

NSW PUBLIC HEALTH BULLETIN

Communication technology
supporting the public health
workforce in New South Wales

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Contents

Foreword	2
Glossary	3
Introduction	4
Report on the use of communication technology by a sample of public health professionals in NSW Carlie-Jane Naylor, D. Lynne Madden and Deborah J. Oong	7
Pilot study of using a web and teleconference for the delivery of an Epi Info training session to public health units in NSW, 2005 Carlie-Jane Naylor, D. Lynne Madden, Leonie Neville and Deborah J. Oong	22
The re-evaluation of the use of videoconferencing to deliver the Bug Breakfast, December 2004 Carlie-Jane Naylor, D. Lynne Madden and Dawn Simpson	38

Foreword

This supplement is a collection of three reports, each one describing the results of a study that was undertaken in either late 2004 or early 2005. These studies were carried out to increase our understanding of how the population health workforce in New South Wales (NSW) uses various forms of communication technology and their future potential use.

The work was done in partnership with the NSW Telehealth Initiative. The NSW Telehealth Initiative was established in 1996 to improve access to health services for people in rural and remote communities in NSW. Since then it has sought to both expand existing services and encourage innovation in the application of the technology. Although there was an initial emphasis on the provision of clinical services, there is a growing appreciation of the potential contribution that Telehealth can make to education and training, mentoring and administrative functions.

The use of communication technology offers, in particular, a way to increase equity of access to learning opportunities. Workforces require support to both update and maintain their skills and knowledge, and to develop new skills when necessary. Access to training opportunities, however, varies between locations and is particularly difficult for isolated practitioners in rural and remote settings. Telehealth is one means through which we can provide this support and link geographically dispersed practitioners.

The results of the studies described here informed applications by population health structures at the NSW Department of Health and in the area health services for funding by the Telehealth Innovation Fund in 2005. Three projects applying videoconferencing to the provision of training to health professionals in areas of significant population health need were funded for 2006–2007. These projects were in the prevention of falls, training in smoking cessation and training in refugee health. The experience gained from implementing these projects has provided further valuable insights into the potential contribution that communication technology can make to support the delivery of population health functions in NSW.

I hope that these reports will encourage dialogue and debate on the use of communication technology in population health.

Dr Kerry Chant
Chief Health Officer and
Deputy Director-General, Population Health
NSW Department of Health

Glossary

audio site these sites are linked through the videoconferencing system but receive audio transmission (sound) only and this is usually via a telephone connection

bandwidth the amount of information that can be transmitted by an information channel. Higher bandwidths allow more information to be carried, which, in videoconferencing, means that the picture will be of better quality. The bandwidth is measured in kilobytes (kbps)

bridge in videoconferencing terminology, a bridge connects three or more sites so that they can simultaneously communicate

dial-in each site initiates their connection by making a call or 'dialling-in' to the bridge

dial-out connection is initiated from the bridge, which makes a call or 'dials-out' to each site

directional microphone a microphone that is able to receive sound from a certain direction

kbps kilobytes per second is the measurement of speed at which images can be transmitted during a videoconference

live site the site from which a session is transmitted and at which the presenters are located

mute activating the mute function stops sounds from being transmitted to other sites

real time virtually simultaneously

remote site site other than the live site—that is, a site receiving the transmission

teleconferencing interactive exchange of voice, usually of more than two participants, by telephone

telehealth site a site established by NSW Health that forms part of the NSW Telehealth Network. The Telehealth Network supports clinicians and patients in providing and receiving quality healthcare using modalities like videoconferencing and image transfer. These modalities must meet technical standards compliant with clinical needs.

videoconferencing the transmission of images, voice and data between two or more sites via telecommunications channels

voice activated mode of videoconferencing in which the cameras are activated by sound. The site at which the sound is originating automatically appears on screen and is seen by all sites

web conferencing computer based and conducted over the Internet between two or more people situated at different locations; enables videos, websites, PowerPoint presentations and software demonstrations to be displayed in real time to all participants

Introduction

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Population health workers already use various communication techniques in their work. However, there are opportunities for increased application of these techniques for the delivery of population health functions. The NSW Telehealth Network provides access to an extensive network of facilities across NSW. The changes in 2005 to the organisation of NSW Health, with fewer, larger area health services, create an additional incentive for developing the capacity of the population health workforce to use this network to link geographically dispersed workers.

The three studies presented in this supplement of the *NSW Public Health Bulletin* were undertaken in 2004–2005 to explore the use of communication technology in population health work. The studies were informed by a review of the literature, both for the application of communication technology to the delivery of education and training and for population health work. The studies are:

1. *Use of communication technology by a sample of public health professionals in NSW* – a survey of the current use of communication techniques by population health workers.
2. *Pilot of using a web and teleconference for the delivery of an Epi Info training session to public health units in New South Wales, 2005* – in which the delivery of a learning session to multiple sites using a combination of communication techniques is described.
3. *The re-evaluation of the use of videoconferencing to deliver Bug Breakfast, December 2004* – which examines changes made to improve the quality of the videoconferencing learning environment following an earlier evaluation in 2002.

This introduction briefly summarises the findings of each study and presents the overall lessons that emerged.

Survey of current use

This study provided a snapshot of the current use of six communication techniques by a small sample of the population health workforce in NSW.

All 12 participants used teleconferencing and most had used videoconferencing. Only a few had used the other modalities that were enquired after: web bulletin boards, web conferencing, media streaming and satellite television. Continuing professional development activities, conducting meetings and collaboration were common uses.

Enabling factors that helped participants to engage with these techniques were: ease of access to facilities, assistance to organise and set up the technology, situations where use of a technique provided efficient and effective use of time, and where the technique suited the purpose. Barriers to use were: difficulty accessing the equipment, difficulty setting up and operating the equipment and the perceived cost.

These findings provide an insight into how these techniques are being used across a broad range of population health practices. The techniques provide equity of access to training opportunities and reduce the time spent travelling to meetings. With the amalgamation of area health services, half the participants felt that it was likely that they would spend more time travelling for work. Although participants indicated that these techniques should not be used to the exclusion of face-to-face participation in events, they agreed that they provide options when this is not feasible.

Using a combination of web conferencing and teleconferencing to deliver training

This study evaluated the utility of web conferencing supported by a teleconference to deliver a learning session in Epi Info 3.3. While both the efficacy of the Epi Info training and the medium of delivery were evaluated, the report focuses on the evaluation of the communication techniques used for delivery.

The trainers were based at the NSW Department of Health in North Sydney and the session was delivered via web conference and teleconference to three public health units. This combination of techniques allowed for active conversation and voice instruction as participants shared the computer that was connected to the web conference.

Participants liked receiving training at their worksite and not needing to travel. They liked training that included completing practical exercises with their colleagues. They did not like the technical difficulties experienced, such as the poor sound quality through the teleconference and the disconnections of the web conference.

Although training activities can be delivered using these techniques, the technical difficulties need to be clarified and addressed to ensure that participants receive a good quality experience. The combination of web and teleconferencing provides a different interactive learning environment than through videoconferencing alone; however, the session must be tailored for delivery through these media.

Evaluating the use of videoconferencing to deliver Bug Breakfast

Since 1999, Bug Breakfast has been delivered to rural and remote audiences through videoconferencing. In 2002, the delivery was evaluated to determine the quality of the learning environment at both the 'live' site and the 'remote' sites. The findings highlighted consistent problems with the quality of the sound and picture for the remote audience, and at North Sydney the growing audience could no longer be comfortably accommodated. A series of recommendations to improve the delivery were made and these were systematically implemented. In 2004, the delivery was re-evaluated to assess the effect of the changes.

The evaluation demonstrated that the quality of the learning environments in which Bug Breakfast is delivered each month had improved. The facilities at North Sydney were considered satisfactory by almost the entire live audience. The quality of the picture and sound had improved for the remote audiences.

The public health workforce in NSW value access to Bug Breakfast and in particular the 'live' delivery, which provides access to experts. Determined efforts to improve the quality of delivery has seen Bug Breakfast established as a model of delivery.

Lessons learnt

Here we present some of the lessons that emerged from the findings across the studies, in particular for the provision of continuing professional development activities and linking of population health networks. The studies demonstrate the potential to expand the role of communication techniques to support the delivery of population health functions, and population health workers were enthusiastic to explore these opportunities.

Current patterns of use

Teleconferencing and videoconferencing are both commonly used. Teleconferencing in particular has been integrated into practice. However, the results of applying teleconferencing to deliver a learning session found that the quality of the reception can be poor. Further, people observed that there are skills required to interact constructively through the teleconference medium and that these are not generally applied.

There is an extensive network of videoconferencing facilities available through the NSW Telehealth Network, but

many feel daunted by this technique. We found that people will use it when they can 'turn up and turn on'. They remain unsure how it can be applied effectively to their practice. However, they like it because, unlike teleconferencing, it provides a personal connection through a visual link.

The challenge is to assist the workforce to be efficient and effective users of teleconferencing and videoconferencing. Consideration should be given to the development of resources that would help ensure high quality interactions. For example, in response to interest from other groups in using the Bug Breakfast model to deliver training, the Division of Population Health has developed a *Bug Breakfast Delivery Manual*.^{1,2}

The other communication techniques explored in these studies were not commonly used.

Using communication technology to deliver learning sessions

Bug Breakfast has been delivered through videoconferencing for 9 years, demonstrating that it is possible to deliver regular professional development activities through this medium. Despite this experience, delivery is never fail-safe and, even with streamlined processes, it takes time and resources to provide a high quality session. Other forms of technology are now used to support the delivery of Bug Breakfast. For example, the Bug Breakfast website allows online registration of participating sites and access to the PowerPoint presentations; and the Bug Breakfast email account is a simple communication channel for participants who have enquiries.

Web conferencing, as a means of delivering training, seems to be particularly appropriate for training that is best received at the worksite. There are, however, information technology infrastructure issues that need to be explored before recommending the widespread use of web conferencing.

For a good quality episode of training through these media, significant preparation is required – more than for face-to-face delivery. The delivery of live sessions of training through videoconferencing requires the presenters to understand the limitations of the medium and to adapt their style of delivery.³ Similarly, when using web conferencing, the trainer is required to think very clearly about how they want participants to learn.

Expanding the application of communication technology

These studies have focused on the application of communication technologies to support workforce learning, develop workplace-based communities of learning and to maintain practice networks. There are, however, many

other potential applications including the implementation of policy, rapid disaster response and ensuring coordinated responses to events. The Morey Review of the Public Health Network in 2006 recognised that the network would rely increasingly on technology for communication and the risks posed if either the level of engagement or access to the technology was impaired (S. Morey, Review of the Public Health Network, 2006, unpublished data). The studies showed that the capacity of the population health workforce to engage with communication technology resources has been restricted by their knowledge of these and how and when they are best applied.

Conclusion

The potential for information and communication technologies to contribute to health is great.⁴ These three studies provide an evidence base for a communication strategy for the population health workforce in NSW. Clarifying the areas of population health work that are best supported by communication technology and the infrastructure required may encourage the integration of these forms of technology into practice. A strategy could also consider ways to link the population health workforce more closely with the ongoing information technology developments of NSW Health.

Summary

- There is opportunity for greater application of communication techniques to population health practice, in particular for workplace learning.
- To encourage uptake of these techniques they must be easy to use and free of technical disruptions.
- A communication technology strategy could facilitate the systematic uptake of these techniques by the population health workforce.
- Population health should be closely affiliated with the developments in information technology and telehealth to identify opportunities for application to practice.

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Report on the use of communication technology by a sample of public health professionals in NSW

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Executive summary

A qualitative survey was carried out with a small sample of senior public health professionals to describe: the types of communication technology that they currently use; the situations in which they apply these at work; and their interest in pursuing these techniques in the future. Six techniques were investigated: teleconferencing, web bulletin boards, web conferencing, videoconferencing, media streaming and satellite television.

Thirteen public health professionals were invited to be interviewed and 12 agreed to participate (response rate 92%). Participants were people working in population health structures in the area health services in New South Wales (NSW) and the NSW Department of Health. Participants were interviewed using a structured survey that examined their: roles and responsibilities; experience of using communication technology; and barriers or enablers to their use.

The survey found that two communication techniques, teleconferencing and videoconferencing, are established in practice. Videoconferencing was more likely to be used where personal connection and visual cues were considered to be

necessary. Satellite television, like the computer-based techniques, was used by only a third of participants.

Factors that helped participants to engage with communication technology included: ease of access to facilities; assistance provided in organising and setting up the technology; and situations where use of the technology resulted in an efficient and effective use of time and where the use of technology suited the purpose. Participants used what was familiar to them or had been recommended by colleagues. Having knowledge and skills about a particular type of communication technology appeared to lead to its routine application.

In contrast, factors that prevented use were the lack of availability of equipment, the lack of experience and skills in setting up and operating the technology and the perceived associated costs.

Many raised cost as an issue, inferring that cheap delivery increased the chance of uptake. However, there is a trade-off between cost and quality of delivery for many of these techniques. Better quality transmission of videoconferencing is associated with higher bandwidth transmission and higher cost.

To integrate the use of communication technology into public health practice, a strategy is required that complements the traditional face-to-face approach. The strategy should increase awareness of the types of techniques available, the benefits they provide and the situations in which they are best applied. The challenge for the public health workforce is to clearly articulate their requirements and to successfully and comprehensively integrate a range of communication techniques into practice.

Background

Communication technology has an important role in health services in NSW, not only for the delivery of clinical services but also as a means of delivering training, holding meetings and sustaining networks. One reason for this is the large geographical size of NSW; it is divided into eight area health services, the largest of which covers 444 586 km².¹ Communication technology provides a means for linking health professionals across areas, particularly those working in rural and remote communities. Where distances are not large, these techniques also allow a more efficient use of time by reducing the need for travel.

Teleconferencing is frequently used for different types of meetings because it is readily available and easy to use. These features led Wildsoet et al.² to pilot a continuing education program via teleconferencing to optometrists in rural Queensland. There are, however, limitations to teleconferencing. A randomised controlled trial compared teleconferencing with videoconferencing for the delivery of multidisciplinary case conferences.³ The trial found that there were benefits associated with videoconferencing and, furthermore, a small survey highlighted that having a visual component generated a high level of satisfaction among team members.

Videoconferencing is widely used in medicine for delivering clinical services such as mental health care.⁴ In these clinical settings, there are two sites: one where the clinician is based and a remote site where the patient is located. This type of videoconference is referred to as point-to-point. Further, as we described in a report published in 2002, videoconferencing can be used to deliver continuing professional development activities to multiple remote sites and retain an environment that supports collegiate networking.⁵

Streaming media over the Internet provides a solution when training schedules conflict with other commitments. Chong et al.⁶ described their experience of setting up and delivering presentations by media streaming to pharmacy staff at a Vancouver hospital. As a result of the streamed presentations, staff who were unable to attend the face-to-face sessions were able to access the presentations at their own convenience, either on their work or home computer.⁶ Other computer-based applications, such as web conferencing and web bulletin boards, offer alternative ways to support the delivery of training.

Satellite television has also been shown to be an effective medium for delivering continuing education to large groups. The Centers for Disease Control and Prevention (CDC) collaborative has used this medium to deliver courses to multiple sites across the United States.^{7,8}

There may be opportunities to expand the contribution of communication technology to public health work. Consequently, to inform strategic planning for the public

health workforce and to identify opportunities to use communication technology, a survey was undertaken to provide a 'snapshot' of the use of communication techniques by public health professionals. The forms used, the situations in which these are applied and the level of use were explored.

Method

Sample

Thirteen public health professionals in NSW were invited via a group email to participate in the survey. To ensure representation across the public health field, a purposeful sample was chosen of at least two people from the population health structures in the area health services, including health promotion and public health. A community health perspective was also sought. Participants were also drawn from the Division of Population Health at the NSW Department of Health. There was rural and metropolitan representation.

Questionnaire

A structured questionnaire using closed and open-ended questions was designed for the survey. The questionnaire had three parts: the first part sought characteristics of the participants and of their work; the second part asked about their experience in using communication technology and their interest in expanding this; and the third part explored factors that would prevent or assist them to do this. A copy of the survey questionnaire is presented in Appendix 1.

Part 1: Characteristics of the participants

Participants were asked about their current role and responsibilities within the NSW Health system, the time required to participate in meetings and continuing professional development activities and time spent travelling to these commitments. Acknowledging the restructuring of health services in NSW into fewer larger area health services, participants were asked whether their role and responsibilities were likely to change and if more travel would be required.

Part 2: Experience of communication technology

Current use of the following communication techniques was explored: teleconferencing, web bulletin boards, web conferencing, videoconferencing, media streaming and satellite television. To ensure that all the participants had a similar understanding of each technique, a brief description was provided for each. These descriptions were imbedded into the questionnaire and can be viewed in Appendix 1.

Part 3: Barriers and enabling factors

Factors that would prevent or assist the future use of these techniques were sought, as was the participant's interest in participating in pilots of these techniques.

Preamble

Before commencing the survey with each participant, the interviewer established the context and the scope of the interview

using a scripted preamble. The preamble encouraged the participants to consider a range of applications of communication technology within the context of the restructure. A copy of the preamble is included in Appendix 2.

The survey and preamble were piloted with a public health professional and the feedback used to make amendments to the questionnaire and its delivery.

Interviews

The interviews were scheduled for March and April 2005. The questionnaire was administered to participants by an interviewer either in person or over the telephone. All the interviews were conducted by the one interviewer. Completion of the interviews took between 30 and 40 minutes.

Analysis

Responses were entered into a database created in Epi Info version 3.3 (CDC, Atlanta, GA). For the closed questions, frequencies were reported. A thematic analysis was carried out on the responses to the open-ended questions.

Results

Part 1: Characteristics of the participants

Thirteen public health professionals were invited to be interviewed and 12 agreed to participate. The overall response rate was 92%. The roles and responsibilities of participants spanned: the management of units or teams; leadership of population health and community services; development of evidence-based guidelines and policies; workforce development; facilitating health promotion; and the provision of population health services. The number of people reporting to them varied from one full time equivalent position to approximately 1000, through direct and indirect reporting lines.

Participants reported that between 20 and 80% of their time was spent in meetings and professional development activities. For eight of the 12 participants most of this time was spent in meetings. Participants reported that the time spent travelling to these activities ranged from 'very little', with meetings being held at their worksite, to approximately 2 hours per day.

Six participants indicated that their role and responsibilities would change as a result of the restructure. Three of these people indicated that the amount of time dedicated to travelling to meet with staff and other organisational functions was increasing. One person reported that their travelling time would decrease and the remaining two reported that this would be dependent on the position they were appointed to within the new structure.

Five indicated that their role and responsibilities would not change as a result of the restructure. Of these, three people indicated that they expected there to be no change in the

amount of time spent travelling, while two expected an increase. One person indicated that it was possible that their roles and responsibilities might change as a result of the restructure.

Part 2: Experience of communication technology

Teleconferencing

All participants reported using teleconferencing to either host or participate in meetings. Participants reported using teleconferencing in situations where the distance to travel was prohibitive for a face-to-face meeting or where an urgent issue had to be addressed at short notice. The types of situations where teleconference was employed included: meetings (locally, state-wide and national), interview panels, organising committees, advisory committees and training.

Videoconferencing

Eleven participants reported using videoconferencing. Videoconferencing was used for a range of activities, including: meetings; research and ethics committees; interviews and selection panels; collaborating on clinical service plans across amalgamated area health services; overseas participants asking questions to a panel at the World Conference on Health Promotion and Health Education in Australia; and other continuing professional development activities. Six respondents cited Bug Breakfast as a professional development activity that was made available to rural and remote sites in NSW by videoconferencing.

One participant reported that videoconferencing had other benefits, including the ability to record a continuing professional development activity and then to circulate this to those who were unable to attend the session.

Web bulletin boards

Three participants reported using web bulletin boards. One participant cited that Quit Online used a web bulletin board. This was accessible via the NSW Health Intranet and moderated by two health professionals. Two participants reported that within their area health services electronic postings were placed on a noticeboard on the Intranet. In one area health service, staff are alerted to a posting by an email that is generated. Unlike the Quit Online bulletin board, the two other bulletin boards described were limited to posting information and did not facilitate a discussion forum.

When the nine participants who had not previously used web bulletin boards were provided with a brief description, three suggested potential applications to assist in the dissemination of information such as circulars, protocols for statewide networks and occupational health and safety advice for staff.

Web conferencing

Three participants reported that they had previously used web conferencing; in two cases this was part of a professional

development activity. Respondents reported using various features of web conferencing, including chat facility, viewing a video and annotating documents.

Eight participants who had not previously used web conferencing indicated that this technique could potentially assist them in their role. They suggested applications such as displaying PowerPoint slides to support presentations delivered via teleconference so that the virtual audience could view the presentation in real time. Respondents highlighted the benefits of the various functions of web conferencing, particularly the ability to share and annotate documents in real time. One respondent suggested sharing applications such as Map Info via web conferencing when seeking assistance from the NSW Department of Health in using this program. Furthermore, web conferencing was suggested as an avenue to demonstrate new software to a widespread public health audience. One person who had not previously used web conferencing was uncertain about how this could be used.

Media streaming

Three participants reported using media streaming. One person reported accessing archived video streaming from the Internet, for example the Surgeon General's Report from the United States, and locally, being able to access the *Environmental Tobacco Smoke and Children* commercial from the website.

Four participants who had not used the technology recognised the potential application in the delivery of professional development activities. Three participants were unsure about its application in their work.

Satellite television

Four participants reported that they had used satellite television. Two described their experiences of using satellite television in other states of Australia: one person had accessed a continuing professional development activity on a regular basis while working in Queensland, and another had viewed media broadcasts and training in Western Australia. One respondent cited the Rural Health Education Foundation as a regular provider of satellite broadcasts on health related topics. One participant reported being interviewed on a live satellite television broadcast.

The area where participants felt that satellite television had the most potential was in the provision of professional development.

Part 3: Barriers and enabling factors

Barriers

Participants cited the following factors as preventing the use of communication technology in their workplace:

- lack of access and availability of equipment

- experience and skills in setting up and operating the technology and
- the associated costs.

Several people highlighted lack of access as a barrier. Reasons cited included: not easily accessible to those who would like to participate, distance travelled to facilities, limited resources (computers) and infrastructure (dial up modems). Participants appreciated that there was a certain level of skill and expertise required to use these techniques successfully. They also reported a limited knowledge of how to use the techniques and that they were unfamiliar with the variety of techniques potentially available and their application.

Participants also emphasised that some areas of public health work do not lend themselves readily to the types of communication technology described in the survey and that face-to-face meetings have an important role to play, for example in liaising with other government departments.

Enablers

Participants cited the following factors as enabling the use of communication techniques in their work:

- ease of access to facilities
- where assistance is provided in organising and setting up the technology and
- when it resulted in an efficient and effective use of time.

Their application was viewed as potentially cost effective, by providing training opportunities for staff and limiting the need to travel vast distances. Participants acknowledged that communication techniques could lead to positive outcomes in their work by: facilitating interactions with other public health professionals across the state; supporting the achievement of good standards in practice; and increasing access to experts. Furthermore, communication techniques were seen as an effective means of gaining widespread access to people where the distance between them is large.

Opportunities for using communication techniques

Nine participants indicated that there were opportunities for exploring the use of these techniques in their work and that they were interested in participating in pilots of these. Pilots that they suggested included: the delivery of training, dissemination of information and working collaboratively. The delivery of training was one area that was identified by several respondents where technology could potentially provide a far greater service to the public health workforce. Exploring ways of combining these techniques with methods of face-to-face delivery was proposed.

There was also a role seen for the utilisation of videoconferencing for public health professionals to attend meetings, particularly in view of the amalgamated area health services, where the distance required to travel across the new larger areas has increased. It was also suggested that following the restructure communication techniques may have a role in maintaining the various public health networks in NSW.

During the interviews participants described using other types of technology that were not raised by the survey. Several reported using list servers. In the former Central Sydney Area Health Service, a pilot was underway where early childhood nurses were using personal digital assistants (PDAs) for collecting information during their home visits. The Quit Smoking Program sends an SMS, or short message service, to the mobile phone of the person who has elected to quit. These messages provide advice and support and their delivery is timed to coincide with when the person can be anticipated to be finding it difficult to sustain quitting.

Discussion

Two communication techniques, teleconferencing and videoconferencing, appear to be well established in practice. Teleconferencing was the most commonly used; all participants had either participated in or hosted one. Teleconferencing was seen as easy to use and accessible; consequently, it has become integrated into everyday practice. Several participants stated that their telephone had the capacity to connect several lines and that only when it was necessary to connect a large number of people did they use an external service provider. Participants noted that there were skills needed when chairing a teleconferenced meeting, for example that it was important to ensure that everyone had an opportunity to contribute and that this seemed harder than in a face-to-face meeting. This survey did not explore the technical resources available to support good quality teleconferences.

Videoconferencing was the second most commonly used communication technique; only one participant had not used videoconferencing. Like teleconferencing, it was used for conducting meetings, for continuing professional development activities and collaborating with colleagues. Participants liked videoconferencing because it provided a personal connection and visual cues, which were seen as being very important when engagement was required. One participant who described face-to-face meeting as the 'ideal' felt that videoconferencing provided a way to meet in real time when the 'ideal' was not possible.

Satellite television is a modality that generally would be reserved for continuing professional development activities for large groups because it is expensive to provide.

Satellite television is primarily used for the widespread dissemination of information and, consequently, has a potential role in broadcasting continuing professional development activities that need to be delivered to large groups of public health professionals.

The remaining three computer-based modalities had each been used by only a few participants.

This survey was carried out with a small, selected group of public health professionals working in a variety of settings in metropolitan and rural NSW. Several of the public health professionals were drawn from the same area health service and this might have impacted on the findings as it is likely that the types of communication techniques available were similar within the same area health service. Despite this the findings from this survey provide an insight into the current use of these techniques across a broad range of public health practice.

Further, the survey asked about current use and the potential for the future use of these techniques. We did not seek information about difficulties currently experienced with the application of individual techniques, rather a general question was asked about the perceived barriers to their use. Consequently, the framework of the questionnaire may have shaped the type of information that was collected and the very positive response by the participants.

Determining why one particular type of communication technology was used in preference to another was outside the scope of this study. However, in general, participants used what was familiar to them or had been recommended by colleagues. Having knowledge and skills about a particular type of technology appeared to lead to its routine application.

Participants were clear about the factors that help them to engage with these communication techniques: easy access; available assistance; familiarity with the technology; and task-appropriateness. These factors were likely to result in an efficient use of time and positive outcomes from the experience and this in turn encouraged future use.

They were similarly clear about the factors that were a barrier to efficient use: when the equipment is hard to access; technical difficulties and the perception that the modality is unreliable; no support staff to help with either setup or to troubleshoot problems; and low levels of knowledge and skill in the use of these techniques due to lack of training in their operation and application.

An example of how the availability of resources and infrastructure influenced the uptake and ongoing use of

communication techniques was provided by one participant who stated that in their area of work it was not unusual for several people to share one computer. It could be anticipated that accessing web bulletin boards, web conferencing and media streaming would be more difficult for this group. Although web bulletin boards and archived media streaming sessions can be accessed at a person's own convenience, web conferencing requires the person to schedule a computer at a set time in order to participate. This example demonstrates that when selecting a communication technique for the delivery of a program or meeting it is important to know who has access to the necessary equipment.

It requires effort for people to change the way they do things and participants queried whether it would be worth the extra effort required to learn how to use these techniques. While positive experiences promote use, negative experiences, like poor quality interactions, create disappointment and can quickly discourage people, particularly where they have choice in how a task is managed.

Many raised cost as an issue, inferring that where the delivery was cheap there was a greater chance of uptake. However, there is a trade-off between cost and quality of delivery in many of these techniques. Better quality transmission of videoconferencing is associated with higher bandwidth transmission and this is more expensive. In some instances using lower bandwidths may be a false economy.

Another aspect of cost is the potential to save both the real and opportunity costs associated with travel. One of the major benefits of these techniques was the reduction in travelling time to attend meetings and other functions. Time spent travelling not only has implications in time away from the workplace but also encroaches on time spent with family. Since the amalgamation of the area health services under the restructure of NSW Health, there are fewer larger area health services. This may result in increased travelling time for some people employed in population health services. Just under half of the participants anticipated that it might be necessary for them to travel more. Consequently, there may be potential for communication techniques to have a larger role in assisting public health professionals to meet their local and state obligations.

In many instances, communication technology expands the size of the population that can access activities, making available experiences that would otherwise have restricted access, for example meetings, training, professional development, mentoring and other work-related activities. For many of these individuals, face-to-face attendance is not an option. Consequently, while remote access is highly valued by people it can be a source of additional cost to the system.

Communication technology has the potential to reduce inequities in accessing professional development activities and potentially can sustain and increase the capacity of the rural and metropolitan public health workforce. However, the risk is that inequalities in accessing these techniques will emerge as some groups may have either easier access or greater skill than others in incorporating these techniques into practice as this area continues to develop.

This study demonstrated that participants commonly use teleconferencing and videoconferencing. The challenge is to assist the workforce to be more efficient and effective in their use. For example, given the high level of use of teleconferencing, consideration should be given to ways of ensuring a high quality of interaction such as access to an audio conferencing system. Also, simple guidelines could be developed for participation in teleconferences.

Several participants indicated that communication technologies should not be used to the exclusion of face-to-face meetings. It was acknowledged that personal contact contributes to developing rapport and networks. Communication technologies can never completely replace face-to-face meetings but provide options when this is not feasible.

Conclusion

This sample of people working in population health in NSW enthusiastically engaged with considering how different communication techniques might be used to support population health work. They were also able to cite factors that would both aid and hinder uptake. To successfully integrate these techniques into public health practice, a strategy is required that complements the face-to-face approach. The strategy could heighten awareness of the types of communication techniques available, the benefits they offer and the situations in which they are best applied. The strategy could also challenge the public health workforce to articulate their requirements to integrate a range of communication techniques into practice.

Recommendations

1. That the Population Health Division consider developing a strategy for the population health workforce to utilise communication technology and that it acknowledges that teleconferencing and videoconferencing are commonly used and it promotes their efficient and effective use.
2. That the potential applications of less frequently used communication techniques are explored and promoted where appropriate.
3. That guidelines are developed for the effective use of selected communication techniques.

Acknowledgments

1. We would like to thank the participants of the survey.
2. A short article from this survey was previously published in the

Bulletin (Vol. 18(1–2) pp. 13–16). Here we present the full report and the survey questionnaire.

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Appendix 1.

Survey on the current use of multimedia by the public health workforce

The first few questions I would like to ask you are about your role and responsibilities within the NSW health system.

1. What is your job title? _____

2. What is your principle responsibility in this position?

3. How many people are you responsible for? _____

4. How much time per week do you dedicate towards participating in meetings and professional development activities?

a. How much time would you spend travelling to these?

5. Is it likely that your role and responsibilities will change as a result of the restructure of the health system?

- ☐ Yes
☐ No
☐ Unsure
☐ Other (*please comment*)

6. Do you see the amount of time you would be travelling to meet with your staff or other organisational functions as increasing or decreasing as a result of the current restructure?

- ☐ Increasing
☐ Decreasing
☐ Other (*please specify*) _____

The next set of questions I will be asking are regarding your experiences in using communication techniques, and your interest in pursuing other types of communication techniques in the future. I will provide a brief description of each type of communication technology, in case you are unfamiliar or unclear about what it is.

This question relates to teleconferencing. A teleconference is the interactive exchange of voice of usually more than 2 participants by telephone.

7. Have you ever hosted or participated in a teleconference?

- ☐ Yes
☐ No
☐ Unsure

If yes,

a. Can you please describe the types of situations where you have used teleconferencing?

If no,

b. Can you see how teleconferencing might be applied in your work to assist you in your role?

- ☐ Yes
☐ No
☐ Unsure

If yes, please explain

This question relates to web bulletin boards. A web bulletin board is essentially an electronic form of a workplace noticeboard. Messages are posted on an area of a website for other users.

8. Have you ever used a web bulletin board?

- ☐ Yes
- ☐ No
- ☐ Unsure

If yes,

a. Can you please describe the types of situations where you have used a web bulletin board?

If no,

b. Can you see how a web bulletin board might be applied in your work to assist you in your role?

- ☐ Yes
- ☐ No
- ☐ Unsure

If yes, please explain

This question relates to web conferencing. Web conferencing is conducted over the Internet between two or more people situated at different locations. The web conference enables videos, websites, PowerPoint presentations and software demonstrations to be displayed in real time to all the participants through their computer.

9. Have you ever used web conferencing?

- ☐ Yes
- ☐ No
- ☐ Unsure

If yes,

- a. Can you please describe the types of situations where you have used web conferencing?

If no,

- b. Can you see how web conferencing might be applied in your work to assist you in your role?

- ☐ Yes
☐ No
☐ Unsure

If yes, please explain

This question relates to videoconferencing. A videoconference is the transmission of video, voice and data between two or more sites.

10. Have you ever used videoconferencing?

- ☐ Yes
☐ No
☐ Unsure

If yes,

- a. Can you please describe the types of situations where you have used videoconferencing?

If no,

- b. Can you see how videoconferencing might be applied in your work to assist you in your role?

- ☐ Yes
☐ No
☐ Unsure

If yes, please explain

This question relates to media streaming. Streaming media is a method whereby video with synchronised sound is sent in compressed form over the Internet to be viewed as a continuous stream.

11. Have you ever used media streaming, for example video streaming?

- ☐ Yes
☐ No
☐ Unsure

If yes,

- a. Can you please describe the types of situations where you have used media streaming?

If no,

- b. Can you see how media streaming might be applied in your work to assist you in your role?

- ☐ Yes
☐ No
☐ Unsure

If yes, please explain

This question relates to satellite television. Satellite television involves a live broadcast over a satellite network.

12. Have you ever used satellite television?

- ☐ Yes
☐ No
☐ Unsure

If yes,

a. Can you please describe the types of situations where you have used satellite television?

If no,

b. Can you see how satellite television might be applied in your work to assist you in your role?

- ☐ Yes
☐ No
☐ Unsure

If yes, please explain

The next set of questions relate to factors that would prevent or assist you in using these communication techniques in your work.

13. What prevents you from using these communication techniques in your work?

14. What helps you to use these communication techniques in your work?

15. Do you see any opportunities in the future for using any of these communication techniques in your work, in addition to what you have already described?

- ☐ Yes
- ☐ No
- ☐ Unsure

If yes,

Can you provide examples of how you might use these communication techniques in your work?

If yes,

Would you be interested in participating in a pilot of any of these techniques?

- ☐ Yes
- ☐ No
- ☐ Unsure

16. Are there any other comments you would like to make?

Thank you for taking the time to participate in this interview.

Appendix 2. Preamble to questionnaire

Thank you for agreeing to be interviewed about your use of communication technologies in your work. The interviews that I am in the process of carrying out will inform a larger piece of work looking at the current communication tools that public health professionals use in their work.

Communication technology is a broad term, but for the purposes of this interview I would like you to reflect on your use of teleconferencing, web bulletin boards, web conferencing, videoconferencing, media streaming and satellite television. I am seeking to obtain a snapshot of how people use these technologies in their day-to-day work in order to, for example, work with individuals and groups, seek information, and stay in contact with networks relevant to maintain professional knowledge and skills.

When thinking about these technologies in your work please consider meetings, professional development activities, conducting interviews, policy launches and any other areas of your work where these communication technologies may assist you.

We are sampling people in different types of roles and in various locations of NSW. We acknowledge that NSW Health is currently undergoing a restructure and that peoples' roles and responsibilities may be changing.

Pilot study of using a web and teleconference for the delivery of an Epi Info training session to public health units in NSW, 2005

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Executive summary

The use of the combination of a web conference and teleconference to deliver an Epi Info training session was piloted with three public health units in New South Wales (NSW), two of which were located in rural areas. The pilot was evaluated to describe both the participants' learning experience and whether this combination of communication techniques provided a satisfactory means of delivering professional development activities.

The evaluation was carried out in two parts: participants were asked to complete a questionnaire; and a focus group was held with the three site facilitators following the session.

Participant evaluation

There were 12 participants and the response rate to the questionnaire was 100%.

After the training session, 83% of participants felt able to apply Epi Info to a foodborne disease outbreak investigation. The participants reported an increase in their confidence in developing a questionnaire using Epi Info, entering

data and conducting basic analyses of that data. However, there was little change in their confidence in interpreting the results of these analyses.

Participants were asked about the delivery of the session. The majority of the participants reported that the picture quality of the PowerPoint presentation on their computer screens was either 'good' or 'average'. However, the sound quality of the teleconference was reported to be of 'average' or 'poor' quality.

During the Epi Info session, two sites experienced disconnections from the web conference and several participants reported delays in the PowerPoint slides being displayed on their computer screen. These technical issues affected the delivery of the training for all the participants. Despite these difficulties, participants cited benefits in receiving training this way, principally being able to access training without the need to travel.

Facilitator evaluation

Facilitators commented on the support and organisation provided by the NSW Department of Health on setting up the session. They could identify opportunities in using web conferencing; for example, for continuing professional development activities and working with public health colleagues. However, disconnections during the training session affected the quality of the learning experience.

Conclusion

This pilot demonstrated that professional development activities can be delivered via a combined web conference and teleconference, and identified simple measures that can improve the learning environment. However, the technical issues raised should be explored and resolved before promoting this means of delivery widely.

Background

In October 2004, the Communicable Diseases Branch of the NSW Department of Health conducted a Foodborne Diseases Workshop. As part of this workshop, an introductory session on Epi Info version 3.3 was offered to public health professionals. The session was well attended and well received. After the workshop, the Food Portfolio Group of the NSW Public Health Directors Forum approached the Communicable Diseases Branch and described a need for public health professionals in NSW to be trained in the use of Epi Info to assist with the management of outbreak investigations. Epi Info is a public domain software package developed by the Centers for Disease Control and Prevention to be used in outbreak investigations for the management and analysis of data.¹ Epi Info allows public health professionals to create questionnaires rapidly, enter data and carry out analysis to generate statistics and graphs to help identify the likely cause of an outbreak.¹

The Communicable Diseases Branch in association with the Executive Officer for the Public Health Directors Forum subsequently sought to organise an introductory Epi Info training session for a number of public health units in New South Wales. At the time of this study, March 2005, there were 17 Public Health Units in NSW; one located in each of the former area health services. Consequently, the people to receive the training were geographically dispersed. The preferred delivery format was an interactive session where the features of Epi Info could be demonstrated using a practical example of a foodborne disease outbreak.

Consequently a training session was developed to enable the remote delivery of training using a combination of a web conference supported by a teleconference. This allowed public health professionals to receive the training at their worksite. This pilot of the training allowed for both the efficacy of the training and the medium through which it was delivered to be evaluated.

Web conferencing is computer based and delivered over the Internet between two or more people situated at different locations. The rationale for using web conferencing was that it enabled a speaker's PowerPoint presentation to be delivered to an audience in real time using Internet Protocol (IP) network connections.² Web conferencing has numerous features, these include: sharing a presentation; document or white board; text chat; tools for annotating documents; and attendance indicators.^{2,3} The features used for the delivery of the Epi Info training were restricted to sharing a presentation and the attendance indicator.^A The reason for restricting the functions was to ensure that the focus of the session was

the Epi Info training and that the web conference did not detract from the learning experience.

Combining the web conference with a teleconference allowed active conversation and voice instruction between the trainers and the sites. It is possible to web conference without teleconference support, the interaction between participants and trainers then occurs through the 'chat' facility and is a typed interaction. The teleconference was considered necessary for the pilot because at each site there were a number of participants who shared the computer connected to the web conference, restricting their access to the chat facility through which they could ask questions.

Aim

To evaluate the pilot of the delivery of an Epi Info training session to three public health units in NSW via a web conference supported by a teleconference.

Objectives

Efficacy of training

1. To introduce public health workers to Epi Info and its application to the investigation of outbreaks of foodborne illness.
2. To evaluate the learning outcomes associated with the training session.
3. To increase the confidence and skills of presenters in using web conferencing for training purposes.

Quality of the learning experience

4. To evaluate the participants response to using web and teleconferencing for training.
5. To evaluate the quality of the delivery of a training session through a combined web and teleconference.
6. To determine the technical and structural resources required to participate in the web conference.

Potential applications

7. To determine potential broader applications of web and teleconferencing for public health practice.

Method

For this pilot the Mid Western, Western Sydney and Greater Murray Public Health Units received the training from the NSW Department of Health where a group of three organisers and trainers were based. Members of the Food Portfolio Group volunteered their sites for the pilot. As most people are unfamiliar with receiving training through web conferencing, a training session in how to web conference was also provided and this preceded the Epi Info training session.

The method is described in three parts:

1. preparing the sites to receive the Epi Info training session

^AThe attendance indicator provides a participant list of who is connected to the web conference.

Box 1. Content covered during the web conferencing training session

The following web conferencing functions were introduced to participants:

- joining a meeting
- sharing a presentation or document
- sharing an application
- tools for annotating and viewing documents
- participants panel
- typing chat comments.

2. delivering the training
3. evaluating the training session.

1. Preparing the sites to receive the Epi Info training session

The following steps were followed:

Site facilitator

A facilitator was identified at each of the three public health units. The facilitator's role was to prepare their site for the web conference so that they could access the Epi Info session. The facilitators were provided with instructions on how to install the software Meeting Manager on the computer/s to be used for the web conference. All sites successfully installed this program.⁴

Web conferencing training

The objective of this training was to provide participants with a basic understanding of the functions of web conferencing and for them to gain confidence in using it as a medium for the delivery of training. Telstra Conferencing using WebEx was the web conferencing provider used for both the web conferencing training and the Epi Info training session. A representative from Telstra facilitated the web conferencing training and also arranged a teleconference to support the web conference. The training was scheduled for one hour and the content covered is described in Box 1.

Organising the Epi Info session

Facilitators were responsible for the setup and organisation of their site for the Epi Info session. Their responsibilities included ensuring that there was a suitable venue with the following resources to support delivery:

- a computer with Meeting Manager installed and connected to the web conference⁴
- a speakerphone connected to the teleconference
- a data projector to view the web conferencing computer screen
- a laptop or personal computer with Epi Info Version 3.3 installed for each participant.

The facilitators were provided with a checklist of these requirements.

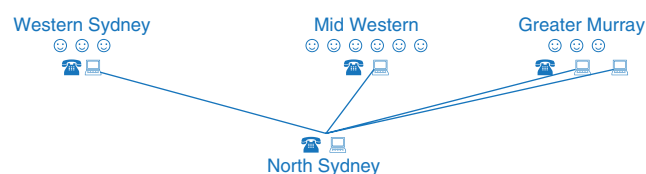


Figure 1. Model used for the delivery training of an Epi Info training session to three public health units in NSW using a combination of a web and teleconference.

The facilitators were also responsible for distributing the materials that were provided for both the training session and its evaluation, these included:

- an outline of the content to be covered
- a workbook for each participant (this included a copy of the PowerPoint presentation used)
- the evaluation questionnaire for participants
- a list of questions for the facilitators.

2. Delivering Epi Info training

The Epi Info training session was conducted in early March 2005. All three public health units successfully joined the teleconference and the web conference. Mid Western and Western Sydney Public Health Units each had one computer connected to the web conference, while at the Greater Murray Public Health Unit there were two connected (see Figure 1). The duration of the training session was two hours.

Prior to commencing the training, the organisers carried out a roll call and then requested that the public health unit sites mute their phones unless they were asking a question.

The trainer at the North Sydney site displayed a PowerPoint presentation on their computer screen and this was viewed by the participants at each of the public health unit sites on their computer linked to the web conference. During the training session, participants were encouraged to use their laptops or personal computers to complete the Epi Info exercises as instructed by the trainer.

Content of the Epi Info training session

The content of the training session was adapted from the Epi Info training manual developed by the Centers for Disease Control and Prevention. The training was based on a food-borne outbreak investigation and covered the following:

- creating questionnaires that automatically generate a database
- entering data into the database
- analysing the data to produce statistics and graphs.

The training was modified for delivery through web conferencing.

3. Evaluating the session

Both the effectiveness of the Epi Info training session in increasing the participants' knowledge of and confidence

in using Epi Info and their experience of using web conferencing for delivery were assessed.

Participants were asked to complete a questionnaire and the facilitators were invited to participate in a focus group that followed the session.

Participant questionnaire

A structured questionnaire was developed that contained three types of questions:

- close-ended questions, including rating scales
- close-ended questions with the opportunity for comment
- open-ended questions.

The questionnaire had two parts. The first part was completed before the session started and sought to establish the participant's previous experience of foodborne outbreak investigations and a self-assessed baseline of their confidence in using Epi Info for developing a questionnaire, entering data and conducting basic analyses. They were also asked about their confidence in interpreting the findings of an Epi Info analysis. Participants could indicate their degree of confidence by selecting from a horizontal scale consisting of five boxes; the first, marked 1, represented 'not confident at all' to the last, marked 5, 'extremely confident'. The second part of the questionnaire was administered at the conclusion of the session. Their confidence in using Epi Info was reassessed using the same scale. Their experience of the web conference was sought, including whether they attended the training and the quality of the sound and the picture.

The facilitators distributed the questionnaire to participants at each site. The participant questionnaire is included in Appendix 1.

While the scales measuring confidence in using Epi Info were constructed to encourage ticks within the boxes, people also marked the line between the boxes. This was interpreted in all cases as halfway between two integers on the scale. The responses were entered into and analysed using a database created in Epi Info version 3.3. Descriptive statistics were used to analyse the responses to the close-ended questions. Open-ended responses were explored for major themes.

Facilitators' focus group

The three facilitators were invited to participate in a focus group with the organiser/trainers via teleconference following the Epi Info training session. Permission was sought from them to record the teleconference onto a compact disc. The teleconference was organised through Telstra Conferencing and Telstra recorded the compact disc. The purpose was to explore any issues associated with the training session or encountered in the organisation of the web conference.

The facilitators were provided with the questions to be used approximately one week before the Epi Info training

Table 1. Number of participants at each site for the Epi Info training session

Public Health Unit	Participants (n)
Greater Murray	3
Mid Western	6
Western Sydney	3
Total	12

Table 2. Age and gender of participants in the Epi Info training session (n = 12)

Participants	n
Gender	
Male	2
Female	10
Age (years)	
20–29	1
30–39	2
40–49	7
50–59	1

session. Questions related to: their overall impression of the training; difficulties encountered in organising the session; the value in rolling out Epi Info training across the state via web conferencing; potential applications of web conferencing in their work; and their views on delivering continuing professional development activities to staff via web conferencing. Their responses were examined and the major themes that emerged identified. The list of questions is included in Appendix 2.

Results

Participants' questionnaire

There were 12 participants across the three public health units. The number of people attending the training from each location is presented in Table 1. The response rate to the questionnaire was 100%.

The age and gender of participants is presented in Table 2. The majority of participants (83%) were female. Participants were asked their job title and four participants reported that they were communicable diseases surveillance officers, two participants were immunisation coordinators and the remaining participants were responsible for management, research and office administrative functions. Almost all participants reported that they had previously had some involvement in a foodborne outbreak investigation. The responsibilities that participants assumed at the time of an outbreak investigation included: conducting interviews; data entry and analysis; site investigation and providing advice on infection control; and the collection of samples.

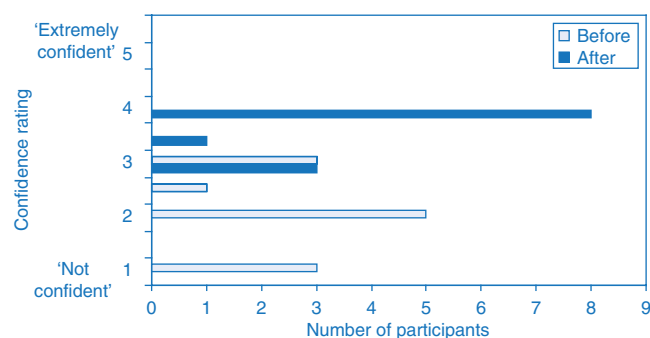


Figure 2. Confidence in developing a questionnaire in Epi Info before and after one episode of training for 12 public health professionals, NSW, 2005.

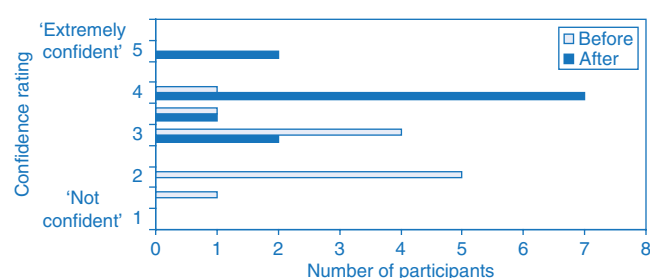


Figure 3. Confidence in entering data into a questionnaire in Epi Info before and after one episode of training for 12 public health professionals, NSW, 2005.

Evaluation of the Epi Info training

Eleven participants indicated that they had previously used Epi Info. Of these, three considered that their level of knowledge in using it was satisfactory whereas eight reported that it was poor.

Participants were asked to rate their confidence in using Epi Info to develop a questionnaire for a foodborne disease outbreak before and after the training. Figure 2 presents the before and after scores for the group and shows an increase in the participants' self-reported confidence in creating a questionnaire.

Participants were asked to rank their confidence in entering data into a questionnaire created in Epi Info before and after training. Figure 3 shows their confidence increased, with two participants reporting to be extremely confident in performing this task.

Figure 4 illustrates the participants' confidence before and after training in conducting basic analysis using Epi Info. Participants' reported that their confidence increased. However, when participants were asked to rank how confident they felt in interpreting the analysis, Figure 5 shows that there was little difference in the scores before and after training.

Overall, 83% of participants felt confident enough to apply Epi Info to foodborne disease outbreak investigations in the future, with 17% of participants stating that they felt unsure.

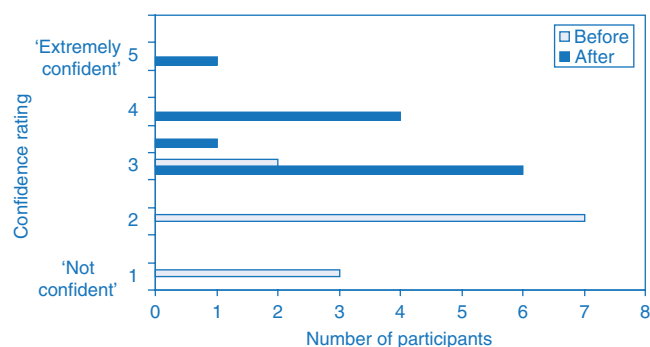


Figure 4. Confidence in conducting basic analysis in Epi Info before and after one episode of training for 12 public health professionals, NSW, 2005.

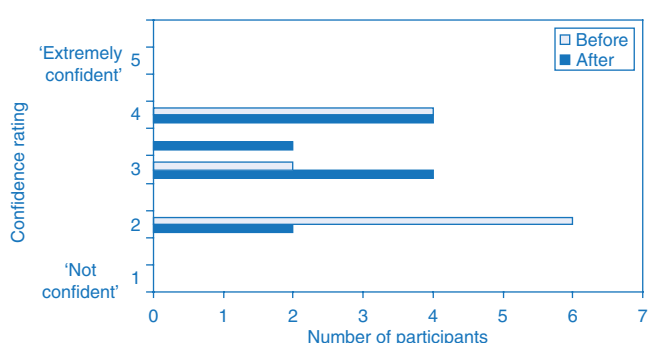


Figure 5. Confidence in interpreting the findings of an Epi Info analysis before and after one episode of training for 12 public health professionals, NSW, 2005.

Table 3. Picture quality of web conference reported by 12 participants across three sites

Picture quality	Participants (n)
Good	8
Average	2
Poor	2

Evaluation of delivery through web conferencing and teleconferencing

Web conferencing training

None of the participants had previously used web conferencing. Six (50%) participants attended the web conferencing training. Of these six, five reported that it prepared them for the delivery of the Epi Info training by providing an overview of the technology.

Web conference

On the day of the Epi Info training session participants were asked to rate the quality of the picture on the computer screen for the web conference. The majority of the participants reported it as either good or of average quality as presented in Table 3.

Table 4. Sound quality of teleconference reported by 12 participants across three sites

Sound quality	Participants (n)
Good	1
Average	7
Poor	4

Participants were asked if the PowerPoint slide visible on their computer screen was the same slide that the presenter at the North Sydney site was describing. Four participants reported delays in the slide becoming visible on their screen, with one participant unsure if they were experiencing a delay. Responses to this question were inconsistent, as not all participants at the same site reported experiencing the delays, despite viewing the same computer screen in two of the public health units. This makes it difficult to interpret these results.

Teleconference

Participants were asked to rate the quality of the sound from the teleconference. Overall the sound was considered to be of average or poor quality, see Table 4. Participants' perception regarding the quality of sound varied at each of the sites.

Other aspects of delivery

Sixty-seven per cent ($n = 8$) of participants reported that, other than the quality of sound and picture, there were aspects of the web conferencing that detracted from the training. The Mid Western Public Health Unit reported that the web conference disconnected twice during the session whereas in the Greater Murray, one of the two computers used for the web conference also lost its connection. These disconnections slowed the pace of the training and this affected the sites that did not experience these technical difficulties.

Continuing professional development

Participants were asked what they liked most about participating in Epi Info training via web conferencing. Eleven participants responded to this question, with four citing the benefits of having training onsite and not needing to travel. Other comments included being able to carry out practical exercises with colleagues during the session.

Participants were also asked what they least liked about participating in the training and eight participants responded to this question. The majority of responses were focused on technical issues such as sound quality and web conference disconnections. Despite the technical issues, only one participant indicated that they would not participate in a web conference for a continuing professional development activity, whereas a further four were unsure.

Several people took the opportunity to make additional comments about the pilot and the application of web conferencing and teleconferencing to public health. One person suggested that public health professionals could use these to obtain assistance in applying Epi Info in the event of an outbreak investigation. However, several people highlighted issues that would need to be addressed in order to provide training via a combined web and teleconference. These included: access to the Internet in regional areas; local site setup for training purposes; and access to teleconferencing facilities.

Suggestions for improving the training

Participants were asked if they had any suggestions on how the training could be improved. Participants suggested allocating additional time for the delivery of the training on analysis and interpretation of results in Epi Info ($n = 2$), whereas other participants commented on the technical issues of web conferencing ($n = 2$) and the sound quality of the teleconference ($n = 1$).

Focus group with facilitators

At the conclusion of the Epi Info training session, the three facilitators participated in a focus group with the organisers from the North Sydney site via a teleconference. They were asked about their overall impressions of the technical delivery of the session. The facilitator from the metropolitan site reported that the training went very well. The rural sites experienced difficulties such as disconnections from the web conference, delays in the PowerPoint presentation becoming available on their computer screen and issues related to the sound quality of the teleconference.

Organising the session

All the facilitators commented on the support and organisation provided by the NSW Department of Health in arranging the session. One site experienced local difficulties when organising the session, these included:

- accessing a speakerphone for the teleconference close to the training area
- securing a room suitable for the training session.

Delivery of Epi Info training by web and teleconferencing across the state

Overall the facilitators were positive about the prospect of Epi Info training being delivered to public health units via web and teleconferencing. However, at the same time the facilitators highlighted that there needed to be a certain degree of confidence that there would not be ongoing disconnections during a web conference. Facilitators suggested that recommendations be developed on the number of sites and number of participants at each of the sites joining the training in order for the session to be a positive learning experience. All facilitators reported that the workbook was an excellent resource.

Potential applications of web conferencing

The discussion highlighted that web conferencing could have many applications for the public health network. Web conferencing could expand the opportunities for rural public health professionals to participate in training. Even for metropolitan sites, where there is a greater availability of training opportunities, it was useful for staff to receive training at their office, particularly when this facilitated learning with their colleagues.

Suggested applications in public health practice included:

- obtaining assistance from the Department of Health at the time of an outbreak investigation with the design and analysis of a database in Epi Info
- providing training for Environmental Health Officers; for example, on tobacco control, as visual images such as examples of advertising could be easily displayed on the computer screen
- working in collaboration with health professionals within the newly established Area Health Services to annotate documents in real time.

Delivery of continuing professional development activities by web conferencing

Facilitators provided suggestions on ways of improving the web conference session. These included using the functions of web conferencing such as 'raise hand' and 'chat' to ask questions, because when participants asked questions through the teleconference it interrupted the flow of the session.

Discussion

This evaluation of using web and teleconferencing to deliver training was performed on a small pilot study involving 12 public health professionals on one occasion of training. The content of the session and the organisation of its delivery were carefully undertaken. Consequently these results provide an insight into some of the issues associated with providing professional development activities through these communication techniques as an alternative to face-to-face delivery for a selected and motivated group of participants. The major limitation of this pilot was, therefore, that there was only one training event and consequently the external variables that influence the quality of delivery could not be investigated in subsequent training sessions.

Epi Info training

The participants reported that their feelings of confidence in applying Epi Info increased in three of the four parameters measured: developing a questionnaire; entering data; and conducting an analysis. This suggests that the Epi Info training session provided participants with an overview of the various functions of the software and therefore fulfilled one of the objectives of the training.

However, this did not extend to their confidence in interpreting findings. Possible explanations for this include: the way in which the training session was constructed and the time allowed for discussion of the results of the analysis. This finding may also reflect the participants pre-existing level of knowledge and skills in undertaking the interpretation of the results of quantitative data analyses. Those who had previous training in epidemiology may have had greater confidence in the analysis component.

The level of skill attained by participants was not assessed. While participants reported improved confidence and familiarity in using Epi Info, this does not necessarily reflect appropriate use of the software.

Delivery of training

Prior to this training, none of the participants had used web conferencing. This highlights the need to provide a session to introduce web conferencing. The willingness of half the participants to attend the web conferencing training suggests a high level of interest and motivation in this group and differs from the experiences reported in the literature. The literature reports low levels of participation when preparatory training is offered and that most people using web conferencing only come to 'grips' with technology at the time of the interaction.¹

Delivering training via web conferencing to a 'virtual audience' introduces its own unique set of challenges to the trainer. In particular, the absence of non-verbal cues makes it difficult to vary the pace of the presentation for the audience. To overcome this problem, the trainer arranged for one of the organisers of the session to work through the Epi Info exercises with the participants to gauge the time taken to complete the exercises. The literature confirms that the virtual group audience differs from its face-to-face counterparts and that there is a 'new learning culture' created by adopting computer technology.⁵

Additional time is also required for discussing the analysis and its implications in managing an outbreak. In view of the wide range of skill levels of public health professionals in using Epi Info, there was support for a staged approach to delivering training. A facilitator also reported that there would be value in having someone familiar with Epi Info available at each of the sites to assist participants during the training session. There was also a suggestion of strengthening the Epi Info training by embedding the training in an outbreak scenario with a focus on study design, analysis and interpretation of results.

Web conferencing enabled the delivery of the PowerPoint presentation from the North Sydney site to all participants in real time, the teleconference provided the audio component. Facilitators indicated that other functions of web

conferencing such as 'chat' and 'raise hand' may provide less intimidating ways for participants to ask questions and also result in fewer interruptions for the whole group. This request may also be due to several participants experiencing poor sound quality from the teleconference. It is likely that these participants used a speakerphone rather than an audio conferencing system. Other factors that will influence the quality of the sound are the set up of the training room and the proximity of participants to an audio conferencing system.

Two of the four computers from the three sites became disconnected from the web conference. This was unexpected, as disconnections were not experienced during the web conferencing training hosted by Telstra Conferencing. Participants also reported intermittent delays with the PowerPoint slide becoming visible. Subsequent inquiries with Telstra Conferencing and the Information Technology Branch at the NSW Department of Health advised that the bandwidth can influence the quality of the delivery for web conferencing. Having either a large number of users or a small number using functions requiring greater bandwidth can affect the delivery.⁶

This pilot therefore demonstrated that there are bandwidth implications for web conferencing over the current network.⁶ If there are low-speed links or network congestion, participants will receive a poorer delivery and this may affect the learning experience. Consequently, information technology departments within area health services need to be consulted regarding the bandwidth capacity of the network for web conferencing, particularly in remote areas.

This pilot has also confirmed that a suitable venue and appropriate equipment are required for the successful delivery of training. Where there are many participants at one site, a data projector is preferable to a computer monitor to display the web conference.

The number of sites connected to the web conference and the number of participants at each site also affects the format of the session. With increasing number of sites or participants, the potential for interaction with the presenter is reduced. Box 2 summarises the advice that would be provided to facilitators at sites to improve the quality of the learning environment experienced by participants.

Despite the technical difficulties encountered, over half the participants reported that they would participate in a web conference for a continuing professional development activity. Participants also suggested several applications of web conferencing to assist them in their role, these included: delivery of training; and carrying out their duties more efficiently and effectively.

Box 2. Recommendations for site facilitators for managing a training session delivered through a combined web and teleconference

- All participants are invited to attend web conferencing training in advance to familiarise them with the technology
- The number of people participating at one site is restricted
- An audio conferencing system is used for the teleconference and that this is positioned close to participants.
- Each participant has access to a computer for the practical exercises
- The computer connected to the web conference is close to participants and if a data projector is available that this is used to view the presentation
- A conference or training room is used for the session.
- Remote sites have a public health professional familiar with Epi Info assist participants during the training session.
- The use of the web conferencing functions 'chat' and 'raise hand' be optional and coordinated by the facilitator
- The facilitator provide feedback to the remote trainer about the progress of participants at their site during the session
- The Information Technology Department within the Area Health Service is consulted in advance regarding the capacity of their network to web conference.

Conclusion

This pilot demonstrated that an interactive training session could be delivered using a combined web and teleconference. Simple measures were identified that can improve the quality of the learning environment, including the layout of the room (such as the proximity to phones and computers). However, there are information technology issues that should be explored before promoting its wider use. Despite this, web conferencing has the potential to increase equity of access to training for both metropolitan and rural public health professionals.

Recommendations

1. Further pilots could be undertaken to support the development of web conferencing to deliver training, in particular to describe:
 - a. types of continuing professional development activities that are suitable
 - b. the implications on the network system and ways of managing this.
2. A series of guidelines could be produced that describe:
 - a. how to organise continuing professional development activity via web conferencing
 - b. how to use teleconferencing for a range of activities including advice on the technical requirements.

Acknowledgments

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Appendix 1. Evaluation of Epi Info training via web conferencing

Part A:

Please complete Part A before the training

Thank you for filling in this evaluation of Epi Info training via web conferencing. Your responses will provide us with a better understanding of the efficacy of web conferencing Epi Info Training, and will assist us in improving the delivery.

1. Transmission site _____

2. Are you: ☐ Female
☐ Male

3. Your age group:
 - ☐ 20–29
 - ☐ 30–39
 - ☐ 40–49
 - ☐ 50–59
 - ☐ 60–69

4. What is your job title here? _____

5. Have you previously been involved in the investigation of a foodborne outbreak?
 - ☐ Yes
 - ☐ No
 - ☐ Unsure

If Yes,
 What was your role in the investigation process?

6. Have you previously used Epi Info?
 - ☐ Yes
 - ☐ No
 - ☐ Unsure

If Yes,

Please tick the appropriate box to indicate your level of knowledge in using this software application?

- ☐ Good
☐ Satisfactory
☐ Poor

The next set of questions ask you to rate your confidence in using Epi Info in four areas using the following scale from 1 to 5, with 1 representing '*not confident at all*' and 5 '*extremely confident*'.

7. Please rate your confidence in developing a questionnaire in Epi Info for a foodborne disease outbreak investigation.

1	2	3	4	5
Not confident at all				Extremely confident

8. Please rate your confidence in entering data into a questionnaire in Epi Info for a foodborne disease outbreak investigation.

1	2	3	4	5
Not confident at all				Extremely confident

9. Please rate your confidence in conducting basic analyses of foodborne disease outbreak data using Epi Info.

1	2	3	4	5
Not confident at all				Extremely confident

10. Please rate your confidence in interpreting the findings of an Epi Info analysis of foodborne disease outbreak data.

1	2	3	4	5
Not confident at all				Extremely confident

Part B:

Please complete Part B after the training

The next set of questions ask you to rate your confidence in using Epi Info following the training, using the following scale from 1 to 5, with 1 representing '*not confident at all*' and 5 '*extremely confident*'.

11. Please rate your confidence in developing a questionnaire in Epi Info for a foodborne disease outbreak investigation.

1	2	3	4	5
Not confident at all				Extremely confident

12. Please rate your confidence in entering data into a questionnaire in Epi Info for a foodborne disease outbreak investigation.

1	2	3	4	5
Not confident at all				Extremely confident

13. Please rate your confidence in conducting basic analyses of foodborne disease outbreak data using Epi Info.

1	2	3	4	5
Not confident at all				Extremely confident

14. Please rate your confidence in interpreting the findings of an Epi Info analysis of foodborne disease outbreak data.

1	2	3	4	5
Not confident at all				Extremely confident

15. Do you feel confident enough to apply Epi Info to foodborne disease outbreak investigations in the future?

- ☐ Yes
☐ No
☐ Unsure

If No, or unsure

Please explain

16. Do you have any suggestions on how the Epi Info training provided could be improved?

Today we used web conferencing as a way of delivering Epi Info training to you. The next few questions will be asking you about your experiences in using web conferencing.

17. Did you attend the web conferencing training in February 2005?

- ☐ Yes
☐ No

If Yes,

Did the feel that the web conferencing training prepared you for today's Epi Info training?

18. Have you used web conferencing besides the training that you received in February 2005?

- ☐ Yes
☐ No
☐ Unsure

If Yes,

Please tick the appropriate box to indicate your level of knowledge in using web conferencing?

- ☐ High
☐ Satisfactory
☐ Low

Can you please describe the types of situations where you have used web conferencing?

19. How would you rate the quality of the sound from the teleconference?
- ☐ Good
- ☐ Average
- ☐ Poor
20. How would you rate the quality of the picture on the computer screen?
- ☐ Good
- ☐ Average
- ☐ Poor
21. When the presenter was speaking to a particular PowerPoint slide, did you find that there was a delay until the slide was visible on your computer screen?
- ☐ Yes
- ☐ No
- ☐ Unsure

If Yes,

Can you please describe the delay experienced at your site?

22. Did any other aspect of the web conference detract from the Epi Info training for you?
- ☐ Yes
- ☐ No
23. What did you like most about participating in the Epi Info training via web conferencing?
-
-
24. What did you like least about participating in the Epi Info training via web conferencing?
-
-
25. Would you participate again in a web conference for a continuing professional development activity?
- ☐ Yes
- ☐ No
- ☐ Unsure

If No,
Please explain

26. Are there any other comments you would like to make?

Thank you for taking the time to complete this evaluation.
The facilitator will collect the completed evaluation form from you.

Appendix 2. Questions for focus group

Thank you for agreeing to take part in this debrief on the web conferencing of Epi Info training. This afternoon we have five questions, which we would like to ask you regarding the utility of web conferencing. We would like to run this focus group as a discussion.

If no one has any objections we would also like to record this focus group.

1. What are your overall impressions of today's training?
2. Did you experience any difficulties with organising this session?
 - a. Did you experience any difficulties with using the web conference?
3. From what you observed today, do you think it would be worthwhile to rollout Epi Info across the state using web conferencing?
4. From your observations today, can you see any other potential applications of web conferencing in your work?
5. From your observations today, do you think web conferencing would be useful to deliver continuing professional development activities to your staff?

The re-evaluation of the use of videoconferencing to deliver the Bug Breakfast, December 2004

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implementation of these recommendations had changed the quality of the learning environments.

Eleven sites were requested to participate in the session and all were successfully connected. Eight sites elected to receive the session via videoconference and three requested an audio transmission only, which was also delivered through the videoconferencing system. All sites participated in the evaluation. The audience comprised: 41 people at the live site and 57 people between the remote sites. The overall response rate to the questionnaire was 91%.

Executive summary

Bug Breakfast is a continuing professional development activity for the multidisciplinary public health workforce in NSW. It is a series of seminars of one-hour duration about communicable diseases that are delivered by the NSW Department of Health approximately 11 times a year. Since 1999, the Bug Breakfast has been videoconferenced through the resources of the NSW Telehealth Initiative to up to 19 remote sites across NSW to enable the participation of rural public health practitioners. This report presents the results of a 2004 evaluation of the videoconferencing of the Bug Breakfast to assess the effect of implementing a range of recommendations intended to improve the quality of the learning experience of participants at both the live and remote sites.

2002 Evaluation

In July 2002, the videoconferencing of Bug Breakfast was first evaluated to document the quality of the delivery and identify ways to improve the learning environment. Participants described recurrent problems, which included the size of the room at the live site and, for the remote sites, the quality of the sound. A series of recommendations to improve delivery were published as part of the report describing the evaluation. These were systematically implemented.

2004 Evaluation

In December 2004, the videoconferencing of the Bug Breakfast was re-evaluated to assess whether the

Live site participants at North Sydney primarily occupied public health roles, whereas the remote audience had roughly equal proportions of clinical and public health professionals. The combined remote audience was larger than the live audience.

The North Sydney audience were satisfied with the layout of the rooms for the delivery of the session and offered few comments regarding the potential for further improvement. The majority of the remote site audience reported that the picture and sound quality was either good or average. These findings demonstrate that the actions taken to improve the delivery at the live site and the transmission of sound to the remote sites had improved the quality of the learning environment for both audiences. All participants valued the Bug Breakfast: as a forum for learning and sharing of up-to-date information; for providing access to a range of communicable disease topics; and for the opportunity to network with colleagues across NSW.

The Bug Breakfast provides a model for applying videoconferencing to the communication and professional development needs of the public health workforce. Remote practitioners value videoconferencing because it allows them the opportunity to participate in this continuing professional development activity.

Since this evaluation further actions have been taken to refine this model of delivery.

Background

Bug Breakfast is a series of hour-long breakfast seminars that have been delivered since 1990 by the Population Health Division at the NSW Department of Health. Held once a month, each session examines the public health aspects of a communicable disease of current relevance. Since 1999, these sessions have been made accessible to a wider audience located at rural sites across NSW by videoconferencing through the resources of the NSW Telehealth Initiative.

In July 2002, an evaluation of the videoconferencing of the Bug Breakfast was undertaken to assess the quality of the delivery at both the live and remote sites and to identify ways to enhance the learning environment for all participants. The findings highlighted consistent problems experienced by the remote audience, in particular with the quality of the sound, while the venue used to deliver the live presentation at North Sydney was no longer large enough to accommodate the growing audience.

A series of recommendations to improve the delivery were subsequently outlined in the report *'An evaluation of videoconferencing Bug Breakfast'*.¹ Through the collaboration of the Department's Telehealth Unit and the Public Health Training and Development Branch many recommendations were promptly actioned. For example, the delivery of Bug Breakfast was moved to a larger suite of conference rooms at the NSW Department of Health in North Sydney to allow the session to be presented in a theatre style. This arrangement provides the live site audience at North Sydney with significantly improved accommodation. It also reduces the ambient noise in the delivery of the session because presenters now use a lectern with a directional microphone.

A working party comprising representatives from the Communicable Diseases Branch, the Public Health Training and Development Branch and the NSW Public Health Unit Directors Forum was convened to determine actions to address the remaining recommendations.

This evaluation was undertaken to reassess the quality of the learning experience for the audience at the live and remote sites. It sought to determine whether the implementation of the recommendations from the 2002 evaluation had resulted in improvements to the learning environments for both audiences. Table 1 summarises the action that had been taken to implement each recommendation at the time of the re-evaluation.

Method

The December 2004 session of Bug Breakfast was evaluated. The session was entitled 'The Rash: A current investigation of an outbreak among methadone users'.

The evaluation was implemented at short notice as an amalgamation of the area health services in NSW was planned for January 2005. The immediate effect of these changes on the delivery of Bug Breakfast was unknown

and we sought to ensure that the environment for the re-evaluation closely resembled that of the evaluation in 2002.

Delivery procedures

The procedure for delivering Bug Breakfast was:

- the live site was the suite of conference rooms (Kurraba, Taronga and Tumbalong) at the NSW Department of Health, North Sydney
- the session was advertised by email to staff within the Population Health Division at the NSW Department of Health, to the public health units within the area health services of NSW and to a small number of public health professionals working in other organisations e.g. Work Cover, University of Sydney and Department of Defence
- Trainee Public Health Officers from the NSW Public Health Officer Training Program assisted with the organisation and delivery of the session
- the videoconference was coordinated by the NSW Telehealth Initiative
- Telstra Conferencing was the external provider who dialled the sites and provided the bridge
- the connection speed was 256 kbps (medium bandwidth)
- the videoconference was 'voice activated'
- the session was one hour long
- there were three presenters with a question and answer session at the conclusion of the presentations
- electronic copies of the PowerPoint presentations were supplied by the presenters and distributed in advance by email to the remote sites
- at each remote site a person within the public health unit acted as a facilitator and was responsible for: promoting the Bug Breakfast session locally; and receiving and distributing copies of the PowerPoint presentations.

The usual procedure is for the PowerPoint presentations to be loaded onto a laptop that is connected to the videoconferencing system. This allows the presentations to be digitally transmitted directly to the remote sites. The PowerPoint slides appear on the screen of the remote sites videoconferencing unit accompanied by the presenters' voice.

On the day of the evaluation the PowerPoint presentations were unable to be loaded onto the laptop. So, to enable the remote sites to view the slides, the camera at the live site videoconferencing unit was focused on the screen where the presentations were being projected for the live site audience. Consequently, remote sites were able to view either the presenter or the slides on their screen, which was managed by the North Sydney site.

Eleven remote sites requested a connection to the session. Of these, eight sites elected to receive the session via

Table 1. Summary of the outcomes of recommendations arising from the 2002 evaluation of Bug Breakfast at the time of the re-evaluation

Recommendation	Outcome at December 2004
<i>Future directions</i>	
1. Review the role and purpose of Bug Breakfast	Principal role and purpose confirmed as: meeting the training needs of Trainee Public Health Officers of the NSW Public Health Officer Training Program
2. Consider requests by remote sites to be connected	Eleven remote sites connect with some capacity for expansion
3. Repeat the evaluation	Re-evaluation carried out in December 2004
<i>Presenters</i>	
4. Develop a guideline for presenters on Bug Breakfast	Standardised letter provided to all presenters that includes a statement of purpose
5. Develop a template for PowerPoint presentations	Standardised letter provided to all presenters includes advice on the background and font size to be used in PowerPoint presentations
<i>Facilitators at remote sites</i>	
6. Develop a guideline describing the role of the facilitator	The role of the facilitator to be confirmed at a public health directors' meeting
7. Remind remote sites of the protocol for muting microphones	Chair reminds remote sites at the beginning of each session
8. Seek regular feedback from the facilitators at remote sites	Informal feedback is provided to the Public Health Training and Development Branch following each session
<i>Delivery</i>	
9. Provide a regular time slot for Bug Breakfast to assist remote sites booking facilities	Schedule of sessions now made available at the start of each calendar year
10. Explore ways of improving the delivery of the session	Lectern stand and directional microphone are used by presenters and a hand-held microphone is used by audience members during question time
11. Review the organisation of the question and answer session	A more efficient method of collating questions from remote sites has not yet been identified
<i>Training</i>	
12. Provide training in the use of videoconferencing equipment to the Trainee Public Health Officers	Training is routinely provided for all Trainee Public Health Officers
13. Incorporate Bug Breakfast into Telehealth Coordinators training	Results of the evaluation were addressed at the annual workshop for site coordinators and also at the state project managers meeting. Copies of the published report were distributed
<i>Communication</i>	
14. Communicate the results of the evaluation to relevant public health and Telehealth groups	Results published as a supplement to the <i>NSW Public Health Bulletin</i> 'An evaluation of videoconferencing Bug Breakfast'. ¹ This report has been widely circulated

videoconference and three sites (Bathurst, Liverpool and Wallsend) requested an audio transmission only. The audio transmission was also delivered through the videoconferencing system. All eleven sites were successfully connected on the morning.

Survey design

The evaluation in 2002 included four groups: the participants; the Bug Breakfast facilitators at each remote site; those involved in organising the session; and the presenters. As the purpose of the 2004 re-evaluation was to determine any perceived changes to the quality of the learning environments at the live and remote sites, only the participants were surveyed on this occasion.

Participant questionnaires

The two questionnaires (one for the live site participants and one for the remote site participants) developed for the 2002 evaluation were slightly modified for the 2004 evaluation. Questions that were included in the 2002 questionnaires that explored issues other than the learning environment were removed. For example, information about travel times to venues was not collected. Otherwise, the questions remained the same to allow comparison.

A copy of the questionnaires used in the 2004 evaluation is included in Appendices 1 and 2. The questionnaires were administered in the same way as in 2002.¹ At the beginning of the session, the chair advised the audience

that the session would be evaluated at the end of the transmission and sought the cooperation of the audience. Participation was voluntary. The questionnaires were distributed and collected at the end of the session at all sites.

Facilitators at each remote site assisted by:

- counting the number of participants at their site
- distributing the questionnaires
- collecting the completed questionnaires
- sending the questionnaires to the investigators at North Sydney.

Analysis

Responses were entered into a Microsoft Access database and then imported into SAS (version 8.02) for analysis. A quantitative analysis was carried out for the close-ended responses. The responses to the open ended questions and the interviews were analysed for major themes.

Results

There were 47 people present at the live site in North Sydney. Of these, six – the three investigators and three presenters – were not required to complete a questionnaire. There were a total of 57 participants at the 11 remote sites. In addition, two people who are regular participants of Bug Breakfast but who were unable to attend this session – one from Albury and one from Port Macquarie – provided feedback based on their previous experience. While they have not been included in the response rate for the remote sites, issues raised in their responses are included in the discussion.

Response rates

A total of 89 participants completed a questionnaire, a response rate of 91%. The number of people attending the session and the number of participant responses from each location are presented in Table 2. The response rates from the remote sites and the North Sydney site were 96% and 83%, respectively.

Profile of participants

The age and gender of the respondents is presented in Table 3. The North Sydney audience had almost equal representation of men and women. The remote audience contained more women and was older compared to the North Sydney audience.

The North Sydney audience were primarily engaged in public health roles, whereas the remote sites had similar proportions of clinical and public health professionals (see Table 4). Fifty-six per cent ($n = 19$) of the North Sydney audience were involved with training in some role, either with delivery or as a trainee. This compared with 7% for the remote audience. The North Sydney audience included trainees from programs including the NSW Public Health Officer Training Program, the NSW Biostatistical Officer

Table 2. Number of participants and the number of responses for all sites that participated in the Bug Breakfast evaluation, 2004

Location of site	Participants (n)	Responses (n)
Live site		
North Sydney	41	34
Remote site		
Broken Hill	11	10
Wallsend*	8	7
Dubbo	6	6
Lismore	6	6
Queanbeyan	6	6
Illawarra	5	5
Goulburn	4	4
Port Macquarie	4	4
Bathurst*	3	3
Tamworth	3	3
Liverpool*	1	1
Total remote	57	55
Total all sites	98	89

*Audio site.

Table 3. Age and gender of participants by site in the Bug Breakfast evaluation, 2004

	North Sydney – Live site		All remote sites	
	n	%	n	%
Gender				
Male	16	47	16	29
Female	18	53	39	71
Age groups				
20–29	4	12	5	9
30–39	17	50	8	15
40–49	10	29	27	49
50–59	1	3	11	20
60–69	1	3	2	4
Not stated	1	3	2	4

Training Program and the Advanced Training Scheme offered by the Australasian Faculty of Public Health Medicine.

Eighty-two per cent of the North Sydney audience had previously attended Bug Breakfast compared with 62% of remote participants.

Videoconferencing technology

Thirty-one per cent ($n = 17$) of remote site participants indicated that the videoconferencing technology hindered their learning experience compared to only 6% ($n = 2$) of the participants from North Sydney. Comments were provided by 22 respondents from the remote audience and

Table 4. Type of job and core role within job of participants by site in the Bug Breakfast evaluation, 2004

	North Sydney – Live site		All remote sites	
	<i>n</i>	%	<i>n</i>	%
Position				
Public health	31	91	29	53
Clinical	0	0	22	40
Other – Not stated	3	9	4	7
Responsibility				
Training	19	56	4	7
Drug and alcohol	3	9	17	31
Communicable diseases	3	9	16	29
Immunisation	0	0	2	4
Other – Not stated	9	26	16	29

these were primarily related to dissatisfaction with the sound ($n = 6$) and the picture quality ($n = 10$).

Questions only asked of live site participants

The layout of the suite of rooms at the North Sydney site for the transmission of Bug Breakfast was reported to be satisfactory by 97% ($n = 33$) of the audience at North Sydney. Three per cent ($n = 1$) of respondents, however, reported that the environment hindered their learning experience.

Seventy-six per cent of respondents indicated that sufficient time was allowed for questions. Comments were elicited from 10 participants; of these, six requested that additional time should be allocated for questions.

Questions only asked of remote site participants

Of the 34 remote site participants who had previously attended a Bug Breakfast, 25 (74%) indicated that the videoconferencing quality of the session was typical.

Twenty-one participants (62%) reported technical problems ‘sometimes’ occurred, whereas seven participants reported that they occurred ‘frequently’.

The majority of remote site participants reported that the sound quality was either ‘good’ or ‘average’ (Table 5).

Of the eight remote sites that received the picture and audio broadcast through the videoconferencing system, the majority of remote site participants reported the picture quality as either ‘good’ or ‘average’ (Table 6).

Seventy-six per cent ($n = 42$) of participants reported having access to a copy of the PowerPoint presentation prior to the session.

Participation in previous evaluation

Seventeen per cent of participants ($n = 15$) recalled taking part in the previous evaluation in 2002. Participants were

Table 5. Sound quality reported by remote site participants attending Bug Breakfast videoconference, 2004

Sound quality	All remote sites	
	<i>n</i>	%
Good	16	29
Average	30	55
Poor	9	16

Table 6. Picture quality reported by remote site participants attending Bug Breakfast videoconference, 2004

Picture quality	Remote sites	
	<i>n</i>	%
Good	16	36
Average	26	59
Poor	2	5

asked to recall any changes that they had observed in the delivery of Bug Breakfast since the initial evaluation. Comments were elicited from 15 participants, with the North Sydney audience citing improvements in the venue ($n = 4$) and the remote audience citing improvements with the delivery through the technology ($n = 3$).

Most liked aspects of Bug Breakfast

Participants were asked what they liked most about attending Bug Breakfast. This elicited 33 and 52 responses from the live and remote sites respectively. The things they liked were: learning and sharing of information ($n = 30$); up-to-date information ($n = 16$); range of communicable disease topics ($n = 10$); and networking ($n = 7$).

Least liked aspects of Bug Breakfast

Participants were asked what they least liked about attending Bug Breakfast. The nature of the responses from the North Sydney and remote sites differed. Five participants

Table 7. Summary of findings regarding changes made to the delivery of Bug Breakfast from the 2002 and 2004 evaluations for the live site participants

	2002 evaluation		2004 evaluation	
	<i>n</i>	%	<i>n</i>	%
Learning experience hindered by videoconferencing technology	13	29	2	6
Learning experience hindered by room layout	22	49	1	3
Insufficient time for questions	30	67	7	21

from North Sydney disliked the early start at 8.30am, whereas the remote audience cited technical problems ($n = 12$) and poor sound quality ($n = 6$).

Comparison of results from 2004 with 2002 findings

The response rate to this evaluation compares favourably with the response rate for the 2002 evaluation (93%) and allows broad comparisons to be made between the findings.

Live site

The 2004 evaluation showed that participants at North Sydney were satisfied with the new venue and other changes made to the delivery (Table 7). In 2002, half the audience felt that the environment hindered learning and in 2004 only one person felt this.

On both occasions, there was dissatisfaction with the amount of time available for questions (Table 7). Comments in 2004 included 'would like more time for questions' and 'remote sites get too much preference'.

The videoconference is allocated one hour and does not extend beyond this. Fifteen minutes is allowed at the end of the session for questions and, consequently, if the presentations encroach upon this, question time is reduced. Further questions from the live site are invited after questions are taken from the remote sites. This evaluation confirmed that the participants value the opportunity to ask questions and that question time should be protected within the session.

Remote sites

Quality of the sound

Table 8 presents the remote audience ratings for sound quality from both evaluations. In 2002, the quality of the sound for the broadcast was reported as 'poor' by most remote site participants.¹ In 2004, 16% of remote site participants reported 'poor' sound quality, suggesting that the wide range of interventions had improved the quality of the sound for the majority. Poor sound quality was randomly reported across the remote sites, a finding that was difficult to interpret.

Since the 2002 evaluation, before each session begins, the speakers are routinely reminded to speak into the

Table 8. Summary of findings for picture and sound quality from the 2002 and 2004 evaluations of Bug Breakfast for remote sites

	2002 evaluation		2004 evaluation	
	<i>n</i>	%	<i>n</i>	%
Picture quality				
Good	11	25	16	36
Average	31	69	26	59
Poor	2	4	2	5
Not stated	1	2	–	–
Total	45		44	
Sound quality				
Good	1	2	16	29
Average	10	22	30	55
Poor	33	74	9	16
Not stated	1	2	–	–
Total	45		55	

microphone located on the lectern to improve the transmission of the audio for remote site participants. A laptop is placed on the lectern so that speakers can read their slides while looking towards the camera and speaking into the microphone. However, audio fading can occur when presenters turn away from the lectern to look at their presentation on the screen that is behind them or if they move away from the lectern while speaking.

Quality of the picture

The picture quality was reported as either 'good' or 'average' by 95% of the remote audience, similar to the results from the 2002 evaluation (Table 8).¹ This finding was surprising, as we had expected that the picture quality of the PowerPoint presentation would be suboptimal on the day of the evaluation as the usual procedure for delivering the PowerPoint presentation could not be followed. The set up followed usually results in a poorer picture quality of the presentation for remote sites due to the movement of the screen and the light from the data projector.

The picture quality of the PowerPoint presentations is also influenced by the style and format used by the presenter.

It is difficult for remote audiences to distinguish text on PowerPoint presentations that use complex backgrounds, particularly on this occasion with the set-up of the camera on the projected screen.

Nature of the audience

The session topic, the investigation of an outbreak of a rash in methadone users that was underway at that time, was of particular interest to the drug and alcohol workforce. Among the audience at the remote sites, one-third identified their main workforce responsibility as 'drug and alcohol' compared with 10% of the North Sydney audience. Members of the drug and alcohol workforce are not regular attendees of Bug Breakfast and this finding suggests that the Bug Breakfast audience is not static and attendance is influenced by the session topic. For example, the 2002 Bug Breakfast topic was Meningococcal Disease and this was of interest to health professionals responsible for immunisation and communicable diseases.

There is, however, a core group of participants who attend regularly. In this evaluation, 72% of participants reported that they had previously attended a Bug Breakfast session; this was similar to the findings in the 2002 evaluation. Despite the high number of participants previously reporting attending a Bug Breakfast session, only 17% of participants could recall taking part in the 2002 evaluation. However, participants that reported participating in the earlier evaluation were able to identify the changes that had been implemented to improve the delivery.

Growth in number of sites requesting a connection

The Centre for Health Protection at the NSW Department of Health provides the financial assistance that allows Bug Breakfast to be videoconferenced.

Connections to the rural area health services have been limited to one site in each area and this number is restricted by cost. However, the expanding interest in Bug Breakfast has resulted in numerous requests for additional sites to connect. For the 2002 evaluation, 10 sites requested a connection, in 2004 the maximum number of sites that were dialled out to was 11.

To meet the request by additional sites to join, sites have recently been offered the option of dialling into the session. However, the number of dial in and dial out sites taking part in Bug Breakfast has been closely monitored, as the maximum number of sites that can be linked by a single videoconference bridge is 20. While it is possible to link multiple bridges, this can affect the stability and quality of the connection for all participants.

Value of participation

Overall, participants supported Bug Breakfast as a professional development activity for the delivery of communicable diseases information. Participants enjoyed receiving

'up to date current information' and found 'videoconferencing a useful tool to communicate with distance audiences'. Remote site participants valued the opportunity to participate and referred to the program as an essential part of professional development for public health professionals residing in rural areas of NSW. For the 2002 evaluation, participants provided detailed comments on the delivery, whereas there were few comments in this evaluation. This may reflect a general satisfaction with the improved quality of delivery of the Bug Breakfast session.

Conclusion

This evaluation of the videoconferencing of Bug Breakfast confirmed the findings from the 2002 evaluation that the public health workforce values Bug Breakfast as a continuing professional development activity. This finding is reflected in the continuing demand from new sites to join the session. The implementation of the recommendations following the 2002 evaluation has resulted in improvements in the quality of the learning experience for both the live site and remote participants, with both audiences reporting high satisfaction with sound and picture quality. Issues remain regarding protecting time for questions and determining the number of sites that it is feasible to connect to a Bug Breakfast seminar.

The NSW Telehealth Initiative has enabled Bug Breakfast to be regularly and continuously delivered via videoconferencing to public health professionals working in rural and remote New South Wales for nine years. The findings of this evaluation demonstrate that it is possible to progressively improve the quality of the delivery of training via videoconferencing through cycles of quality review.

Outcomes

Since the evaluation, several actions have been carried out to improve the delivery of Bug Breakfast.

The Public Health Training and Development Branch has:

- briefed speakers on delivering presentations using videoconferencing
- developed a Bug Breakfast website on the NSW Health Intranet where facilitators register attendance of their remote site and are able to access copies of the speakers' presentations and provide feedback on the session
- established a generic email account for Bug Breakfast to provide a central point of contact for administration purposes
- included the Telehealth Helpdesk in the link up on occasions to observe and monitor technical configurations for quality assurance purposes
- accommodated additional sites as dial in sites
- published a *Bug Breakfast Delivery Manual* that describes how to deliver Bug Breakfast.²

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Bug Breakfast participants

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References

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2. Simpson D, Madden DL, Naylor CJ. Bug Breakfast Delivery Manual. Sydney: NSW Department of Health; 2007.

Appendix 1. Bug Breakfast Videoconferencing Evaluation North Sydney

Thank you for attending Bug Breakfast!

You are invited to fill in this evaluation on the videoconferencing of Bug Breakfast. Your responses will provide us with a better understanding of the usefulness of videoconferencing Bug Breakfast, and will assist us in improving the delivery. The survey will take approximately 5 minutes to complete.

1. Are you:
☐ Female
☐ Male

2. Your age group:
☐ 20–29
☐ 30–39
☐ 40–49
☐ 50–59
☐ 60–69

3. What is your job title? _____

4. What is your major role in this position?

5. Have you previously attended a Bug Breakfast?
☐ Yes
☐ No

6. Does any aspect of the use of videoconferencing technology hinder your learning experience?

☐ Yes

☐ No

Please explain_____

7. Does the layout of the room hinder your learning experience in any way?

☐ Yes

☐ No

Please explain_____

8. Do you feel sufficient time is allowed for questions, including the questions from the remote sites?

☐ Yes

☐ No

Please explain_____

9. What do you like most about participating in Bug Breakfast?

10. What do you like least about participating in Bug Breakfast?

11. Do you recall participating in the previous evaluation of Bug Breakfast (July 2002 session on ‘Meningococcal Disease’)?

- ☐ Yes
- ☐ No

If yes, how would you describe any changes that you have observed in the delivery of Bug Breakfast since then?

12. Are there any other comments you would like to make?

Thank you for taking the time to complete this evaluation.
The facilitator will collect from you the completed evaluation form.

Appendix 2. Bug Breakfast Videoconferencing Evaluation Remote Sites

Thank you for attending Bug Breakfast!

You are invited to fill in this evaluation on the videoconferencing of Bug Breakfast. Your responses will provide us with a better understanding of the usefulness of videoconferencing Bug Breakfast, and will assist us in improving the delivery. The survey will take approximately 5 minutes to complete.

1. Transmission site _____

2. Are you: ☐ Female
☐ Male

3. Your age group:
☐ 20–29
☐ 30–39
☐ 40–49
☐ 50–59
☐ 60–69

4. What is your job title? _____

5. What is your major role in this position?

6. Did you have access to a copy of the PowerPoint presentation prior to the session?

☐ Yes
☐ No

7. Have you previously attended a Bug Breakfast?

- ☐ Yes
- ☐ No (*please go to question 8*)

If Yes, was today typical of your experience of the videoconferencing quality?

- ☐ Yes
- ☐ No (*please go to question 8*)

If Yes, do technical problems interrupt the transmission?

- ☐ Never
- ☐ Sometimes
- ☐ Frequently

8. How would you rate the quality of the TV picture?

- ☐ Good
- ☐ Average
- ☐ Poor

9. How would you rate the quality of the sound?

- ☐ Good
- ☐ Average
- ☐ Poor

10. Does any other aspect of the videoconferencing technology hinder your learning experience?

- ☐ Yes
- ☐ No

Please explain_____

11. What do you like most about participating in Bug Breakfast?

12. What do you like least about participating in Bug Breakfast?

13. Do you recall participating in the previous evaluation of Bug Breakfast (July 2002 session on 'Meningococcal Disease')?

- ☐ Yes
☐ No

If yes, how would you describe any changes that you have observed in the delivery of Bug Breakfast since then?

14. Are there any other comments you would like to make?

Thank you for taking the time to complete this evaluation.
The facilitator will collect from you the completed evaluation
form.