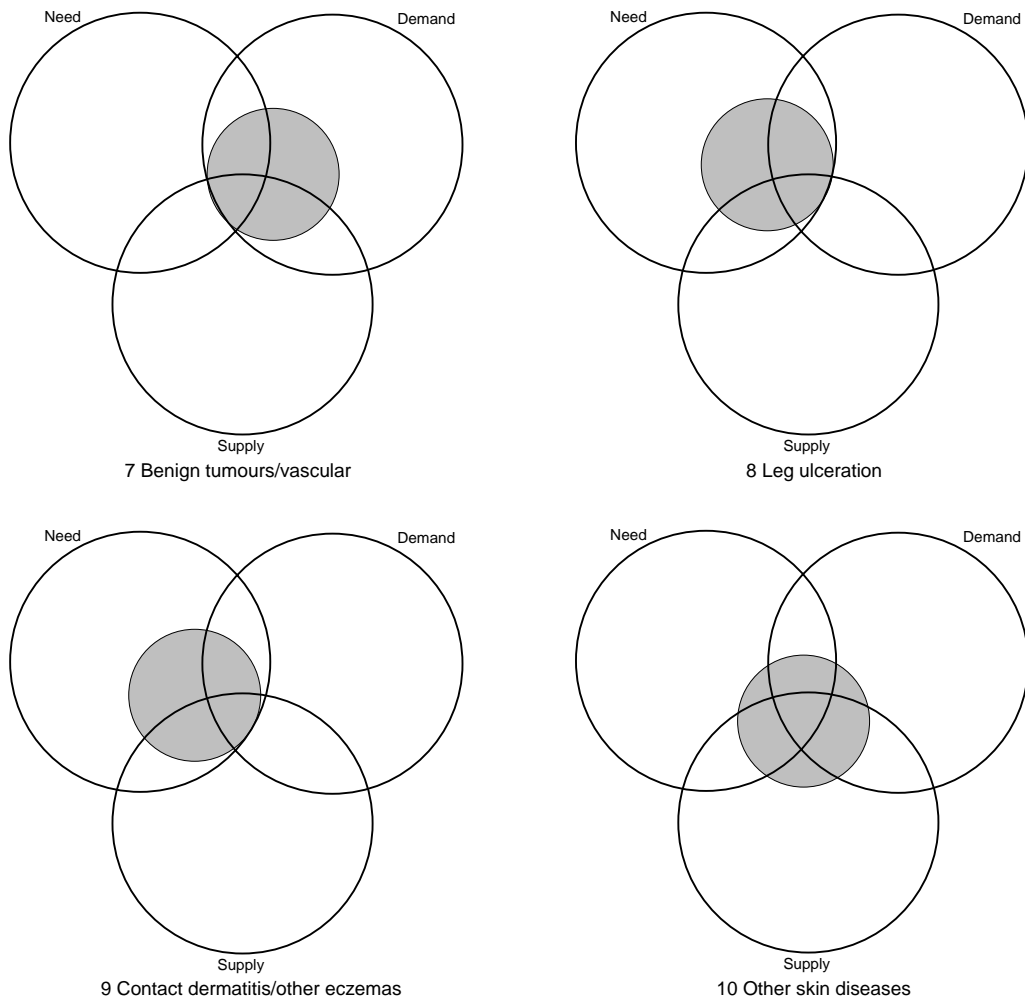


Figure 7: continued.

Table 9: The relationship between dermatology services and population need and demand

Need, supply and demand pattern	Skin disease sub-category
1 Large need, large demand, modest supply	Atopic eczema, contact dermatitis and other eczemas
2 Large need, modest demand, modest supply	Skin cancer
3 Moderate need, demand and supply	Psoriasis, acne, other infective skin conditions, leg ulceration, other skin conditions
4 Large demand, small need, moderate to large supply	Viral warts, benign skin tumours

## Summary

- People with skin conditions require a range of services from self-help groups to specialist inpatient care.
- Around 15% of the population consults the GP each year because of a skin complaint.
- The UK has the lowest ratio of dermatologists to population in Europe (around 1 : 200 000).
- At least 12.5 per 1000 people are referred to a dermatologist each year in the UK.
- Considerable variation in specialist referral rates exist for dermatology.
- There is some evidence to suggest that these variations in referral rates may be related partly to established patterns of care.
- In addition to diagnosis and management, dermatologists offer a range of services such as surgery for skin cancer, laser treatment, patch testing, ultraviolet light therapy and other special clinics such as pigmented lesion and paediatric dermatology clinics.
- Around 30% of a dermatologist's work involves a minor surgical procedure.
- The dermatology nurse is a vital person in the dermatology team.
- Dermatology inpatients account for 1.4% of all admissions.
- Dermatology accounted for £617 million in direct costs to the NHS in 1994 (2% of the total NHS budget for direct costs).
- Skin diseases are still one of the commonest occupational disease, and accounts for a considerable amount of absence from work and sickness benefit.
- Generalizing the relationship between the need, supply and demand of skin disease over all disease sub-categories is difficult.
- Apart from a large iceberg of unmet need, the current core pattern of services for dermatology generally fits the evidence except for uncertainties regarding the relative merits of care settings.

## 6 Effectiveness of services

This section summarizes what is known about the effectiveness of current dermatological services in different care locations, focusing on diagnostic accuracy and appropriateness of treatment where this information is available. Strength of recommendation will be based on the quality of evidence<sup>72</sup> (Appendix XVI). Discussion will also include primary and secondary prevention of skin disease where this is relevant. Effectiveness of currently available treatments by dermatological disease sub-categories is also discussed, together with examples of cost-effectiveness and cost utility data where these are available.

### Dermatology services as a whole

#### *Over-the-counter preparations and pharmacists' advice (BIV)*

Although some OTC preparations such as 1% hydrocortisone, anti-fungal creams, topical acyclovir for herpes simplex and topical benzoyl peroxide have been rigorously tested (AI to BI), many others are less well tested or have not been tested at all (CII to CIV). It is likely that the availability of OTC acne preparations has resulted in less patients consulting with their doctors but whether this is appropriate in terms of correct diagnosis or choice of treatment and satisfactory outcome has yet to be examined. Wastage of family income on ineffective skin treatments has been shown to be a problem in other countries<sup>73</sup> but this has yet to be studied in the UK. Little is known about the way in which availability of OTC substances affects the total burden of skin disease, as is the quality and appropriateness of advice given by pharmacists on skin matters.<sup>44,74</sup>



### Primary care (CIII)

Apart from specific diseases such as viral warts and pigmented lesions, very little work has examined the outcome of consultation and treatment of skin diseases in general practice.<sup>5</sup> Some GPs trained in dermatology have reported high rates of positive diagnosis (85%).<sup>46</sup> The low ratio of benign lesions to melanoma in UK hospitals (40 : 1 compared to 253 : 1 in US skin cancer fairs) has been cited as an illustration of the usefulness of GPs in screening such lesions<sup>75</sup> but such an assessment does not take into account those lesions dismissed or incorrectly diagnosed by GPs. Despite considerable personal experience in dermatology, Horn pointed out that with an expected frequency of one malignant skin condition once every two to three years GPs cannot be expected to diagnose skin malignancy reliably.<sup>26</sup> General practitioners with some specialist training probably have higher but more appropriate overall referral rates to hospital specialists.<sup>76</sup>

Although minor skin surgery conducted by GPs may offer a more personal and convenient service to patients<sup>77</sup> a recent UK study of pathology requests submitted by GPs for minor surgical procedures found that the overall correct diagnosis rate for skin malignancy and seborrhoeic warts was below 30%.<sup>78</sup> Most of the three-fold increase in workload in the local pathology department generated by GPs was due to benign lesions such as moles, cysts and seborrhoeic warts. None of the four melanomas in this study was correctly identified. Only nine out of 21 squamous cell carcinomas were adequately excised. Similar rates of correct diagnoses for seborrhoeic warts by non-specialists (35%) have been found elsewhere.<sup>79</sup>

The study by Stevenson *et al.* of 2940 dermatology patients in the West Midlands found that 12% of referrals were considered inappropriate by the dermatologist (mainly viral and seborrhoeic warts).<sup>51</sup> Around one-quarter to one-third of referrals for atopic eczema, acne and psoriasis were also considered inappropriate in that adequate primary treatment had not been given prior to referral. In another study of 686 consecutive new referrals to a dermatology unit in London<sup>80</sup> 32% were judged to have been inappropriate on the grounds of not requiring specialist diagnosis or management. Some of these inappropriate referrals might have been due to increased patient demand for specialist referral. It is also not clear whether these problems are likely to be resolved simply by intensive training programmes. A study by Sladden *et al.* showed that over 75% of their inappropriate referrals belonged to just six diagnostic categories,<sup>55</sup> suggesting that focused educational programmes might be beneficial. One recent study which set out to train GPs in distinguishing malignant from benign lesions found that although the proportion of melanomas diagnosed correctly rose from 65% to 81% after training the proportion of seborrhoeic warts diagnosed correctly remained unchanged at 54%.<sup>81</sup>

### Specialist services (BIII)

Except for sub-categories of skin disease and meeting reports<sup>28,82,83</sup> (BIII) no systematic research into the differential health gain of referral to dermatologists has been undertaken (CIV). In a comprehensive study of hospital outpatients in 1970<sup>84</sup> Forsyth and Logan commented that 'Of all out-patient departments dermatology had the clearest function and is the least suspect of impinging on territory which might safely be left to a retrained and revitalised corps of general practitioners'. It seems obvious that the consequences of non-referral of a patient with a diagnostic or management problem to a dermatologist could be serious (e.g. missing a melanoma or death due to generalized pustular psoriasis) but little is known about the threshold and reasons for referral for common skin disorders. One study by Roland and colleagues in Cambridge has suggested that many more patients with skin disease might benefit from specialist help.<sup>85</sup> This study identified 22 patients with skin problems whose GPs were satisfied with their management and had no intention of sending them to hospital. These patients were reviewed by a dermatologist who made treatment recommendations in 14 cases, six of whom reported a definite improvement in their skin condition six weeks later and the GPs themselves found the consultation helpful in 17 cases.

Although these patients might have improved anyway, the authors have drawn attention to a large and understudied group of patients who might benefit from brief assessments by specialists. The views of consumers with regards to satisfaction of dermatological health care services have not been examined, except in a small study of satisfaction with hospital versus outreach clinic appointments.<sup>86</sup>

In addition to outpatient referrals generated by GPs, dermatologists also see referrals for inpatients from other specialties who have skin disease. In a recent study Falanga *et al.* found that dermatologic consultation changed dermatologic diagnosis and treatment in more than 60% of patients, usually common conditions with established treatment.<sup>87</sup> In a study of 500 non-dermatological inpatients referred for a dermatological opinion, 37% were considered to have a skin condition which contributed substantially to the diagnosis of the systemic disease.<sup>23</sup>

Another study of melanoma cases seen in a London hospital over an 18-year period showed that dermatologists were more likely to enter the correct clinical diagnosis on pathology forms when compared with general surgeons (85% compared with 61% respectively).<sup>88</sup>

Although there are compelling arguments for ensuring that dermatologically trained nurses should be key members of the specialist team<sup>63-65,89</sup> no studies have examined the cost-effectiveness of this professional group in dermatology (CIV). Similarly the cost-effectiveness of liaison dermatology nursing has not been assessed.

The effect of outreach dermatology clinics (DIII) has been monitored in terms of activity.<sup>28</sup> Preliminary results suggest that around half as many patients are seen than in a dedicated dermatology outpatient set up, at the possible expense of patients who do not have the benefit of outreach clinic services. Shorter waiting times and ease of access have been reported with such clinics but they have not increased interaction between specialists and GPs.<sup>90</sup>

### **Specific services for skin disease sub-categories (AI to BII-2)**

Although many excellent clinical trials have been conducted in dermatology, the vast number of skin disorders and small number of dermatologists has meant that many treatments for less common skin conditions have not been fully tested by means of randomized placebo-controlled studies. In assessing the quality of evidence it is important to distinguish procedures which lack adequate evaluation (where currently there may be no alternative treatments) from those where there is some evidence to reject the use of the procedure.

Other problems exist such as a lack of agreement on suitable end-points<sup>91,92</sup> and a profusion of studies that are too small to answer the questions posed.<sup>93</sup> Recent work on the development of patient-derived measures of skin disability such as the Dermatology Life Quality Index are a welcome development in patient-centred assessment of effectiveness of skin treatments but requires further evaluation.<sup>94</sup> Little work has been conducted in implementing research findings in dermatology and a few studies point to a considerable gap between intended and actual practice.<sup>95</sup>

In considering effectiveness of newer and more expensive dermatological treatments it is important not to consider initial purchase costs in isolation. Several cost-effectiveness and cost utility analyses have shown that treatments with high initial costs such as isotretinoin (a potent oral treatment for acne),<sup>96-98</sup> terbinafine (an anti-fungal agent),<sup>99</sup> cyclosporin A (for treatment of resistant psoriasis)<sup>100</sup> and calcipotriol ointment (a new topical vitamin D preparation for treatment of psoriasis)<sup>101</sup> may be offset by reduced frequency of follow-up visits, better compliance and higher clearance rates.

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*Skin cancer***Primary prevention of melanoma (BII-3)**

Concerns that excessive exposure and burning in the first ten years of life may be critical in the development of melanoma have led the Health of the Nation to encourage efforts directed at informing school children of the dangers of excessive sun exposure.<sup>4</sup>

Preliminary studies in school children indicate that knowledge of skin cancer can be enhanced by such schemes<sup>102</sup> but studies in the UK have been unable to show that people's sun exposure behaviour actually changes as a result of such knowledge.<sup>103</sup> No studies have yet showed that sunscreens reduce numbers of melanoma cancers.<sup>4</sup>

Since 1993 issues pertaining to skin cancer have been co-ordinated by a national UK Skin Cancer Working Party composed of representatives from dermatology, cancer charities and the Health Education Council.<sup>4</sup> This working party is further divided into four sections which deal with the following:

- 1 cancer registration problems
- 2 helping the primary care team
- 3 helping hospital skin cancer services
- 4 public education.<sup>104</sup>

**Secondary prevention of melanoma (BII-3)**

Since thin melanomas have a relatively good prognosis, rapid access to specialists has been a priority for health professionals. Many dermatologists run specially designated pigmented lesion clinics. The establishment of a pigmented lesion clinic does not in itself influence melanoma prognosis in a population. The main source of delay in seeking medical help has been shown to be because of patients' lack of knowledge of the significance of the lesion. Pigmented lesion clinics may provide an administrative focus for skin cancer services and they may also play a part in public education and generation of important research data.

Publicity campaigns to alert the public to the early signs of malignant melanoma have been evaluated on a before and after basis in the UK with mixed results and the effects on melanoma mortality are awaited. Population screening for melanoma has not been adequately assessed, although the disease fulfils most of the requirements for screening, especially in high risk groups such as those with fair skin.

Evidence that skin cancer screening is effective for melanoma skin cancer is incomplete.<sup>105</sup> Secondary prevention does not seek to reduce the incidence rates of these diseases.

**Treatment of melanoma**

Management is mainly by surgical excision. Narrow excision margins for thin lesions have been associated with an excellent prognosis (AI). Thicker lesions may require wider excision and further surgery or other treatment modalities (BII-2). The treatment of disseminated disease is disappointing (CII-2).

**Non-melanoma skin cancer**

Although non-melanoma skin cancer is a potentially preventable disease, the cost-effectiveness of primary and secondary prevention of non-melanoma skin cancer in the UK is unknown (BIII). Surgical excision produces excellent results in basal cell and squamous cell carcinomas of the skin (AII-1) and other treatment modalities such as radiotherapy and cryotherapy may also be effective (BII-3). Some invasive tumours in

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<sup>a</sup> c/o British Association of Dermatologists, 19 Fitzroy Square, London W1P 5HQ.

certain anatomical locations may require more advanced techniques such as Mohs micrographic surgery, an intensive time-consuming procedure which requires special training (usually in the US). Recurrence rates however are the lowest for all procedures for removal of skin cancer (AII-2). Although people with one non-melanoma skin cancer are at a high risk of developing further lesions, the optimum frequency and level of review is unknown.

### *Acne (AI)*

Treatments for acne vulgaris have been well evaluated.<sup>106</sup> Consideration of disease severity<sup>107</sup> and whether lesions are inflammatory or non-inflammatory and compliance are the main determinants of therapy. Mild disease is usually treated with topical agents such as benzoyl peroxide, tretinoin and isotretinoin, antibiotics and azelaic acid. Long-term systemic antibiotics (minimum six months) and anti-androgens are used in more extensive disease. Oral isotretinoin is used under specialist supervision for severe and unresponsive disease, with excellent long-term results. Around 40% will be cured, 21% will require topical therapy only and the remaining 39% relapsing usually with milder disease within three years of treatment.<sup>98</sup>

### **Cost-effectiveness (AII-2)**

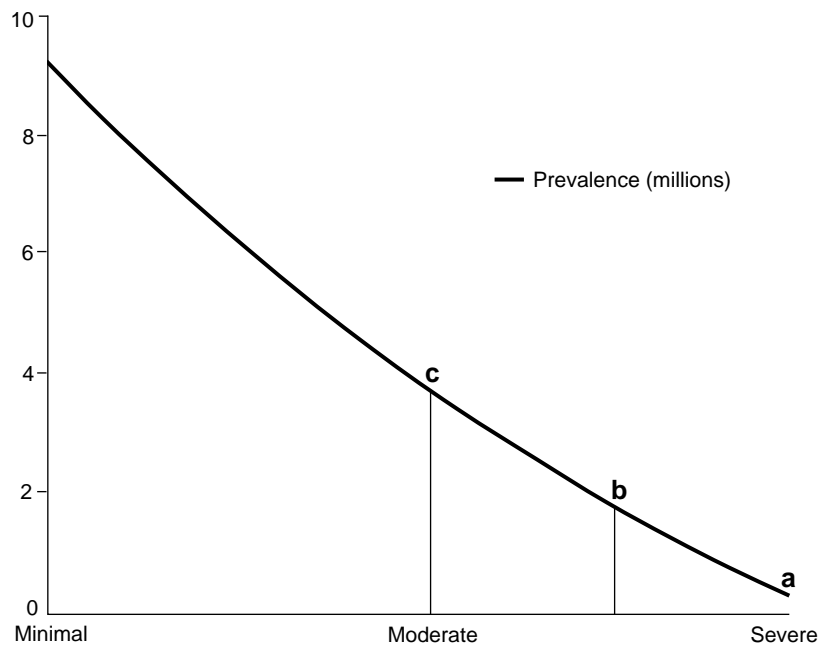
Although a four-month course of oral isotretinoin for severe acne may appear to carry high initial costs (£650 including outpatient costs, 1991 prices), this was considerably less than the cumulative costs of conventional treatment with rotational antibiotics and return visits to GPs (£2108).<sup>97</sup> Simpson in 1993 calculated that the cost per subsequent disease-free year was £192 for oral isotretinoin and a median cost per QUALY of £899.<sup>96</sup>

The severity threshold where oral isotretinoin is no longer cost-effective in acne vulgaris is unknown. Small changes in this threshold brought about by more demanding and articulate groups of patients with high expectations of treatment, could have serious financial implications and alteration in the cost : benefit ratio as illustrated in Figure 8.

### *Atopic eczema (BI to BII-2)*

One randomized study has suggested that prevention of atopic eczema in children born to parents with atopic disease may be possible by restricting maternal allergens and reducing household dust mite levels.<sup>108</sup> Further studies are needed to assess the impact in unselected populations. Observational studies on the effect of exclusive breastfeeding on the development of atopic eczema is conflicting and beneficial effects are likely to be small (CIV).

The mainstay of treatment of mild to moderate atopic eczema is with emollients to moisturize the skin (BIII) and mild to moderate potency topical corticosteroids (BI). Other treatments such as bandaging limbs (BIII), topical tar (BIII), antibiotics for secondary infection (BIII) and evening primrose oil are also used, although the additional benefits may be small. The roles of allergy testing and environmental manipulation have not been adequately assessed. No treatments have been conclusively shown to alter the natural history of established atopic eczema. Given such limitations in treatment patients value adequate time to have the nature and prognosis of the disease explained to them, as well as easy access to a specialist during exacerbations.<sup>109</sup> Severe atopic eczema is usually treated with potent topical corticosteroids (BII-2) and other measures such as short courses of oral corticosteroids (BII-3), ultraviolet light (BII-3), traditional Chinese herbs (BII-1) and other immunosuppressive agents such as azathioprine or cyclosporin A (BII-1), or hospital admission (BIII). Cost-effectiveness studies are absent but one study has suggested that costs to patients incurred by prescription charges for topical treatments are considerable even for milder cases in the community (mean two month expenditure by patients of £22.50 compared with £16.20 direct NHS costs in 1993).<sup>110</sup>



**Figure 8:** Acne severity in females and the possible implications of changes in the threshold for treatment with powerful agents such as isotretinoin. Even a small change in treatment threshold from **a** (severe disease) to **b** (moderately severe) would result in a seven-fold increase in prescriptions. A change in treatment threshold from **a** (severe) to **c** (moderate) would result in a fifteen-fold increase in prescriptions in absolute terms.

(Source: Based on actual data on acne severity in US females.<sup>107</sup>)

### *Psoriasis (AI to BII-2)*

Smoking and alcohol are both risk factors for psoriasis which are amenable to public health manipulation (BII-2) but their avoidance as a means of prevention or treatment of established psoriasis has yet to be studied. Mild cases of psoriasis may be treated with a variety of effective topical treatments such as coal tar (AI), dithranol (AI), topical corticosteroids (AI) and calcipotriol (AI). Ultraviolet light both in the form of long-wave ultraviolet light (UVB) and oral PUVA is well established and is an effective method of treating more extensive psoriasis (AI), although there is a small risk of long-term skin cancer in those receiving high cumulative doses (BII-2). Severe disease may also be treated by immunomodulators such as oral acitretin (AI), cyclosporin A (AI) and low dose oral methotrexate (AI). Day case topical treatment (AII-3) or hospital admission is occasionally required for assistance in treating widespread or life-threatening disease. Cost of methotrexate per year has been estimated at £875 (1993), £586 of which is due to the initial liver biopsy required to monitor possible liver damage. Phytochemotherapy treatment for one year has been estimated to cost around £560 and a six-week course of UVB ultraviolet light and tar baths at £222 (1993).<sup>101</sup>

### **Cost-effectiveness**

Although the unit cost of new drug developments such as calcipotriol (a topical vitamin D analogue) may be high (£23.49 per 100 g tube compared with £2.06 for diluted betamethasone valerate ointment in 1993) this may bear little relationship to its overall cost-effectiveness as savings may be made in terms of fewer follow-up visits, less recourse to second-line therapy and possibly less inpatient admission which may be costly.<sup>101</sup> Similarly although second-line treatments such as cyclosporin A are expensive, preliminary cost-comparison analyses suggest that such drugs may be up to four times less costly than conventional treatments such as short-contact dithranol plus UVB therapy in a supervised outpatient setting.<sup>100</sup>

*Viral warts (AI to DIII)*

Treatment of simple viral warts on the hands or feet is usually either by topical salicylic acid paints or liquid nitrogen cryotherapy. There is little evidence to suggest that cryotherapy at three-weekly intervals is any more effective than topical application of salicylic acid for simple hand and foot warts, each having a three-month cure rate of around 60% to 70% after three months treatment (CII-2).<sup>111</sup> Double freezing is probably no more effective than a single freeze except for warts on the feet (AI).<sup>112</sup> There is reasonable evidence to suggest that considerable savings could be made by the provision of liquid nitrogen to GPs or by health authorities employing nurses to treat warts (BIII).<sup>113</sup> The cost-effectiveness of medical practitioners in treating simple warts with liquid nitrogen has not been assessed (CIV). Although liquid nitrogen is cheap, treatment is time consuming and this needs to be weighed against the fact that around 65% of viral warts on the hands and feet clear spontaneously within two years.<sup>111</sup>

It is probably wasteful of resources for dermatologists to be concerned with the routine treatment of warts (DIII) but they may need to see patients with resistant warts, where a number of treatments such as intralesional bleomycin, interferon, retinoids, topical sensitization and more prolonged or aggressive cryotherapy have been tried (BII-1 to CIII).

*Other infective skin disorders (AI to AII-3)*

Controlled trials have shown that both oral and topical antibiotics are effective in treating bacterial skin infections such as impetigo (AI). The pain and duration of herpes simplex infections may be reduced by specific anti-viral agents such as acyclovir, either given topically or orally (AI). Short- and long-term pain due to Herpes zoster infection (shingles) may also be reduced by high dose acyclovir administration (BI). Many effective topical and systemic anti-fungal agents have been evaluated for the treatment of fungal infections of the skin, hair and nails (AI). Systemic anti-fungals are required to treat fungal nail and scalp infections and although the unit cost of newer treatments such as terbinafine and itraconazole may be high, the cost-effectiveness of these drugs may be higher than cheaper alternatives because of shorter duration of treatment,<sup>99</sup> better cure rates and fewer follow-up visits (BII-3).

*Benign tumours and vascular lesions (AII-3 to C4)*

Benign tumours such as naevi, dermatofibromas and sebaceous cysts which cause discomfort or concern for other reasons can all be treated by surgical removal with good cosmetic results and high patient satisfaction (BII-3). No studies have examined the cost-effectiveness of treatment and its relation to the threshold of intervention; although treatment by dermatologists is considerably cheaper than treatment by general surgeons because of lower theatre and overhead costs. In Watford General Hospital for example, excision of a skin lesion by a dermatologist was charged at a rate of £28, whereas an identical procedure performed in the main theatre by surgeons cost £250 (JK Schofield, personal written communication, 1994). Treatment of unsightly seborrhoeic warts with topical liquid nitrogen is highly effective with high degrees of patient satisfaction (AII-3). The Candela flash lamp pumped pulsed tunable dye laser is considered as the gold standard for treating facial port wine stains in children because of its high efficacy and low incidence of side-effects such as scarring or pigmentary changes (AII-3), although techniques are continually being refined. Treatment is likely to produce 50% lightening of the stain in 70% to 80% of patients and around 20% may clear completely. Best results are seen in small children where the mean number of treatments may be reduced. Treatment costs are related to the number of treatments which are required but an estimate of costs would be between £150–£300 per treatment episode with an expected number of treatments ranging from 6–15 (S Lanigan, personal written communication, 1995).

Although cost-effectiveness of such laser treatment has not been evaluated, the social stigma and psychological morbidity for patients with these disfiguring marks can be very serious.

Treatment of solar keratoses with topical liquid nitrogen or 5-fluorouracil cream is effective (AIII) but the extent to which treatment of visible lesions prevents the development of subsequent squamous cell carcinomas is unknown. Large long-term trials will be needed to address this important question because of the very low rate of malignant transformation of these common lesions and substantial rates of spontaneous regression. Although the presence of solar keratoses is a marker of solar damage indicating a possible increased risk of skin malignancy, the evidence that all such patients need to be followed-up is poor (CIV).

#### *Leg ulceration AII-1*

Primary and secondary prevention of leg ulcers in high risk populations such as the elderly has not been assessed in the UK (CIII). Treatment of leg ulcers is tailored to the cause. Most venous ulcers respond readily to adequate external graduated compression, wound cleansing, leg elevation and exercises. Healing rates for venous ulcers with adequate external compression therapy vary from 33% to 60% at 12 weeks<sup>114,115</sup> (AII-1). Basic treatment is simple and is designed to counteract the effects of raised venous pressure in the affected limb. Although many new topical ulcer preparations and dressings are available their advantage in terms of cost-effectiveness over simple hydrocolloid alternatives for most venous ulcers is doubtful (BII-1). Other treatments such as skin grafting may accelerate the healing of large ulcers and reduce costly inpatient care (AII-1). Support groups such as healed ulcer clinics may play an important role in encouraging self-care and prevention of ulcer recurrences (AIII).

Ischaemic ulcers require a different treatment approach as external compression may lead to irreversible ischaemia and amputation. Vascular surgeons offer a range of treatments including arterial bypass surgery, angioplasty or sympathectomy for ischaemic leg ulcers (AIII).

Costs associated with the treatment of leg ulcers may be high (£400 to £600 million in 1992) mainly due to nursing time. One study has examined the cost-effectiveness of establishing community leg ulcer clinics versus existing hospital-based services and found that community clinics were associated with higher healing rates (80% and 22% healed at three months respectively) and less cost (£169 000 compared with £433 600 per year, 1993 prices for 500 ulcer patients in a district with a population of 270 000).<sup>116</sup> This study referred to a well-motivated research group in the community and caution should be exercised in generalizing costs and healing rates to other settings. The study does however show that good healing at lower costs can be achieved in well-run community clinics (AIII).

#### *Contact dermatitis and other forms of eczema (AIII-3)*

Contact dermatitis is a preventable disease and skin protection in high risk occupations such as cleaning work is encouraged to a variable degree (AIII). Although most eczematous skin reactions respond to treatment with topical corticosteroids and emollients to hydrate and protect the skin, treatment without investigation is not cost-effective as the avoidance of external causes such as irritants or allergens identified through patch testing may offer a permanent cure. Not all patients require referral for specialist assessment if features elicited in the history and examination suggest an obvious cause. Treatment (including avoidance of provoking factors) results in clearing or improvement of around 40% to 70% of those with hand eczema, regardless of the cause. A range of effective treatments is available for 'other eczemas' such as seborrhoeic, discoid, stasis, photosensitive and asteatotic eczema depending on the underlying cause (AII-3).

*Other skin diseases (A1 to CIII)*

Too many skin diseases are included within this category to make any generalizations of effectiveness of services. Treatment of some of the more common diseases such as symptomatic relief of urticaria by antihistamines has been well evaluated (A1), whereas the treatment of many rare skin disorders is based on case reports or uncontrolled series (CIII) because of practical difficulties in organizing randomized controlled studies. It is important that purchasers appreciate that 'treatment' does not necessarily imply drug treatment. Effective drug treatment may not yet be available in some serious skin diseases such as epidermolysis bullosa but explanation, practical advice and special footwear to avoid skin trauma, surgical procedures to release fingers trapped by scar tissue and access to specialist nursing care may be very valuable for sufferers and their families (AIII).

**Key points on service effectiveness**

- The effectiveness of OTC preparations and pharmaceutical advice on the burden of skin disease in the community is unknown.
- Little is known about the differential health gain of specialists versus generalists in the diagnosis and treatment of common skin diseases.
- Some evidence suggests that the diagnosis and surgical removal of skin cancer is best carried out by dermatologists.
- General practitioners are in the best position to manage mild to moderate common recurrent skin diseases such as acne, psoriasis and atopic eczema.
- Better management of these conditions could reduce unnecessary referrals to specialists.
- Most viral warts do not require referral to a specialist.
- Outreach specialist clinics are probably not an efficient use of the limited specialist care currently available in the UK.
- The cost-effectiveness of liaison dermatology nurses is unknown.
- There is reasonably good evidence to support the effectiveness of most treatments used for the common skin disease sub-categories.
- Many skin diseases, especially skin cancer, are theoretically preventable but prevention programmes have not been evaluated adequately.

**7 Models of care**

This section deals with a variety of alternative scenarios for delivering dermatological care and examines the possible consequences of these models. By considering both ill-deployed services and opportunities for investment in health care gain, an agenda is set for some potential changes in dermatological health care provision. With such scanty and out-of-date information on the prevalence of skin disease and even weaker data on economic costs of skin disease, the emphasis on direct costing estimates has been reduced in favour of suggestions as to where shifts in the provision of skin care need to be explored, based upon available evidence. The models of care topic requires further discussion and piloting before any decisions are made.



## Public health approach

Prevention of skin disease is more desirable than investment in expensive treatments and technologies for sick individuals who present themselves at the end of a long chain of pathological events. The high prevalence of many skin conditions combined with knowledge of their causes makes some of them an ideal target for future public health intervention programmes. Infectious skin diseases such as scabies,<sup>117</sup> head lice and scalp ringworm outbreaks are obvious examples of appropriate management utilizing a public health approach in order to facilitate disease control at a population level.

Skin cancer, a Health of the Nation target,<sup>4</sup> is the most common form of cancer in the UK yet it is largely a preventable disease. Already there is sufficient information on the link between ultraviolet light and skin cancer and predisposing factors such as skin type to suggest primary and secondary prevention strategies are worthy of further evaluation.

There is a chasm however between what might at first appear to be a sensible approach and what has been shown to be effective in terms of skin disease prevention. For example although skin cancer fulfils most of the requirements for a successful screening programme, randomized population studies examining the cost-effectiveness of such approaches in various risk groups have not yet been performed. Urgent research is required if costly programmes with low diagnostic yields and unnecessary public anxiety are to be avoided.<sup>105</sup>

Early intervention of incident cases of leg ulcers when they are at a small stage in elderly groups is another area where secondary prevention may be cost-effective. More research is required into the effects of manipulating environmental risk factors for atopic eczema (e.g. reducing house dust mite and cow's milk exposure during pregnancy in high risk groups), psoriasis (reducing smoking and alcohol consumption) and contact dermatitis (protection, education and use of substitutes for potent sensitizers) in order to formulate the most efficient preventative strategies.

However lack of adequate research data should not be a reason for inaction over primary prevention of skin cancer by attempts at altering public attitudes and behaviour (especially children) because the results of such endeavours may not be known for several decades and the cost of forgoing such programmes are potentially high in terms of mortality, morbidity and future treatment costs. Greater emphasis on prevention of skin cancer by reducing excessive sun exposure in early and adult life can be justified, as well as the continued emphasis on early diagnosis of melanoma skin cancer. Widespread screening for skin cancer cannot be currently recommended until further research is conducted.<sup>105</sup>

## Service approach

This approach considers possible changes in existing services in the light of the prevalence and incidence of skin disease and available effective treatments so that people are treated in the appropriate health care setting by appropriate personnel. Generalizations for skin disease as a whole may be difficult since different skin disease sub-categories may have different health care requirements. For example the shift in services for viral warts should be from secondary towards primary care because hospital treatment is expensive and no more effective than in the community;<sup>113</sup> whereas there is a strong argument that dermatologists should see all patients with skin malignancy because the cost of missing a case or inadequate excision of a lesion could be high.<sup>78</sup>

Current evidence would suggest that demand for dermatological services is likely to increase over the next 30 to 40 years because:

- 1 prevalence surveys have indicated a large iceberg of people with unmet dermatological needs, most of whom would like treatment if they knew effective treatment was available<sup>2,3,118</sup>
- 2 the public exposed to a US-style culture which encourages use of specialist services and empowered by the Patient's Charter are more likely to request specialist referral for milder common chronic skin diseases, thereby exerting greater pressure on GPs to reduce their threshold for specialist referral
- 3 the prevalence of three of the most common and most costly skin diseases – skin cancer,<sup>119,120</sup> atopic eczema<sup>6</sup> and leg ulcers<sup>121</sup> is increasing and will continue to increase with an ageing population<sup>5</sup>
- 4 there may be increased demand for attention to skin lesions which were formally considered as cosmetic problems by physicians.

The drug industry has been quick to recognize the large burden of untreated disease in the community and some companies are actively distributing posters in sports centres and advertisements in newspapers in order to increase the public's awareness of the particular condition that their product is used to treat.<sup>122</sup> Any health care strategy which focuses solely on the relationship between primary and secondary care is doomed to failure unless it considers the enormous and unstable burden of people with unmet dermatological needs. Small changes in awareness within this population are likely to have a far greater effect on dermatological services than minor changes in referral patterns.

Three scenarios for dermatology health service provision are now discussed in the light of these projected increased service demands.

#### *Maintaining the current passive response model*

Although the status quo model involves the least organizational disruption, such a passive response to demand is likely to perpetuate and possibly exacerbate the mismatch between need and supply at all levels of health care delivery and be the least cost-effective in the long term. Specialist services are already saturated and long waiting lists are the norm. Hospitals in the London area have been particularly hard hit, with waiting lists varying from four to 46 weeks whilst at the same time losing 68% of dedicated dermatology beds and 60% of trained dermatology nurses.<sup>28</sup> Such a stressed system lacks the flexibility to respond to even small further increases in demand without compromising the quality of patient care. The direct costs per 100 000 population of the current system at 1994 costs for one year are estimated at £1.26 million (GP consultations £0.29 million, inpatient costs £0.45 million, prescription costs £0.32 million, dispensing costs £0.08 million, dermatology outpatient costs £0.12 million).

#### *The outreach clinic model*

Dermatology is a unique specialty in that a considerable proportion of diagnoses can be made on the basis of history and examination alone. This makes it an appropriate specialty for developing in a community setting and the idea of employing dermatologists solely as community specialists serving a series of 'outreach' clinics might appear attractive at first. Whilst the provision of medical services at a location convenient to the patient is a desirable aim, such a scheme would result in giving undue attention to a few at the expense of others, given the current number of dermatologists in the UK. With around 223 dermatologists and 28 460 GPs (with an average of three per practice) currently in the UK,<sup>52</sup> one dermatologist would have to cover 42 health centres. Even if clinics were held once a fortnight at each centre, then with five clinics per week, each dermatologist could only manage to cover ten health centres.

If equity of coverage is to be maintained this strategy would require a four-fold increase in dermatology specialists. With only two extra dermatology unified training grade posts being announced by SWAG for the whole of England and Wales in 1996, it is hard to envisage how this approach could work. Such a top heavy service is probably least efficient in terms of costs and use of expertise. Some surveys have suggested that around half as many patients are seen in outreach clinics when compared with their hospital equivalents<sup>28</sup> and around one-third of such patients require further procedures for which referral to hospital might have been more appropriate.

Another problem is that funds (e.g. to employ retired dermatologists to run outreach clinics) may be directed into the private sector rather than into developing and training local dermatology services. Other studies have suggested that outreach clinics have not increased the interaction between GPs and specialists,<sup>90</sup> a finding echoed by the BAD survey which found that a GP or GP trainee sat in with the dermatologist in only 6% of outreach clinics.<sup>123</sup> Another study in Aylesbury found that GPs did not attend outreach clinics run by a consultant dermatologist,<sup>124</sup> despite initial agreement, although this study found that these clinics were an excellent setting for teaching dermatology to local nurses.

Although many GPs quite reasonably hold the view that outreach clinics can improve their access to and involvement with a dermatologist, a recent consumer survey in Stoke-on-Trent suggests that the provision of outreach clinics is not the wish of the majority of patients,<sup>86</sup> with most wishing to be followed-up by a specialist in a hospital centre.

The removal of dermatologists from a hospital base also holds potentially serious implications for the development of future services. Given the low ratio of specialists per population, specialists are best retained in hospital sites because of access to diagnostic facilities such as patch testing, specialist nursing support, specialist treatment facilities such as PUVA, access to counselling services for patients with chronic or disfiguring conditions and contact with other members of the professional team such as plastic surgeons, radiotherapists and paediatricians.

With a complement of over 1000 skin diseases support from other consultant colleagues over diagnostic or therapeutic difficulties is also important for patients. Dermatologists are also needed in hospitals to see patients with serious systemic diseases who also have dermatological manifestations as their input frequently helps in diagnosing or managing that condition.<sup>87</sup> Since skin cancer is the most common form of cancer in human populations dermatologists must be retained in cancer treatment centres because of their diagnostic skills and experience at surgically treating large numbers of people at low cost.

The removal of dermatology as a hospital based specialty would pose difficulties for training and research by losing a critical mass of patients and staff. Dermatologists also need access to hospital beds where patients can be cared for in an appropriate environment by appropriately trained dermatology nurses.

Whilst a shift in emphasis from hospital to community care for dermatology is desirable for most common skin disorders the *ad hoc* adoption of outreach dermatology clinics in the absence of a large expansion of dermatologists and financial investment is likely to result in unequal coverage of the whole population and possibly an erosion of the specialty in general. With an estimated four-fold expansion of dermatologists and reduced numbers of patients seen in outreach clinics (many of whom are likely to have milder skin disease and who might not have otherwise been referred) this model would also be the most costly option in the long run, representing an additional estimated £0.36 million per 100 000 population. This would increase the estimated service costs from £1.26 million for the status quo model in 1994 (page 302) to £1.63 million. This estimate does not take into account extra prescribing and dispensing costs and increased GP's time.

The other extreme of this model i.e. routine open access to specialist clinics could lead to fragmentation of patients' care and undermine the unique role of the GP as a generalist with higher rates of intervention and higher costs.<sup>125</sup> It would also lead to the overmedicalization of patients and propagate the 'collusion of anonymity' where many specialists see a patient but no one accepts overall responsibility.<sup>126</sup>

Such outreach clinics need to be distinguished from 'outpost' clinics conducted in remote areas by dermatologists on a firm basis of geographical need which have been in place long before the recent health service reforms.<sup>123</sup>

Other modifications of the outreach clinic approach exist such as moving a regular hospital clinic to a community location strategically located close to purchasing district boundaries (as opposed to a dermatologist visiting several individual general practices).<sup>127</sup> Offering more convenient locations to patients and direct training to GPs (providing attendance by GPs is mandatory) are advantages of this system but given that the same number of dermatologists will have to staff such clinics in the same number of sessions it is not clear how this approach offers any advantage over the status quo model in terms of waiting lists. Such a system may help to attract more business away from neighbouring services where there is an abundance of competition<sup>128</sup> but shortage of patients is unheard of in most dermatology departments. Given the shape and size of the dermatological iceberg there is clearly an enormous amount of dermatological demand that can be passed as 'business' in today's purchaser/provider culture but in over-stretched areas, such increases in business will need an equivalent service investment.

#### *The hybrid model*

This model proposes an integrated district approach to serving the dermatological needs of its community by building on the strengths of existing services. Within the next 20 years several factors will combine to reshape the pattern of the NHS into smaller more specialized acute centres with a focus on short day cases and complex treatments. The corollary is an extended role for primary and community health services which is capable of delivering some of what currently takes place in hospitals.<sup>125</sup> Purchasing, as a new strategic tool, could extend the scope of these boundary changes.<sup>82</sup>

A hybrid model is proposed of:

- 1 developing community services by the formation of district dermatology liaison teams
- 2 establishing dermatology treatment centres in the community set up at sites convenient to the public
- 3 maintaining a critical mass of expertise within hospitals
- 4 involvement of community pharmacists.

Research into such shifts of emphasis should start with the user's experience.

#### **Developing community dermatology services by establishing a liaison team**

This could be accomplished in a number of ways but the formation of a district liaison team of dermatologists, GPs, dermatology nurses, community pharmacists and public representatives could provide a framework for further development. The function of such a team would be to identify areas for releasing ill-deployed services (e.g. dermatologists treating simple warts or straightforward acne) which could be harnessed for areas of potential health gain such as improving services for the early assessment and treatment of skin cancer.

Issues such as current variations in referral patterns and unnecessary specialist referrals could also be addressed by such teams so that dermatologists are deployed for what they are best at doing i.e. diagnosing skin disease and suggesting management for severe/difficult cases. The dermatology liaison team would formulate targets for referral and management policies for common skin diseases based on guidelines developed by BAD and the Royal College of General Practitioners. Such an approach would present a more consistent and explicit approach to consumers of health care. Corporate needs assessments which are sensitive to issues such as age and ethnic group composition of the local population could be performed so

that decisions regarding what should be considered cosmetic and what constitutes reasonable need could be made more explicit, enabling dialogue between consumers and health care providers.

Other ways of improving the practice of dermatology within the community could be through shared care schemes, such as those used for people with asthma and diabetes. These could serve as models for other common and occasionally severe skin diseases such as atopic eczema and psoriasis in order to use the resources of the primary care team already in place more effectively. Such a scheme would release dermatologists from following-up large cohorts of patients with chronic skin disease thereby reducing waiting lists so that his/her skills could be used more appropriately for new patient assessments.

Chronic skin disease management clinics in primary care could provide a useful educational setting for both patients and members of the primary care team and the establishment of registers could enable more appropriate services and audit to be carried out.<sup>50</sup> This requires the ability to distinguish those individuals with simple maintenance needs from those who need specialist care for stabilization or special treatment as well as a professional commitment and adequate funding to producing and developing guidelines.<sup>82</sup>

The use of technologies such as high resolution video cameras, high quality photographs, or digital images transmitted down telephone lines as a means of obtaining a rapid opinion from specialists, especially for straightforward disorders, needs further evaluation.<sup>129,130</sup> The concept of teledermatology as a means of increasing contact between GPs and dermatologists sounds promising and such an approach may be particularly useful for specialists covering remote communities in a large geographical area. It is unclear whether such a system will help dermatology waiting lists given the current number of available dermatologists, as, given the enormous size of the dermatological 'iceberg' it is possible that such a convenient system will simply encourage a large increase in teleconsultations for transient skin problems which GPs would have otherwise managed themselves. Whether the quality of images will be sufficiently high for dermatologists to make difficult diagnoses (e.g. over-pigmented lesions where the cost of false reassurance may mean the difference between life and death) is questionable but some preliminary work has suggested a role for teledermatology in triage of pigmented lesions.<sup>129</sup> Patients may value the convenience that teledermatology may offer them, although simple image transmission will deny them the opportunity of benefiting from a personal consultation with dermatologists to discuss treatment options and prognosis. High resolution audio-visual contact could offer a direct two-way consultation between a GP, patient and dermatologist but with the large demand for consultants' opinions, such a system might become quickly choked leading to on-line queues with patients waiting hours in order to get through. There is a danger that as this technology spreads it will become increasingly difficult for clinicians to invite patients to participate in randomized trials – a situation that implies that the position of clinical equipoise has been missed.<sup>131</sup> Further evaluation of teledermatology from the user's perspective, with consideration of diagnostic accuracy and cost-effectiveness from the provider's and purchaser's perspective along the lines of the US National Library of Medicine Teledermatology project<sup>132</sup> is urgently required.

### **Establishing dermatology treatment centres within the community**

Many of the nursing activities of hospital dermatology outpatients such as day treatment for psoriasis, ultraviolet light therapy, leg ulcer treatment, wart treatment and counselling and treatment of common skin conditions such as atopic eczema could easily be carried out in the community providing adequate facilities and close supervision is made available (K Dalziel, personal communication, December 1994). Under this scheme hospitals will remain as assessment centres for new patients (or rapid access for those with unstable conditions) with the treatment being carried out in the community closer to patients' homes at flexible times to fit in with patients' work and school commitments. Senior dermatology nurses could run such centres with accountability to a named dermatologist and a group of GPs. Such a system would need further development of training nurses in dermatology and rigorous monitoring for compliance to guidelines such as those developed by the British Photodermatology Group for ultraviolet light therapy.<sup>133</sup> The extended role for GPs

would require more incentives for educational development in dermatology and those with special interest in dermatology could play a key role in ensuring continuity of care in the treatment centres. The number of treatment centres required would be calculated from estimated numbers of patients currently attending hospitals for such treatment at present (approximately one-third to half of follow-up visits, equating to around one centre per 100 000 population).

### **Maintain hospital-based specialists and use their skills more effectively**

Dermatologists need their hospital facilities and colleagues in order to function effectively. Dermatologists would be responsible for rapid assessment of those who need help and for supervising treatment centres. Skin cancer is one area where there is strong argument for dermatologists to take the main responsibility for initial assessment. Establishing the 'correct' number of specialists will be difficult without further information about the differential gain of specialists over GPs for each skin disease sub-category. The British Association of Dermatology has recommended that in order to ensure a continuing quality service one dermatologist per 100 000 will be needed (still the lowest ratio in the EU). This ratio can only serve as a guide as it depends on other factors such as urban/rural mix, the availability of specialist dermatology clinics such as paediatric or tumour clinics and junior staff support. Lower follow-up ratios usually mean that those who are recalled for follow-up visits are often more complex than the traditional dermatology follow-up patients, and this along with an increasing tendency to practise defensive medicine will mean that dermatology consultation times will increase in the future. A maximum of 12 new patients or 24 return patients or a pro rata mix per single consultant session has been recommended by BAD. Some highly specialist services such as phototesting for light sensitivity or diagnosis of epidermolysis bullosa are probably best dealt with at a regional or supraregional level.

### **Involvement of community pharmacists**

Better public information about effective OTC skin preparations and involvement of community pharmacists in providing better information regarding the treatment of common mild skin diseases such as acne could lead to substantial savings in consultation and prescribing costs,<sup>44</sup> given that around 50% of people with skin complaints self-medicate.<sup>30,31</sup> This may not appear at first to be the remit of purchasers but they could ensure that local pharmacists are linked with the district dermatology liaison team so that locally approved information leaflets concerning common skin diseases are made available to those who seek help at community pharmacists.

In summary the hybrid model emphasizes strengthening existing services by improving communication and co-operation between various health care providers, encouraging greater public participation in deciding appropriate levels of care and a shift of care towards developing treatment facilities in the community. It is a model which recommends improved co-ordination of available skills. The model offers a quality service which would:

- ensure many entry points into a system which provided consistent advice or support
- develop a real ownership between professionals and patients
- promote informed expectations and outcome measures
- develop an appropriate cascade of expertise with access to a named person/case manager.

Such a scheme would need adequate financial support for implementation of educational programmes and collaborative initiatives between local teams. The total running costs of such a hybrid model would depend on the needs and priorities of the local population but a for a mixed urban/semi-urban population of 100 000 in the Nottingham area, around £1.47 million would be required at 1994 prices (excluding initial building

costs of community treatment centres). This estimate assumes a consultant/population ratio of 1 : 100 000 but with a 16% reduction in dermatology outpatient running costs due to the availability of community day treatment facilities (£0.2 million), a 11% reduction in inpatient costs due to day treatment facilities (£0.4 million), running costs for one community skin treatment centre treating 1000 patients per annum (£0.05 million), the appointment of three additional 'F' grade community specialist liaison dermatology nurses (£0.08 million), an implementation fund of £0.05 million and costs for GP consultations and prescription and dispensing remaining the same as current expenditure (£0.29, £0.32 and £0.08 million respectively).

## Summary

- Care models that focus solely on the relationship between general primary and secondary dermatological care are likely to fail unless they consider the large and unstable burden of unmet dermatological needs.
- Most common skin diseases can and should be managed in the community.
- Some shift from secondary to primary care for dermatological services is desirable but it will need considerable investment in terms of GP education and/or specialist expansion.
- Initial assessment of all skin cancers should be performed by dermatologists.
- Retaining the current system of dermatology services without specialist expansion is likely to fail patients by not responding to unmet needs and responding inappropriately to increased demands.
- A shift of dermatologists away from hospitals into community-run outreach clinics would require a costly four-fold expansion of dermatology consultants in order to ensure equitable care, with serious implications for the future of dermatology development as a scientific discipline.
- A hybrid model consisting of hospital-based dermatology assessment centres, shared care clinics in primary care for chronic skin diseases and community-based treatment centres run by dermatology nurses accountable to district dermatology liaison teams is described.
- Individual skills are used more appropriately in such a scheme in that assessment is carried out in hospitals where appropriate facilities are available and treatment is carried out nearer patients' homes.
- The formation of a local dermatology liaison team of dermatologists, dermatology nurses, GPs, local pharmacists and public representatives could form the basis for corporate needs assessments which are sensitive to local issues.
- Cost estimates for the hybrid model (£1.47 million per 100 000, 1994 prices) are slightly higher than the status quo model (£1.26 million) but less costly than the outreach clinic model £1.63 million and offers additional flexibility for adjustment to future demands in skin health services.
- New technologies such as teledermatology which enhance communication between GPs and dermatologists require further evaluation before they become adopted in practice.

## 8 Outcome measures

The development of generic outcome measures in dermatology is still in its infancy and most practical measures which could be used to monitor effectiveness of current services are indirect. Given the vast differences in needs of patients with different skin diseases simplification of outcome measures for dermatology as a whole may be misleading. For example an elderly person who has had an incidental, symptomless basal cell carcinoma removed by his or her doctor may not record any change in a life quality index measurement, as it was not perceived as a problem by themselves in the first place. In contrast a family whose child has a severe atopic eczema which is unresponsive to most medical therapies may still find that the support and information given to them by their doctor are extremely useful but such a beneficial outcome would not be evident with a measure such as 'percentage reduction in surface area of affected skin'.

### Direct outcome measures

- Simple surveys that assess patient satisfaction regarding adequacy of information provided by GP/dermatologist/nurse regarding their skin condition.
- Disease-specific outcomes such as improvement in acne disability index, improvement in sleep loss for atopic eczema sufferers, duration of remission following psoriasis treatment, percentage satisfied or symptom free after reassurance or removal of benign skin tumour, percentage warts clear at three months, venous ulcer healing rates of over 33% at three months and 45% at six months for uncomplicated ulcers treated in the community<sup>114</sup> and proportion of people with hand dermatitis who are able to return to work within six weeks.
- Further development of the use of generic skin disease disability scores such as the Dermatology Life Quality Index.

### Indirect outcome measures

- Use of computerized pathology records to determine the thickness distribution of melanomas as an indicator of possible patient delay in presentation.
- Use of pathology records to determine diagnostic accuracy of skin cancer request forms and adequacy of excision margins.
- Use of pathology records to determine proportion of moles and seborrhoeic warts that have been excised for 'cosmetic' reasons.
- Melanoma mortality in relation to tumour thickness compared with national rates.
- Recurrence rates of non-melanoma skin cancer.
- Re-referral rates for patients seen in specialist settings with different new or follow-up ratios as an indicator of cost-effective use of specialist services.
- Appropriateness of referral for specialist advice as measured by proportion of warts referred and by variations in referral rates between practices.

## 9 Targets

Dermatology fulfils all of the Health of the Nation target requirements, i.e. it is a major cause of avoidable ill health, effective interventions are available and it is possible to set objective targets and monitor progress. Requesting evidence for efficacy of new technologies such as photophoresis for systemic sclerosis, teledermatology, laser treatment for strawberry haemangiomas etc. is a positive action. However insisting on high quality evidence for all dermatological interventions currently carried out on the 1000 or so skin diseases is unrealistic given the low priority accorded by central and local funding agencies in evaluating dermatological interventions.

Care must be taken in distinguishing between those procedures which urgently require further evaluation because of lack of evidence and those where there is reasonable evidence against the use of the procedure.

Purchasers are in a good position to specify service priorities and targets – for example in the diagnosis and treatment of skin cancer – but require close professional advice to ensure that, for example, carcinoma *in situ* is not given priority over scarring acne or a flare-up of pustular psoriasis. Purchasers should not be misled into believing that encouraging GPs to perform more minor surgery will cut the demand for dermatology surgery,<sup>134,135</sup> though it may well reduce standards.<sup>78</sup> Improved training of GPs in dermatology, while



important for patients,<sup>25</sup> does not reduce referrals to dermatology departments, though it may change their nature.<sup>76</sup>

The following targets are suggestions for dermatology which could be realistically accomplished within the next ten years.

### Prevention

- To educate every child on the dangers of excessive sun exposure through educational programmes co-ordinated by the UK Skin Cancer Working Party.<sup>104</sup>
- To inform outdoor workers on simple measures to reduce sunburn and cumulative ultraviolet light exposure.
- To reduce the incidence of skin cancer in younger people and the prevalence of skin cancer in the elderly.

### Information

- For each district to commission simple population-based needs assessment exercises for skin disorders and to formulate service strategies based on the results.
- Each district to complete an assessment exercise on the direct and indirect costs of the dermatology service.
- Computerized patient records of diagnosis and severity of skin disease in both primary and secondary care.
- To achieve a 100% registration for melanoma and non-melanoma skin cancer for each district with regular review of the completeness and accuracy of data.

### Service

- One dermatologist per 100 000 of the population.
- Retention of a core of hospital-based diagnostic facilities with access to inpatient beds.
- Dermatology outpatient waiting lists of under six weeks for a routine appointment, under three weeks for a 'soon' appointment, within one week for an urgent referral and within 48 hours for a telephoned emergency request.
- Demonstrable benefits to patients based on a range of outcome measures (including improved coping with skin disability) in skin disease sub-categories in both primary and secondary care.
- Clear links between primary and secondary care with patient centred record keeping, combined audit exercises and a clear description of what patients can expect from each level of service.
- Shared care schemes for common chronic skin diseases linked with national guidelines.
- The establishment of local district dermatology liaison teams to improve unexplained variations in referral patterns and the establishment of community treatment centres.
- Inclusion of the commissioning of services located outside of normal working districts (such as laser treatment for port wine stains) into current purchasing arrangements.
- Development of a good skin care guide that covers both primary and secondary care which makes it clear to patients what they can expect from each service and who has responsibility for their care.
- An increase in dermatology training for GPs so that at least one in three have received additional training by the year 1998.

## 10 Further information and research priorities

Care has to be taken in distinguishing between health care requirements and distress caused by skin disease for which available treatment is not beneficial. Some degree of prioritization is inevitable with such a large burden of unmet dermatological needs but these priorities should be more open so that they can be debated, criticized and changed. Even with such explicit rationing some degree of implicit rationing will be necessary at the point of service as this is likely to be more sensitive to the complexity of medical decisions and the needs of personal and cultural preferences of patients,<sup>136</sup> especially in a field where perception of disease is intimately linked with personal and cultural factors. As Frankel has pointed out even if demand generally exceeds supply this does not mean that particular health care requirements cannot be satisfied.<sup>137</sup> Limited data from the NHANES study suggest that only a certain amount of those with skin disease feel the need to request help,<sup>3</sup> adding some support to the concept that infinite demand may be a myth. Providing future epidemiological surveys incorporate other factors which may influence health care requirements such as the relationship between symptoms, examination findings, handicap and effectiveness of treatment, there may be a realistic prospect of demand and supply achieving a balance for skin disease.

Because dermatology is such a vast and complex subject with health care requirements ranging from simple reassurance for benign moles to life-saving interventions for skin cancer or drug eruptions, dermatologists must be involved in future needs assessments if useful information is to be collected.

With the exception of protocols for better management of some common skin diseases in the population and the provision of liquid nitrogen to all GPs for treatment of warts, there seem to be no glaring examples of inappropriate distribution of existing services for dermatology. Rather the major omissions in NHS provision for skin diseases are those which can only be filled by adequate research and development of services.

Because of the vast nature of unmet dermatological needs, research should focus on skin disease in the community, rather than on minor differences in existing primary care and secondary care. Research into the determinants of health seeking behaviour is needed as well as research into how some of the population's dermatological needs might be met by other approaches, such as better OTC treatment and information.

The boundary between disease and cosmesis is especially blurred in dermatology and one which is likely to shift according to availability of effective treatments and social attitudes. Normative care is likely to vary according to local resources and interests. Just as patients are encouraged to participate in choices and decision making, so populations should participate in the process of deciding with doctors and purchasers about what constitutes reasonable demand,<sup>138</sup> so that boundaries are explicit and open to further debate if circumstances change. This is compatible with the NHS' and dermatologists' long-term strategic aim to promote a healthy skin for all.<sup>139,140</sup>

### Ensuring a quality future service

- Urgent research to determine the prevalence and incidence of skin disease in different regions and age groups throughout the UK and to investigate factors which influence people to seek medical care.
- An explicit policy based on public consultation to determine guidelines which will distinguish between reasonable need and demand for dermatology services.
- Examination of the differential health gain and costs of specialist versus generalist or nursing care for skin disease.
- Investigation of the cost-effectiveness of liaison dermatology community nurses.
- The development of achievable outcome measures for the nine common skin disease sub-categories which could be built into contracts.

- Research into the use of information technology which could increase the flexibility of the primary/secondary care interface such as high resolution photography and shared computerized coding systems for diagnosis, severity and costing.
- The development of a more co-ordinated approach to health services research in dermatology such as the establishment of centres for systematic review and evaluation of outcome measures.
- Research into the effectiveness of OTC skin preparations and pharmacy advice for skin complaints.
- Cost-effectiveness of community skin treatment centres.
- Research into factors which enhance implementation of good practice guidelines.
- Randomized studies which examine the cost-effectiveness of screening for skin cancer in high risk groups.

## Appendix I ICD codes relating to skin diseases

### ICD 9

Only diseases that commonly have cutaneous manifestations have been included. Readers are referred to Alexander and Shrank for a more detailed alphabetical list of all possible dermatological entries in ICD 9.<sup>18</sup>

Conditions belonging to sub-categories discussed in more detail in the text are in **bold**.

#### *Chapter I: Infectious and parasitic disease*

017	Tuberculosis of other organs
022	Anthrax
030	Leprosy
031	Diseases due to other mycobacteria
034	Streptococcal sore throat and scarlatina
<b>035</b>	<b>Erysipelas</b>
<b>053</b>	<b>Herpes zoster</b>
<b>054</b>	<b>Herpes simplex</b>
<b>078.1</b>	<b>Viral warts</b>
057	Other viral exanthemata
091	Erysipeloid
102	Yaws
103	Pinta
104	Other spirochaetal infection
<b>110</b>	<b>Dermatophytosis</b>
<b>111</b>	<b>Dermatomycosis, other and unspecified</b>
112	Candidiasis
114	Coccidioidomycosis
115	Histoplasmosis
117	Other mycoses
118	Opportunistic mycosis
128	Other and unspecified helminthiasis
<b>132</b>	<b>Pediculosis (lice) and phthirus infestation</b>
<b>133</b>	<b>Acariasis (scabies)</b>
134	Other infestation
135	Sarcoidosis
137	Late effects of tuberculosis

#### *Chapter II: Neoplasms*

<b>172</b>	<b>Malignant melanoma of skin</b>
<b>173</b>	<b>Other malignant neoplasms of the skin</b>
174.0	Paget's disease of the breast
<b>202.1</b>	<b>Mycosis fungoides</b>
202.2	Sezary's disease
<b>216</b>	<b>Benign neoplasm of skin</b>
<b>232</b>	<b>Carcinoma <i>in situ</i> of skin</b>

#### *Chapter III: Endocrine, nutritional and metabolic diseases and immunity disorders*

277.8	Histiocytosis X
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*Chapter IV: Diseases of blood and blood forming organs*

287 Purpura and other haemorrhagic conditions

*Chapter V: Mental disorders*

300.2 Parasitophobia

306.3 Psychogenic pruritus

*Chapter VI: Diseases of the nervous system and sense organs*

380 Disorder of external ear

*Chapter VII: Disease of the circulatory system*

446 Polyarteritis nodosa and allied conditions

448 Diseases of capillaries

451 Phlebitis and thrombophlebitis

457 Non-infective disorders of lymphatic channels

*Chapter X: Diseases of the genitourinary system*

607.8 Balanitis xerotica

*Chapter XI: Complications of pregnancy, childbirth and the puerperium*

646.8 Herpes gestationis, chloasma, pruritus gravidarum

*Chapter XII: Diseases of the skin and subcutaneous tissue*

## Infections of skin and subcutaneous tissue

**680 Carbuncle and furuncle**

681 Cellulitis and abscess of finger and toe

682 Other cellulitis and abscess

683 Acute lymphadenitis

**684 Impetigo**

685 Pilonidal cyst

**686 Other local infections of skin and subcutaneous tissue**

## Other inflammatory conditions of skin and subcutaneous tissue

690 Erythematousquamous dermatosis

**691 Atopic dermatitis and other related conditions****692 Contact dermatitis and other eczema****693 Dermatitis due to taken internally substances**

694 Bullous dermatoses

695 Erythematous conditions

**696 Psoriasis and similar disorders**

697 Lichen

698 Pruritus and related conditions

## Other diseases of skin and subcutaneous tissue

700 Corns and callosities

701 Other hypertrophic and atrophic conditions of the skin

702 Other dermatoses

703 Diseases of nail

704 Disease of hair and hair follicles

705 Disorders of sweat glands

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706	Diseases of sebaceous glands (Acne vulgaris 706.1)
707	<b>Chronic ulcer of the skin</b>
708	Urticaria
709	Other disorders of skin and subcutaneous tissue

### *Chapter XIV: Congenital anomalies*

757	Congenital anomalies of the integument
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### *Chapter XV: Certain conditions originating in the perinatal period*

778	Conditions involving the integument and temperature regulation of foetus and newborn
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### *Chapter XVI: Symptoms, common signs and ill-defined conditions*

782	Symptoms involving skin and other integumentary tissue
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### *Chapter XVII: Injury and poisoning*

995.1	Angioneurotic oedema
995.2	Unspecified adverse affect of drug, medicament and biological

### *Comment on usefulness of ICD 9 Chapter XII on skin disease*

The ICD 9 chapter code for disorders of the skin and subcutaneous tissues (Chapter XII) is of limited operational use because of problems with completeness, accuracy, diagnostic transfer and appropriateness of diagnostic categories. Important exclusions from the ICD 9 chapter for disorders of the skin and subcutaneous tissues include neoplasms of the skin, localized cutaneous infections such as fungal infections and herpes simplex, perinatal skin disorders such as erythema toxicum, systemic diseases which commonly affect the skin such as sarcoidosis and a range of other miscellaneous conditions such as hirsutism and hyperhidrosis. Inappropriate inclusions within the ICD 9 coding for disorders of the skin and subcutaneous tissues include some categories which are perhaps best regarded as 'surgical' such as acute lymphangitis, and abscess of finger or toe.<sup>17</sup>

The rationale for some of the diagnostic codes used in ICD 9 is not especially helpful for the purchaser interested in common disease groupings. Some important categories are not mutually exclusive e.g. a child with atopic dermatitis could be classified under atopic eczema, flexural eczema, neurodermatitis, infantile eczema or intrinsic allergic eczema, permitting diagnostic transfer according to which is the predominant fashionable term. Thus in the first national morbidity survey,<sup>36</sup> there was apparently twice as much eczema as dermatitis in the South West, whereas in Wales the position was reversed with three times as much dermatitis recorded as eczema. The total incidence of the two however was almost identical in the two areas. Unfortunately ICD 9 173, which codes for non-melanoma skin cancer, does not distinguish between the two commonest forms of skin cancers, namely basal cell carcinoma (rodent ulcer) and squamous cell carcinoma.

## ICD 10

Diseases of the skin and subcutaneous tissues are coded as L00 to L99.<sup>19,20</sup> The codes are grouped as follows:

L00–L08	Infections of the skin and subcutaneous tissues
L10–L14	Bullous disorders
L20–L30	Dermatitis and eczema
L40–L45	Papulosquamous disorders
L50–L51	Urticaria and erythema
L55–L59	Radiation-related disorders
L60–L70	Disorders of skin appendages
L80–L99	Other disorders of skin and subcutaneous tissues.

Important exclusions from L00 to L99 include:

- malignant skin neoplasms (malignant melanoma of the skin C43, other malignant neoplasms of the skin C44)
- carcinoma *in situ* D04 (excluding melanoma *in situ*)
- benign neoplasms of the skin (melanocytic naevi D22, other benign skin neoplasms D23)
- certain skin infections such as erysipelas A46, herpes simplex B00 (non-genital), molluscum B08.1, mycoses B35-B49, infestations such as scabies B85-89 and viral warts B07.

A detailed list of exclusions which include congenital, perinatal and connective tissue diseases are given in the opening section dealing with skin diseases of the ICD 10 handbook.<sup>20</sup>

## Appendix II UK prevalence studies of skin diseases

The table shows the PAGB study of self-reported skin disease.<sup>29</sup>

**Table II.1:** Two-week incidence of ailments of the skin according to diagnostic group and age in a stratified sample of 1217 UK adults and 342 children (the PAGB study<sup>29</sup>)

Base = all adults	All adults (%)	Men (%)	Women (%)	15–19 years (%)	20–34 years (%)	35–64 years (%)	65 years or over (%)	All children <sup>a</sup> (%)	Boys (%)	Girls (%)
Unweighted base	1217	589	628	140	334	526	215	342	185	157
Weighted base <sup>b</sup>	1217	595	622	126	347	531	212	354	194	160
	100	100	100	100	100	100	100	100	100	100
Minor cuts and grazes	16	23	10	35	23	13	4	21	25	17
Acne/piles/spots	14	13	15	41	25	5	1	3	2	4
Bruises	12	12	12	30	16	8	5	22	25	18
Oily/greasy skin	10	9	11	27	17	5	1	1	1	1
Bunions/corns/callouses	6	4	8	5	3	7	12	<sup>c</sup>	1	<sup>d</sup>
Discoloured skin/blotches/age spots	6	4	8	7	4	4	15	<sup>d</sup>	<sup>d</sup>	<sup>d</sup>
Thinning/losing hair/baldness	6	10	2	<sup>d</sup>	3	6	10	<sup>c</sup>	<sup>c</sup>	<sup>d</sup>
Irritated skin	5	3	6	3	5	5	5	2	2	1
Varicose veins	5	2	7	1	2	7	7	<sup>d</sup>	<sup>d</sup>	<sup>d</sup>
Rashes/skin allergies	4	3	5	4	5	5	3	5	7	3
Chapped skin	4	2	6	4	6	4	<sup>c</sup>	3	4	1
Minor burns/scalds (not sunburn)	4	3	5	5	6	4	<sup>d</sup>	<sup>c</sup>	1	<sup>d</sup>
Insect bites/stings	4	5	3	6	4	4	3	2	1	3
Piles/haemorrhoidal problems/itching	4	3	4	1	2	4	7	<sup>d</sup>	<sup>d</sup>	<sup>d</sup>
Athletes' foot	3	5	2	4	5	3	3	2	2	1
Ingrown toenail	3	2	4	2	2	4	4	1	1	1
Warts	2	2	3	6	3	2	1	1	1	1
Animal bites and scratches	2	2	3	7	4	1	<sup>d</sup>	1	2	<sup>d</sup>
Psoriasis	2	2	2	1	1	3	2	<sup>c</sup>	<sup>c</sup>	<sup>d</sup>
Sunburn	2	2	2	5	4	1	<sup>c</sup>	1	2	<sup>d</sup>
Severe dandruff	2	2	2	1	3	1	1	1	1	1
Eczema	1	1	2	1	2	1	1	2	3	1
Septic/infected cuts	1	1	1	2	2	1	<sup>d</sup>	1	1	1
Verruca	1	1	2	1	1	1	1	2	2	3
Boils	1	1	<sup>c</sup>	1	2	<sup>c</sup>	<sup>d</sup>	<sup>d</sup>	<sup>d</sup>	<sup>d</sup>
Headstroke/sunstroke	<sup>c</sup>	<sup>d</sup>	<sup>c</sup>	1	<sup>c</sup>	<sup>d</sup>	<sup>d</sup>	<sup>d</sup>	<sup>d</sup>	<sup>d</sup>
Head lice	<sup>d</sup>	<sup>d</sup>	<sup>d</sup>	<sup>d</sup>	<sup>d</sup>	<sup>d</sup>	<sup>d</sup>	1	1	1
Ringworm	<sup>d</sup>	<sup>d</sup>	<sup>d</sup>	<sup>d</sup>	<sup>d</sup>	<sup>d</sup>	<sup>d</sup>	<sup>d</sup>	<sup>d</sup>	<sup>d</sup>
Nappy rash	<sup>d</sup>	<sup>d</sup>	<sup>d</sup>	<sup>d</sup>	<sup>d</sup>	<sup>d</sup>	<sup>d</sup>	5	5	6
Cradle cap	<sup>d</sup>	<sup>d</sup>	<sup>d</sup>	<sup>d</sup>	<sup>d</sup>	<sup>d</sup>	<sup>d</sup>	4	3	4

<sup>a</sup> Data collected by proxy from mothers.

<sup>b</sup> Weighted to population structure of the UK.

<sup>c</sup> Less than 0.5% but not zero.

<sup>d</sup> Zero.



**Table II.2:** Estimated prevalence of skin diseases (per 1000) by age group and grade of severity in 2180 adults in Lambeth<sup>2</sup>

Grade of severity	Age group (years)							
	15–24		25–34		35–54		55–74	
	All grades	Moderate and severe	All grades	Moderate and severe	All grades	Moderate and severe	All grades	Moderate and severe
Eczema	122.7	72.6	35.4	34.2	126.5	89.4	64.4	38.0
Acne	273.2	137.8	78.7	34.5	57.2	8.9	20.3	8.6
Scaly dermatoses	60.5	9.8	35.3	14.0	56.4	40.1	173.0	35.8
Prurigo and allied conditions	66.8	38.4	42.4	34.4	122.6	32.6	54.0	50.8
Erythematous and other dermatoses	14.2	–	99.4	4.1	89.4	15.2	73.0	55.1
Warts	61.5	–	35.3	7.1	3.1	–	59.1	–
Psoriasis	4.2	–	51.6	23.2	–	–	16.4	3.6
Any skin condition	614.1	308.0	543.3	246.0	514.0	186.0	545.9	211.0

**Table II.3:** Use of medical care for major sub-categories of skin disease by grade of severity in 2180 adults in Lambeth.

Group	Grade of severity	No. of persons (= 100%)	Self medication	General Practitioner	Hospital		Use of any medical service	No treatment
					Outpatient	Inpatient		
Eczema and prurigo	Trivial	57	27	7 (12)	3 (5)	–	8 (14)	26 (45)
	Moderate/severe	100	(47)	27 (27)	6 (6)	–	30 (30)	41 (41)
Acne	Trivial	40	17	9 (22)	1 (3)	–	9 (22)	18 (45)
	Moderate/severe	43	(42)	5 (12)	1 (2)	–	6 (14)	25 (58)
Psoriasis	Trivial	6	–	–	1 (17)	–	1 (17)	5 (83)
	Moderate/severe	11	2 (18)	3 (27)	1 (9)	–	4 (4)	6 (55)
All other conditions	Trivial	215	70 (33)	18 (8)	6 (3)	1	22 (10)	130 (60)
	Moderate/severe	94	28 (30)	19 (20)	7 (7)	(0.5)	23 (24)	48 (51)

Percentages are shown in parenthesis

## Appendix III Prevalence of examined skin disease in the US NHANES study

Table III.1: Prevalence of significant skin pathology among 20 749 US persons aged 1–74 years<sup>3</sup>

Condition	Male	Female	Both sexes
Persons with one or more significant skin conditions	339.8	286.6	312.4
Significant skin conditions, all types	499.4	383.4	439.7
Acne vulgaris	70.5	65.9	68.1
Cystic acne	3.3	0.6	1.9
Acne scars	2.0	1.3	1.7
Xerosis	5.3	7.7	6.5
Dermatophytoses	131.4	33.7	81.1
Tumours	59.6	53.7	56.5
Malignant	6.4	5.3	5.9
Basal cell epithelioma	4.7	3.5	4.1
Benign	35.8	40.5	38.2
Pre-cancerous and not specified	17.4	7.9	12.4
Actinic keratosis	13.9	5.5	9.6
Seborrhoeic dermatitis	26.7	30.1	28.5
Atopic dermatitis, eczema	19.5	17.4	18.4
Atopic dermatitis	8.2	5.6	6.9
Lichen simplex chronicus	4.7	4.4	4.5
Hand eczema	1.1	2.1	1.6
Nummular eczema	1.0	2.4	1.7
Dyshidrotic eczema	3.1	1.2	2.1
Contact dermatitis	13.4	13.8	13.6
Ichthyosis, keratosis	9.3	9.6	9.5
Verruca vulgaris	10.3	7.2	8.5
Folliculitis	12.3	4.0	8.0
Psoriasis	5.9	5.1	5.5
Seborrheic keratosis	4.6	5.8	5.2
Vitiligo	3.6	6.2	4.9
Urticaria (hives etc.)	3.8	5.6	4.8
Herpes simplex	4.0	4.5	4.2
All other skin conditions	106.7	105.0	106.2

See also Figure III.1 on page 321.

**Table III.2:** Significant skin pathology and its relationship to subject's concern according to sex category<sup>3</sup>

Age	Both sexes			Male			Female					
	Skin condition of concern	Significant skin pathology of:		Non-significant skin pathology of concern	Skin condition of concern	Significant skin pathology of:		Non-significant skin pathology of concern	Skin condition of concern	Significant skin pathology of:		Non-significant skin pathology of concern
Concern		No concern	Concern			No concern	Concern			No concern		
	Rate per 1000 population											
<b>Total 1-74 years</b>	118.2	97.1	215.3	21.1	128.2	108.0	231.8	20.2	108.8	86.9	199.7	21.9
	Standard error of rate											
Total 1-74 years	7.58	6.23	13.82	1.35	7.94	6.69	14.36	1.25	7.64	6.10	14.02	1.61

<sup>3</sup>'Concern' implies that the subject expressed concern or complained about their skin condition

**Table III.3:** Proportion of skin conditions classified as significant by a dermatologist examiner in the NHANES study<sup>3</sup>

Condition	Total	Skin condition		Proportion classed as significant
		Significant	Non-significant	
	Rate per 1000 population			%
Other skin disorders (vitiligo, traumatic scars, ephelides etc.)	516.2	27.5	488.7	5.3
Ichthyosis, keratosis	432.7	21.8	410.9	5.0
Tumours, malignant and benign and leukemias	357.1	56.7	300.4	15.9
Malignant tumours	11.6	5.9	5.7	50.9
Diseases of sweat and sebaceous glands	209.5	87.0	122.5	41.5
Other diseases of circulatory system (Osler's disease, telangiectasis etc.)	182.7	1.0	181.7	0.5
Corns, callosities	156.9	3.2	153.7	2.0
Lichen planus	140.6	0.8	139.8	0.6
Seborrhoeic keratosis	124.1	5.2	118.9	4.2
Seborrhoeic dermatitis	116.7	28.5	88.2	24.4
Dermatophytoses	81.1	81.1	–	7.8
Infections of skin (boils, impetigo, infectious warts etc.)	60.0	15.9	44.1	26.5
Contact dermatitides	53.9	13.6	40.3	25.2
Diseases of hair and hair follicles	50.5	15.8	34.7	31.3
Pruritus	25.8	13.7	12.1	53.1
Psoriasis	14.3	8.8	5.5	61.5
Injuries, adverse effects of chemical and other external conditions	3.8	3.7	0.1	97.4

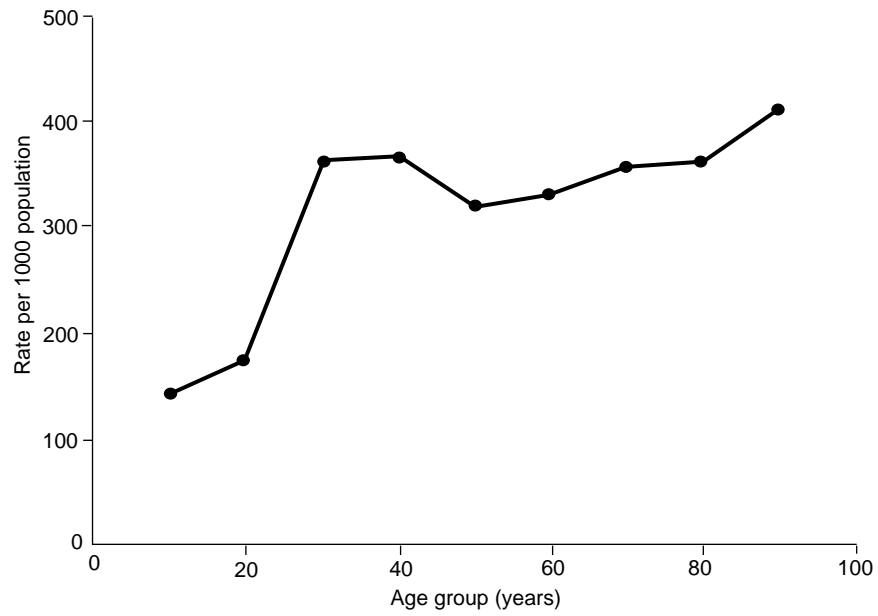


Figure III.1: Age-specific prevalence of one or more significant skin conditions in a US population.<sup>3</sup>

## Appendix IV The general practitioner morbidity surveys

Every ten years, the Royal College of General Practitioners conducts a survey of 25 to 60 practices in England and Wales on every face-to-face consultation with patients over a one-year period.<sup>5,7,36,37</sup>

The sample is not fully representative of England and Wales in that practices from the North, Midland and Wales are over-represented whilst practices from the South are under-represented.

The studies also include too many practices with four or above principals and too many with larger list sizes. The surveys are also limited by employing similar classification systems to ICD 9 and no direct validation of diagnosis is available.

Despite these limitations the studies remain the most useful routinely available data on people who seek help through the first entry point in the health service. Each study covers a total of around a third of a million patients and slightly less patient-years. There have been no direct studies on validity of the diagnoses entered by GPs into these statistics but indirect validation is available in the form of the confidence expressed by the GP in the diagnosis given.<sup>5</sup> These are summarized in Table IV.1.

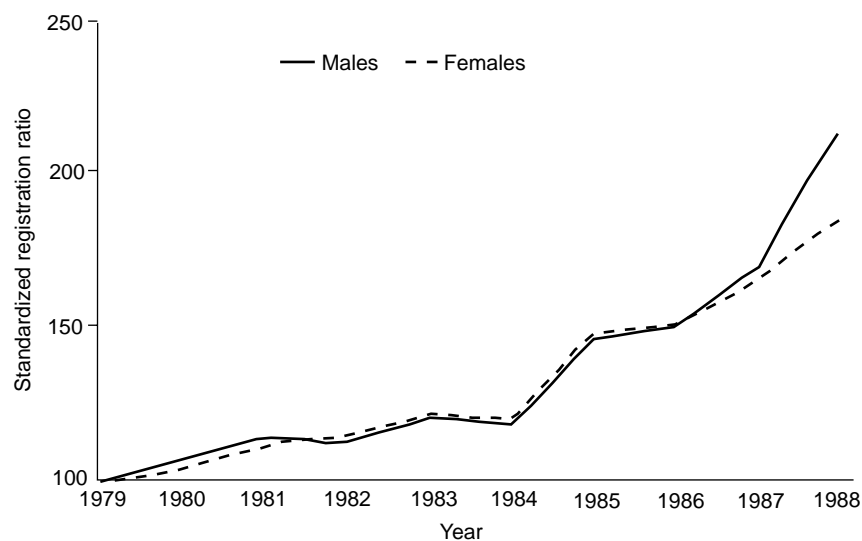
**Table IV.1:** Confidence expressed by GPs in diagnosis of skin disorders

Symptom	Diagnosis not advanced beyond presenting (%)	Provisional diagnosis (%)	Confident diagnosis (%)
Cough	4	20	76
Rashes	7	28	65
Sore throat	2	9	89
Abdominal pain	18	60	21
Back pain	8	52	40

Degree of confidence (%)

## Appendix V Prevalence of melanoma skin cancer

Malignant melanoma is a comparatively rare but potentially lethal form of skin cancer which develops in the pigment-producing cells of the skin. There are three reasons why health professionals have expressed concern over what may be a largely preventable cancer.<sup>41,119</sup> First incidence rates in England and Wales have doubled over the last ten years<sup>41</sup>(Figure V.1). Second the disease affects young adults and third survival rates could improve if more patients were treated at an early stage when excision may be curative.



**Figure V.1:** Standardized registration ratios (SRRs) for melanoma skin cancer in England and Wales 1979 to 1988.<sup>141</sup>

Melanoma accounted for 1142 deaths in England and Wales in 1992.<sup>10</sup> In both men and women death rates at ages over 40 years rose three-fold between 1959 and 1989.<sup>120</sup> Mortality rates have also increased at younger ages, though not so dramatically. New cases of melanomas were recorded in 1354 males and 2249 females in England and Wales in 1989.<sup>141</sup> Estimates for the whole of UK are shown in Table V.1.<sup>41</sup> In Scotland it is the most rapidly rising cancer.<sup>41</sup> In a special survey in South Wales the crude cancer registration rates for melanoma were 7.4 and 13.7 per 100 000 per year for males and females respectively.<sup>142</sup>

**Table V.1:** Numbers of new cases and deaths from melanoma in 1988 for the UK<sup>41</sup>

	Number of new cases UK 1988			UK
	England/ Wales	Scotland	Northern Ireland	
Males	1497	203	16	1716
Females	2394	300	28	2722
Persons	3891	503	44	4438
Numbers of deaths UK 1992				
Males	565	46	12	623
Females	577	56	9	642
Persons	1142	102	21	1265

The most common type of melanoma is the superficial spreading melanoma – a lesion which can remain in a horizontal growth phase for a period of several years during which removal may be curative. Prognosis of melanoma which has not metastasized to lymph nodes is directly related to its depth of invasion into the skin. Lesions removed at a thin early stage have a very good prognosis (over 92% five-year survival for lesions less than 1.5 mm thick in females) whereas lesions presenting at a later thick stage fare poorly (five-year survival of around 37% for lesions thicker than 3 mm).<sup>143,144</sup> Melanomas are characterized by irregularity of shape, colour and border – features which are usually easily recognizable by health professionals.

In an attempt to alert people to the importance of early diagnosis of melanoma several public education campaigns were initiated by the Cancer Research Campaign in the late 1980s and early 1990s. These well-intentioned campaigns generated a considerable increase in workload of benign pigmented lesions in both GP and dermatology departments.<sup>60–62,75</sup> Since the campaigns, the proportion of thinner, better prognosis melanomas has increased, although these trends had been in place long before the campaigns were started.<sup>62</sup> Melanoma mortality has continued to increase in England and Wales although a flattening of melanoma incidence has been reported over the last ten years for females in Scotland.<sup>145</sup> Due to the long latency of melanoma (incidence to mortality ratio of 3.9 for females and 3.2 for men) it is too early to assess the effects of the public education campaigns for early diagnosis on melanoma mortality. Purchasers need to be aware that whilst the Health of the Nation Target ‘to halt the year-on-year increase in incidence of skin cancer by the year 2005’ is a noble one, it is most unlikely to be realized within the allotted time span because of the lag between exposure and the development of skin cancer and the fact that a cohort of older patients who have already received excessive ultraviolet light exposure through leisure activities will continue to develop skin cancers such as melanoma for the next 40 to 50 years.

Melanoma is more common in fair skinned populations living in sunny climates such as Australia and Southern USA.<sup>144</sup> The increased incidence of melanoma has affected both sexes and all ages and there is progressive risk for successive birth cohorts. These changes appear to be real as opposed to changes in diagnostic criteria or increased reporting.<sup>144</sup> Risk factors for melanoma include fair skin, red or blonde hair, blue eyes, tendency to burn easily on sun exposure, tendency to freckle, excessive number of benign moles and family history of melanoma. The importance of sunlight is illustrated by the association of melanoma incidence in white skinned people with latitude, although melanomas may occur on non-exposed sites. In addition to different susceptibility of melanoma, intermittent (recreational) exposure to sunlight is important.<sup>146,147</sup>

Unlike Australia and USA melanoma is more common in females in the UK, with a female to male ratio of 1.7:1, the reasons of which are unclear.<sup>75</sup> Melanoma exhibits a social class gradient with higher rates among professional and non-manual workers thought to be due to intermittent intense UV exposure. The age-specific incidence rates increase with increasing age (Figure V.2). Melanoma is very rare in childhood but around 20% of melanomas occur in young adults (20–39 years), whereas less than 4% of all neoplasms occur in this age group. Standardized registration rates (SRRs) show some variation with region, with highest rates in the Wessex and South Western regions (female SRRs 160 and 152 respectively) and lowest rates in Northern and Merseyside (female SRRs 68 and 70 respectively).<sup>141</sup>



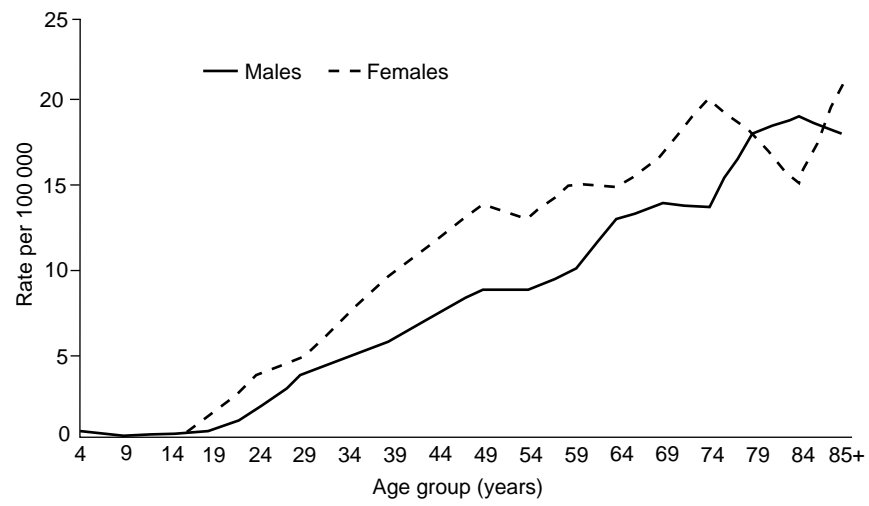


Figure V.2: Age and melanoma incidence per 100 000 population for England and Wales in 1988.<sup>141</sup>

## Appendix VI Prevalence of non-melanoma skin cancer (NMSC)

Of the NMSCs around 80% are basal cell carcinomas (BCC) and most of the remainder are squamous cell carcinomas (SCC). In most countries NMSC is more common than melanoma skin cancer by a factor of ten and BCC is much more common than SCC by a factor of four. Melanoma skin cancer on the other hand causes more deaths than NMSC (1142 and 486 deaths respectively in 1992).<sup>10</sup>

Official cancer registration statistics probably underestimate the incidence of NMSC by a factor of at least two.<sup>141,148</sup> Despite under-registration it is by far the most common form of cancer in the UK. There was a total of 32 000 registrations for NMSC in England and Wales in 1988,<sup>141</sup> with the majority of tumours occurring in the over 60s age group. The incidence of both these tumours increases sharply with increasing age (Figure VI.1). Considerable regional variation in NMSC registration rates are seen within the UK but in the absence of complete data from special surveys it is difficult to comment on whether these differences are due to differences in registration/awareness or whether they are due to the age and skin type structure of the populations or whether they are due to total UVR exposure.<sup>141</sup> Coastal areas with a large proportion of retired people such as the South Western area have the highest rates (Figure VI.2). In a random sample of 560 subjects aged over 60 years in South Wales<sup>142</sup> the prevalence of non-melanoma skin cancer was 2.1% (95% confidence interval 1.1% to 3.7%) with a basal to squamous cell ratio of 5:1. The incidence of non-melanoma skin cancers was 5.4 per 1000 person-years (1.2 to 15.6 per 1000 person-years). Malignant melanoma was found in 0.2% of subjects (0.01% to 1%). Accurate and up-to-date statistics on the prevalence of NMSC in different regions of the UK according to age or other high risk groups is absent. This information is essential for the planning of appropriate services.

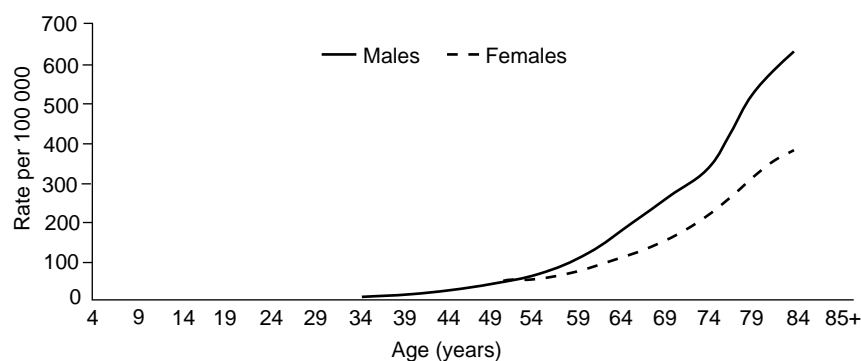


Figure VI.1: Incidence of non-melanoma skin cancer with age for England and Wales in 1988.<sup>141</sup>

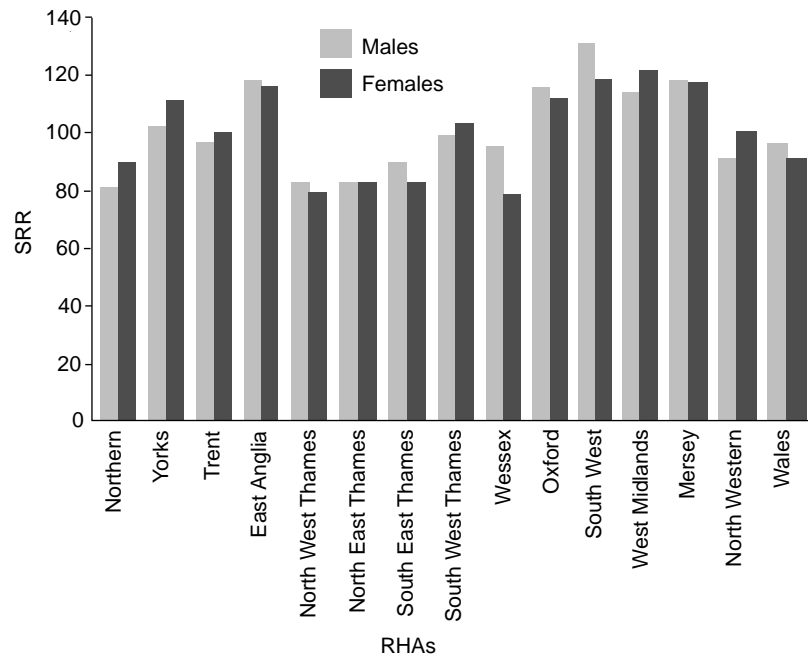


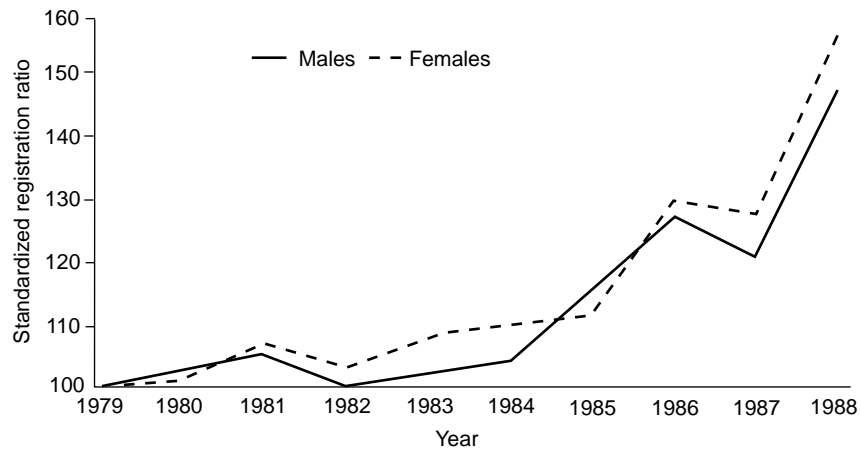
Figure VI.2: Standardized registration ratios (SRR) for non-melanoma skin cancer for different regions of England and Wales in 1988.<sup>141</sup>

Very few people die from NMSC. The five-year relative survival rates for men and women were about 97% for 1981 registrations<sup>10</sup> and the ratio of incidence to mortality is probably around 160:1 if known under-registrations are allowed for.

Susceptibility to both NMSCs is inversely proportional to degree of melanin pigmentation and most tumours occur on areas of the body which have received large amounts of ultraviolet radiation over many years, i.e. an effect of cumulative rather than intermittent exposure.<sup>149</sup> There has been a striking rise in the incidence of NMSC over the last 20 years in the UK (Figure VI.3). Some of this rise may be a pseudoepidemic caused by increased reporting<sup>148</sup> but increased recreational and occupational exposure to sunlight is also important and this will continue to affect successive population cohorts well into the next 30 years because of the long latent period (decades) between exposure and disease. The amount of ultraviolet radiation (especially UV-B) that will reach the earth's surface will also increase as a result of depletion of stratospheric ozone. It has been estimated that a 1% ozone depletion could give rise to a 1% to 3% increase in both melanoma and non-melanoma skin cancers.<sup>149</sup> It seems likely that the cohort effects of excessive recreational and occupational exposure to ultraviolet radiation, combined with an increasingly elderly population and diminished ozone will ensure that prevalent cases of NMSC will continue to rise for at least the next 30 years.

Although BCC and SCC are frequently grouped together in cancer statistics, there are some important differences in the behaviour of these tumours. Basal cell carcinomas are slow growing tumours (years) of the skin usually occurring on sun-exposed areas such as the face. If left untreated they eventually ulcerate and cause local problems. Secondary spread is extremely unusual and surgical removal is highly effective. People with a basal cell carcinoma are at a very high risk of developing further new lesions.<sup>150</sup>

Squamous cell carcinoma of the skin has been related to cumulative sun exposure, and also typically occurs on sun-exposed areas of the skin such as the head or backs of the hands in the elderly. These tumours grow



**Figure VI.3:** Standardized registration ratios for non-melanoma skin cancer for England and Wales 1979 to 1988.<sup>141</sup>

more rapidly (months) and can eventually metastasize if left untreated. As most NMSCs in white populations are probably due to UV-B exposure, a change in sun exposure habits could greatly reduce their incidence in future cohorts.

## Appendix VII Prevalence of acne

Acne vulgaris is a very common condition characterized by papules, pustules, comedones (blackheads) and scars. It is caused by a combination of factors such as excessive and abnormal grease production, a bacterium (*Propionibacterium acnes*) and other abnormalities of the skin which lead to plugging of pilosebaceous openings. Mild degrees of acne are extremely common amongst teenagers and some have even considered it as a physiological disorder.<sup>16</sup> In discussing disease prevalence it is essential that some form of further breakdown according to disease severity is considered. It is also important to realize that whilst these severity gradings are reasonably objective they do not usually take into account the views of the sufferer. With increasing awareness of effective medical treatment and a decrease in the threshold of what both patients and doctor consider as a disease worthy of medical treatment, the distribution between the various severity categories could change substantially in the future. This would have major cost implications, as shown in Figure 8, page 297; as many more people exist with minor to moderate degrees of disease.

In a recent survey of Glasgow school children 83% of girls and 95% of boys had acne.<sup>151</sup> Most of these pupils had minimal disease and only 1.8% of boys and 0.3% of girls had moderate to severe disease in this study. 9% of boys and 14% of girls had visited their GP because of their acne and 0.3% were referred to a dermatologist.

Detailed analysis of 8328 people aged 15 to 44 years who were examined by dermatologists in the US in the early 1970s suggested that 20.7% of females had minimal disease (comedones and small pustular inflammatory lesions), 8.6% had moderate disease (comedones, pustules and deeper inflammatory lesions, considered by the examiner as a true disease as opposed to a passing cosmetic change), with a further 0.6% with severe disease (infected extensive cystic acne).<sup>107</sup> Corresponding prevalence rates for males were: 19% minimal, 11.3% moderate and 1.4% severe. Scarring secondary to acne was noted in 5.8% of females and 9.1% of males. Another US survey found that clinically significant inflammatory acne was present in 17.7% out of 435 boys aged nine to 15.<sup>152</sup>

The prevalence of moderate to severe acne in the Lambeth study was 13.8% in those aged 15–24 years.<sup>2</sup> Although much emphasis has been placed on teenage acne, moderate to severe disease may still affect a large number of older individuals affecting about 3.5% of those aged 25 to 34 years and 0.89% of those aged 35–54 years. Of all those with acne recorded in the NHANES study 17% were younger than 15 years old, 81% were aged 15 to 44 years and 2% were more than 44 years.<sup>3</sup> There is no evidence that ethnic group is an important determinant of acne prevalence when pubertal development has been adjusted for.<sup>152</sup>

No data are available on the incidence of acne in the population apart from GP morbidity statistics which reflects the incidence of those who choose to seek help.<sup>5,7</sup> With over £11 million spent on OTC acne preparations in the UK it is likely that the majority of sufferers do not seek a physician's assistance. In 1993 the cost of prescriptions for treatment of acne by GPs and dermatologists was £44.8 million.<sup>153</sup> An estimated 3.6 million consultations took place in GPs' surgeries, with 57 000 specialist referrals. Apart from the financial cost of acne, the human costs may also be high, since acne predominantly affects the face (Figure 2, page 276). Around 70% of acne patients experience shame or embarrassment because of their acne and 27% were depressed.<sup>154</sup> A specially designed acne disability index has been devised to assess the psychological effect of acne on the sufferer and disability correlates well with severity as measured by an objective grading system in most people.<sup>155</sup> There is however a small group of people whose disability appears to be out of proportion with severity. Little research has been conducted into the handicap caused by acne but a recent case-control study suggests that acne sufferers are more likely to be unemployed.<sup>156</sup>

It is possible that there has been a decrease in the proportion of people with moderate to severe acne over the last 50 years.<sup>151</sup> Although some of this shift could have been due to changes in defining disease severity, increased availability of effective treatment from chemists and GPs seems a more likely explanation.

## Appendix VIII Prevalence of atopic eczema

Atopic eczema (or childhood eczema, infantile eczema, atopic dermatitis) is an inflammatory skin disorder characterized by itching, involvement of the skin creases and onset in early life.

Genetic factors are important<sup>157</sup> and hypersensitivity to a range of allergens and non-specific irritants may be implicated.<sup>158</sup> Although a tendency to dry irritable skin may be lifelong with atopic eczema, around 60% to 70% of children are clear of significant disease by their mid-teens.<sup>158,159</sup>

Recent prevalence studies of children in temperate developed countries suggest an overall cumulative prevalence of between 5% to 20% by the age of 11.<sup>160-162</sup> Point prevalences of visible dermatitis in populations of similar ages yield values approximately half of those for a history of ever having had atopic eczema,<sup>163</sup> compatible with the fluctuating nature of the disease. Data on the prevalence of severe disease is scanty but it is likely that most cases are mild and can be managed with simple treatments. In a recent study of 695 school children in London where 8.5% were noted to have visible atopic eczema 60% of eczema cases were considered to be very mild by the examining physician (i.e. required a moisturizer alone), 24% were mild (warranting a moisturizer and weak topical corticosteroid) and 16% were moderate or severe (requiring stronger topical preparations and a physician's supervision).<sup>164</sup> Prevalence estimates for adults suggest an overall frequency of atopic eczema of between 1.2% to 10%.<sup>2,3,71</sup>

Comparisons between different studies are limited, as diagnostic criteria which are suitable for epidemiological studies of atopic eczema have only recently been developed.<sup>165</sup> Even allowing for changes in diagnostic fashion, there is reasonable direct and indirect evidence to suggest that the prevalence of atopic eczema has increased two- to three-fold over the last 30 years.<sup>6,166</sup> The precise reasons for this increase in disease is not known but it is likely that environmental factors associated with urbanization are important.<sup>158</sup>

Atopic eczema in childhood shows a striking social class gradient for both reported and examined disease,<sup>163</sup> with higher rates in socio-economically advantaged groups and smaller families. Ethnic group may be an important factor for expression of atopic eczema. A recent study has found that the prevalence of atopic eczema (measured in three different ways) was twice as common in London born Afro-Caribbean children when compared with their white counterparts.<sup>164</sup> Generalizations to other ethnic groups may be unwise. For instance studies of Asian children in Leicester show that although they are three times as likely to be present in specialist clinics than white children, no differences in prevalence rates were seen in a community survey.<sup>167</sup>

Although there are no recent national prevalence studies of atopic eczema in the UK data for examined eczema from a national birth cohort study (the National Child Development Study or NCDS) points to considerable variation in disease prevalence and region, with highest rates in the South East and industrialized Midlands and lowest rates in Wales and Scotland.

Incidence figures are harder to obtain but unpublished data from the NCDS suggest around 50 cases per 1000 in the first year of life, falling to around five new cases per 1000 per year for the remainder of childhood.

Little is known about the direct and indirect costs of atopic eczema but it is clear that atopic eczema may be a source of considerable distress to both the children and their parents.<sup>168</sup> Atopic eczema consistently exhibits some of the highest scores on the Dermatology Life Quality Index<sup>94</sup> (a patient-derived tool for estimating the misery caused by skin diseases). A recent study of adult and childhood atopic eczema in Scotland has estimated that at least £288 million is spent annually on atopic eczema in the UK, with around one-third of costs being met by patients.<sup>71</sup> Although prevalence rates of atopic eczema were around five times higher in children than in adults, those aged over 16 accounted for 38% of all atopic eczema patients in absolute terms in this study.

## Appendix IX Prevalence of psoriasis

Psoriasis is a chronic inflammatory skin disorder characterized by red scaly areas and tends to affect areas such as the knees, elbows, lower back and scalp. Onset of psoriasis is usually either in early adulthood or in later life and this bimodal onset may indicate different causative mechanisms.<sup>169</sup> Genetic factors are important in psoriasis and environmental factors such as skin trauma, streptococcal infection, certain medications, smoking, alcohol consumption and psychological stress may also play a role in disease expression.<sup>170</sup>

Epidemiological studies conducted in Northern Europe suggest an overall prevalence of between 1% to 3%.<sup>33,34,171,172</sup> Adult males and females are affected equally but age of onset may be earlier in females. The point prevalence of examined psoriasis was 0.5% (45/9263) and 0.8% (77/9263) at the ages of 11 and 16 respectively in the National Child Development Survey.<sup>173</sup> Psoriasis may be less common in blacks and oriental populations.<sup>174</sup> Longitudinal studies to examine the natural history of psoriasis have not been carried out but a retrospective questionnaire study suggested that between 36% and 55% of subjects experience some form of remission of their psoriasis for one to 54 years.<sup>174</sup> In this study 29% of patients considered that their psoriasis went into remission without physician-directed therapy.

The Lambeth study found that 1.6% (95% confidence intervals 0% to 3.3%) of the population had some psoriasis, a third of which was moderate to severe. Peak psoriasis prevalence was noted in the 25–34 years age group, with a second smaller peak 1.6% in the 55–74 years age group. Around two-thirds of the 1.4% of those noted to have psoriasis in the NHANES study were considered by the examining dermatologist to have clinically significant disease.<sup>3</sup>

A recent Gallup pole survey of 2019 people found that 5.5% of the public (or 8% of those aware of the disease) claimed to suffer from psoriasis.<sup>175</sup> This is considerably higher than examined psoriasis estimates from prevalence surveys but may reflect incorrect diagnoses by the public, differences between point and period prevalences and mild degrees of disease which might be ignored by physicians.

Although experience with hospital cases suggests that psoriasis is a chronic persistent condition,<sup>174</sup> care has to be shown in extrapolating this observation to milder community cases in the absence of appropriate studies of disease periodicity.

It is not known whether psoriasis prevalence rates vary throughout the UK but GP morbidity data suggest that a similar proportion of people seek advice about the condition throughout the UK.<sup>5</sup>

## Appendix X Prevalence of viral warts

Warts are caused by human papilloma virus, of which over 50 subtypes have been described. Genital warts are usually treated in genitourinary departments and will not be discussed further here. Viral warts usually occur on exposed areas such as the fingers, hands and feet. Warts occurring on the soles of the feet are often referred to as verrucae.

The prevalence of examined warts according to medical officers in a representative sample of 9263 school children in the UK (NCDS) was 3.9% (95% confidence interval 3.5 to 4.3) and 4.9% (95% confidence interval 4.5 to 5.4) at the ages of 11 and 16 respectively.<sup>176</sup> Other surveys in the Northern Hemisphere quote prevalence rates of between 3% to 20% in children and teenagers,<sup>177</sup> the wide range possibly reflecting the conscientiousness with which warts were looked for. Further analysis of those ages with visible warts in the NCDS showed marked regional differences in wart prevalence with an increasing gradient of wart prevalence from the Southern to the northern regions at both 11 and 16 years of age.<sup>178</sup> In this study wart prevalence was also less in children born to parents with non-manual occupations, a finding echoed in the Lambeth study.<sup>2</sup> No sex differences in wart prevalence were noted in this study but children coming from smaller families had a lower prevalence of warts perhaps reflecting decreased opportunity for cross-infection. Visible warts were also twice as common in white Europeans when compared with other ethnic groups in the NCDS study. This study also suggested that over 90% of those children with warts at the age of 11 had cleared up by the age of 16.<sup>176</sup> Other studies have suggested two-year clearance rates of around 65%.<sup>177,178</sup> Although viral warts are often considered as a condition of childhood and adolescence the Lambeth study found that 3.5% of adults aged 25–34 years also had warts of which one-quarter were ‘moderate to severe’.<sup>2</sup>



## Appendix XI Prevalence of other infective skin disorders

The most common cutaneous bacterial infections in the UK include furunculosis (boils), impetigo, and folliculitis. Common viral infections other than warts include molluscum contagiosum, herpes simplex (cold sores) and herpes zoster (shingles). Fungal infections are usually described according to the site which they affect. The main forms include tinea corporis (affecting body skin), tinea capitis (affecting hair and sometimes referred to as ringworm) and onychomycosis (fungal infections of nails).

Prevalence rates for this category range from 4.6% to 9.3%.<sup>2,3</sup> These figures are to be viewed as a minimum, since most infective disorders are transient and might be missed in point prevalence surveys. As with any 'rag bag' category the prevalence rate will vary considerably with what is thrown into that bag and comparisons between surveys is difficult as different diseases have been included in the category. Cutaneous infections are also especially common in immunosuppressed individuals, such as those with AIDS<sup>179</sup> or transplant patients on immunosuppressive drugs and older surveys will underestimate the contribution of skin infections by such groups. Incidence data for cutaneous infective disorders are required in order to plan appropriate services but none are available for the UK. Morbidity statistics from general practice show that at least 4% of the population per year consult their GP for a skin infection other than warts.<sup>7</sup>

Bacterial impetigo and mollusca usually affect children, whereas boils and folliculitis peak in the 18 to 34 year age group. Herpes simplex shows a steady prevalence rate throughout the first four decades of life whilst new cases of herpes zoster peaks increase strikingly in later life.<sup>5</sup> In 1981/82 around 2.9 new episodes of herpes simplex infection (cold sore) and 3.7 new episodes of Herpes zoster (shingles) per 1000 people were recorded in general practice.<sup>5</sup> Fungal skin infections of the scalp typically occur in childhood and may form outbreaks in schools. Chronic fungal infection of the toe spaces (athletes' foot) is commonest in young adult life and this condition alone may affect as much as 3.9% of the population at any one time.<sup>3</sup> A recent survey of a representative sample of 9332 adults in the UK found that 2.8% of men and 2.6% of women suffered from fungal nail infections and this increased to 4.7% in those aged 55 and over.<sup>118</sup> Only 12% of those with nail infections had sought specialist medical advice and of those who had not sought help, 80% would have liked further treatment if they knew that effective treatment was available. This study estimated the incidence of fungal nail infection at 4.8 per 1000 per year. Fungal infection of the feet and toenails is more common in occupational groups such as miners and members of the armed forces, where it may affect 6.5% to 27% of the workforce.<sup>180</sup>

## Appendix XII Benign tumours and vascular lesions

This category represents a heterogeneous group of lesions such as moles, seborrhoeic warts, sebaceous cysts and pre-malignant lesions such as solar keratoses. From an operational point of view the common end-point of a consultation for a person with such a lesion is usually either to reassure and discharge, or perform minor surgery to remove/biopsy the lesion for discomfort or diagnostic reasons. Many benign vascular lesions occur on the skin but perhaps the most important lesions which purchasers need to be aware of are port wine stains because of their persistent nature and effective but expensive treatment.

The elasticity of this sub-category is considerable, since every person has some form of benign cutaneous lesion which may or may not cause them concern. Benign melanocytic lesions (moles) exemplify the difficulties in deciding what to include within this sub-category. Most white adults have between 40 and 60 moles on their body. Some moles can look very worrying to patients and many will seek medical advice to exclude malignancy. Some people may be very unhappy with the cosmetic appearance of their moles, whereas the majority of people are probably not bothered by their presence. Thus even for one common lesion there may be a range of concerns from none at all to cosmetic concerns or a wish to exclude malignancy. Purchasers are probably only concerned with the last category but the relative proportions of these categories are unstable. Small changes in the public's anxiety about moles, as has occurred in conjunction with media publicity directed at early diagnosis of skin cancer, or a small decrease in the threshold of what people regard as cosmetically unacceptable (as has occurred with the unrealistic media image of a blemishless skin), will have large implications for health services. Similar arguments apply to other benign tumours such as seborrhoeic warts, which are almost universal in later life.

Both the Lambeth and the NHANES study evaluated the prevalence of benign tumours which the examining physicians considered were worthy of medical attention.<sup>2,3</sup> Although 20.5% of the Lambeth study population were noted to have a tumour or vascular lesion of some sort, in only 7% of these was it considered 'moderate to severe'.<sup>2</sup> This corresponds to prevalence of 1.4% (95% confidence intervals 0.3% to 2.5%) in this adult population. In the NHANES study clinically significant benign tumours and precancerous lesions (excluding seborrhoeic keratoses) were noted in 5.1% of people.<sup>3</sup> The prevalence of benign tumours and precancerous lesions showed a striking increase with age from 2% in children to 13% in those aged 65–74 years.

It is possible that the threshold of what physicians might consider as worthy of medical attention might have changed considerably over the 20 years since these important surveys were conducted. During this time interest in the differential diagnosis of malignant melanoma has flourished and new concepts such as dysplastic naevus syndrome have emerged.

Solar keratoses deserve further mention in their own right because of their high prevalence and uncertainty regarding malignant potential. Solar keratoses are dysplastic epidermal lesions which occur in pale-skinned individuals who are chronically exposed to bright sunlight. Prevalence rates in the Northern hemisphere range from 11% to 25% with a striking increase in prevalence over the age of 65.<sup>181</sup> A recent study of 560 subjects aged 60 and over in South Wales reported a 23% prevalence (95% confidence interval 19.5% to 26.5%) of solar keratoses.<sup>142</sup> The incidence of new lesions after one year in this population was 88 newly affected persons per 100 person-years (95% confidence intervals 66–114 per 100 person-years). Very little is known about their natural history and role in carcinogenesis. Reported rates of malignant transformation have varied from fewer than 1 : 1000 to 20% but recent prospective studies suggest that this risk is likely to be less than 1% per year.<sup>181</sup> Around 10% to 27% of solar keratoses probably remit spontaneously.<sup>142,182</sup>

Port wine stains are rare vascular malformations composed of mature capillaries which are present at birth. Their presence can lead to considerable psychological disability if untreated. Unlike the more common strawberry haemangioma, spontaneous resolution does not occur and the affected area can become more prominent as the person becomes older. One previous study suggests an incidence rate of three per 1000 live

births in the UK.<sup>183</sup> Similar rates have been shown in a Finnish study of 4346 consecutive live births who were examined by a dermatologist, where 0.23% (95% confidence intervals 0.09% to 0.37%) were born with a port wine stain.<sup>184</sup> Another study of 3345 Chinese infants born in Taiwan suggested 0.4% had a port wine stain, most of which occurred on visible areas of the head and neck.<sup>185</sup>

## Appendix XIII Leg ulcers

The most common causes of leg ulceration in the UK are venous disease, arterial disease or a mixture of both. The distribution of different types of leg ulcer in earlier studies is venous ulcers 70–90%, arterial ulcers 5–15%, mixed venous/arterial 5–10% and other causes 1 to 15%.<sup>186</sup> In addition to a careful history and full examination various non-invasive techniques such as Doppler ultrasound testing which can be performed by trained nurses are used in assessing the relative contribution of venous versus arterial disease. The proportion of people with significant arterial ischaemia rises with age from 5% in patients under the age of 70 years to 31% over this age.<sup>187</sup>

Apart from pain,<sup>188</sup> discomfort and inconvenience, leg ulcers may become infected or develop superimposed contact dermatitis which requires further investigation with patch testing.<sup>189</sup> Recurrences of venous ulcers are high, with up to two-thirds of ulcers recurring within one year of discharge following intensive hospital inpatient admissions.<sup>190</sup>

Recurrence rates in the community have been studied less well but many ulcers remain unhealed for years. A recent study in Watford suggests that referral for specialist assessment of leg ulcers is a relatively late event (36% of 107 patients had their ulcer for over two years).<sup>191</sup> This delay was important as arterial disease was found to be the sole cause in 7% of cases and in four patients malignancies were found to be the cause of ulceration. Surveys suggest that district nurses spend between 25% and 65% of their time treating ulcers.<sup>121</sup> The UK cost of treating venous ulcers alone has been estimated as £400 to £600 million in 1992,<sup>192,193</sup> most of which is due to nursing costs.

Surveys have suggested that the prevalence of venous ulcers in the general population is around 0.1% to 2% of the population with a marked increase in rates with increasing age from 0.5% over 40 years to 2% in the over 80s.<sup>121,187,194</sup> Venous leg ulcers affect between 1% to 2% of people in their life time.<sup>187,195</sup>

The point prevalence of venous leg ulcers was 0.16% (95% confidence intervals 0.15 to 0.18) in a study of 270 800 Swedish people in a defined geographical area.<sup>196</sup> Prevalence rose markedly with age and over 85% of patients were older than 64 years. The median age was 78 years for women and 76 for men. Half of those with venous disease had onset before the age of 65 years and half had suffered from the ulcer for over one year. Venous ulcers were recurrent in 72% of cases. Duration of ulcer was more than one year in 54% of patients with venous ulcers and 44% with non-venous lesions. Dressing changes were painful in 31% of patients with venous ulcers and rest pain was reported by 28% of venous ulcer sufferers and by 29% of the others. The number of dressings per week for venous ulcers alone was 1100 per 100 000 population.

Another Swedish study of 5140 people in Gothenburg aged 65 years and above found that 2.15% (95% confidence intervals 1.73% to 2.57%) had a current leg ulcer.<sup>197</sup> Of these around one-third were found to have arterial disease/diabetes.

Morbidity data from general practice suggest leg ulcers are becoming more common, or at least that more people are seeking treatment. Some of these changes could be due to an increasingly ageing population but comparison of age-specific rates over the last 40 years shows increases in consultation rates within each age band (Table XIII.1).<sup>5</sup> In the decade 1981 to 1991 there was a 17.6% increase in those aged 75–84 and a 49.2% increase in people aged 85 and above<sup>38</sup> and with a 43% increase in the number of people over the age of 85 years projected by the year 2000 the prevalence of leg ulceration from venous and arterial disease is likely to increase.

**Table XIII.1:** Age-specific patient consulting rates for chronic ulcer of the skin 1955/56, 1971/72 and 1981/82<sup>5</sup>

Year	0–4	5–14	15–24	25–44	45–64	65–74	75+
1955/56		0.4		0.6		1.8	5.0
1971/72	0.1	0.1	0.5	0.4	2.0	4.8	9.1
1981/82	0.4	0.3	0.6	0.6	2.7	6.7	15.4

Rates per 1000 persons at risk

## Appendix XIV Contact dermatitis and other eczemas

The terms dermatitis and eczema are synonymous and refer to a characteristic reaction pattern of the skin to a range of external and internal factors. In the UK the term dermatitis is usually used by the public and GPs to denote an exogenous process, such as contact dermatitis which may or may not be related to occupational exposure, whereas the term eczema refers to an endogenous disease such as atopic or seborrhoeic eczema.

This distinction is an important one for this sub-category as service requirements may differ. Contact dermatitis refers to either:

- irritant contact dermatitis (e.g. frequent exposure to mild irritant soaps seen in trainee nurses or hairdressers)
- allergic contact dermatitis, where subjects develop a delayed type of allergic response to certain potentially sensitizing substances such as metals, perfumes, preservatives, or rubber compounds.

Although both mechanisms may occur simultaneously, distinction between the two requires further investigation by means of patch testing, a process whereby a standard battery of known allergens is applied in non-irritant concentrations on the subject's back and read 48 to 96 hours later. If the subject is found to be positive to a particular substance which is clinically relevant to that person's dermatitis, then complete avoidance of that substance offers the opportunity of a permanent cure.

Other eczemas in this section refer to any eczema that is not contact eczema or atopic eczema (Appendix VIII). Examples are seborrhoeic eczema, discoid eczema, asteatotic eczema, pompholyx eczema, varicose eczema, photosensitive eczema and lichen simplex. Detailed prevalence rates for the various endogenous eczemas are not available but the NHANES study suggested that around 1% of the population had clinically significant eczema that was not atopic eczema or contact dermatitis.<sup>3</sup> Seborrhoeic dermatitis was recorded separately in that study and clinically significant disease was found to affect 2.8% of the population, mainly adults. Asteatotic eczema may be especially common in old age, affecting around 29% of those in residential old people's homes.<sup>197</sup>

### *Contact dermatitis*

Overall estimates of the prevalence and incidence of contact dermatitis in the general population are scarce, whereas a number of studies have looked at special groups such as occupations at high risk of disease. The Lambeth study found a bimodal distribution of eczema prevalence thought to warrant medical care with 7.3%, 3.4% 8.9% and 3.8% in age groups 15–24, 25–34, 35–54 and 55–74 years respectively.<sup>2</sup> This study did not distinguish between endogenous and contact eczema. Younger ages may also suffer from contact dermatitis and a recent study in Sweden found that 9% of school girls had nickel allergy, with highest rates in those with pierced ears.<sup>198</sup>

Significant contact dermatitis was noted in 1.4% of the population in the NHANES study and a further 4% was noted to have insignificant disease, with no overall sex differences.<sup>2</sup> Age-specific prevalence showed a similar bimodal distribution to the Lambeth study<sup>3</sup> probably corresponding to a peak of irritant dermatitis occurring in housewives in their 20s and occupational hand eczema in men and women in the 40 to 60 year age group. Coenraads has pointed out that age and sex are not risk factors for contact factors in themselves but that these characteristics are associated with exposure in occupational and household activities.<sup>199</sup> A recent study of an unselected population of Danish adults found that 15.2% were allergic to one or more substances when patch tested but the proportion with clinically relevant dermatitis was not clear.<sup>200</sup> Around half of those with irritant contact dermatitis and around one-third of those with allergic contact dermatitis were cured 4–7 years after attending a dermatology clinic.<sup>201</sup>

### *Occupational groups*

Contact dermatitis is especially common in certain occupational groups such as the car, leather, metal, food, chemical and rubber industries and those frequently exposed to irritants such as hairdressers, nurses and nursing mothers. It has been estimated that eczema or contact dermatitis accounts for 85% to 98% of occupational skin disease.<sup>202,203</sup> Skin diseases are among the top three reasons for occupational diseases in Northern Europe and constitute 9% to 34% of all occupational disease. Despite differences in entry criteria for occupational skin disease in different European countries the incidence of occupational skin disease is of the same order of magnitude, with 0.5 to 0.7 cases per 1000 workers per year.

### *Hand eczema*

A number of prevalence studies has specifically looked at hand eczema in adults and reported point prevalence rates of between 1.7% to 6.3% and 12-month period prevalences of 8.9% to 10.6%.<sup>199,204</sup> Although most of these studies have not distinguished between endogenous hand eczema and contact eczema the study of hand eczema *per se* is a useful concept since it is the form of eczema most frequently associated with work disability. In a study of 1992 adults in The Netherlands examined by a dermatologist, where hand/forearm eczema was seen in 6.2% of individuals, irritant factors were found to play a role in 73% of cases and contact allergy was detected in 30%.<sup>205</sup> A past history of atopic eczema is a strong risk factor for the development of subsequent irritant contact hand dermatitis.<sup>204</sup>

As with atopic eczema, consideration needs to be given to clinically significant disease. In the NHANES study for instance, only about one-quarter of all cases of contact dermatitis or seborrhoeic dermatitis were considered as significant by the examining dermatologist.<sup>3</sup>

## Appendix XV Prevalence of skin diseases excluded from the main disease sub-categories

Although there are rational arguments for considering nine dermatological sub-categories on the basis that they constitute the bulk of skin disorders in the population and in primary care, the remaining 30% or so of disorders which do not fit neatly into the above system still represent a large sector of the UK population (around 3.9 million people). Because of the difficulties in making generalizations about this heterogeneous group, there will be a temptation to ignore it or accord it a low status in purchasing plans. Whilst it is beyond the scope of this review to mention the 1000 or so remaining disorders contained in this group, some deserve special mention because of their service implications.

Included within this group are genetic disorders such as epidermolysis bullosa, a condition characterized by increased skin fragility. Although rare (one in every 50 000 live births) the consequences of more severe forms of this disease are devastating and diagnosis requires special expertise usually at specialized centres.

Urticaria (hives) is one of the 20 most common skin diseases affecting 1% to 5% of the general population. Vitiligo (loss of pigment) is another progressive and potentially disfiguring disorder affecting 0.5% of the US population.<sup>3</sup> Infestations with pediculosis capitis (nits) is also common in modern schools, although no recent incidence/prevalence estimates are available. Scabies outbreaks may also occur in old people's homes, nurseries and other institutions but incidence figures are lacking. Disorders of the hair and nails that could have benefited from medical help were found to affect 1.4% and 1.8% of adults respectively in the Lambeth study.<sup>2</sup> Also included in this group are blistering disorders such as pemphigus, which can be fatal if untreated. Cutaneous T-cell lymphoma and other skin lymphomas, whilst rare when compared to other skin diseases may require proportionately more services because of the unique treatments involved. Drug reactions which manifest themselves in the skin are also very common and most mild reactions are probably not reported. It has been estimated that around 1% to 8% of people taking antibiotics develop a skin reaction.<sup>206</sup> Of more concern are the rare but potentially fatal skin reactions characterized by skin necrosis (Stevens-Johnson syndrome). A recent West German register has estimated that at least 1.7 per million inhabitants per year develop such a reaction, with higher rates in the Asian population.<sup>207</sup>

There is also a temptation to consider the main nine sub-categories as mutually exclusive categories, whereas in reality many individuals have more than one skin disease, simply because skin disorders are so common and some skin diseases such as skin cancer and solar keratoses are related. The NHANES study found that 6% of the population had more than one significant skin pathology and 3% had more than two significant skin pathologies.<sup>3</sup> This implies that surveys and routine data which measure disease frequency according to persons consulting without regard to the total number of new skin problems will considerably underestimate the service requirements for dermatology.

## Appendix XVI Strength of recommendations

### Evidence

- A There is good evidence to support the use of the procedure
- B There is fair evidence to support the use of the procedure
- C There is poor evidence to support the use of the procedure
- D There is fair evidence to support the rejection of the use of the procedure
- E There is good evidence to support the rejection of the use of the procedure.

### Quality of evidence

- I Evidence obtained from at least one properly designed, randomized control trial
- II-i Evidence obtained from well designed controlled trials without randomization
- II-ii Evidence obtained from well designed cohort or case control analytic studies, preferably from more than one centre or research group
- II-iii Evidence obtained from multiple time series with or without the intervention. Dramatic results in uncontrolled experiments (such as the results of the introduction of penicillin treatment in the 1940s) could also be regarded as this type of evidence
- III Opinions of respected authorities based on clinical experience, descriptive studies, or reports of expert committees
- IV Evidence inadequate owing to problems of methodology (e.g. sample size, or length or comprehensiveness of follow-up or conflicts in evidence).



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