

Community dermatology

**Managing skin disease in resource-poor environments –
the role of community-oriented training and control programs**Roderick Hay¹, DM, Roberto Estrada², MD, and Henning Grossmann³, MD

¹International Foundation of Dermatology, London, UK, ²Proyecto Comunitaria Dermatologia, Acapulco, Mexico, and ³Regional Dermatology Training Center, Moshi, Tanzania

Correspondence

Professor Roderick Hay, DM
International Foundation of Dermatology
Willan House
4 Fitzroy Square
London W1T 5HQ
UK
E-mail: roderick.hay@ifd.org

Abstract

Programs that have been devised to improve the lot of patients with skin disease, or disease presenting with skin signs and symptoms, in resource-poor regions have focused mainly on education and training or community-oriented control measures. However, both have in common an objective of managing disease at population level. Training has been delivered in different ways both by direct teaching for varying periods of time or by web-based and electronic communication; control measures have been less in evidence and there is a great need for more support from funding agencies. Despite this, there is now a growing number of successful initiatives in health improvement for skin conditions that cover many parts of the world. This report describes many of these schemes as an example of what can be done to help patients.

Introduction – dermatological public health

While medicine, as traditionally taught, has focussed on the care of the individual patient, the greatest successes achieved in the improvement of human health have generally followed the implementation of programs designed to control disease in communities. The scope of work of this nature extends well beyond the normal confines of medical practice as improvements to social infrastructure, such as poverty and drainage, have provided huge health dividends. Notwithstanding the utilitarian nature of this approach, the greatest benefit for the greatest number, it is also both practical and cost efficient. Dermatology, as with all branches of medicine, sets great store on the acquisition of skills in the diagnosis and management of the individual, which are both challenging and rewarding. However, in recent years attention has begun to focus on the benefits of the wider population-based approach.¹ In the Western world the major target has been the prevention and early recognition of skin cancers that followed a closer understanding of the relationship between sun exposure and the risk of both melanoma and non-melanoma skin cancers.² This has been the subject of intensive activity at all levels of health care, and has included the development and evaluation of campaigns that have promoted sun avoidance or minimization of excessive sun exposure. It is difficult to estimate the benefits of these programs, as the goal, the elimination or reduction in the incidence of disease, can only be realized many years after the implementation of the

control programs, because of the slow onset of skin cancer. But community programs have not been restricted to skin cancer, as in skin infection there have also been attempts to target specific diseases. An example of this was the institution of regional programs, usually based in schools, to identify and treat scalp ringworm following the discovery that it could be cured with griseofulvin.³

In poor countries there are additional benefits to a population-based approach to disease management. Firstly, although skin diseases are common, the majority are caused by a small group of conditions, many of which are infections. These are likely to be amenable to control measures that focus on elimination of organisms or prevention of transmission within local populations. For instance, in 1991 Taplin *et al.*⁴ published an account of a program to control scabies in a community of Kuna Indians on the San Blas islands off Panama. At the time, the best option for treatment was the topical application of permethrin. The study showed that this was highly effective in reducing the case load, but it also showed that disruptions to the supply of drug or its administration led promptly to a new surge in numbers. However, the team had made the important point that effective action backed by appropriate systems for administering the control measure, in this case a topical medication, could improve the levels of health significantly. Since then there have been a number of different initiatives that have made great inroads into the huge task of reducing the burden of skin disease in populations most at need.

Community dermatology

The phrase Community Dermatology was coined by a group working in Mexico⁵ to describe the concept of the application of a system of healthcare that could help with the management of the vast burden of skin disease, particularly that seen in poorer regions, through an understanding of local health needs and the provision of programs that would deliver health improvements through community-based management and training (see below). The task of describing these programs is daunting, both because there are now increasing numbers of them, but also because it is likely that we are not aware of all the initiatives. Nonetheless, setting out the current situation is an important goal in describing what can be done by using specific examples. These range from educational and practical management support to those designed to eliminate disease; the majority though are designed to improve community care of skin conditions through education.

Sub-Saharan Africa

One of the first of these initiatives was the foundation of an integrated institute in Tanzania known as the Regional Dermatology Training Center (RDTC).^{6,7} This was established in 1990 by an alliance between the government of Tanzania, the Good Samaritan Foundation (GSF) and the International Foundation of Dermatology (IFD).^{8,9} The IFD was created by the International League of Dermatology Societies with the aim of improving the care of patients with skin and sexually transmitted disease, as well as leprosy, in underserved areas of the developing world. It quickly identified that an area of great need was sub-Saharan Africa, and raised funds to build the RDTC. The initiative had to focus on the best ways of reaching the highest number of patients, and this was achieved by focussing on training the leads of primary care. In east Africa these are generally clinical officers, highly trained individuals who do not have medical degrees, but who operate many of the frontline services at both district and regional levels. The program of the RDTC focuses on those with a higher level of responsibility, with the view that the skills acquired can be passed onto other frontline health workers.

The work of the RDTC is overseen by an International Advisory Board, which has representation from the IFD, the Tanzanian Government and GSF, the Hospital Management Board, the regional WHO office and the East African Commonwealth. The center is recognized as a training center for skin disease, leprosy and sexually transmitted infections by WHO. Its first director was Henning Grossman who was succeeded by John Masenga

in 2007. The RDTC treats patients from the whole region and trains two groups of health care workers. Senior medical officers (MOs), or assistant MOs, from any African country are trained in the diagnosis, management and control of skin disease, leprosy and sexually transmitted infection. The RDTC trains 15–20 MOs each year, and has graduated over 200 from over 12 countries in Africa. Most work in regional hospitals or medical centers, but some have national roles in the control of skin disease or sexually transmitted infections. Three graduates are heads of training schools in their countries. Graduates receive a University Diploma at the end of their 2-year training. The second group of trainees is made up of African specialist residents in dermatology, leprosy and venereology. This course is a 4-year M.Med program, modeled on the similar residency programs for dermatologists in Europe or the USA. Medical graduates from Tanzania, Ghana, Kenya, Ethiopia, Malawi, Rwanda and Uganda have completed their training. The center also hosts an annual medical education workshop for past graduates. The teaching faculty comprises both African dermatologists and visiting staff from Europe, USA and elsewhere. The RDTC runs other initiatives, such as an outreach program for prevention of skin cancer in albinos and a small research program that focuses on health systems research; trainees on both the Diploma and M.Med programs participate in this.¹⁰ Recently, RDTC staff have contributed to the new International Diploma of Tropical Medicine run by the London School of Hygiene and Tropical Medicine, in collaboration with physicians based in Tanzania and Uganda.

Initiatives such as the RDTC depend critically on a well-managed collaboration between national and regional institutions or governments and non-governmental organizations. Regular and continuing communication ensures smooth running. Equally, any such program has to be structured in order to cater for local needs; it also has to be prepared to adapt to changing circumstances. This means that other programs are likely to have both a different structure as well as objectives as they are based on practice in different health care environments. A second example of a national dermatology program is one developed in Mali, which is designed to strengthen dermatological skills and knowledge of French-speaking doctors or nurses at primary care level. This program has targeted training for primary health care leads with the support of the national government, and the first phase of education covering the different regions of the country will be completed within the next year. This work was initiated by Antoine Mahé, and now continues under the guidance of Ousmane Faye based at Center National d'Appui à la lutte contre la Maladie (CNAM) in Bamako, Mali. It has improved the care of skin disease in the

country, and also provided valuable research into the methods of training used and their evaluation, based on an algorithmic approach to diagnosis and management.^{11–13} This program was set up as a collaboration with the IFD and the Ministry of Health in Mali, and it also receives support from dermatologists based in France, French-speaking Canada and Switzerland.

Other African programs have different aims. These include a residency training program that was initiated in collaboration between the major teaching hospital, the Black Lion Hospital, in Addis Ababa, Ethiopia and the dermatology department of the University of Southampton, UK. This has been successful in producing high-quality graduates in dermatology, some of whom have begun to set up their own programs for dermatological care in surrounding communities, for example in Gondar. An important dermatology program was also established by Aldo Morrone, director of the S. Gallicano Institute for Preventive Medicine of Migration, Tourism and Tropical Dermatology, Rome and of the Istituto Nazionale per la Promozione della Salute delle Popolazioni Migranti (INMP), together with the regional government of Tigray, Ethiopia.^{14–16} The clinic, set up in a hospital in Mekele, is a key resource that sees patients and provides training for local healthcare workers and visiting doctors and nurses. It also hosts an annual meeting to sensitize participants to the problems of managing both simple and complex disease in a resource-poor environment. The Italian program has also made the important connection between health in tropical and developing regions, and the health of immigrants and marginalized communities in industrialized countries. Through a program of social and medical support, carried out by medical staff, social care or legal workers and anthropologists, the principles of care for immigrants provide a model developed by the Istituto San Gallicano for other European societies. The Institute was recognized by the Italian government and the European Commission as a new center to improve the health of migrants entering Europe.

In South Africa a new course for training nurses in the community management of skin disease was established in 2010 at the University of Capetown.

Latin America and the Caribbean

In Latin America there have been dermatological initiatives aimed at poor or marginalized communities for many years. Much of this work had focused on diseases such as leprosy, yaws and pinta. But an important step was taken in Mexico in establishing the Dermatologia Comunitaria program based in Acapulco, Guerrero state.¹⁷ Run by Roberto Estrada and Guadalupe Chavez, it provides a different model for regional management of

skin problems and it is backed by state government institutions and the IFD as well as the American Academy of Dermatology. The model used here is based on a different operational model as in Mexico; as in other Latin American countries, much of the frontline healthcare is led either by pasantes, newly qualified doctors, or general MOs in rural areas. In other parts of the state, nurses or health promoters, *promotores*, also play key roles. The system developed by the Dermatologia Comunitaria team is based on a regular cycle of training visits, where a day of lectures is backed by ‘before and after’ assessments coupled with a day clinic that provides local residents with dermatological advice and attendees with practical training. An important development that has occurred here is that both residents and senior doctors from other parts of Mexico or other Spanish-speaking countries participate and provide invaluable support, for instance, by helping with the management of complex cases that need more extensive investigation and management. Again, a key part of the work of this group has been to publish their observations in the scientific and medical literature, and to work closely with regional institutions to translate their findings into clinical practice.^{18,19}

The Mexican model has provided an example for other Latin American initiatives, such as a recent one based in Patagonia, Argentina. Established by Isabel Casas this new scheme also has backing from the regional health authorities, the IFD and Argentinian dermatologists who have sent their residents and consultants to assist.²⁰

The American Academy of Dermatology (AAD) has a number of volunteer schemes, but it also established a program of work and support in Haiti run jointly by James Nordland and James Ertle at the Hospital Leogane, outside Port au Prince. This has focused on providing care for rural and urban poor. Originally set up with the help of staff working on the filarial program from the Centers for Disease Control, Atlanta, the AAD/Haiti initiative has provided a regular source of assistance and help. It established a pharmacy and provided dermatological care with a team of AAD members as volunteers, who also taught local health care workers. The site was badly damaged in the 2010 earthquake.

SE Asia and India

An initiative in Cambodia has also provided new light on the community approach to dermatological care. Faced with a critical lack of doctors following the rule of the Khmer Rouge, Cambodia had no specialists yet a high burden of disease.²¹ A German dermatologist, Christoph Bendick, working initially on a leprosy support program, created a training scheme for general medical officers in dermatology. This scheme, backed by universities in

France, for example Nancy, and Germany, for example Munster, has successfully graduated cohorts of general MOs with specialist expertise. The team is now part of a more ambitious program organized by the National University of Phnom Penh to develop specialist training in medicine, of which dermatological and sexually transmitted infections training would form a part. With the help of the IFD, a needs assessment is being planned so that the program can match its teaching with a comprehensive knowledge of local disease prevalence and impact.

A collaboration between the Institute of Dermatology in Bangkok and Japan, initiated with Japanese governmental support and now managed with the help of the Japanese Dermatology Association, was set up in 1975. This training program has produced 796 specialists from 30 countries.²² After gaining the Diploma, participants return to their workplace in their respective countries. Some of them work in remote areas as dermatological practitioners serving their countries by improving skin disease and related problems; others find work in universities and research institutions as lecturers or dermatologists. The training is managed jointly by the staff of the Institute and visiting Japanese dermatologists. The coordinator in Japan is Hideoki Ogawa, and successive directors of the Institute of Dermatology in Bangkok have led the Thai side (Renoo Kotrajaras, Preya Kullavanijaya, Pimonpun Gritiyarangsang and Jiro Sindhvananda).

Other programs have been developed in India. The integrated care program at the Institute of Applied Dermatology in Kasaragod, Southern India (Kerala) is an alliance evaluating Western and local medical treatments in the management of lymphatic filariasis and skin disorders, such as vitiligo. It has delivered the first Cochrane review of ayurvedic practice in the diagnosis and management of disease – vitiligo. The leader, Saravu Narahari, in collaboration with other specialists, including Terence Ryan, has made a key impact in this initiative to develop outreach programs in other states. Other programs in development include one developed for Indian nurses working in community settings in different sites in India and Nepal run by Veneet Kaur. An Australo-Indian initiative in North India has started local dermatological services coupled with training (Claire and Nathan Grills). It followed the completion of a comprehensive needs assessment survey in this hilly region.

West Pacific and Australasia

The Australian team from the Menzies Center in Northern Territories has been at the forefront of improving rural care, but also contributing to our knowledge of the major clinical implications of skin infection such as nephritis and rheumatic fever (Bart Currie, Jonathan

Carapetis and colleagues). They have developed and successfully implemented widespread control measures for scabies amongst the indigenous populations of the area.²³ In collaboration with dermatologists such as Margot Whitfield and pediatric infectious disease physicians (Andrew Steer), they have been working with the government of Fiji improving child health, of which the control of skin disease is an important part.²⁴ The recognition and successful management of this also required an approach based on the development and application of diagnostic and treatment algorithms. The major targets in this work have been the elimination of endemic childhood pyoderma mainly due to Group A streptococci.²⁵

Distance and electronic teaching support

The initiatives described above have largely depended on face-to-face teaching and training in order to improve the care of patients with skin disease. However, the role of distance and web- or mobile telephone-based aids has now been developed to a high degree and is capable of strengthening training. The programs in dermatology range from the work of the University of Zurich (Gunther Burg, Peter Schmit), where web-based dermatological teaching is available in many different languages, including a significant component of tropical dermatology. The African Telederm group (<http://www.telederm.org/africa>; Carrie Kovarik, Stephen Kaddu) is providing training through a web-based system. This is a collaborative effort between Commission for Development Studies, Austrian Academy of Sciences (KEF: Kommission für Entwicklungsfragen, Österreichischen Akademie der Wissenschaften),²⁶ BIPAI, the American Academy of Dermatology, seven African countries, and other institutions. The purpose of this project is to establish a virtual collaboration between African partners, the USA and Austria, and to develop an internet source of educational material for training and research. It was aided in this mission by the ability to monitor and assess teaching with field-based work through the University of Pennsylvania/Botswana project, and the scope of this activity now extends to other countries of sub-Saharan Africa.

A Portuguese program for supporting dermatological diagnosis using telemedicine has been developed by Oswaldo Correia. Focusing on East Timor, as well as other Portuguese-speaking countries, this provides rapid advice on health care as well as teaching support.

In Nepal, a scheme developed by Anil Jha also uses telemedicine, with the support of Gunther Burg and James Britton, to address the problem of access in a geographically challenging region with hard and prolonged winters.

Control programs

We started this article by showing the importance of approaching the management of disease through coordinated programs designed to control disease. Much of the work described above is based on a strategy of strengthening community management by extending education in the management of skin disease to frontline health workers. However, control programs designed to control or eliminate infectious skin diseases have an important part to play in community dermatology. The example of Taplin's initiatives in Panama⁴ was possible because it focused on an island epidemic of scabies. A similar example was Lawrence's program, which used ivermectin as a means of controlling scabies in the Solomon Islands. Here he showed that it was effective, coupled with permethrin for younger children, not only in reducing the prevalence of scabies, but also the serious consequences of streptococcal infection, such as nephritis as measured by the reduction of hematuria.²⁷

However, larger scale programs require the attention of the larger international agencies because without their help in recognizing that skin disease is a health problem in many poor parts of the world little is likely to be accomplished. Indeed, the case for including skin infections in children amongst the neglected tropical disease is very strong. The combination of scabies and secondary streptococcal or staphylococcal infection is not only disabling in communities because of incessant itching, but it also contributes to major morbidities such as chronic renal damage²⁸ and infant septicemia.²⁹ Surely these are worthy targets for control measures.

The precedent has already been set by WHO in leading and facilitating control programs for the major tropical diseases, many of which present with lesions in the skin such as leprosy, onchocerciasis, lymphatic filariasis, yaws and Buruli ulcer.^{30,31} Indeed, the major focus of many of the training schemes described previously has been to ensure that local healthcare workers recognize and adequately manage these conditions. As the cadre of specialist trained staff diminishes, the onus for management has fallen on frontline care workers, and ensuring that they use knowledge of skin signs as the trigger to recognize endemic neglected tropical disease is an important objective of the training programs. For this reason the IFD became part of the Global Alliance for the elimination of lymphatic filariasis, as the control of morbidity and secondary infection of chronic lymphedema is a core skill of dermatologists and dermatology nurses.

Measuring success

How successful have these initiatives been? The effective management of most disease at community level takes

many years to reach fruition, and this work is only in the opening phases. However, the indications are encouraging. A formal audit carried out by the East African Commonwealth of the training and subsequent career courses of the graduates of the RDTC has shown the effectiveness of this training in improving skills and knowledge. The Mali program has been systematically evaluated, and again this has shown that this approach improves the standard of care for patients with skin disease.¹³ In Mexico the institution of a regional training program has been shown in areas surveyed to reduce the prevalence of disease such as scabies (Roberto Estrada and Hugo Alarcon, personal communication). This is not the whole story though, as it is very important to continue to focus on improving health literacy by ensuring that patients know what can be accomplished by effective management of skin disease. Many studies show that poor dermatological care is recognized by patients who are discouraged from seeking medical advice. The training programs have to be boosted by a systematic approach to health promotion that will encourage patients with skin problems to seek help; the evaluation of the Mali project showed this to be a potential obstacle to the ultimate goal, which is reduction in the prevalence and, therefore, impact of treatable skin disease. Equally, there is evidence that knowledge of skin disease through health education leads to these objectives,¹⁹ and it forms part of many of the field applications of the training schemes described in this report.

References

- 1 Anonymous. Skin disease and public health medicine. *Lancet* 1991; 337: 1008–1009.
- 2 Aitken JF, Elwood M, Baade PD, *et al.* Clinical whole-body skin examination reduces the incidence of thick melanomas. *Int J Cancer* 2010; 126: 450–458.
- 3 Grin EI. A controlled field trial in Yugoslavia of the efficacy of griseofulvin in the mass treatment of tinea capitis. *Bull World Health Organ* 1962; 26: 797–821.
- 4 Taplin D, Porcelain SL, Meinking TL, *et al.* Community control of scabies: a model based on use of permethrin cream. *Lancet* 1991; 337: 1016–1018.
- 5 Hay RJ, Andersson N, Estrada R. Mexico: community dermatology in Guerrero. *Lancet* 1991; 337: 906–907.
- 6 Regional Dermatology Training Center, Moshi Tanzania. Available at: <http://gc21.inwent.org/ibt/site/rdtc/ibt/main.html>. Accessed November 20, 2010.
- 7 Stingl P. Dermatology for Africa – The Regional Dermatology Training Center in Tanzania. *Hautarzt* 1997; 48: 136.
- 8 Kopf AW. International Foundation for Dermatology. A challenge to meet the dermatologic needs of developing countries. *Dermatol Clin* 1993; 11: 311–314.

- 9 Hay R, Marks R. The International Foundation for Dermatology: an exemplar of the increasingly diverse activities of the International League of Dermatological Societies. *Br J Dermatol* 2004; 150: 747–748.
- 10 Reports of Health Services Research RDTC, Available at: http://www.ifd.org/protocols_RDTC_reports.htm. Accessed 2 January 2011.
- 11 Mahé A, Cissé IA, Faye O, *et al.* Skin diseases in Bamako (Mali). *Int J Dermatol* 1998; 37: 673–676.
- 12 Mahé A, Faye O, N'Diaye HT, *et al.* Definition of an algorithm for the management of common skin diseases at primary health care level in sub-Saharan Africa. *Trans R Soc Trop Med Hyg* 2005; 99: 39–47.
- 13 Mahé A, Faye O, N'Diaye HT, *et al.* Integration of basic dermatological care into primary health care services in Mali. *Bull World Health Organ* 2005; 83: 935–941.
- 14 Morrone A, Padovese V, Margherita T, *et al.* Skin and health; an operational research in Tigray (Ethiopia). Available at: http://www.iismas.it/congr_ab.htm. Accessed 2 January 2011.
- 15 Morrone A. *Skin Disease Case Management Algorithms and Atlas*. Tigray: THB-INMP-IISMAS-Cooperazione Italiana Mekelle, 2009.
- 16 Accorsi S, Barnabas GA, Farese P, *et al.* Skin disorders and disease profile of poverty: analysis of medical records in Tigray, Northern Ethiopia, 2005–2007. *Trans R Soc Trop Med Hyg* 2009; 103: 469–475.
- 17 Dermatologia comunitaria web site Available at: <http://www.dermatologiacomunitaria.org.mx/>. Accessed 2 January 2011.
- 18 Estrada R, Romero M, Chavez G, Estrada G. Dermatologia comunitaria: diez años de experiencia. Estudio epidemiológico comparativo entre población urbana y rural del estado de Guerrero. *Dermatol Rev Mex* 2000; 44: 268–273.
- 19 Alarcon HH, Estrada CR, Chavez LG, *et al.* Can a school health program affect the prevalence of skin disease? – a study of pediculosis capitis in Mexico. *Int J Dermatol* 1997; 36: 826–830.
- 20 Casas I. Dermatologic primary care program for Neuquén Province, Patagonia, Argentina. *Community Dermatol J* 2010; 10: 1.
- 21 Bendick C. Dermatologie in Kambodscha. Qualitätsmängel treten überall zutage. *Dt Ärztebl* 1999; 96: 221–224.
- 22 Ogawa H. International Diploma Course in Dermatology – education of dermatologists and sexually transmitted disease specialists in the Asia-Pacific region. *Dermatology ILDS Newsletter* 2010; 16: 3–4.
- 23 Carapetis JR, Connors C, Yarmirr D, *et al.* Success of a scabies control program in an Australian aboriginal community. *Pediatr Infect Dis J* 1997; 16: 494–499.
- 24 Steer AC, Tikoduadua LV, Manalac EM, *et al.* Validation of an integrated management of childhood illness algorithm for the management of common skin conditions in Fiji. *Bull World Health Organ* 2009; 87: 173–179.
- 25 McDonald MI, Towers RJ, Andrews RM, *et al.* Low rates of streptococcal pharyngitis and high rates of pyoderma in Australian Aboriginal communities where acute rheumatic fever is hyperendemic. *Clin Infect Dis* 2006; 43: 683–689.
- 26 Kaddu S, Soyer HP, Gabler G, Kovarik C. The Africa Teledermatology Project: preliminary experience with a sub-Saharan teledermatology and e-learning program. *J Am Acad Dermatol* 2009; 61: 155–157.
- 27 Lawrence GW, Leafasia J, Sheridan J, *et al.* Control of scabies, skin sores and haematuria in children in the Solomon Islands: another role for ivermectin. *Bull World Health Organ* 2005; 83: 34–42.
- 28 White AV, Hoy WE, McCredie DA. Childhood post-streptococcal glomerulonephritis as a risk factor for chronic renal disease later in life. *Med J Aust* 2001; 174: 492–496.
- 29 Mulholland EK, Ogunlesi OO, Adegbola RA, *et al.* Etiology of serious infections in young Gambian infants. *Pediatr Infect Dis J* 1999; 18(Suppl): S35–S41.
- 30 Rinaldi A. Yaws: a second (and maybe last?) chance for eradication. *PLoS Negl Trop Dis* 2008; 2: e275.
- 31 WHO Annual Meeting on Buruli Ulcer, Geneva. Summary Report, 2010. Available at: http://www.who.int/buruli/events/Summary_report_2010_BU_Meeting_ENG.pdf. Accessed 2 January 2011.