e-health initiatives at Country Health SA Mental Health—"fostering collaboration and strengthening networks"

Niranjan Bidargaddi[1], Ken Fielke[1], T Freeman[1]
[1]Country Mental Health SA

Niranjan Bidargaddi is the Manger of Mental Health Research and Observatory Unit at Country Health South Australia, exploring range of e-health initiatives focused on overcoming access barriers to treatment as well as further development and evaluation of rural mental health services. He is guiding the development and implementation of an evidence-based mental health promotion, prevention and early intervention program for Country SA. Niranjan has previously worked on developing IT solutions for home based chronic disease management at the e-Health Research Centre, CSIRO. He has an undergraduate degree in Computer Science Engineering a received a PhD in Bioinformatics from Monash University in 2007. He has published over 30 scientific articles and project reports. He continues to provide advice in choosing appropriate technologies for client monitoring, evaluation of health services and measurement of outcomes.

Dr Ken Fielke is currently the Clinical Director of mental health services in Country Health SA. He is also the Chair of the SA State-wide Mental Health Network. He is committed to developing innovative service models to provide psychiatric care to the under-serviced and under-resourced areas of country South Australia. Ken is a fellow of both the RANZCP and RACGP and this dual background has enabled him to focus on developing models for the delivery of specialised psychiatric services in primary care using a consultation–liaison approach. He has also been keen to explore a range of e-health initiatives to overcome some of the barriers in delivering care over vast geographic areas in SA. Clinically he conducts outreach clinics to a number of rural and remote locations including the Aboriginal communities of Yalata and Oak Valley. In 2008 Ken was honoured with an OAM for his 'service to the communities of rural and remote South Australia through the delivery of mental health services and programs'.

Abstract

This paper provides an overview of country South Australia mental health service efforts in maximising the potential of Information and Communications Technology (ICT), to ensure that sustainable, high quality care reaches to all of our communities across rural and remote South Australia. Over the past decade, innovative use of video-conferencing in conjunction with consultation-liaison primary care psychiatry model has helped overcome vast distances, to address fragmented and poorly coordinated services. Country Health SA will begin by using the Digital Regions Initiative to upgrade its broadband infrastructure to form a statewide SA Health Digital Telehealth Network. This will enable implementation of various ICT applications and expansion of services, to maximise the benefits of the digital network.

We are currently trialling "real-time" interactive web based communication and networking technologies, such as wiki collaboration portals, and web conferencing, to facilitate "real-time" discussions amongst geographically isolated workforce. This has enabled staff to contribute to the further development of the service as well as to share clinical ideas and experiences with other networks across the state. Online tools are being used to facilitate ongoing educational and learning process—these tools are easily accessible and available on demand in more than one format. The potential of many of the technologies are well understood and exploited in other industries; Country Health SA (CHSA) is devising ways to overcome barriers to their widespread use in rural mental health services.

Background

In South Australia (SA), traditional strategies to overcome vast distances, link fragmented and poorly coordinated services, and recruiting and retaining a skilled, specialised workforce have so far failed. SA covers 1 million square kilometres, with a widely dispersed population and no city or town of greater than 25,000 people outside of Adelaide. There is still no resident psychiatrist in country SA which continues to rely heavily on General Practitioners to provide mental health care.

In the mid 90s, in some forums, mental health care in SA was described as a "disgrace". The estimated resident population of country South Australia, now of 469,609 people representing 29.6% of the South Australian population (according to 2006 ABS Census), receive little or no coordinated specialised mental health care.

However, in recent times SA has embraced the potential of e-Health initiatives, and over the past decade, high quality specialist input has been used to enhance local care by successfully embedding videoconferencing into our consultation—liaison "primary care psychiatry" model[1].

This is strengthened by a new Model of Care for Country Health Mental Health Services, which has laid the foundation stone for the formation of four mental health networks around populations of interest. Mainstream mental health services partner and collaborate with primary care, and the NGO sector, to provide a comprehensive suite of mental health services. This is underpinned by ICT and teleheath facilities. The networks are linked to an acute distance consultation and bed based service, located in metropolitan Adelaide at Glenside campus, which is considered one of the acute hub networks.

The original IDSN network, which was rolled out in 1996, is now obsolete. Image quality was deemed unsatisfactory for conducting reviews, particularly for the SA's new *Mental Health Act 2009*. The image quality, sound delay and "fuzziness" experienced with agitated and anxious patients no longer supports best practice. The ongoing use of 128 kbps posed significant medico legal risks and impacted on the accuracy of mental state assessments, diagnosis, treatment and on-going patient care.

Digital network

In 2009, Country Health SA was successful in receiving $2.5 million from the Digital Regions initiative, aimed at the improvement and extension of the remote consultation currently undertaken by CHSA Mental Health. This initiative aims to:

- upgrade existing analog video conferencing capability at Country Health SA sites to use the IP network
- increase video conferencing coverage to include Aboriginal communities
- deploy capability to support video conferencing to mobile devices (e.g. mobile phones)
- increase ability to bridge more than two sites into a video conference which may include end points external to the SA Health network
- increase bandwidth to support web 2.0 applications across networks.

The new video conferencing system allowed CHSA to satisfy the following usage scenarios:

- complete a mental health consultation between a mental health professional in Adelaide and a patient in a country location
- complete a mental health consultation between a mental health professional and patient in Adelaide and a community mental health team in a country location
- complete a mental health consultation between a mental health professional in Adelaide and a patient in an Aboriginal community health centre
- using mobile video services to complete a mental health consultation where a patient may be in their own home or where a consultant is not at a designated SA Health facility
- complete a remote consultation with a patient and be able to include the patient's GP into the call over the internet from the GP's surgery
- complete a Guardianship Board hearing between the Guardianship Board, a consultant located at Rural and Remote Mental Health Service and a country site.

This capability will increase the capacity to both expand the existing clinical services, as well as explore potentials of web 2.0 technologies in enhancing the workforce development, optimal deployment, collaboration, multimodal communication and consumer engagement with our services. In recent years, the web has become more interactive; most popular websites are now online applications which depend heavily on user participation to facilitate the creation and exchange of user generated content[2]. Web 2.0 applications

such as social networking (*facebook*, *myspace*), blogs (http://www.psychforums.com/living-with-mental-illness/, http://www.mentalhealthforum.com/), video sharing (*Youtube*), online health services (http://www.patientslikeme.com/) etc, are enhancing user experience and engagement, changing the way communication and networking occurs in a virtual environment. These technologies with their rich multimedia platform provide opportunities for traditional health care organisations to increase participation with clinicians, patients and laypersons[3,4].

Online collaboration portal for mental health networks

CHSA Mental Health Service has developed an online collaboration portal, using mediawiki to foster networking and more than one ways of real-time communication across networks. It encompasses a suite of online applications—blogs, group-calendars, group-announcements, group-forums, and shared file-storage. It supports both synchronous and asynchronous information exchange among country mental health workforce across four diverse networks.

A majority of the collaboration portal content is visible to all staff. In order to edit or modify the content, staff needs to be registered and authenticated. An IT administrator oversees registration and enforces editing privileges to a selected group of users based on topics (see Figure 1). Each registered user has an online profile detailing their institutional affiliation and credentials. Users with interest and expertise in a given topic oversee the content development for that area.

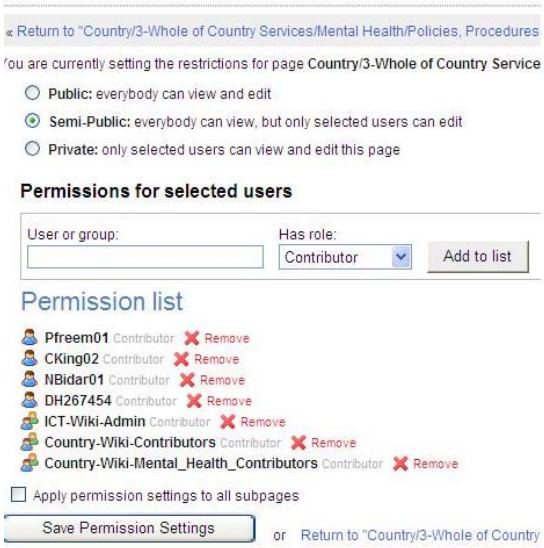

Figure 1 User permission settings

Users can edit the content of pages online through a web browser (in edit mode using standard MS Word features), provide feedback through the comments box, and receive alerts when changes are made to pages of their interest by other users (see Figure 2). In order to improve the quality of information in the portal, users can also rate the usefulness of a page on a given topic through a voting button (see Figure 2).

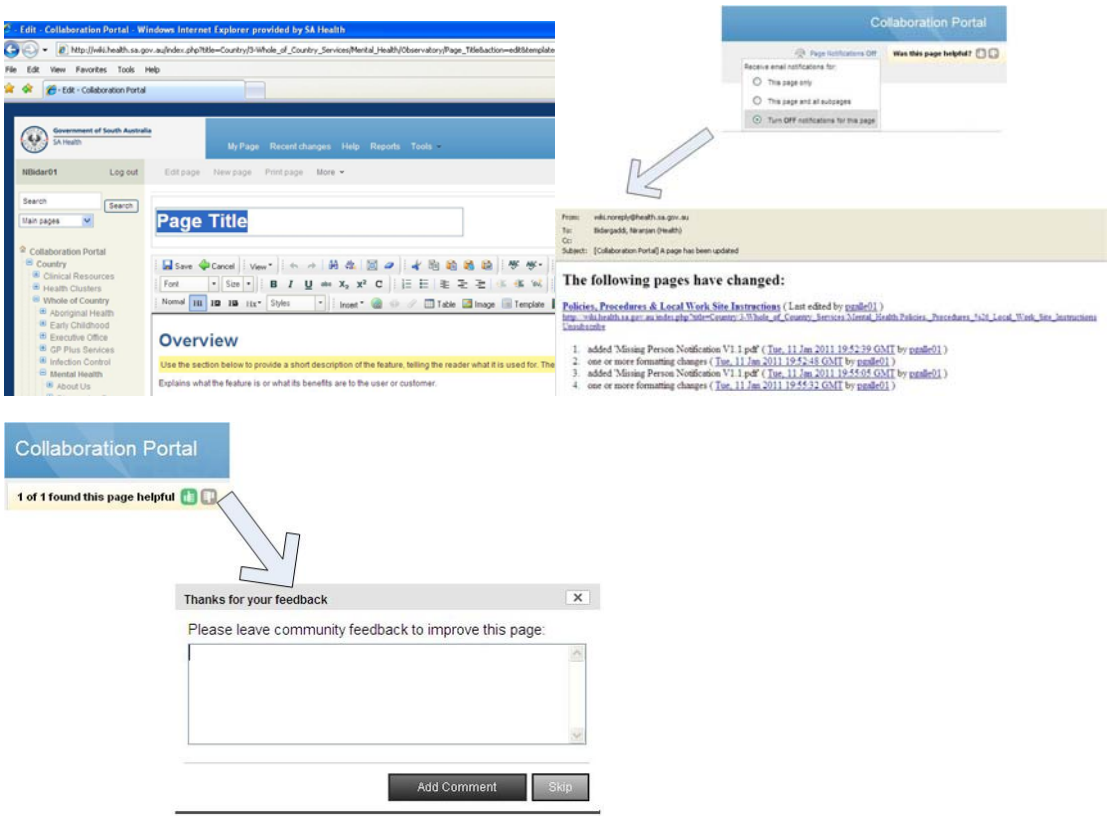

Figure 2 **Portal interactions; creating a new article (top left), receiving alerts for new posts (top right) and rating topics (bottom)**

A multitude of applications and utilities aimed at enhancing communication and networking has been developed through this collaboration portal. It has helped develop virtual communities of interest and is continuously evolving as a source for information and knowledge.

Source for information and knowledge

Through collaborative writing from users, pages in portal are continuously developed as a collective knowledge base, to serve as a replacement for traditional corporate Intranet.

In order to promote active learning, we have incorporated a repository of research activities, publications and presentations.

The portal is used to compile various community projects currently under way to manage and track the progress of projects, as well as facilitate collaborative information sharing between similar project groups.

As a maturing organisation committed to the monitoring and evaluation of its clinical and operational systems, establishing a workplace culture that embraces change through collaborative technologies is supporting development of a strong procedural framework, which translates the requirements of key legislation, national standards, evidence-based practice and government policy into service realities.

Through workplace redesign, the routing of procedures and local work site instructions through the wiki has mitigated problems associated with content and version control, and speeds up the consultation process. This emerging practice leads to greater responsibility and accountability by driving transparency, participation and ensures that the end product meets our needs. The wiki strengthens our connectivity and transfers useful knowledge in real time; providing increasing opportunities for staff to be engaged and feel empowered.

Expansion of the wiki portal functionalities into our workplace will enhance educative and learning environments, providing a platform for even further collaboration and sharing of knowledge, whilst supporting group interaction.

Communication

The wiki collaboration portal has transformed computer-mediated communications for our mental health workforce. It is used by Mental Health Directorate Executives to disseminate bulletins, weekly updates on critical projects, and receive feedback/response in real-time. The bulletins are made interactive, to receive feedback from our workforce. The feedback mechanism is engaging the front line clinicians to discuss and network on issues that support further development of services.

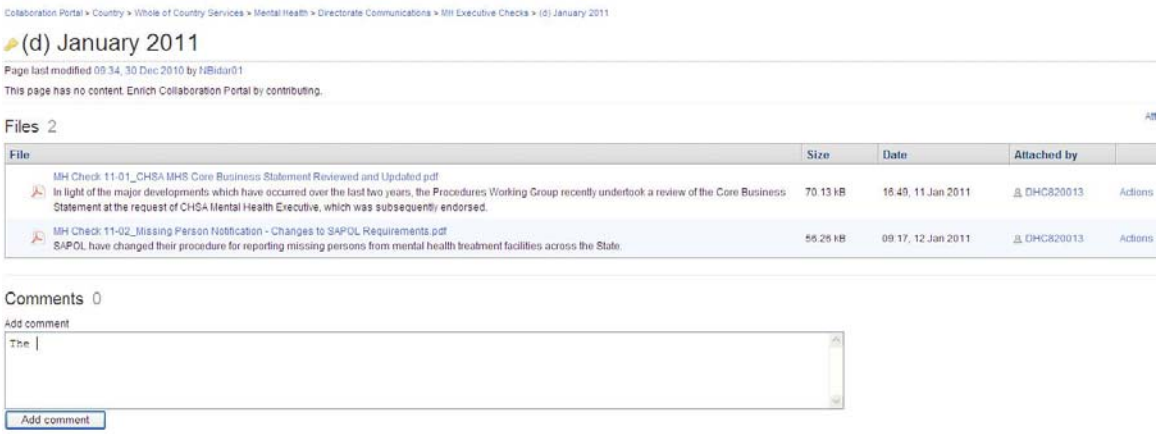

Figure 3 Interactive bulletins

The portal is linked to the web-based conferencing system, which has enabled geographically isolated clinicians to share presentations and images and communicate in real time. Through web meetings, care plans for a patient can be jointly reviewed and developed online by MH clinicians, GPs, NGO workers etc who are often from different organisations, located at some distance from each other, but involved in the shared care of patients. It is helping improve communication and collaboration between clinicians from different organisations, with many positive outcomes for providers, consumers and carers.

Education and supervision

Workforce development requires tools to support education, training and learning of our emerging rural and remote mental health workforce. We have incorporated podcasts and videocasts in the collaboration portal to ensure that training and learning resources are easily accessible, available on demand and in more than one format. Podcasts are audio files that are made available for download through the portal. A listener plays them through the inbuilt player in the portal. The video equivalent of a podcast is the ‘vodcast’. A major advantage of podcasts and videocasts on portal is that they can be listened to or viewed anywhere, at any time, leading to ‘mobile learning’ and flexibility of the times made available for education.

Figure 4 An example video presentation on collaboration portal

Processes are being developed to identify and support information creators to produce and distribute podcasts and videocasts that are also of interest to the broader community. To enhance the users learning experience, we are exploring the feasibility of embedding real time knowledge test questionnaires into the educational content on our portal. The portal was used to disseminate presentations on the new *Mental Health Act 2009,* and to promote the Mental Health Professional Online Development (MHPOD) trial (http://www.mhpod.gov.au/).

Online communities

Virtual web based communities have shown to be effective in bringing together participants from a range of settings, based on areas of interest[5]. We have developed several blogs in the collaboration portal. A blog is an online journal containing contributions from one person or a group of contributors. The contributions can be on various issues of interest, comments and feedback, links to other websites, videos and images on related issues. All posts are archived indexed by topics of discussion; where in the contributions by authors are sorted by date in reverse chronological order.

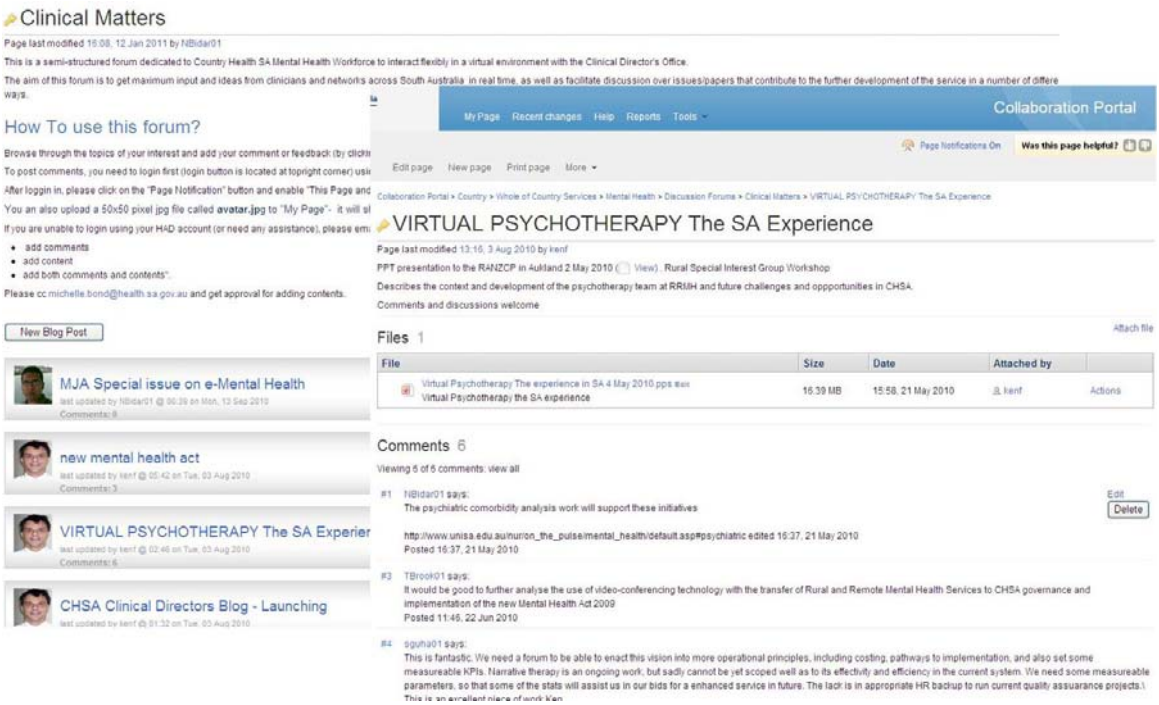

Figure 5 An example blog

Blogs have facilitated communication between country mental health workforce in "real time" on more than one topic of interest, thus acting as a networking tool for all country mental health workforce. The blogs have engaged frontline clinical workforce in reflection and debate on issues affecting service delivery. Staff can post new articles for discussion, as well as comment or provide feedback on already posted articles based on their areas of interest. If new articles are posted or a comment/feedback is posted on an existing article, all interested staff's are automatically notified by email. The workforce can set the notification options to subscribe only to those forums or blogs which are of interest to them. The blogs are structured around topics of interest, facilitating small virtual groupings of individuals from different regions, interested in co-constructing and sharing knowledge around a common topic within a community of practice. The discussions in these virtual communities are moderated by the relevant expert leading and supporting that group. Currently we have the following active groups in these domains:

- Clinical Matters—The information exchanged includes dispersing information regarding services, research clinical experiences, and opportunities within that community.
- Model of Care issues—Operational issues that affect networks.
- Older Persons Mental Health Service issues—Information relevant to development of older person's mental health services.
- Mental Health Professional Online Development (MHPOD)—Country Health SA was one of the pilot sites for the National e-Learning program. We developed a virtual community to facilitate collaboration and mutual support for participants involved in this online learning program. We have found that fostering virtual communities is critical to ensure the broader uptake of online e-learning initiatives.

There is untapped potential of these technologies for clinicians to support their continuing professional development. It can assist by establishing virtual communities of practice where advice and expertise, and even multi-media clinical elements, can be easily shared amongst clinicians. It creates learning opportunities by sharing with others and assists in keeping staff up to date with the latest advances in mental health. This is particularly useful for rural and remote clinicians who are isolated from opportunities in the typical urban clinical centres of excellence (eg. access to libraries, journal clubs, grant rounds, peer review and other forms of feedback).

Future directions

The continued roll out of the IP network has provided Country Health with a wider platform to explore the potential of various web 2.0 ICT applications and technologies in addressing the geographical barriers faced by rural health services and workforce.

Blogs, remote presentations, videocasts and audiocasts have great potential to improve the e-learning capabilities of our rural and remote mental health workforce.

While the collaboration portal has been a very effective communication and networking tool for country mental health workforce across geographically disperse networks, its potential can be further enhanced by rolling it out to NGOs and primary care networks. We believe this would strengthen the alliance and collaborations between various sectors translating to better outcomes for people with mental health issues.

Evidence is growing that sociable interactive technologies can augment patients and older peoples sense of connectedness and belonging, something denied to those separated by the tyranny of distance, or confined to home through illness or fear. In rural communities there has also been a growing familiarity with web technologies, including in the elderly, challenging the beliefs that web technologies are beyond their grasp. Technologies such as *Skype* and *facebook* are widely used and are becoming simpler and cheaper, with potential to be incorporated into clinical care.

Adding a consumer interface provides opportunities for policy makers to gather information about patient experiences which could be utilised as part of health care decision-making[6]. CHSA Mental Health Service is currently in the process of developing support groups moderated by consumers who have recovered (experts by experience). We are also exploring an online resource portal for rural cancer patients who have psychosocial needs, guiding them to pathways, information and ease of access to appropriate resources.

In order to realise the full potential of "web 2.0", it is important that the workforce become comfortable with the actual technology. Training and ongoing support is critical in the initial stages to ensure that it is seen to improve work practice, potentially reduce administrative work load (eg travel time), remove duplication of effort, and enhance patient outcomes. In our experience the degree of uptake depends on identifying a core group within the workforce who have an interest in technology and knowledge base, and training them up to be local champions.

Ultimately embracing "web 2.0" has enormous potential not only as a technology, but as a powerful tool to underpin services to rural and remote communities, and for staff who deliver the care.

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