

Community dermatology

The assessment of dermatological needs in resource-poor regionsRoderick James Hay¹, DM, FRCP, and Lucinda Claire Fuller², BM, FRCP¹International Foundation of Dermatology, London, UK, and²Dermatology Department, Kent and Canterbury Hospital, Canterbury, Kent, UK**Correspondence**

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Abstract

The assessment of health needs is a key step in determining the nature and level of health service provision required in any global region. In dermatology, information on needs has provided information on the scale and impact of skin conditions in poor rural and urban populations. In such areas, additional problems in providing adequate services are access to trained health care professionals and cost to families and individuals, set against the background of a village-mixed economy. A further problem is health literacy, which may limit the use of services. However, some of the most comprehensive surveys of the prevalence of skin disease have been carried out in resource-poor countries, and attempts have been made to assess these along with their impact on individual disability. These studies and their outcomes are described in this article.

Introduction

At the outset, the provision of medical services is seldom the result of a systematic analysis of the needs of populations.¹ Often they evolve in a series of seemingly haphazard stages, which depend on a variety of different bits of information that range from elements of regional knowledge of disease patterns to the whims of local or national government, alas not always based on facts. In the same way that Cochrane² challenged the institution of therapies without knowledge of their relative efficacies and risk, so we should also question whether allocation of scarce resources is wise without a clear understanding of a number of simple facts – disease prevalence, disease impact and obstacles to management.

While the unplanned approach usually achieves results, eventually, by a tortuous route in richer countries, this is more because of changes brought about by a combination of health care professionals' understanding of the most appropriate approach, epidemiological information, legislation, and patient pressure. All these can achieve substantial results and lead to the adaptations necessary to provide a good service. The risk in relying on this approach is that the treatment provided is often best for those whose disease meets society's preconceptions of priority as well as for those who shout the loudest. In addition, all depend on a basic level of financial provision and the availability of suitably qualified personnel combined with ready access for the populations living in the area concerned. This is seldom achievable in underprivi-

leged regions, and so there is often a mismatch between demand and supply of appropriate treatment and care facilities,³ whether these are healthy care workers or buildings and equipment. Yet it is in precisely those areas, where resources are limited, where knowledge of the health needs of the population would be most valuable to ensure targeted, cost-efficient, relevant, and prioritized health care provision. This article will discuss the methods used to assess the health needs in dermatology in resource-poor regions.

Health needs

The main elements comprising these health needs are the answers to two questions, and seeking answers to a third is key to solving the problem.

- 1 What and how common are the main local diseases?
- 2 What is their impact on those affected by them in terms of disability, reduction in quality of life, and cost?
- 3 What obstacles prevent people from seeking remedies? These range from lack of understanding of the potential for treatment, tolerance of disease, distance to health center to cost of treatment.

Epidemiology and prevalence of skin disease

In dermatology there is often a lack of knowledge of the prevalence of skin disease in communities. In some parts of the world there is a rising appreciation that these simple facts are key to supporting the exciting scientific

advances in cutaneous medicine, and a number of countries have now published national skin disease needs assessments, e.g. USA⁴ and UK.⁵ Part of the sluggishness inherent in producing simple data is because there are problems unique to dermatology that has made accurate assessments of disease in populations difficult. The most obvious one is that diagnosis is based on a personal visual analysis of a patient's skin. The interpretation of this process requires training, and may also vary between individuals making the judgment. Hence, two prerequisites for determining disease levels in large numbers are ease of diagnosis and a low level of inter-individual variation, both of which are compromised without suitable training. In the past few years, huge steps have been taken to remedy this by studying and defining diseases, and investigating the limitations of the diagnostic criteria subsequently produced. A good example is atopic dermatitis, where a number of disease definitions have been produced and tested in recent years with the result that the International Study of Asthma and Allergy in Childhood (the ISAAC study) has been able to produce global data on the prevalence of atopic dermatitis,⁶ and thereby documented the changing pattern of the disease in different world regions.

In the developing and emerging countries, such studies are also difficult to perform as they depend on examination of the skin. However, there are now a series of thorough analyses of the prevalence of skin disease in rural areas as divergent as Ethiopia,^{7,8} Nepal,⁹ Mali,¹⁰ Tanzania,¹¹ Indonesia¹² and Brazil.¹³ These show a high prevalence of skin disease, usually exceeding 50% and sometimes as much as 80% of the population, depending on whether there are local endemic conditions such as scabies, onchocerciasis or tinea capitis, all of which lead to significant increases in case numbers. For instance, the study in Nepal⁹ used data from a survey conducted in five villages and found an overall point prevalence of skin disease of 62.4%. Over 20% of these conditions were superficial fungal infections, but acne, melasma and eczema were among the top five most common diagnoses. The study in South West Ethiopia by Figueroa *et al.*⁷ also showed a high prevalence of reported skin disease, over 40% in one community. However, it also highlighted a problem in detecting cases, as in 30 households randomly selected for examination 67% of those not reporting skin disease were found on examination to have at least one treatable skin problem. The clinical pattern of skin disease in this region was dominated by infectious conditions, which accounted for over 70% of skin disease. The area included one village where onchocerciasis was endemic and therefore, onchodermatitis accounted for a large proportion of cases. Another medical problem endemic in the area was podoconiosis, a chronic non-infective form of lymphedema associated with exposure to certain soil

types, where in one village 5.8% of those over 50 years old had this problem. In Gibbs' study of two villages in Tanzania,¹¹ there was a lower prevalence rate for skin disease (28.6%), but again over 70% of these patients had skin infections. Both the two latter studies pinpointed household overcrowding as a significant risk factor for skin infection. A survey in Assuid, Egypt showed a higher level of skin disease, with 87% of those examined having at least one skin problem. This study included individuals with pediculosis capitis, which had a prevalence of 19.37%. In addition, 10% had bacterial skin infections and 16% fungal infections. Eczema prevalence was also high at 19%.¹³ By contrast, the survey carried out in Sumatra, Indonesia showed a lower prevalence of skin problems. In children and adolescents, 28.2% of the population studied had skin disease although, once again, fungal and bacterial infections were the most common diseases seen.¹² The brunt of disease affecting the skin in developing countries is born by children under the age of 15 years. This is a conclusion common to most of these studies. For instance, Mahé's survey in Mali showed that 34% of children had one or more skin problems, with infections predominating.¹⁰ A study of skin disease in 12,586 Indian school children ranging in age from 6 to 14 years showed an overall point prevalence of skin conditions of 38.8%. Of these, 30% had only one skin disease, 6% had two and 2.7% had three skin problems.¹⁴ The most common of these were infections (11.4%), but pityriasis alba (8.4%), eczemas (5.2%) and infestations (5.0%) were also common. Bechelli in Brazil found a prevalence of skin disease in the villages surveyed that ranged from 20 to 87% in children, aged 5–16 years, living in different municipalities in Acre state, Brazil.¹⁵ Again, infestations and infections were the dominant conditions; for instance, the prevalence of pediculosis capitis exceeded 50% in most areas. A common theme of all these studies is that the prevalence of disease is often affected by the prevalence of parasitic infections, such as scabies. In those populations where scabies reaches prevalence levels of over 20%, there is a corresponding increase in the risk of pyoderma. For instance, in Northern Australia amongst aboriginal children, scabies often affects over 50% of the population, and pyoderma and infected sores affect 70%.¹⁶ It is also possible, as stated above, that a high prevalence of head lice may be responsible for a similar increase in secondary infection.

Survey methods

The conduct of these surveys has usually followed a similar methodological pattern. First, a suitable site is chosen, and the representatives of the local population contacted to ascertain acceptance of the survey. This process is

seldom complicated, but is an essential first stage in winning the consent and confidence of the community; it is also a simple and necessary courtesy to inform the same community of the results of the work when it has been completed. The studies have utilized a questionnaire-based survey conducted from house to house as the best means of collecting demographic data on the community and the presence of skin problems in households. The questionnaire is piloted in the local language to ensure accuracy and consistency of the information. In different languages symptoms and signs are described in different ways; for instance, in some areas it is better to ask the patients if they scratch rather than if they itch. Likewise, the local words that describe physical concepts including clinical signs, such as a nodule or macule, are also different and need to be adapted for local usage. The piloted questionnaire is validated by clinical examination either by using a large representative sample – the whole community is rarely practicable – or by examining a random sample of those reporting the presence of skin problems as well as those who deny having skin disease. In many regions there is a significant disparity between the latter, with many patients not recognizing that they have a problem. The disparity between reported and actual disease prevalence can exceed 20%, but in the Ethiopian study mentioned previously it was 67%.⁷ It is also important that the team agrees beforehand if they will include every skin anomaly, including those that are physiological or benign and congenital. For instance, should they include male pattern hair loss (usually not) or benign nevi (possibly)?¹⁷ Providing it is clearly stated in the disease methodology and described in any report, either approach is acceptable. Another potential source of error is the use of certain clinical descriptive terms. For instance, children in many developing countries have patchy areas of hypopigmentation and dry skin on the face and upper trunk.¹⁴ It is not clear if these are the same as pityriasis alba, or if this should be classified as pityriasis alba, or if these changes have a different etiology; but, once again, agreeing on a standard approach to the definition before embarking on the survey will at least ensure consistency. The problems inherent in any of the survey work should be discussed in the report or paper.

In Western studies other approaches have been used and, with careful validation, surveys using self-reported disease, either by post or by telephone, can produce good responses that are reasonably accurate, although there is still underreporting or non-attendance for examination in order to validate the work. This results in an underestimation of at least 10% of skin conditions.¹⁸ The reasons for this disparity are not clear, although it seems to occur more frequently in older individuals, but patients are just

as likely to underreport the potentially serious as the trivial; an Australian analysis of the non-attenders, i.e. those invited to come for examination at the Maryborough community survey but who did not attend, showed that non-attenders were more likely to have skin cancers and also Campbell de Morgan spots.¹⁹

Other surveys have concentrated on disease prevalence in specific groups. For instance, a study in Egypt showed that over 100% of mentally ill and 89.5% of blind children had at least one skin disease compared with 24.2% of age-matched controls.²⁰ While these do not highlight the prevalence in the whole population, they inform a specific task in highlighting needs in special groups.

If the survey is based on a study of disease backed by clinical examination, are there conditions that are readily and regularly missed? Often not every disease is recorded. Sometimes this is by prior agreement as described above, but in other cases it is because the task of checking is difficult to perform accurately or the disease may be difficult to see. An example of the former is pediculosis capitis, which is very rarely recorded in dermatological surveys. It is not clear if this is because it is truly absent, missed or whether the scalps are not examined. Tinea capitis is an example of a disease that is difficult to recognize in mild cases, particularly in areas of endemic anthropophilic ringworm, because the clinical signs are often subtle.²¹ In this case many estimates are likely to be underestimates. The problems of interpreting these data are inherent in all surveys, which is the reason for recording potential sources of error in the final report.

Quality of life and disability

Estimating the impact of disease in large populations is equally difficult. However, access to validated quality of life instruments for use in dermatology has proved highly useful.^{22,23} One of the simplest and most used is the dermatology life quality index (DLQI), which is available from the University of Cardiff (<http://www.dermatology.org.uk/quality/quality-dlqi.html>). These life quality scales have also been validated through comparison with general health scales.²³ The results are interesting because they show how highly patients value skin health. There are other useful scales, although the best known is the SkinDex.²⁴ In addition, there are life quality scales that are specific to diseases such as acne or psoriasis and those that can be used by children or families.²⁵ Strictly speaking, disability measures, which are based on an independent observer's rating of disability rather than that of the patient, have been applied less in dermatology, largely because the chronic and non-life-threatening nature of skin disease makes the patient's own assessment of the impact of skin disease on their life a better predictor of

uptake of skin care services. The results of the most recent Global Burden of Disease survey (<http://www.glob.alburden.org/>), which uses a disability assessment approach, through impact scores for skin that rate the presence of different levels of symptoms such as itch and disfigurement, are awaited/in press?

Cost and skin disease

The impact of non-life-threatening disease on local micro-economics is also difficult to estimate in rural areas of the developing world. In order to assess the cost impact, it is important to know what individuals earn and how much they spend on health care. Firstly, many individuals are reluctant to disclose their income to a third party or it may be highly variable and difficult to estimate over a period of time. This is particularly the case in the many areas where the household economy is of a mixed type where local transactions are in part based on self-sufficiency or the exchange of goods for goods or services, and only partly based on the model most familiar in richer countries, a cash economy. In many households in poorer countries, a mixed economic model for household transactions prevails, and so some members of the family provide the bulk of goods or food for family use or exchange (barter), engaging in farming being an example, whereas others may have a whole or part-time job paid by cash. Nonetheless, the cash is usually pooled and so forms part of the household income. Often cash is in short supply in this type of mixed economy, and there are conflicting priorities in the household for essentials such as additional food or clothing vs. luxuries including alcohol and cigarettes. The need to buy health care is, therefore, potentially a heavy burden in poor communities whose economy is mixed, simply because of the shortage of cash. Chronic skin problems can be a major drain on this already restricted resource. Estimates of the cost of treatment in these settings are difficult. One approach has been to estimate the total direct cost of treatment, including doctor's costs, travel and medicines, over a period such as 3 months.²⁶ Ideally, the indirect costs such as loss of labor through illness would be included, but this calculation is seldom feasible. In the examples described above, the costs of simple disease such as scabies or pyoderma over a defined period can be estimated. Again ideally this is set against a fixed expenditure such as rent in an urban setting or the cost of additional food over the same period. The latter is useful as to an outside observer the complexity of household economics is seldom apparent without detailed study, and yet even in the poorest villages there may be a striking disparity of both income and ownership between different households.²⁷ The use of traditional healers is variable in these regions, but

often they are consulted because they are easier to access, cheaper and will accept payment in kind, such as goods for services.²⁸ There is also often a cultural imperative to consult a traditional healer before accessing Western or allopathic health resources. It is difficult to estimate the use of traditional healers as patients are often reluctant to share this knowledge with outsiders. Equally, in many villages individuals have a varying range of knowledge of local herbal or other remedies, which they may apply to their own families or provide to their neighbors without charge.

Obstacles to health care

Often surveys of disease that estimate needs also record obstacles to achieving this. While not a formal requirement, these are useful in understanding potential remedies. The two major obstacles are health literacy and access. Health literacy is difficult to estimate and covers a number of different fields.²⁸ These are ignorance of the connection between a physical sign and disease, such as a crusty lesion on an exposed site and non-melanoma skin cancer in, for example, an albino patient. But it may also be lack of awareness that effective treatment is available. Health literacy is the measure of a patient's knowledge about defined health issues, and is the intended outcome of health promotion or education. While in resource-poor settings this may be accorded low priority, there are specific examples where investing in simple health messages for adults or children can produce benefits.^{29,30} Ignorance may also affect the ability of the healthcare worker to function effectively in that lack of training, and therefore knowledge and skills, in the care of simple skin conditions is widespread at the frontline healthcare level.⁷

It is important not to overestimate the lack of knowledge though. Often there is a deep tradition of knowledge about specific diseases that informs choice of treatment in a commonsensical way. For instance, in areas where fungal infections of the scalp are endemic, patients or their families clearly distinguish between common tinea capitis, for which they often seek no treatment recognizing that in most cases it will disappear with time, and favus, for which they usually do seek treatment as it is recognized that this has different consequences; it seldom remits and often leads to severe scarring alopecia.

Access is always an issue, and if a patient has to travel long distances to receive treatment they may carefully weigh the likelihood of improving vs. the problems and costs of traveling to seek aid.³¹ A study in Nigeria pinpointed this issue very effectively.³² It showed that a patient presenting with a rash was almost as likely to present for treatment as a patient with fever, but that if it meant traveling longer distances, e.g. 10 km, those with a

rash did not make the journey whereas those with fever did. Where the distance was even greater, neither patient traveled. The two obstacles discussed above are also related because expectation of recovery, which is dependent on some prior knowledge in the community of the possible outcomes, may motivate patients to travel further to receive care. There are other obstacles to care, which are beyond the scope of this article, but it is important to recognize the devastating affect that involuntary mass movement of population through famine, drought or warfare have on the management of simple skin conditions, not forgetting disruption to control programs for diseases such as leprosy or yaws that rely on surveillance.³³

Disease Control Priorities

The Disease Control Priorities project was an initiative supported by WHO that was intended to highlight problems specific to developing countries. The section on skin disease made the points described previously.³⁴ This included estimates of global disease levels. Using the World Bank figures (World Development Indicators 2002) for low-income populations in 2000, the estimated global numbers of individuals infected with pyoderma and scabies based on the highest prevalence figures from community surveys were 400 and 600 million, respectively, those based on the lowest prevalence figures were 40 and 50 million. However, the report also included other estimates of disability in terms of the standard unit, the disability-adjusted life year (DALY) that relates prevalence of disease and its disability weighting to the cost of treatment. Using skin cases with the lower disability estimates such as mild to moderate scabies and pyoderma, the cost per DALY gained was estimated to be of the order of \$1–1.5, which in practical terms is a low price to pay for disease control. In tinea capitis, the cost per DALY gained using daily treatment would be considerably higher at \$175 at the lower cost per drug. This reflects the higher cost per treatment combined with a lower disability score.

Summary

The assessment of need is an important way to gain objective information on the impact of disease in large communities. Although, as highlighted in this report, it is not always possible to estimate how common skin disease is in communities of the developing world and resource-poor regions, whatever method is used it is important to know what the frequency of unreported or unrecognized disease is. However, there is sufficient information to state unequivocally that the prevalence of skin disease is high in poor countries, and where there is endemic

disease, including parasitic infections such as scabies, the prevalence of skin disease in the community may exceed 80%. We would argue that this high prevalence level alone is likely to be followed by a high rate of consultation in local healthcare facilities, which, unless managed appropriately, can overwhelm an already stretched health system. Likewise, measures that reduce this level of disease but also help healthcare workers to manage these problems simply and within the limits of budgetary constraint are key to improving the health of poor communities.

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