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TRAINING COMMUNITY HEALTH WORKERS: USING TECHNOLOGY AND DISTANCE EDUCATION

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DEFINITION OF FRONTIER

Note: All references to "frontier" use the Consensus Definition of the Frontier Education Center unless otherwise indicated. Counties and/or frontier areas so defined have been developed with the involvement of all of the relevant State Offices of Rural Health (100% response rate). This definition has not been adopted by any Federal programs but has been adopted as policy by the Western Governors' Association and the National Rural Health Association. The Consensus Definition weights three elements - population density, distance in miles and travel time in minutes - which together, generally describe the geographic isolation of frontier communities from market and/or service centers. The Center understands that various programs will establish their own programmatic definitions and eligibility criteria.

TRAINING COMMUNITY HEALTH WORKERS: USING TECHNOLOGY AND DISTANCE EDUCATION

EXECUTIVE SUMMARY

Dedicated community members - volunteer or paid - are often the glue that holds the local frontier heath care system together. Some are Community Health Workers (CHWs), caring community members with levels of training that vary from location to location. Depending on the organization they work with, they will have different roles and responsibilities ranging from providing direct services, health education, emotional support and patient advocacy, and intake and referral to higher levels of care.

These providers are often unable to leave their home community for training and education. In response to their travel challenges, education and training programs are more frequently using technology to bring training opportunities into the community.

- Investment in technological infrastructure is necessary.
- Faculty must be supported to increase their cultural competence as well as their comfort with new technologies for distance education.
- Students must be supported to increase expertise with both their complex provider role as well as new technologies.
- Existing quality standards for distance education should be adapted to assure their appropriateness for frontier education programs.
- Current and emerging models of frontier training should be evaluated using appropriate standards and realistically achievable competencies.

TRAINING COMMUNITY HEALTH WORKERS: USING TECHNOLOGY AND DISTANCE EDUCATION

I. INTRODUCTION

Community Health Workers (CHW) play a pivotal role in meeting the health care needs of frontier communities. These essential community providers work under many labels, including Community Health Worker, Community Health Advisor (CHA), Promotora, ayudante, and other locality-specific titles. This paper will use term Community Health Worker (or CHW) as an umbrella term, except where specific sources use a different term.

Community Health Workers help increase access to health services (particularly among racial and ethnic minority groups), improve quality of care, reduce health care costs, and contribute to broader social and community development (Witmer et al, 1995). As "in-between people," CHWs "draw on their insider status and understanding to act as culture and language brokers between their own community and systems of care (Satterfield et al, 2002; Love et al., 2004, p. 418)."

Although CHWs are not always accepted by the medical establishment, a number of key organizations support the development of CHW programs, including The American Public Health Association (2002), the Centers for Disease Control and Prevention (2005), and the National Rural Health Association (2000). The Pew Health Professions Commission recommended in its 1998 report Recreating Health Professional Practice for a New Century that public health schools, programs and departments focus some of their resources on training lay health workers and community residents to understand the mission of public health and equip them in basic competence to achieve this mission (Oneill, 1998).

CHWs may be known by many different titles, may be paid or unpaid/volunteer, and have varying levels of job-related education and/or training. According to the National Rural Health Association, "the most significant commonalities of CHA programs are that:

- they are focused on reaching hard-to-reach populations;

Despite the importance of CHWs, the challenges of providing them with high-quality training opportunities can be problematic. In an issue paper on community health advisors, the National Rural Health Association (NRHA) states, "training of CHAs is variable in terms of quality and content" and considers it to be a major challenge to community health advisor programs (National Rural Health Association, 2000).

In frontier communities, training challenges include limited infrastructure, distance from population and technological centers, cultural and social norms that sometimes resist even positive change, and the high turnover of key staff. Use of information and communication technologies (ICT) and distance education modalities are a promising strategy for improving training of CHWs and thus the quality of care provided within frontier communities.

A. Training Community Health Workers

CHWs are organized (or employed) within a number of types of organizations: community-based non-profit organizations, public health departments, and national organizations. Training can be formal or non-formal, occur as pre-employment education or on-the-job training, or self-taught. Because the varied and disparate nature of CHW training is thought to contribute to a certain lack of respect within the health professions, as well as a lack of sustainability in terms of funding programs, there is a movement to formalize and standardize basic training within institutions of higher education.

In a 1998 National Community Health Advisor study, CHWs and their program managers identified a set of essential core roles and competencies (Rosenthal et al, 1998). The seven 'core roles' identified by the national study are:

- Cultural mediation between communities and health and human services systems
- Informal counseling and social support
- Providing culturally appropriate health education
- Advocating for individual and community needs
- Assuring people get the services they need
- Building individual and community capacity
- Providing direct services

Rosenthal and colleagues also identified eight core skill clusters including (in order of frequency cited) communication skills, interpersonal skills, knowledge base, service coordination skills, capacity skills, advocacy skills, teaching skills and organizational skills. Clearly the roles played and skills needed by CHWs are complex and multi-dimensional.

As a relatively new "occupation" however, formalized CHW education programs have only recently been developed. Most CHWs receive on-the-job training that targets narrow program objectives. Community Health Works, jointly sponsored by City

states (Alaska, Indiana and Texas) have systematic, state-sponsored certification programs, and seven others (Arizona, California, Kentucky, Massachusetts, Nevada, New Mexico, and Ohio) were considering state-level certification.

Because of CHWs' "in-between" role, there is some tension between those calling to professionalize CHWs as members of the healthcare workforce, and the need to preserve the characteristics that make CHWs effective within the community. Sustainability of CHW programs depends on improved recognition of and respect for CHWs within the health services community; advanced education which socializes and places the CHW within the biomedical community can accomplish this goal. However, "...displacing natural CHW skills and experiential knowledge with the biomedical health system's values and methods may undermine their effectiveness within their communities (Love et al, 2004 p. 419; see also Witmer et al, 1995)." Educational philosophy will influence not only the content of CHW curricula, but the educational model selected to develop the competencies of CHWs. To accomplish both objectives, the Community Health Works' CHW certificate program in San Francisco selected a combined pedagogical approach: a performance-based approach to certification in combination with a popular education model. Through this combination, "CHWs learn to bridge the often-disparate worlds of their communities, and the professional health care system, while maintaining their facility and credibility within both" (Love et al, 2004).

B. Challenges of Training in the Frontier

Frontier advocates and trainers are very familiar with the realities of educating truly remote service providers. Challenges include the tremendous cost of travel to regional training hubs and resistance to relocating, even temporarily for such training. Yet institutions of higher education are few and far-between in frontier areas. These training challenges have led to an increased reliance on distance education and technology. As a recent report on the rural health workforce noted, "Distance education is a proliferating response to the demands of rural-based students to obtain in-place education" (Addressing the Nursing Shortage, Frontier Education Center, 2004, p. 15).

The possibility that appropriate distance education provided to community health workers may actually increase the quality of care to frontier residents is the driving force behind some of the most innovative models of technology use in frontier regions. Such goals are consistent with the emphasis on quality of care that is at the heart of the new Institute of Medicine Report Quality Through Collaboration: The Future of Rural Health (IOM, 2005). As Dr. Wayne Myers, former Director of the Federal Office of Rural Health Policy and past President of the National Rural Health Association notes, this new and influential report "recognizes the potential for distance education to help train health personnel in smaller towns, capitalizing on the strengths of place-committed local students (Myers, 2005)."

Internet access in rural communities. Frontier and rural communities are less likely to have access to the internet, affordable internet, or high-speed internet connections

included:

- Less choice of internet service provider (ISP): more rural respondents (29%) reported using the only ISP available to them, compared with suburban (9%) and urban (7%) users.
- Rural respondents reported lower broadband use than others. Between 2000-2003, the home use of broadband increased from 8-36% among urban respondents, 7-32% among suburban respondents, and 3-19% among rural respondents.
- In 2002, 25% of rural respondents reported that broadband was not available to them (compared with 5% and 10% among urban and suburban respondents).
- More rural internet users (9%) than urban (5%) or suburban (3%) users are dependent on internet access outside of home or work
- More rural users reported "mixed feelings" towards computers and ICTs (50%) than urban (32%) or suburban (27%) users.

Rural Communities and the Internet: Summary of Findings at a Glance
Internet penetration has grown in rural communities, but the gap between them and suburban and urban communities has remained constant over time.
Rural Americans are older and less wealthy than those in other parts of America and that may account for some of the differences in Internet penetration between community types.
Another factor in lower Internet penetration may be that many rural residents say they have less choice than others about the way they access the Internet.
Rural communities hold larger proportions of relative newcomers to the Internet than do urban and suburban communities. Yet rural Americans are often enthusiastic adopters.
Broadband adoption is growing in urban, suburban, and rural areas, but broadband users make up larger percentages of urban and suburban users than rural users.
A portion of rural Internet users depend on Internet connections at places other than work or home. They are more likely than suburban or urban users to say they depend on another place for going online.
Rural African-Americans are significantly less likely than rural whites to go online, possibly because of differences in income and education.
Rural users pursue many of the same online activities as urban and suburban users, but they are more likely to look for religious or spiritual information and less likely to engage in transactions.
Rural Internet newcomers are wary of technology, but those with experience embrace it.
Source: Bell, Peter, Pavani Reddy and Lee Rainie. "Rural Areas and the

By most definitions, CHWs are well-established members of a community with a commitment to the people and place that make up the community. Few institutions of higher education are easily accessible to the frontier CHW. Yet leaving the community for training is difficult for a number of reasons. The CHW may have family and community obligations that make it difficult to leave. Also training is removed from the context in which it will be applied. For many CHW programs, it is difficult to gather enough trainees from within a reasonable distance to offer face-to-face training. Distance learning enables learners to participate in in-place education and training. It potentially enables more frequent training as well.

Distance learning has been promoted by the CDC since the 1960s, however the technology revolution has dramatically transformed distance learning. The Public Health Training Network (PHTN), established by the CDC in 1994, "is a distance learning network of people and resources that takes training and information to the learner." According to the PHTN, "whatever you call it, and whatever form it takes, distance learning can be an effective and economical strategy for reaching widely dispersed learners-such as members of the pubic health workforce." Characteristics of distance learning are:

1. Physical distance between instructor and learner. The distance learning strategy is often given other names-distance teaching, distance education, distributed education, learning at a distance. All of these names refer to some form of instruction in which instructor and learner are physically separated from one another. This physical separation is the principal-and defining-characteristic of distance learning.
2. Independent study or study groups. Distance learning may be set up to have learners participate either individually or in groups-or both.
3. Many delivery options. Instruction may be provided in a variety of media, from printed materials to live satellite videoconferences to electronic messages on the Internet (CDC, 2004).

Distance learning is increasingly computer-based (e.g. computer-based training, or CBT), with internet-based modes of delivery. This has lead to the proliferation of web-based courses and curricula. According to a 2000-2001 survey of distance education programs at degree granting post-secondary institutions, 90 percent offered Internet-based asynchronous courses (Waits and Lewis, 2003). Thus in addition to issues of content in CHW training, issues of access to computers, to internet service providers, and computer literacy must be addressed.

Local community colleges are emerging as leaders in distance education, including those colleges serving frontier communities. A 2003 study reported that, "the paucity of quality internet access and the lower adoption rates of information technology in rural areas are frequently cited as barriers to economic growth. Many states have initiatives to spur better, affordable internet access in rural regions, and they should consider the community college as a logical level of redress (Butzen and Liston, 2003, p. 5)."

II. TRAINING ISSUES

Distance training for community health workers raises several issues for CHW programs, including developing a consensus on definitions of terms and the best technology format, improving access, cultural competency/proficiency of faculty, low literacy of students, support for faculty and students, establishing quality standards, and the evaluation of training efforts.

A. Definitions and Formats

Distance education takes many forms. The most important element of any successful training program is the selection of the appropriate format(s) and then ensuring that interested and appropriately selected students have access to the right technology.

Mode of delivery depends on the instructional goals of a course and the desired level of interaction between instructor and students. Although asynchronous course delivery, like most Internet based courses, offers the greatest flexibility for students, some may find the lack of interaction hinders the learning process (American Association of Colleges of Nursing, 2005). Where higher levels of interaction are required, interactive video may be the mode of choice. Appendices C, D, and E provide a glossary of distance learning terminology, definitions of technology assisted learning, and a summary of distance learning technologies from the Rural Trust (Hobbs, 2004).

Because it is costly for any one program or institution to support all the technological infrastructure for a flexible distance learning curriculum, many pool resources and capacities through collaborative distance learning networks. These consortia help make cost-effective use of multiple technologies and increase accessibility to courses that may be infrequently taught, or courses that might otherwise not be offered due to insufficient enrollment. One drawback, however, is the broader range of infrastructure and systems that must be coordinated for compatibility.

Many distance learning curricula make use of multiple media and formats. With technologies constantly changing, it is perhaps not surprising that a significant number of problems can ensue from incompatible technologies or formats. Dedicated technical support to assist students and instructors in resolving technical problems is fundamental to the success of a distance learning course.

B. Access Barriers and Limited Resources

Recent reports have highlighted challenges including spotty availability of broadband infrastructure, connectivity issues, and lack of technology integration. The critical steps for future planning are determining hardware, capacity, and connectivity requirements and making existing and planned systems work better together (First Consulting Group, 2002).

American Indian and Alaska Native Communities Have Less Access to Technology.

only 76.4% of rural Native American households had telephone service, compared to 94.1 percent of all US rural households.

These tribal connectivity issues are shared by other frontier communities, and make effective distance delivery of training more complicated and resource-intensive. As a result of these reports, in 2000 the Federal Communications Commission (FCC) supported enhanced Link-Up America (Link-Up) and Lifeline Assistance (Lifeline) programs that allowed tribal consumers not only to connect, but also to subscribe to telephone service at a lower cost.

The National Congress of American Indians commenting to the FCC on the Lifeline and Link-Up Service for All-Income Consumers in December 2001 stated that some American Indian and Alaska Native communities continue to grapple with a "Dial-Tone Divide" reminiscent of developing nations.

C. Cultural Competence/Proficiency of Faculty

Community health worker training is dependent upon the cultural sensitivity and proficiency of the faculty. Mujer Y Corazon: Community Health Workers and Their Organizations in Colonias on the US-Mexico Border, a 2004 report from the Southwest Rural Health Research Center (May and colleagues) described a qualitative and ethnographic study of six organizations in New Mexico and six organizations in Texas. The study had several objectives, including identifying factors that shape the work of Community Health Workers along the border. They concluded that policy and programs for training CHWs must incorporate information about the local community settings in which CHWs will function, and that the training components should include input from local community health worker organizations and local community experts.

At the College of Rural Alaska, new faculty hires are expected to be familiar with rural/Alaska Native cultures as a job requirement, and a cultural component is incorporated into the mentoring process for new faculty (Ruedrich, 2003-04).

D. Electronic Literacy of Students and Community

For some students, access barriers are more complicated than access to the technology. While appropriate equipment and infrastructure are necessary, they are not the only requirements for student engagement in distance education.

The San Diego Regional Technology Alliance issued a report "Beyond Access-UCSD Civic Collaborative-2001 San Diego Digital Divide." This report is based on an 8-month in-depth qualitative study of new computer users and non-computer users. The report identified three kinds of non-economic obstacles that lead some people to remain computer illiterate: relevance, comfort zone, and self-concept (Stanley, 2001). While about 40 percent of respondents explained that cost interfered with computer ownership, "the vast majority emphasized that one or more of these other obstacles significantly discouraged their initial interest in achieving computer literacy."

contributing to computer literacy are fear and self-doubt.

This report concludes on a positive note calling for "a series of culturally-sensitive, community-based outreach efforts (that)...target adults of all ages, ethnicities and socio-cultural backgrounds - and especially those that are active in the labor force."

The lessons learned in San Diego and the solutions proposed are relevant guidance for programs to train Community Health Workers. These programs should focus on the many educational, economic and social advantages of technological literacy. Effective, culturally sensitive outreach will help reduce barriers to learning new technologies.

E. Support for Faculty and Students

Many people engaged in distance education acknowledge the critical role of support for both faculty and students. In 2004, the Rural School and Community Trust (known as 'the Rural Trust) prepared a policy brief on distance learning in rural K-12 education that highlighted several critical issues, including the need to support both faculty and student comfort levels with new technology (Hobbs, 2004).

The Distance Learning Standards and Guidelines adopted by the Missouri Distance Learning Association and others include benchmarks in program design, curriculum and instruction, student support, instructor support, and assessment and evaluation.

F. Quality Standards and Evaluation

The National Education Association (NEA), the nation's largest professional association of higher education faculty, and Blackboard, Inc, a widely used internet platform provider for online education, recently commissioned the Institute for Higher Education Policy to review and validate benchmarks of quality with specific reference to internet-based distance education (Quality on the Line, 2000).

The final outcome of the study is a list of 24 benchmarks that are essential to assure quality in distance education and include indicators related to student support, faculty support, and evaluation and assessment.

Student Support Benchmarks

- Students receive information about programs, including admission requirements, tuition and fees, books and supplies, technical and proctoring requirements, and student support services.
- Students are provided with hands-on training and information to aid them in securing material through electronic databases, interlibrary loans, government archives, news services, and other sources.
- Throughout the duration of the course/program, students have access to technical assistance, including detailed instructions regarding the electronic media used, practice sessions prior to the beginning of the course, and

online instruction and are assessed during the process.
- Instructor training and assistance, including peer mentoring, continues through the progression of the online course.
- Faculty members are provided with written resources to deal with electronically accessed data.

Evaluation and Assessment Benchmarks

- Educational effectiveness and the teaching/learning process is assessed through a multifaceted evaluation.
- Data on enrollment, costs, and successful/ innovative uses of technology are used to evaluate program effectiveness.
- Intended learning outcomes are reviewed regularly to ensure clarity, utility, and appropriateness.

III. PROMISING MODELS

While the use of electronic CHW training is just beginning, there are several good programs underway. Some of the most established models of distance education come from the most frontier state: Alaska. This is not unexpected since Alaska has been a pioneer in advancing telecommunications of all types in response to the extreme remoteness of many of its communities and villages. Various funding sources, primarily public, have come together and built this critically important communications infrastructure in Alaska.

A. Generalist CHW Programs

College of Rural Alaska
Human Services Statewide Distance Delivered Program
http://www.tvc.uaf.edu/programs/HSV/hsv-rural.htm

College of Rural Alaska (CRA) serves 160 communities through five community campuses: Chukchi Campus (Kotzebue), Northwest Campus (Nome), serving the Inupiaq people of that region, Bristol Bay Campus (Dillingham), Kuskokwim Campus (Bethel) serving the Yupik people of that region and Interior Aleutians Campus stretching to Unalaska. UAF Tanana Valley campus offers the vocational and technical programs, including the Human Services Statewide Distance Delivered program. Other partners in CRA are USDA Cooperative Extension, and the Center for Distance Education and Independent Learning. In 2004, University of Alaska Fairbanks (UAF) College of Rural Alaska (CRA) Executive Dean Bernice Joseph commented: "CRA has an excellent understanding and capacity to respond to the needs of rural Alaska. Community campuses are strategically placed in rural hubs. Local corporations provide scholarships, internships, mentorships and faculty support. Another strength is the College's knowledge of learning styles and cultural background; we tailor our educational offerings while maintaining high standards (Landon, 2004, p. 1)."

have one year to complete the coursework. Proctored exams are required; proctors "must be education officials at a university, community college or public school site, other governmental or community officials, or, if such persons are unavailable, other people approved in advance by the Director." The UAF Rasmussen Library has an Off-Campus Services offices to assist distance learning students in accessing on-campus resources. The UAF Writing Center and Math Hotline (tutoring) are other resources with services for distance students. Distance learning instructors are supported through Distance Learning Systems, which provides resources for technical systems components as well as instructional design for "distributed classroom cohorts."

The associate degree program in Human Services is an expansion of a Rural Health Services (RHS) certificate that had been previously delivered from the Interior-Aleutians campus of UAF (Ruedrich 2003-04). A 3-year sequence of coursework leads to the AAS degree. After core courses are completed, students choose an area of concentration in addictions counseling, mental health and developmental disabilities, residential care, supervision and management in human services, or workforce development. Additional coursework can lead to Alaska Substance Abuse Counselor Technician certification (Tanana Valley Campus, 2002; Roberts, no date).

The AAS degree can be completed without moving to a main campus location. All classes (60 credit hours) required for the degree are available both at the UAF Tanana Valley Campus in Fairbanks and through the statewide distance delivery system. Practicum placements are coordinated locally.

The program is designed for flexibility in degree progression. Students who have completed a certificate in Rural Human Services can apply 27 credits toward the AAS; most credits earned for the AAS degree can apply to a bachelor's degree in either social work or rural development. The AAS can also serve to fulfill a minor requirement in other B.A. programs.

The College of Rural Alaska also has online materials for the Community Health Aides. Using Denali Commission grant funds, the staff is focusing resources on converting the PreSession course, some Continuing Medical Education (CME) credits and the medical standing orders for the newly revised Community Health Aide Manual (CHAM) released in Fall 2005.

Dean Joseph further commented on the future of distance learning in Alaska: "Definitely, we will advance our technology. We are seeing more web-enhanced courses. Although we have trouble with connectivity in many of our rural communities, I think we will see more people gaining access. We are coordinating with University of Alaska Anchorage (UAA) and University of Alaska Southeast (UAS) to deliver courses and I think we will see more coordination in the future (Landon, 2004, p. 1)."

Community Wellness Advocate (CWA)
University of Alaska Southeast (UAS)-Sitka
http://www.uas.alaska.edu/sitka/CWA.html

audioconference equipment is supplied to students. Two courses require a 1-week residency at the UAS-Sitka campus, but provide scholarships to cover travel, housing, and per diem.

After completing 30 hours of coursework, students have the opportunity to earn a UAS Community Wellness Advocate Certificate that can apply toward an Associate Degree in Health Sciences. Currently, the CWA program has a supplemental Nutritional Specialist tract; future tracts being considered include Injury Prevention, School-Based Health Education, Health Promotion with Elders, and Diabetes Prevention.

Diné College of the Navajo Nation
Arizona and New Mexico
http://www.dinecollege.edu/

Dine College is 'The Institution of Higher Education of the Navajo Nation', and serves nearly all of the 25,000 square miles of Navajo Nation, with campuses at Crownpoint and Shiprock, New Mexico and at Tsaile, Window Rock, Ganado, Tuba City, Kayenta and Chinle, Arizona. Over the past 5 years, a Polycom brand videoconferencing system has been installed at Shiprock, Crownpoint, Window Rock, Tuba City and Tsaile, with the system hub at Tsaile. As of August 2004, a new Associate of Science (AS) degree program in Public Health is available, including an imbedded Certificate option. This option allows students completing all requirements to earn both a Certificate and Associate Degree, although some may opt for completing just the Certificate.

Courses in this degree program originate at the Shiprock campus, and are transmitted via Polycom to Crownpoint, Window Rock, Tuba City and Tsaile. According to Ed Garrison, a Memorandum of Understanding (MOU) between Dine College and the CHR/Outreach Program of the Navajo Division of Health supports a collaboration in which the 160+ staff (including supervisors) of the program enrolls in the Dine College courses and degree program. According to Garrison all courses are open to everyone, but the Community Health Representatives (CHR's) typically comprise 90% or more of current enrollments.

To date (August 2005), only three courses (Introduction to Public Health, Community Health Assessment and Planning, and Introduction to Wellness) have been offered via Polycom, each one multiple times. More courses in the AS degree program via Polycom are expected as the program grows. According to Garrison, at least one of the Shiprock based instructors is on the road almost every week in order to be in the distant classrooms during the class sessions. This assures that the students at all of the distant locations get to meet and personally interact with the instructors at least 3 or 4 times each semester.

Dine College has not yet connected their Distance Education system with external entities, so students outside of Dine College cannot currently enroll in these courses. The current program has been successful in training community health workers

In Hawaii, there are five Native Hawaiian Health Care Systems, and each uses community health workers. Distance learning has long played a major part in the CHW conferences and trainings, developed by the community college system in partnership with the University of Hawaii. Allied health workers at substance abuse and child abuse programs, community health clinics and others participate in training and continuing education. Skybridge, Telecom, V-tech and Polycom are just some of the technology systems used to support in-service trainings, classes and workshops. The Hawaii and Pacific Basin Area Health Education Centers currently lists 68 sites throughout the islands with video teleconferencing (VTC) capacity (Hawaii/Pacific Basin AHEC, 2005).

Maui Community College (MCC) offers a number of community-based health worker certificates through the Departments of Nursing and Community Health, Human Services, and Continuing Education and Training. The Department of Nursing and Community Health offers two levels of certificates of competence for the generalist CHW, and specialist courses including a certificate in case management. In partnership with the Hawaii/Pacific Basin AHEC, MCC plans to offer these courses via distance education within the next 3 years.

The Department of Human Services offers an A.S. degree in Human Services, as well as certificates in substance abuse counseling and child development. The department added a new 9-credit Certificate in Case Management for Health and Human Services in 2004; the certificate was developed with the Department in collaboration with the Hawaii Primary Care Association and a Community Advisory Committee made up of community health workers, supervisors and administrators from community health centers and the five Native Hawaiian Health Care Systems. The Community Advisory Committee identified case management/interpersonal counseling skills as the highest priority for developing CHW capacity. The Case Management certificate was offered in 2004 by MCC on community college campuses on Maui, Molokai, Hawaii and Kauai (MCC hired the instructors from each island, and students registered through MCC Admissions and Records, but classes were held on CC campuses on their own islands). On Oahu, Leeward Community College offers the Case Management Certificate. Three courses are offered every year, one in the spring and one in the fall, with the practicum offered every semester. The Hawaii Primary Care Association is currently working on a project to investigate possibilities of offering some courses statewide through VTC over the next three years.

A new certificate program is being developed by the Community Health Worker Training Program of the Hawaii Primary Care Association, and will be offered by the MCC Office of Continuing Education and Training. This new program is a 100-hour certificate in "Outreach for Health Promotion" with two main segments, a 45-hour section on improving outreach to underserved communities (includes a 3-credit human services community action class), and 55 hours of health promotion consisting of modular training in nutrition/fitness, oral health, behavioral health, and chronic diseases affecting Hawaii's underserved communities.

The Hawaii Primary Care Association is currently working on a project through the

The Arizona Community Health Outreach Worker Network
http://www.publichealth.arizona.edu/azchow/

The Arizona Community Health Outreach Worker Network (AzCHOW) is supporting a new project spearheaded by Dr. Ana Maria Lopez of the Arizona Cancer Center. This project, entitled 'Tele-Education in Breast Cancer for Community Health Outreach Workers in Five Southern Arizona Communities', will use the Arizona Telemedicine Program to develop and evaluate a tele-education program on breast cancer for CHWs. Volunteer CHWs will participate in eight sessions, and actively evaluate each session. A focus group of course participants will be conducted by video-conference three months after the series has concluded.

Community Supports for People with Disabilities Program
South Central College, North Mankato, Minnesota
http://online.southcentral.edu/

In the 1990s, the Minnesota governor and State legislature mandated standardized training and skills standards for those working with the disabled, and the Community Supports program was developed to fill this need.

South Central College in North Mankato, Minnesota is a rural site involved in the Community Supports program. Since 2003, South Central College has offered certificate, diploma, and AAS degree programs online (via WebCT platform) (South Central College, 2005). The graduates of this program works with a diverse patient base and in a wide variety of settings, from supported living situations, elder care, behavioral disorders, day treatment, chemical dependency, State Hospitals and the traditional residential/group home settings. Functional English competency is required for participation, but a recent cohort taught by Ms. Nagel included almost half for whom English was a second language.

A consortium of seven colleges teaches the core courses online. On-line faculty participate in a monthly support group that has evolved over time. Students are supported not only by faculty, but also by the consortium technology support staff. Each student receives a CD-ROM with appropriate software and tutorials needed to succeed in distance education; the costs of these materials are included in the costs of the course.

This program was recently identified as a national model, and is benefiting from Robert Wood Johnson Foundation and other private and public funding streams to expand the programs and increase awareness of the critical role paraprofessionals play in service delivery. They are now in the process of expanding this model to reach more culturally diverse community health workers who function in other settings. In 2006, South Central College will begin offering a new generalist Community Health Worker certificate program online.

Milagros, The Center of Excellence in Migrant Health
http://elearn.stcc.cc.tx.us/milagros/

The Rural Assistance Center describes the training program as "An adoptable and adaptable curriculum in migrant health and welfare that will be available to all states using web-based online platforms, after assessment of the first two courses are completed". The curriculum will address conditions that place migrant families at risk, as well as teach the protective factors that help overcome health disparities across the life span (Rural Assistance Center, 2004).

The first two classes offered were "Mental Health and the Migrant Family" and "Growing Up on the Border." Initially students will be accepted from states in the Northeastern and Midwestern migrant streams, with Georgetown managing the former and Texas the latter. Program administrators hope eventually to expand to sites in California. The Milagros Center also hosts a virtual library on migrant health.

C. Continuing Education and Peer Learning

Use of distance technologies for improving the knowledge and skills of CHWs is not limited to formal training programs. The same technologies can be used to provide post-training follow up and support, create access to formal or informal continuing education opportunities, and importantly, connect isolated CHWs with one another. The networking function of distance technologies creates opportunities for ongoing experiential learning by giving distant CHWs a virtual forum in which they can interact.

The CHR On-Line Program
Portage College, Alberta, Canada

Technology also may be used to provide direct support to traditional students after they graduate. As the National Indian and Inuit Community Health Representatives (CHR) Organization noted in their newsletter In Touch in 2001, the CHR On-Line program piloted by Portage College in Lach Le Biche, Alberta, Canada in collaboration with the Community Health Representatives Association of Canada. The project connected otherwise isolated front-line community health workers not only with online resources but with each other. While the ultimate objective of the program was to prepare and equip CHWs for advanced education opportunities, the pilot project was focused on creating distance learning capacity among working CHWs (Parker and Froehler, 2000). The initial cohort completed the one-week "Computers for Distance Education Skill Enhancement" course at Portage College.

The project eventually encompassed 30 different sites in Alberta. By 2001, fifty-three frontline CHRs, with little or no previous computer experience, learned basic computing and Internet skills. Most of the 53 CHRs who participated in the program can now surf the Internet, find reliable and culturally appropriate health information, and communicate by e-mail with their colleagues in other communities (Kuran, 2001). The enthusiasm of the CHRs speaks for itself:

I believe it is a great project. Once we CHR's are connected, it will be great. I sure hope everyone will have connection with a computer, so that the distance will be a

positive. The program seems to be particularly helpful in situations where there are lone CHRs in isolated communities. Approximately 38% of those surveyed now use the CHR On-Line website. A full 20% use the site at least weekly.

The Mary Amelia Douglas-Whited Community Women's Health Education Center
New Orleans

The Mary Amelia Douglas-Whited Community Women's Health Education Center in New Orleans has developed a low-tech model of post-training support for community-based health workers that includes a weekly telephone support call. By providing this post-training support, a health educator assists the community health workers to feel more empowered and to create positive behavior changes in their own lives. To date, programs on cardiovascular disease and breastfeeding have been piloted and evaluated, with good results. Such 'low-tech' supports should be used by trainers working with community health workers in frontier regions.

Most models of distance training include explicit attention to support for all of the participants. These programs will potentially be strengthened by the development of national standards.

IV. NATIONAL INITIATIVES

A. Center for Sustainable Health Outreach (CSHO)
University of Southern Mississippi, Hattiesburg, MS
http://www.usm.edu/csho/

The Center for Sustainable Health Outreach (CSHO) serves as a national point of contact for CHWs and supports them by providing support and technical assistance in public policy, sustainability, education and training, and evaluation and planning (CSHO 2005). Between 1999 and June 2005 the center was operated as a joint project between the University of Southern Mississippi (USM) focusing on education, training, and evaluation, and the Harrison Institute for Public Law at Georgetown University Law Center focusing on policy and sustainability issues. Since June 2005 the projects have been separated, with CSHO remaining at USM.

The Community Health Advisor Network (CHAN) is one program of CSHO. CHAN conducts two different annual training workshops in Hattiesburg; one workshop is on the development and start up of a CHW program, the other is a training workshop for CHWs. CSHO also sponsors an annual Unity conference for CHWs and program administrators. The center communicates with CHWs using a variety of materials including a quarterly newsletter, a website, an email listserv, and direct mailings.

In May 2003 with support from the W.K Kellogg foundation, CSHO began a project to develop a catalog of generalist CHW training and education programs offered by institutions of higher education. Fifteen programs are currently described in the guide, with information on institutional setting, program overview, admission criteria

Improvement of Post Secondary Education (FIPSE) at the US Department of Education. The project has recently launched a website to support a "community of practice" for CHWs and their educational partners.

According to the CHW-NEC website,

"this postsecondary innovation supports non-traditional, socio-economically disadvantaged and ethnically diverse students (including U.S./Mexico border health "promotores" and Native American tribal and Pacific Islander "community health representatives" working in rural and urban resource-poor and medically needy neighborhoods). Students in community health work represent a new entry-point in higher education, where the validation of core competencies for this workforce has become a critical national public health and human service issue and where curriculum standards and credentialing are now high on the national agenda. The project is also supported by several nationally recognized experts and by national leaders of active community health worker associations/organizations."

Fifteen college sites are being supported by a partnership of six collaborating universities, colleges, and agencies providing technical assistance. Each partner brings unique expertise to the project. The project shares "best practice materials and methods" for college-supported curricula, core competency assessment, and employment market development. The goal of this project is to develop national programs for the educational preparation of community health workers.

The catalyst for this project was a National Community of Practice Invitational Workshop hosted by the University of Arizona in Tucson in the summer of 2005. Key topics for the National Workshop included:

- Students New to Higher Education
- Navigational Skills for Non-Traditional Students Community Health Worker Employment Market Assessment Strategies
- Community Health Worker Core Competencies Defined
- College Credit by Assessment, Prior Leaning, and Experience
- Literacy, Language, and Cultural Diversity in Higher Education
- Community Health Worker Credentialing

Several participants in this collaborative currently are, or plan to use distance technologies. Because of its unique focus on training community health workers, the CHW-NEC is an important resource for faculty responsible for CHW training.

State	Core Technical Assistance Institutions	Adaptor Institutions/College Sites
Arizona	The University of Arizona Pima Community College in Tucson	Diné College (Navajo Nation)
Oregon	Multnomah County Health Department's	Portland Community

Florida	The University of South Florida, Lawton Rhea Chiles Center	St. Petersburg College Hillsborough Community College Central Florida Community College
Connecticut	Sacred Heart University Southwestern Connecticut AHEC	Housatonic College Three Rivers Community College
New Mexico		Diné College (Navajo Nation)
Hawaii		Maui Community College Kapi'olani College
Indiana		Ivy Tech State College

V. CONCLUSIONS

This paper has provided a brief overview of some current and emerging issues in the use of technology and distance education in the training of community health workers in frontier areas. The community programs highlighted are meant to be illustrative, not exhaustive. It is likely that there are others doing good work in remote locations, perhaps in isolation from others. Communication among these pioneers should be actively encouraged and supported.

Those entrusted with the responsibility of supporting healthy frontier communities and training the community health workers that serve them might consider these brief conclusions and recommendations for action:

- Investment in technological infrastructure is necessary.
- Faculty must be supported to increase their cultural competence as well as their comfort with new technologies for distance education.
- Students must be supported to increase expertise with both their complex provider role as well as new technologies.
- Existing quality standards for distance education should be adapted to assure their appropriateness for frontier education programs.
- Current and emerging models of frontier training should be evaluated using appropriate standards and realistically achievable competencies.

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Note: Not all contacts were interviewed.

APPENDIX B: LIST OF ACRONYMS

AAS	Associate of Applied Sciences
AS	Associate of Science
AHEC	Area Health Education Center
AIHEC	American Indian Higher Education Consortium
BSW	Bachelors of Social Work
CBT	Computer Based Training
CD-Rom	Compact Disc-Read Only Memory
CHA	Community Health Advisor
CHAM	Community Health Aide Manual
CHR	Community Health Representative
CHW	Community Health Worker

FCC	Federal Communications Commission
FIPSE	Fund for the Improvement of Secondary Education (US Department of Education)
ICT	Information and Communication Technology
ILT	Instructor- Led Training
ISP	Internet Service Provider
LAN	Local Area Network
NRHA	National Rural Health Association
RHS	Rural Health Services
VTC	Video Teleconferencing
WAN	Wide Area Network
WBT	Web Based Training

APPENDIX C: GLOSSARY OF DISTANCE LEARNING TERMS (Source: Hobbs, 2004)

Asynchronous (Not Synchronous)
With reference to video and data signals and devices, asynchronous transmissions are those in which local and remote communication is not precisely in step, not of the same frequency, or does not happen together in time.

ATM - Asynchronous Transfer Mode
An international high-speed, high-volume, packet-switch-ing transmission protocol standard. ATM uses short, uniform, 53-byte cells to divide data into efficient, manageable packets for ultrafast switching through a high-per-formance communications network. ATM is the first packet-switched technology designed from the ground up to support integrated voice, video, and data communication applications. High costs often make this transmission mode impractical for K-12 I-TV networks.

Bandwidth
The capacity to transfer data over telecommunications lines, usually measured in bits per second. The necessary bandwidth is the amount of spectrum required to transmit the signal without distortion or loss of information.

Broadband
A high capacity communications network that can enable the simultaneous transmission of voice, data, and video. Broadband networks are usually defined as operating at greater than T-1 speeds (1.544Mbps).

CODEC
COder - DECoder. A digital device for the coding and decoding of video and/or audio signals usually to permit them to be transmitted in compressed and/or encrypted

DS-3 line is approximately 30 times the bandwidth of a T-1 line.

DSL - Digital Subscriber Line
A generic term including a family of moderate speed access technologies that use sophisticated modulation schemes to pack data onto copper wires. They are sometimes referred to as last-mile technologies because they are used only for connections from a telephone switching station to a home or office, not between switching stations.

E-Rate
A telecommunications discount program for schools and libraries begun as part of the Telecommunications Act of 1996. Telecommunications services, Internet access, and internal connections are eligible for 20-90% discounts based on the free and reduced-price lunch rate of students within a school-or schools within a library district.

Fractional T-1
One or more channels of a T-1 service. A full T-1 carrier contains 24 channels; each provides 64 Kbps. Most phone companies, however, also sell fractional T-1 lines, that provide less bandwidth but are also less expensive. Typically, fractional T-1 lines are sold in increments of 56 Kbps (the extra 8 Kbps per channel is used for data management).

Fractional T-3 or DS3
A telecommunications service that uses a portion of a 672channel T-3 circuit for any mix of voice, data, or broad-cast-quality video.

IP - Internet Protocol
The set of rules that allow the transmission of data among all computers. IP specifies the format of packets and the addressing scheme. Most networks combine IP with a higher-level protocol called Transmission Control Protocol (TCP), which establishes a virtual connection between a destination and a source. IP by itself is like the postal system. It allows you to address a package and drop it in the mail, but there's no direct link between you and the recipient. TCP/IP, on the other hand, establishes a connection between two hosts so that they can send messages back and forth.

IP Address
An IP number is a numerical address consisting of several numbers separated by periods. Each IP address uniquely identifies a certain computer on the Internet.

ISDN - Integrated Services Digital Network
An international communications standard for sending voice, video, and data over digital telephone lines or normal telephone wires. ISDN supports data channel transfer rates of 64 Kbps (64,000 bits per second), but multiple channels can be purchased to increase bandwidth. There are two types of ISDN lines: Basic Rate Interface (BRI) and Primary Rate Interface (PRI). ISDN charges are typically incurred for each call or connection made. Costs increase as the number of channels used increases.

Refers to the data speed of a telecommunications line. Data is transmitted in bits per second. A bit is the smallest unit of information on a computer network, a binary digit (0 or 1). A kilobit is 1000 bits.

Mbps - Megabits per second
Refers to the data speed of a telecommunications line. Data is transmitted in bits per second. A bit is the smallest unit of information on a computer network, a binary digit (0 or 1). A megabit is one million bits.

Point-to-Multipoint
A circuit that connects a single node to a switch. In continuous presence I-TV, it is a single site connecting to up to three additional sites, such that all sites can see all other sites at all times. In a switched I-TV network, it is a single site connecting to any number of additional sites. In a switched mode, each I-TV site will routinely see only the presenter or the site having last spoken.

Point-to-Point
A non-switched, dedicated communication circuit. In I-TV, a single site connecting to only one other site.

Real Times
Rapid transmission and processing of event-oriented data and transactions as they occur, in contrast to being stored and retransmitted or processed in batches. I-TV is a "real time" technology because it is broadcast live, as it occurs.

Synchronous
With reference to video and data signals and devices, synchronous means being precisely in step, or happening together at the same time. I-TV involves synchronous communication because the teacher and student interact at the same point in time through the same medium.

T-VDSI
A telecommunications line (or digital transmission system) operating at a speed of 1.544 million bits (megabits) per second (1.5Mbps). A T-1 line consists of 24 individual channels, each of which supports 64Kbits per second. A T-1 line is a preferred means of transmitting I-TV, taking both cost and quality into account. T-1 lines, though transmitting lower quality, compressed video signals than DS-3 lines, for instance, are much less expensive and more widely available.

Tariff
A public document filed with a state public utility commission that outlines services and rates of telecommunications carriers. Usually, all customers are offered the same rate for a specific service, based on published constraints. In some states telecommunications carriers have filed special distance learning tariffs available to K-12 schools.

Teleconference
Live, two-way audio transmission between two or more locations. Usually includes

Video Conference
An audio and video link between two or more remote locations with live, moving image transmission and display. Two-way video conferencing allows both locations to see and hear the people and presentation materials at other locations, although not necessarily in a continuous presence mode. I-TV is the term usually used to signify videoconferencing in an educational setting. Videoconferencing most often refers to the business application of the technology, e.g., video meetings. Increasingly, the terms are used interchangeably.

Wireless
Radio waves, cellular, satellite, microwave, etc. are alternative modes of telecommunications transmission to land lines. I-TV via wireless transmission is possible, but is in its infancy.

APPENDIX D:
DEFINITIONS OF TYPES OF TECHNOLOGY ASSISTED LEARNING

The following definitions are a synthesis from several sources, all or some of which have been, or could be, used for training community health workers in frontier communities (accessed August 9, 2005 from the Distance Learning Glossary).

Asynchronous Learning - Any learning event where interaction is delayed over time. This allows learners to participate according to their schedule, and be geographically separate from the instructor. Could be in the form of a correspondence course or e-learning . Interaction can use various technologies including threaded discussion.

Computer Based Training (CBT) - Training or instruction where a computer program provides motivation and feedback in place of a live instructor. CBT can be delivered via CD-ROM, LAN or Internet. Its creation is done by teams of people including instructional designers, and often has high development costs.

Correspondence Course - A course completed from a distance using written correspondence for interaction and also to submit assignments. Correspondence classes became popular in the 1890's and remain popular today.

Distance Education - The formal process of distance learning . This term has traditionally implied higher education, post-secondary.

Distance Learning - Learning where the instructor and the student(s) are in physically separate locations. Can be either synchronous or asynchronous . Can include correspondence , video or satellite broadcasts, or e-Learning . Usually implies higher education.

Distance Training - A reference to distance learning for the corporate or professional levels. More commonly referred to as distributed learning , WBT or e-Learning .

e-Learner - Any learner taking part in an e-Learning course or program.
Instructor-led Training (ILT) - A learning event which is led by an instructor , and either held in a physical location or delivered via a network (WBT , e-Learning). Usually implies the professional or corporate level and synchronous learning.

Online Learning - e-Learning over the Internet (as opposed to a local or wide area network).

Online Training - Same as online learning , only it implies the professional or corporate level.

Synchronous Learning - Any learning event where interaction happens simultaneously in real-time. This requires that learners attend class at its scheduled time. Could be held in a traditional classroom, or delivered via distributed or e-Learning technologies.

Threaded Discussion - a type of on-line interaction in which discussion postings are automatically 'threaded' typically by topic area or author.

Web Based Training (WBT) - Training which is delivered over a network (LAN, WAN or Internet). Can be either Instructor-led or Computer Based . Very similar to e-Learning, but it implies that the learning is in the professional or corporate level.

APPENDIX E: SUMMARY TABLE OF DISTANCE LEARNING TECHNOLOGIES (Source: Hobbs, 2004)

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(Source: Hobbs, 2004)