# CONTENTS

## INTRODUCTION ................................................... 1

## PERU RURAL COMMUNICATIONS SERVICES PROJECT .................... 3

* Health Care .................................................. 3
* Project Organization ........................................... 3
* Service Use in 1984 and 1985 .................................. 4
* Content of Teleconference Sessions .............................. 6
* Preparation for the Sessions ................................... 7
* Results ........................................................... 7

## UNIVERSITY OF THE WEST INDIES DISTANCE TEACHING EXPERIMENT ................................................... 8

* UWIDITE Use from 1983 to 1985 ................................ 8
* Courses in Reproductive Health .................................. 10
* Course on Nutrition for Community Workers ....................... 11
* Cardiology Consultations ......................................... 11
* Results ........................................................... 12

## A MODEL FOR A TELEPHONE SYSTEM TO SUPPORT HEALTH CARE ................................................... 13

* The Telecommunications Infrastructure .......................... 13
* Health Care Services and Support Infrastructures ............... 14
* Conclusion ........................................................ 14

## AID RURAL SATELLITE PROGRAM PUBLICATIONS ...................... 15

## ACKNOWLEDGEMENTS ................................................ 16
INTRODUCTION

This report describes the uses health care providers make of audioconferencing facilities in the Rural Communications Services Project (RCSP) in Peru and the University of the West Indies Distance Teaching Experiment (UWIDITE) in the Caribbean. It should give health and communications services planners a better understanding of the telecommunications requirements of the health care sector. It also describes the potential benefits of audioconferencing services for the health care sector and the training and administrative requirements for realizing these benefits. The two projects were conducted by the USAID Rural Satellite Program (RSP).

To achieve "health for all" within the economic constraints and resources of the developing world, planners are looking for new methods of health services delivery as well as for new low-cost technologies and simple methods of improving health status. Breastfeeding, immunization, and oral rehydration therapy are examples of this approach. Planners are looking for ways in which parents or community workers, who are beyond the reach of modern health care services, can participate in the promotion of such practices. Recently there have been many encouraging examples of the use of broadcasting for promoting health. With the expansion of rural telephone services, an additional health care delivery method is becoming available.

The roles and usefulness of telecommunications in rural health care are different from those of broadcasting services. Broadcasting can reach large numbers of people quickly and effectively with the same messages. Telephone services allow communication among fewer people, but the content can be as diverse and flexible as those who use telephones want to make it.

Through country studies and discussions with rural health service providers, the RSP identified a strong need for communications among different components of the rural health care system. The need ranges from disaster assistance, to getting necessary medical supplies to regions suffering epidemics, to teaching new health care techniques. In areas where travel and transport are difficult and expensive, telecommunications services can be an effective tool to address these needs.

These findings are also supported by historical precedents. The health care sector has traditionally been an active user of two-way communications services, often through its own radio systems and often in support of physician visits, patient evacuations, or disaster relief. Over the past decade the systems are used increasingly for in-service training and for routine administrative tasks.

The Peru and University of the West Indies projects described here demonstrate two different types of applications of telecommunications services which can assist health care providers. UWIDITE has a mandate to train and assist health care providers and to promote the knowledge and skills required to make a do-it-yourself revolution work. In the Peru program a rural health care system is in the process of making this revolution work.

At present rural telephone services in developing countries are limited in scope and often hampered by technical or operational problems. In addition, telephone rates tend to be higher than the budgets of the various users can accommodate. Over the past
decade, however, there have been some pioneering approaches to telecommunications in the developing world, and new technologies, such as low-density satellite services, have matured. There will be a significant increase in rural telephone services over the coming decades. Experiences in the Rural Satellite Program and earlier projects demonstrate that those services can significantly contribute to the effectiveness and efficiency of the rural services sectors and, in particular, to health care services.

After the RSP identified the need for telecommunications in support of rural health care, it identified the particular communications requirements which rural health care services might have and assessed institutional arrangements through which rural health care providers could have access to telecommunications services. The model developed by RSP is a good one for telephone companies to consider in making their services more directly relevant for health care.
PERU RURAL COMMUNICATIONS SERVICES PROJECT

Planning for the Peru Rural Communications Services Project (RCSP) began in 1978. The resulting project was implemented in late 1983 by the Peruvian telephone company (ENTEL-Peru) with external assistance for specific uses of the system to promote development in the high jungle region of northeastern Peru. The system supports health services and other development activities.

The RCSP links seven communities of 1,000 to 10,000 inhabitants through a network of three satellite earth stations (the primary network) and four VHF links (the secondary network). In each community public telephone services are provided. In addition, one audioconferencing channel links the sites with each other and with Lima. Small conference rooms in telephone company facilities or municipal buildings are provided where participants can listen and talk to each other. Each room has one loudspeaker and six microphones. These facilities were established to support training, consultation, and management of rural community services.

Health Care

Hospitals and other health care facilities are few and far between in the project region. There are regional hospitals in Tarapoto, Tocache, and Juanjui. Tarapoto has the largest of the three and has two or three medical specialists in addition to general practitioners. It also has the most resident nurses. In addition, the regional headquarters of Peru's Ministry of Health are located in Tarapoto. There are about six physicians in addition to some nurses in Tocache and Juanjui.

Facilities at the smaller towns of Saposoa and Bellavista are more limited, each with one or two physicians. Other communities have primary health care workers provided by the Ministry of Health as well as other types of rural workers provided by other agencies. Because it is relatively easy to reach from other parts of the RCSP region, the Juanjui hospital plays a major role in health care. Patients are referred to that hospital from other health facilities, and Juanjui hospital staff have responsibility for outreach. The outreach responsibilities for Tarapoto and Tocache extend beyond the project region.

Project Organization

In addition to the central role played by ENTEL, each user agency has its own structure through which telecommunications is promoted. Each community has a person responsible for local coordination of telecommunications services for health. This person's responsibility includes organizing participants for each session, providing feedback on the sessions, and proposing additional topics or activities of local interest. Regional coordination of most of the sessions is done by representatives of the Ministry of Health. When required, experts from Lima are brought into the network through ENTEL.
The organizational structures for ATCs are not startlingly different from those for broadcasting. Central coordination and local field organization are necessary for both. However, software development for interactive systems differs from that of broadcasting because programming is originated by experts or administrators with almost no intervention from production staff, and the size of the audience reached by telecommunications is much smaller.

**Service Use in 1984 and 1985**

During 1984 the RCSP had over 200 teleconferencing sessions, of which 95 were organized by the health care sector. In 1985, 403 sessions were conducted, with 87 organized by the sector. The remaining sessions originated from the education and agricultural sectors as well as the telephone company.

**Frequency and Duration of Use**

The 95 sessions conducted by the health care sector in 1984 had a total duration of 88 hours. The 87 sessions conducted in 1985 had a total duration of 79 hours. Total attendance was 1,660 in 1984. Comparable participant information is not available for 1985, but the number has remained stable according to field staff. A participation rate this high means that the same people attended many sessions. In view of the limited numbers of health care workers in the region (about 50), the average of 7.5 participants per session is rather remarkable.

Discussions with participants revealed that the communications services offered meet definite needs, particularly those related to continuing health care education and training and to clinical support. Local health care personnel are often confronted with health problems specific to the region for which their prior training did not prepare them.

**Types of Use**

The following table shows health sector use of the teleconferencing system in 1984.

**Table 1**

*Total Health Sector Use of Network by Function, Hours, and Participants in 1984*

<table>
<thead>
<tr>
<th>Function</th>
<th>Hours</th>
<th>Percentage of Use</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Number</td>
</tr>
<tr>
<td>Training</td>
<td>57</td>
<td>64</td>
<td>1,113</td>
</tr>
<tr>
<td>General Information</td>
<td>12</td>
<td>13</td>
<td>277</td>
</tr>
<tr>
<td>Consultation</td>
<td>9</td>
<td>11</td>
<td>89</td>
</tr>
<tr>
<td>Administration</td>
<td>10</td>
<td>12</td>
<td>181</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>88</strong></td>
<td><strong>100</strong></td>
<td><strong>1,660</strong></td>
</tr>
</tbody>
</table>
The percentages of hours of system use and the percentages of participants by function are roughly the same except for the consultation category. This is logical because medical consultations do not usually require many participants, whereas for other activities it is the reverse. The greatest use of the system was for training, reflecting the isolation that many health workers experience in remote areas.

Although the information available for 1985 differs slightly from the previous year, the following data on health sector use of teleconferencing allow some comparison.

### Table 2

**Comparison of Health Sector Use of Network by Function for 1984 and 1985**

<table>
<thead>
<tr>
<th>Function</th>
<th>Number of Sessions</th>
<th>Percentage of Sessions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training</td>
<td>58</td>
<td>51</td>
</tr>
<tr>
<td>Consultation</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td>Coordination</td>
<td>0</td>
<td>17</td>
</tr>
<tr>
<td>Administration</td>
<td>11</td>
<td>15</td>
</tr>
<tr>
<td>General Information</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>93</strong></td>
<td><strong>87</strong></td>
</tr>
</tbody>
</table>

Despite the differences in the types of information collected, the training function remains in both years stable at about 60 percent of network use. It must not be overlooked, however, that the functions are not as strictly delineated as they appear in these tables because most sessions covered a mix of functions and issues, depending on participant concerns. Most sessions, for instance, were used to relay messages regarding coordination of activities, regardless of their major focus. The categories really represent the central focus of a given session.

**Participation by Site**

In 1984 most of the sessions originated from Tarapoto, the location of Ministry of Health regional headquarters. Eight of the sessions originated from Lima and took a total of 10 hours with an average of 29 participants per session. Five of these sessions dealt with in-service training, the remainder with administration. Lima was very active in December and had only seriously begun to participate in September. This shift partially resulted from increased promotion of the project in Lima by ENTEL's social program office, the exhaustion of local capabilities to provide in-service training, and growing interest in topics for which there was no local expertise.

This shift toward Lima as the originating site for sessions is reflected in the 1985 data. Fifty-five (63 percent) of the sessions originated from Lima, 29 (33 percent) from Tarapoto, and three (4 percent) from Juanjui and Tocache.

Only a small fraction of the sessions in 1984 included the secondary network because of technical problems. No action from these sites is reported for 1985.
sessions linked the VHF communities with Juanjui. Participation in 1984 by the four communities is shown in the following table:

<table>
<thead>
<tr>
<th>Community</th>
<th>Duration</th>
<th>Number of Sessions*</th>
<th>Type of Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>Huicungo</td>
<td>8 hrs.</td>
<td>9</td>
<td>8 consultation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 training</td>
</tr>
<tr>
<td>Pachiza</td>
<td>8.5 hrs.</td>
<td>9</td>
<td>8 consultation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 training</td>
</tr>
<tr>
<td>Bellavista</td>
<td>7 hrs.</td>
<td>6</td>
<td>5 consultation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 training</td>
</tr>
<tr>
<td>Tingo de Saposoa</td>
<td>2 hrs.</td>
<td>2</td>
<td>1 consultation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 training</td>
</tr>
</tbody>
</table>

* Total number of sessions was 13.

The above data would indicate a need for linkages, particularly to provide medical consultation services between hospital staff and village health care workers. Further exploration of linkages was impossible because of the technical problems with the VHF equipment. Although the experience among the secondary sites is very limited, one might speculate that two-way communications services for consultation are of particular importance to the remote village health care worker, because the data indicate that two-way consultation services ranked higher in importance than training for the secondary sites. Consultation is probably less important for larger institutions. At least two factors would contribute to this. One is the much higher level of training hospital staffs already have received, and the second is the access hospital staff have to colleagues' opinions and support.

Content of Teleconference Sessions

The content of the different teleconferencing sessions was developed through a variety of approaches. At the beginning of both project years each site identified the types of sessions it would like to have and the topics which would help the most. These proposals were developed into a quasi-master plan, and expertise and resources were identified in the region or in Lima.

The resulting training and general information sessions in 1984 ranged from medical techniques to public health education. Vaccines and vaccination programs, pre- and post-natal care, contraceptive methods, plus breastfeeding and other maternal and child care issues were most frequently discussed. Other topics included malaria, nutrition, drug dependency, infectious diseases, parasites, and tropical diseases.

The administrative uses of the system dealt mainly with coordination of the teleconferencing program. The teleconferencing network was used very little for the administration of health programs.
Preparation for the Sessions

Audioconferencing, by its nature, allows discussion and feedback among participants. Administrative audioconferencing sessions basically follow the same process as well-organized, face-to-face meetings, with the addition of sending support materials ahead of time to participants.

For educational and training sessions, more preparation is required. Session presenters needed to adopt new methods to present their materials in shorter lecture sequences interspersed with discussion. Most presenters received basic training in audioconferencing techniques. Initial reluctance to use teleconferencing was overcome through growing familiarity with the technology coupled with growing experience in the use of the network in general.

Presenters were also encouraged to develop a few pages of text, drawings, or agenda outlines to be distributed to the participating sites; however, project offices often received the materials too late to distribute on time. This remains a problem. Participant interest in the sessions does not appear to have been seriously curbed through the lack of materials; however, when materials were received on time, participants expressed satisfaction.

Results

The main use of audioconferencing in the health care sector in Peru is for continuing medical education and in-service training. This is similar to developments in North America. It certainly responds to a need identified in the early planning phase of the project.

Medical consultation and patient management support were assessed only minimally. The sites with the more reliable communications links are roughly those with the better medical staff skills. Physicians at these sites do not expect support from colleagues at the other sites but look to Lima for such support. Increasing dependence on Lima for sessions run by medical specialists makes sense in a region with few resident specialists. Between the regional health centers and village care facilities, however, characterized by distinctly different levels of skills, the demand for such consultations is reflected in the data available.

Use of the system as a research tool developed toward the end of 1984. Tropical medicine specialists were beginning to discover the system's value not only as a tool to impart information but also as a means to collect epidemiological information.

The use of audioconferencing in the Peru project is very encouraging for health care in the future. Rural telephone system planners should pay serious attention to the needs of this sector. Health care planners should consider audioconferencing as a viable delivery method for in-service training of rural personnel. Because of the poor technical performance of the secondary network, its use for medical consultations cannot be assessed because there are not enough data. However, feedback from village workers suggests that reliable services would result in continuous use and, at times, save lives.
The University of the West Indies Distance Teaching Experiment (UWIDITE) was preceded by experimental satellite projects and a regional communications needs study for the University. Study recommendations were supported by senior policymakers in the health care sector.

UWIDITE was planned and implemented in the early 1980s and began operating early in 1983. Its overall purpose was to bring the resources of the University more directly to the smaller countries, where the University operates extramural centers. Communications services were planned to supplement and at times replace the need for travel.

Since early 1983, the UWIDITE network has linked UWI campuses in Jamaica, Trinidad, Barbados, and extramural centers in St. Lucia, Dominica, and, since September 1984, Antigua. The sites are connected by a single voice channel controlled by a conferencing bridge. The telephone channel is leased from the telephone companies in the region. Each site is equipped with microphones, loudspeakers, slow-scan television, and electrowriting equipment.

UWI does not have a mandate to provide health care services to the different countries. However, through its medical faculties and associated institutes, such as the Caribbean Food and Nutrition Institute, UWI plays a significant role in health care in the region. Patients are referred to its tertiary care facilities. Various continuing and professional education activities in health-related areas offered by UWI are offered to care providers in the region.

The UWIDITE project office is located at the Jamaica campus. The staff consists of the project director, the coordinator, and technical and clerical support. Most text materials are printed and distributed from there. The office is in charge of scheduling, promotion, training, and formative evaluation. The central maintenance and spare parts depot is located in the project offices.

UWIDITE health programming originates primarily from the Jamaica campus and is organized by members of the academic faculties or institutes. Thus, the Fertility Management Program, the nutritionists programs, and the medical consultations, or "grand rounds," were each developed by the respective groups of specialists.

UWIDITE Use from 1983 to 1985

UWIDITE is used by a variety of University departments and institutes. From April 1983 to October 1985 the system was used for about 3,000 hours of conferencing, including such diverse uses as nutrition courses for community workers and University senate meetings. Health-related sessions over the same period accounted for well over
300 hours of use, or approximately 10 percent. This percentage of health-related sessions vis-a-vis total network use has remained relatively stable over time.*

From the project beginning in the spring of 1983 to March 1985, the UWIDITE network was used for health-related sessions for a total of approximately 200 hours, or a little less than 10 percent of total network use. Of those, roughly 160 hours were used for teaching and 40 hours for consultations or patient management discussions.

The sites participated for the following number of hours:

- Jamaica 192 hours
- St. Lucia 175 hours
- Dominica 172 hours
- Barbados 130 hours
- Trinidad 131 hours
- Antigua 95 hours

The flexibility of the network itself is shown by the fact that sites could participate in some sessions and not in others. Some sessions were expressly between two sites only. In addition to the above sites, Montego Bay Hospital in Jamaica was linked to some of the medical sessions with varying degrees of technical success.

Participants in medical sessions numbered well over 500, with the largest number, 492, in training sessions. These sessions fell into the following categories: 306 doctors and nurses in the in-service training programs in fertility management, 54 undergraduates in a review course in obstetrics and gynecology, 48 in a postgraduate obstetrics and gynecology review course, 27 in a food and nutrition program, and 57 in a course on disaster preparedness. Other sessions were specific consultations among professionals on different islands, and the number of participants often was very small.

The total number of hours by use can be broken down as follows:

<table>
<thead>
<tr>
<th>Course/Session</th>
<th>Number of Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reproductive Health</td>
<td>115.5</td>
</tr>
<tr>
<td>Food and Nutrition</td>
<td>27.0</td>
</tr>
<tr>
<td>Anesthesiology Consultations</td>
<td>13.5</td>
</tr>
<tr>
<td>Obstetrics and Gynecology</td>
<td>13.0</td>
</tr>
<tr>
<td>Cardiology Continuing Education</td>
<td>7.0</td>
</tr>
</tbody>
</table>

The remaining sessions were short one-time events, whereas the above represents a series of sessions with underlying instructional goals. The first course is at the university level, but does not lead to qualification. It awards a certificate of participation, not an official University award. Discussions are under way to turn this course and the nutrition course into University diploma or certificate courses. Such change in status would

* Project data after March 1985 are not available in as much detail as for the preceding period. Based on observations of network use over time by the health care sector and discussions with project personnel, the data covering April 1983-March 1985 appear to accurately reflect system use since then. Therefore, in the subsequent discussion only these periods are included.
increase the attractiveness of the program for participants because it probably would contribute to personal promotion and ultimately recertification. Further, as an official University program, a fee could be charged. The other programs can be classified as outreach courses.

UWIDITE is developing, upon request from several governments, additional health care uses, including family education and psychiatry.

In the two key health applications, i.e., reproductive health for physicians and nurses and the Food and Nutrition Institute's course, the texts and materials were developed by the course organizers with assistance from the project office. Delay with the regular mail service caused some start-up problems, but the delays were circumvented by using courier services. Both used the slow-scan transmission system to send and receive graphics and other support information. The electrowriter was not reliable enough to be integrated into the session. It was used on an intermittent basis.

Courses in Reproductive Health

Since 1979, the staff of the Advanced Training and Research in Fertility Management Project, based in Jamaica, has designed and delivered postgraduate courses to health personnel in the region. Since 1983, in collaboration with the Johns Hopkins University Program for International Education in Gynecology and Obstetrics, UWIDITE has been used to upgrade the knowledge and skills of health professionals in reproductive health. In early 1984 the reproductive health project organized three courses of about three months each, the first two for physicians and senior nurses and the third for nurses only. In addition, there were monthly consultations and presentations among physicians, and for two months starting in November 1985 a refresher/review course was conducted for undergraduate students.

By mid-1985 the need for continuing reproductive health education was being met, particularly in the smaller territories. Aside from refresher sessions, continuing medical education must develop new areas of interest to participants.

Participants in the reproductive health courses were recruited through the ministries of health. Pre- and post-tests were conducted. The award of the certificate, however, was based mainly on attendance. Although some practitioners withdrew from the project because they had minimal obstetrics and gynecology caseloads, some had not expected the course to be as structured and demanding, and others found the course conflicted with their clinic's schedule and could not attend, overall attendance at all sites was good.

Comments of participants at the time of graduation reflected a high level of interest. They found the audioconference classes to be relevant to their work and to be an ideal medium for continuing medical education, especially in the non-campus territories. They thought the handouts were well prepared but said that more visuals would be welcome. The opportunities for discussion with specialists and among colleagues in the region were praised in particular.

Monthly consultation and case management sessions have become a regular part of the UWIDITE schedule and seem to fill a real need for contact among practicing obstetricians and gynecologists in the region. The number of participants is usually not high because of the limited numbers of obstetricians and gynecologists. The sessions are
very interactive, and different sites take turns initiating the presentations. Usually four or five doctors are present at the larger sites and two or three at the smaller sites. The review sessions on reproductive health helped undergraduates to prepare for upcoming examinations. Sessions for the course were presented by specialists from the campuses. Of the 40 students participating from Jamaica, 23 never or seldom asked questions over the network. Not all participants interacted over the system; however, students expressed satisfaction with the process and the response from presenters.

Course on Nutrition for Community Workers

The Caribbean Food and Nutrition Institute (CFNI), a Pan American Health Organization Center, provides support and advice to nutrition programs region-wide. The Institute is located at UWI in Jamaica, which offers a masters degree program in nutrition as well as a diploma course. There are few nutritionists in the region, and often agency staff from other disciplines have to carry out the nutrition work.

CFNI conducted a course for nutrition staff from July through September 1984. The 27 participants came from different sectors: 13 health workers, eight agricultural workers, three primary school teachers, two from community development offices, and one supervisor of a day care center. Eight presenters selected from specialists at different UWIDITE sites formed the core teaching staff. They received training in planning teleconferencing sessions and utilizing the UWIDITE system. The major reference work was a CFNI nutrition handbook. Presentations were supplemented by materials transmitted by slow-scan video.

Each site had a nutritionist as country coordinator who would promote the course, assist in candidate selection, be available for local follow-up, and in some cases present a session. Candidates were recruited through the governments, which provided local travel support.

Pre- and post-tests were administered to participants and resulted in a mean of 91 percent correct responses in the post-test. Overall, the sessions were characterized by a high level of participation, which can be attributed to small groups at each site, effective instructional methods, and maturity and experience of the participants. After the sessions on some islands the dialogues continued. Absenteeism was at a minimum. When participation was low, it was related to late receipt of materials, lack of preparation on the part of some participants because assignments were too broad, and in some cases unevenness in levels of knowledge and experience among the participants.

For the second CFNI course, held in the summer of 1985, it was recommended that more assignments be given, more use be made of slow-scan, that there be more co-lecturing among different sites, and that the course be extended to eight or twelve weeks. It is encouraging to see that CFNI intends eventually to use all its professional personnel as presenters, expanding its core of competent staff.

Cardiology Consultations

In October 1984 monthly cardiology consultations of one and a half hours each were initiated primarily among physicians (cardiologists as well as residents) and students in Jamaica, Barbados, and St. Lucia. The sessions were routine presentations of two to three patients per session to improve diagnostic techniques and patient management
decisions. Some consultations followed up on post-hospital care of individual cases after their return to the home island.

The educational gains for all participants were high. In a few instances a patient was transferred abroad rather than to Jamaica. Overall, medical and health specialist staff finds UWIDITE an extremely effective method of assisting care providers throughout the region. Routine personal consultations are not possible because of the lack of personnel, funds, and time.

In October 1985 a regional cardiology conference was held on the network. It brought together over 100 specialists and general practitioners from the participating islands. Presentations originated from all three campuses.

Results

The medical uses of the UWIDITE system have been substantial and successful and have made good use of the system's interactive capabilities. UWIDITE has helped the health and nutrition institutions and specialists in Jamaica to reach out to the smaller countries as well as to share expertise with the other campuses. Health briefings have been successful in drawing the participating sites into the discussion process through joint case presentations and co-teaching.

The relatively limited number of participants at the individual sessions reflects the limited number of health and health-related professionals in the region. Thus, the numbers of those who did participate reflect a strong interest in continuing education among Caribbean health care professionals. The feedback from health users of the UWIDITE system is largely positive regarding the uniqueness and appropriateness of the interactive system for continuing medical education. It appears that case presentations and interaction are very much part of the usual teaching methods in medicine and thus accepted by the professionals.

On the technical plane, slow-scan TV was used and praised by most as an effective way to amplify discussions and issues, as well as to transmit patient data and x-rays. However, it required more training in material preparation than anticipated. Electrowriting, albeit judged desirable by some, was not fully integrated because of technical problems. The computer linkages need to be improved to be used effectively for the health care activities of UWIDITE. Except for the Montego Bay link, which was not originally planned for, overall technical performance has been satisfactory.
A MODEL FOR A TELEPHONE SYSTEM TO SUPPORT HEALTH CARE

A model for a telephone system to support health care has two main facets. One is the telecommunications infrastructure required, and the other is the structure necessary within the health care sector to make use of telecommunications.

The Telecommunications Infrastructure

As demonstrated in the two projects discussed in this report, audioconferencing services in support of the health care sector make eminent sense. To keep costs down and to prevent health care providers from having to be concerned with technical problems, these services should be part of the existing telephone infrastructure. Audioconferencing systems, which allow discussions between two or more sites with a varying number of participants per site, are suitable for in-service training, staff meetings, and medical consultations.

The facilities at these locations should be small rooms equipped with a microphone and loudspeakers or a speakerphone. Facilities are best located in the telephone office or a municipal building to allow easy access by other public agencies such as agricultural extension services. The audioconferencing service probably would not be used more than a few hours a week by health care providers. Sharing of facilities thus makes economic sense. Obviously, a fully dedicated service (i.e., used by one institution or sector) is not required, but the service should be available as needed.

In the case of UWIDITE a dedicated service made sense when the overall volume of activities reached five or six hours a day. However, the UWIDITE network is a multi-purpose network and serves educators, undergraduate students, and general university administrative staff as well as the health care sector.

A system which provides basic audioconferencing services can be effective. Additional equipment, such as facsimile machines, slow-scan TV, or electrowriters are features which users would like to have to improve their communications. In the case of a rural service such as Peru, however, the frequency of use of such equipment is not likely to warrant the investment. Furthermore, the installation of such equipment in rural areas, with limited power supplies and a lack of local technical support, might result in technical problems that would overwhelm its benefits. Facsimile transmission, however, might be a desirable feature because mail services and other means of coordination often prevent the timely receipt of session agendas by participants. This might be a service which rural telephone companies could integrate into their services. In the UWIDITE project, slow-scan TV and electrowriters were tested and received positive reviews. After these types of supplemental components become reliable their inclusion is very worthwhile within an institutional context similar to that of UWI.

The price for rural audioconferencing systems for educational services remains a problem. Preferential tariff rates make sense under such circumstances. Such rates, however, would have to be determined at the national planning level because the benefits and possibly the cost reductions do not fall within the purview of telephone companies.
Health Care Services and Support Infrastructures

Experience with the two projects shows that audioconferencing services can bring advanced medical technology and critical resources to rural or remote areas without placing major burdens on existing professional staff members. As a matter of course the part-time appointment of one person at each location was sufficient to promote and coordinate local activities. Contributing to this was the establishment of a program administration office responsible for scheduling events, training presenters and users, and coordinating overall activities.

Interestingly, the major use by the health care sector was for training. Patient management, consultation, or health sector administration were less important. It is unfortunate that more data could not be gathered in the Peru project regarding the secondary network where consultations were more important than training. It also appears from discussions with health care providers that increased consultation, patient management, and health administration through telephone services may require increased staffing in the field. Physicians and nurses in the rural hospitals and clinics are very busy dealing with existing case loads and cannot take on additional tasks requiring several hours a week. Although long-term support of village workers by telephone services might decrease the number of people who come to clinics, the reality of the physician workload prevents physicians from providing such support.

Conclusion

There is ample evidence that rural telephone services can support and improve rural health care services. These Rural Satellite Projects demonstrate how this can be done. The two projects also show that the services should not be limited to the health care sector but that services also should be provided for other sectors, such as agriculture and education, to spread the costs over a larger base.

A critical future step will be planning and implementing projects that integrate health care and the development of rural telephone services, with the telephone company playing the major role in coordinating such services, as was the case in Peru.
AID RURAL SATELLITE PROGRAM PUBLICATIONS

This report is one of a monograph series, "Telecommunications and Rural Development," prepared for the AID Rural Satellite Program by the Academy for Educational Development, including:

- An Overview of the AID Rural Satellite Program, Tietjen, K.
- The Design and Installation of Rural Telecommunications Networks: Lessons from Three Projects, Goldschmidt, D., Tietjen, K., and Shaw, W. D.
- Distance Education via Satellite in Indonesia, Shaw, W. D.
- An Analysis of the Costs and Revenues of Rural Telecommunications Systems, Goldschmidt, D.
- Training for Technology Transfer in Telecommunications Support Projects, Tietjen, K.

Also included in the series is a report prepared by Florida State University:

- An Evaluation of the Peru Rural Communications Services Project, Mayo, J., Heald, G., Klees, S., and Cruz, M.

Other Rural Satellite Program reports available are:

- Telecommunications Services for Agriculture and Rural Development: Experiences of the AID Rural Satellite Program
- Telecommunications Services for Health Care: Experiences of the AID Rural Satellite Program
- Peru Rural Communications Services Project: Final Field Report

Copies may be obtained from:

Dr. Clifford Block  
United States Agency for International Development  
Bureau for Science and Technology  
Office of Education  
Washington, D.C. 20523  
U.S.A.  
(703) 235-9006

Ms. Karen Tietjen  
AID Rural Satellite Program  
Academy for Educational Development  
1255 23rd Street, N.W.  
Suite 400  
Washington, D.C. 20037  
U.S.A.  
(202) 862-1900
Acknowledgements

The following individuals are among the many who have contributed to the success of the AID Rural Satellite Program:

Agency for International Development
Bureau for Science and Technology
Office of Education
Clifford Block
Peter Spain
Robert Schenkkan
Lawrence Frymire

Office of Energy
Shirley Toth

Bureau for Latin America and Caribbean
Office of Development Resources
Richard Martin

Florida State University
John Mayo
Gary Heald
Steven Klees
Martha Cruz
Diefla Pramono

Abt Associates
Larry Kerpelman
John Hodgdon
Elaine Mason

Academy for Educational Development
Karen Tietjen
Willard Shaw
Hugh Orozco
Luis Medrano
Michael Calvano
John Tatlock
Sandra Lauffer
Anna Stahmer
Douglas Goldschmidt
Frank Dall
Jay Miller
Peter Boynton

NASA—Lewis Research Center
William Bifano
Richard DeLombard
Anthony Ratajczak

Institute for Telecommunication Sciences
Peter McManamon
Ray Jennings

SISDIKSA—Indonesia
Sidharta Pramoetadi
Hasyah Haneng
Tahir Ali
Rajab Johari
Rhiiza Sadjad
I. G. N. Agung
Purwadi Harto
Soedarso
Bambang Riady Oemar
I. A. Arief
Abd. Musi Ba'dulu
Musyir Amal
M. Lawele
Mirhanuddin
Yan Pieter Karafir
K. W. Timboeleng
F. Manuhutu
Zainuddin
Soedarto
Emir A. Siregar
L. A. Sinsuw

UWIDITE—West Indies
Gerald Lalor
Christine Marrett
Diana Grant
Keith Hunte
Max Richards
Marilyn Floissac
Roy Braithwaite
Elizabeth Campbell
E. R. Waldron
Christine Craig
Sadie Campbell
Edith Allen
Tony Walling
Keith Manison
Marlene Hamilton

ENTEL—Peru
Angel Velasquez
Felipe Yanes
Hector Cossio
Jorge Cisneros
Isabel Candia
Mildred Casanave
Margot Ruis
Victor Torres
Alippio Quincho
Ruth Cardenas
Gladys Infante
Angela Campos
Lili Aguila
Carmen Reategui
Cesar Arias