

Telemedicine for Altruistic Reasons: the Swinfen Charitable Trust

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Abstract

Telemedicine can provide a useful way of reducing inequities of access and strengthening health systems in developing countries. The Swinfen Charitable Trust (SCT) set up an email-based telemedicine network in 1998, initially to support a single hospital in Bangladesh. Over the years, the network has grown substantially, and currently supports doctors in 242 hospitals in 67 countries, mostly developing countries. Over 500 volunteer consultants, in a total of 140 different specialties/subspecialties, provide support. The method of operation has evolved from plain email to secure web-based messaging. Over the last 14 years, the SCT has completed 2900 telemedicine referrals, at an average rate of about 250/year. Surveys show that referring doctors find the service valuable and half say that it improves the management of their cases. Since the SCT network is now global in extent, referrals can be received at any time of the day or night. To ensure a prompt response there is a 24/7 duty roster of coordinators. The three regular system operators are situated in the UK, New Zealand and the USA.

1. Introduction

Telemedicine can provide a useful way of reducing inequities of access and strengthening health systems in developing countries. There are a number of telemedicine networks which deliver services in developing countries, some of which have been in operation for more than ten years [1]. One of these is operated by the Swinfen Charitable Trust (SCT), which was set up in 1998, with the aim of assisting poor, sick and disabled people in the developing world. The Trust's policy is to do this by establishing telemedicine links between medical practitioners in the developing world and expert medical and surgical specialists who generously give free advice via the Internet.

2. Development

The first hospital to which the SCT provided a telemedicine service was the Centre for the Rehabilitation of the Paralysed in Bangladesh. Telemedicine advice was originally provided by a panel of five consultants (medical and surgical) and ordinary email was used for communication. In its first 12 months of operation the service proved useful and popular with the referring doctors, and four other hospitals asked to join the system [2].

Over the next few years the telemedicine system grew rapidly in size and scope [3]. However, the increased messaging volume brought with it the practical problem of coordinating the activities, for example, ensuring that all cases were provided with a satisfactory response and none were overlooked and forgotten. To aid this process an automatic email routing system was used, which operated successfully until 2008 [4].

The email system was replaced in 2008 with a web-based messaging system, which offered improved security and ease of coordination. This is the system in use today.

2.1 Model of Operation

For telemedicine networks with a clinical purpose, there are two fundamentally different modes of operation which correspond to the different ways in which an expert is chosen to reply to a query. In "targeted" mode of operation, a query is directed to a specific expert for reply. In the "open" or "distributed" mode, a query is directed to a group of experts, of whom all, some or none may reply. The SCT, in common with most of the long-running networks, uses a targeted model of operation. That is, the steps involved in dealing with a new case are:

1. new case submitted by referrer (doctor or other health worker)
2. coordinator examines the submission and confirms that the relevant information has been received and is of appropriate quality (e.g. that clinical images are in focus!). The coordinator decides which of the available specialists should respond
3. the system notifies the chosen specialist(s) that a new case is waiting for response
4. the specialist logs in to the web system, reads the details and provides an initial response; the system notifies the referrer that a response is available
5. the referrer logs in to the web system and reads the reply. Further dialogue may then ensue.

If a specialist does not respond within a reasonable period (usually 24-48 hours), the coordinator allocates the case to another specialist.

2.2 Referring Doctors and Specialists

The SCT's database contains details of 430 referring doctors from 242 hospitals. The hospitals are located in 67 different countries, most being developing countries. The doctors have, over the past 14 years, referred cases through the system or expressed a wish to do so, though not all would be considered currently active. The database also contains details of 525 volunteer consultants, in a total of 140 different specialties/subspecialties. All have offered to provide their expertise to assist their colleagues in developing countries and doctors working in isolated areas. The Trust is particularly grateful to them.

2.3 System Operators

Since the SCT network is now global in extent, referrals can be received at any time of day or night. To ensure a prompt response, there is a 24/7 duty roster of coordinators. The three regular system operators are situated in the UK, New Zealand and the USA, respectively. They cover duty periods of eight hours each day, roughly corresponding to their local daylight hours.

3. Current Use

Over the last ten years, the average number of cases received by the SCT has been 251/year, or approximately 20/month. At the time of writing (July 2012) the SCT has completed 2900 telemedicine referrals. Over the last five years there have been 1173 referrals, which have required 2133 queries to specialists, i.e. each new case requires on average 1.8 requests to specialists.

The average length of time between the referrer submitting a case and a specialist response becoming available was 24.4 hours. The main type of queries that are dealt with concern medicine (36%) and surgery (24%), and paediatric cases represent about 20% of the total (Table 1).

Referrals have emanated from a total of 54 countries, with most being received from Iraq, Bangladesh and Nepal (see Figure 1).

4. Evaluation

A user survey concerning the value of the consultation to the referring doctor was carried out in 2003/04 [5]. There was an 85% response rate (n=106) to the survey. All the referring doctors who responded made positive comments about the service and half said that it improved their management of the case. This was confirmed by a subsequent survey concerning neurology referrals from the Middle East [6].

Table 1 - Types of queries to the SCT

Specialty	Percentage of queries
Allied health	0.4
Anaesthetics	0.6
Emergency medicine	0.3
General practice	0.1
Internal medicine	35.7
Mental health	0.6
Nurse	0.5
Obstetrics and gynaecology	9.9
Other	1.1
Paediatrics	19.9
Pathology	2.5
Radiology	4.1
Surgery	24.4
<i>Total</i>	<i>100</i>

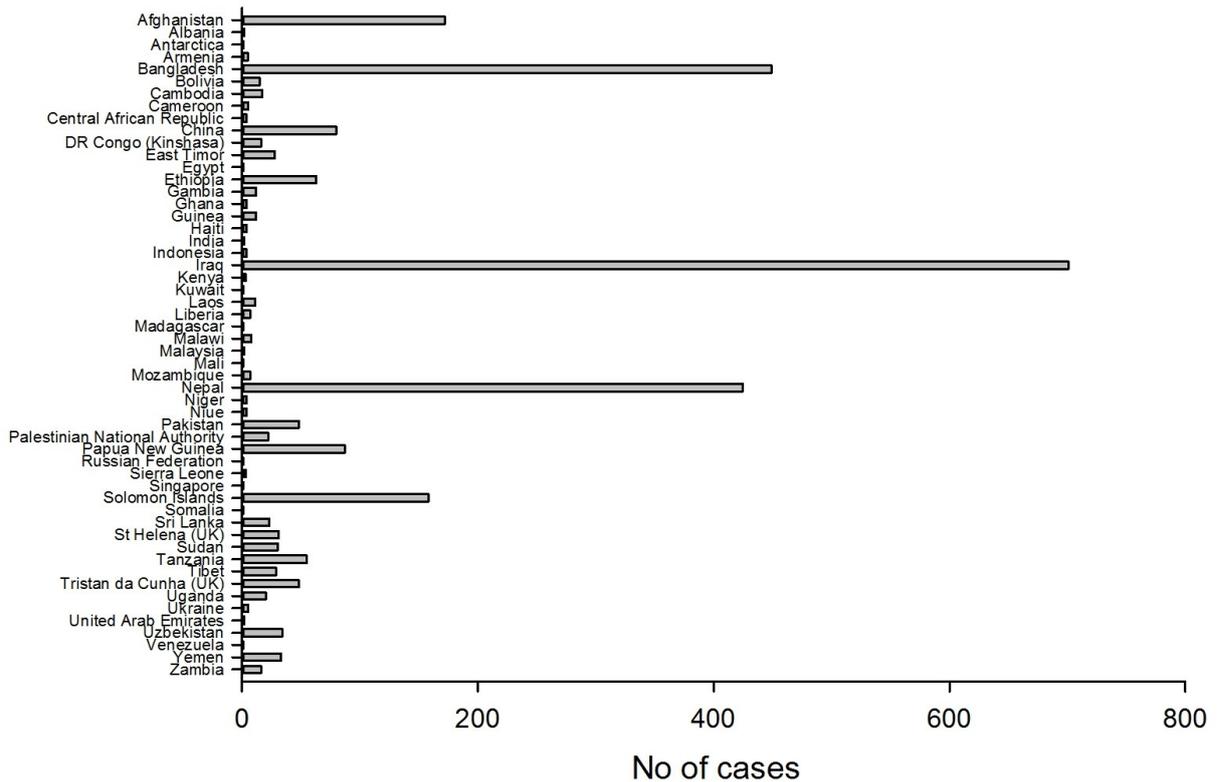


Figure 1 - Country of origin of SCT cases

During 2005-2008, follow-up data on patients managed by telemedicine was obtained in Papua New Guinea, with the aid of medical students on elective [7]. The cases were reviewed by an independent doctor. Telemedicine was considered to have assisted with the diagnosis in all cases (median score 5 on a five-point scale from 1=not helpful at all to 5=very good/excellent). The advice to the referring doctor for further action was considered helpful in all except one case (median score 5 on the same scale). The outcome for the patient was considered to be good in 15 of the cases (median score 4 on the same scale).

5. Conclusion

The principal achievement of the Swinfen Charitable Trust is the demonstration that valuable telemedical support can be provided to doctors in developing countries using relatively simple and low-cost techniques. Although formal evidence for cost-effectiveness is still to be documented, the service is much appreciated by the referring doctors and there are indications that clinical outcomes for telemedicine patients are often improved.

One still-to-be-solved problem, which applies to almost all other telemedicine networks, is the language barrier. The SCT's work is conducted in English and only limited assistance can be provided to non-English-speaking referrers, usually necessitating communication through a third party. A partial solution is the establishment of "sister" networks which operate in other languages, but this requires committed organisations to operate them. Working with other organisations, networks have been established by the SCT which operate in French and Spanish, but their long-term sustainability is not yet known.

Over the last 15 years the Trust has facilitated referrals in a wide range of areas, covering the entire spectrum of medical, surgical, nursing and allied health activity. The Trust takes pride in its ability to locate an appropriate specialist to provide advice whatever the nature of the referring doctor's query. The telemedicine system also provides a valuable educational resource for otherwise isolated doctors.

The Trust is always pleased to receive offers of help with its work, and details are provided in Figure 2.

<p>Consultants</p> <p>Health care specialists of consultant status (medical, nursing or allied health) who would like to assist their colleagues in developing countries by providing telemedical advice should contact the Trust.</p> <p>Medical students</p> <p>Final-year medical students who would like an overseas placement for a short research project are encouraged to contact the Trust.</p> <p>Voluntary organisations</p> <p>Organisations which would like to support the work of the Trust, perhaps by providing equipment or training for specific regions, should make a proposal to the Trust administrators.</p> <p>Sponsors</p> <p>Commercial organisations which wish to support the work of the Trust can make financial donations through the SCT website. Offers of in-kind resources can be made direct to the Trust administrators.</p> <p><i>Contact the SCT via http://www.swinfencharitabletrust.org/</i></p>
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Figure 2 - How can you help?

6. Acknowledgements

We are grateful to our colleagues in the Swinfen Charitable Trust.

7. References

- [1] Wootton R, Geissbuhler A, Jethwani K, Kovarik C, Person DA, Vladzmyrskyy A, Zanaboni P, Zolfo M. Long-running telemedicine networks delivering humanitarian services: experience, performance and scientific output. Bull World Health Organ. 2012 May 1;90(5):341-347D.
- [2] Vassallo DJ, Swinfen P, Swinfen R, Wootton R. Experience with a low-cost telemedicine system in three developing countries. J Telemed Telecare. 2001;7 (Suppl. 1): 56-8.

- [3] Wootton R, Youngberry K, Swinfen R, Swinfen P. Referral patterns in a global store-and-forward telemedicine system. *J Telemed Telecare*. 2005;11 (Suppl. 2): 100-3.
- [4] Swinfen P, Swinfen R, Youngberry K, Wootton R. A review of the first year's experience with an automatic message-routing system for low-cost telemedicine. *J Telemed Telecare*. 2003;9 (Suppl. 2): 63-5.
- [5] Wootton R, Youngberry K, Swinfen P, Swinfen R. Prospective case review of a global e-health system for doctors in developing countries. *J Telemed Telecare*. 2004;10 (Suppl. 1): 94-6.
- [6] Patterson V, Swinfen P, Swinfen R, Azzo E, Taha H, Wootton R. Supporting hospital doctors in the Middle East by email telemedicine: something the industrialized world can do to help. *J Med Internet Res*. 2007 Oct 22;9(4):e30.
- [7] Wootton R, Menzies J, Ferguson P. Follow-up data for patients managed by store and forward telemedicine in developing countries. *J Telemed Telecare*. 2009;15(2):83-8.