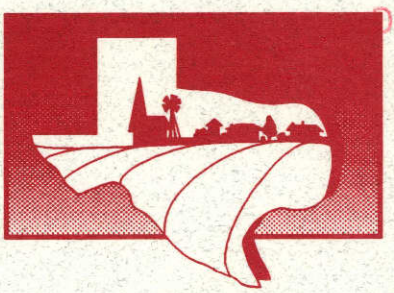
Texas Journal of Rural Health



VOLUME XIX, NUMBER 2
2001

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TEXAS JOURNAL OF RURAL HEALTH

MISSION STATEMENT

The purpose of this journal is to provide a forum for sharing ideas related to rural health.

Authors are encouraged to submit relevant and current research studies as well as legislative and/or health care policy papers. Descriptions of innovative strategies in primary health care settings are especially welcome. Manuscripts will be evaluated for pertinence to the issues on a statewide basis. Response to our articles is also encouraged and will be printed under the section "Letters to the Editor."

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TEXAS JOURNAL OF RURAL HEALTH

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INSTRUCTIONS FOR AUTHORS

Authors interested in submitting articles for publication should send them to:
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Managing Editor: Texas Journal of Rural Health
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MANUSCRIPT SPECIFICATIONS

- **Blind Review:** Prepare manuscript for blind review—authors names on cover sheet only and title sheet without names.
- **Manuscript:** Submit one original manuscript plus three additional copies on clean 8 1/2 x 11 inch paper. Include a disk version if possible. See "save" formats below.
- **Length:** Average article length is 10 double-spaced typewritten pages excluding references. Lengthy manuscripts may be considered at the discretion of the managing editor.
- **Cover Sheet:** The cover sheet of the manuscript should include: (a) the title of the article, (b) the complete name(s) of all the authors, degrees, and certifications, (c) a brief biographical sketch (one or two sentences) about each author with present employment position and location, (d) addresses and phone numbers of all authors, and (e) one fax number.
- **Title Sheet:** Include name of article and abstract or summary of article.
- **Body of Text:** Double spaced, no running heads. Include page numbers such as "1 of 10," etc.
- **Abstract:** Include an abstract of 25 to 75 words if the article calls for an abstract. If no abstract is required, please write a summary of the contents for the editor's quick reference.
- **References:** Please cite all references with complete information. The form is that of the American Psychological Association, fourth edition—author/date in text and alphabetical listing in reference section.
- **Copyright Materials:** Authors must supply copyright "permission to print" with manuscripts including quoted copy, derivatives, graphs, and/or photos from original publisher or author/creator.
- **Graphics and Illustrations:** Graphics and illustrations are reproduced by the managing editor so that style and form are consistent from issue to issue.
- **Charts and Tables:** Charts and tables must meet American Psychological Association (APA) guidelines.
- **Photos:** Black and white photos may be submitted if relevant to the article.

"Save" formats for text conversion:
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- PageMaker 5.0-6.0 Stories
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Graphics can be converted from:
- GIF files
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The Editorial Process
for the Texas Journal of Rural Health

Step One: Submit Manuscript
A manuscript should be presented in the form described in "Manuscript Specifications."

Step Two: Blind or Masked Review Process
The editor and managing editor reserve the right to invite manuscripts for publication. The editor and managing editor also reserve the right to accept or reject manuscripts outright. Before a manuscript is sent for review, it **must** meet APA specifications. Manuscripts sent for review are read by those considered experts on the subject. Thus, a peer review is conducted. The author's name does not appear anywhere on the manuscript, providing a fair review.

Step Three: Recommendations from Reviewers
After the manuscript is reviewed, it is forwarded to the managing editor who discusses the reviewer's recommendations and comments with the editor and members of the editorial board. If a manuscript is rejected during the initial review, every effort is made to encourage the author to proceed with the manuscript to make the article publishable. Reviewers' remarks are included with the return of the manuscript.

Step Four: Editorial Board
The editorial board has quarterly meetings to discuss the manuscripts recommended by the reviewers. Content is the most important feature discussed at this meeting. Recommendations are to either (a) accept the manuscript, (b) accept the manuscript with revisions, (c) revise and resubmit the manuscript, or (d) reject the manuscript. In all cases, authors are encouraged to continue toward publication and every effort is made to facilitate that process.

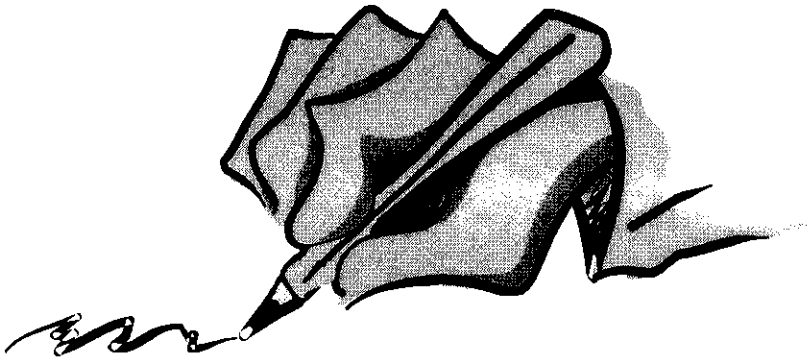
Step Five: Getting the Manuscript Ready for Publication
Recommendations are sent to the author. The manuscript is scrutinized for content, accuracy in interpretation and application of referenced material, and for topic completeness.

Step Six: Return of Manuscript to Managing Editor
The manuscript is read to make sure all recommended revisions have been satisfactorily completed. Sometimes, a reviewer will request that the revised manuscript be returned for another reading. When that happens, the reviewer may accept the manuscript or request more changes. If the author has not proven diligent in satisfying the reviewer's or editorial board's requests for revisions, the manuscript may be rejected.

Step Seven: Getting Ready for Publication
The managing editor performs the job of editing, proofing for grammar, syntax, spelling, and word usage and then puts the manuscript into page layout form.

Step Eight: Authors Final Approval
The article will be sent to the author in page-proof (galley) form only if major changes are required within the text. In that event, the author usually signs "approval for printing with/ without changes." Beyond this, no other changes can be made.

Call for Papers



The *Texas Journal of Rural Health* is currently accepting manuscripts for publication on various topics relating to rural health issues. We are looking for articles to go into our new sections:

- **Notes From the Field**
- **Policy and Law**
- **Research**
- **Review Articles**
- **Brief Reports**

Some topic examples are listed below:

- **Community and Migrant Health Centers**
- **Critical Access Hospitals**
- **Rural Health Policy**
- **Primary and Emergency Care in a Rural Setting**
- **Current Legislative Issues**
- **Border Health Issues**
- **Rural Health Clinic Management**

Papers should be submitted to the Managing Editor as outlined in the "Instructions for Authors." Because of our updated look, we are more than happy to accept manuscripts longer than outlined in the "Instructions."

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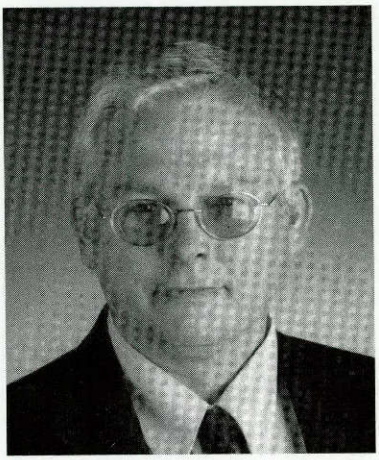
EDITORIAL

RURAL HEALTH: WHAT IS IT?



James E. Rohrer, Ph.D.
Professor and Chair
Department of Health Services
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Lubbock, Texas

We speak of rural health as if all concerned were in agreement on the definition of the term. This is not an accurate assumption. In fact, if we try to clarify the meaning of the term, we are forced to confront value-laden issues that will not easily be resolved.

In graduate school, we teach our students that health is not merely the absence of disease, but complete physical, mental, and social well-being. Then we review the indicators commonly used to measure community health. None of the available data, of course, reflect complete physical, mental, and social well-being. Our excuse for this bait-and-switch routine is that by examining a wide variety of indicators we can gain a general sense of community health. Just as the physician uses a battery of tests to diagnose the health of a patient, the community-oriented observer uses a battery of indicators to diagnose the health of a community.

We fail to address the contradictions in goals that are inherent in various health indicators. Take, for example, life expectancy versus years of potential life lost (YPLL). Monitoring life expectancy implies that our goal is maximization of the quantity of life as expressed by its duration. Pursuit of this goal could cause the average person to spend his or her last couple of decades trapped in a dysfunctional mind and body – a frightening prospect. YPLL assumes that a fair or reasonable life expectancy is all that a person has a right to expect, all he or she really should want, and all that society has a responsibility to assure.

The state of Texas has age 65 as its default setting in the years of potential life calculations it employs, which is an interesting decision to consider. Certainly, the Social Security Trust Fund would be in better shape if the game ended at age 65. The Health and Human Resources Administration prepares a health profile for each county in the nation, but years of potential life lost is not included in the list of indicators. One wonders whether this omission reflects an inability to set the standard for how many years of life we might expect to achieve.

The notion that three-score-and-ten is enough has been with us for a long time. After a person has achieved that figure, some would say, then he or she should be grateful for whatever healthy span is remaining. After that figure is attained, then perhaps the priority should shift to other health indicators. For example, we might devote our energies to addressing injury and disabilities, providing medications for chronic disease, and reducing infant mortality rates. We also might survey

people to ask about their quality of life. Do they feel that they have control over the decisions that affect them? Are they able to pursue their normal activities? Are they satisfied with life? Dare we ask, are they happy?

When it comes right down to it, we work for rural health because it contributes to life, liberty, and happiness in groups of people for whom we have personal feelings as well as professional responsibilities. We must guard against letting the beans we count become more important than the larger goal of quality of life.

Letter From the Managing Editor

Connecting Through the Internet

In a continued effort to serve rural Texas and, indeed, rural communities across the United States and abroad, I'd like to call your attention to our first website survey. You can find it at www.tjrh.homestead.com. It'll only take a few minutes to complete and we'll use your opinions to help shape future issues of the *Texas Journal of Rural Health.*

While you're at the website, take a look at the Abstract section. In that section, you'll find a complete list of the abstracts that we've published for the past four years. If you're interested in obtaining an article reprint, simply write us at the address listed on the website and we'll send one out to you.

For those of you entertaining the idea of submitting an article for publication, our website provides complete submission guidelines in the Instructions for Authors section. I can't encourage you enough to submit an article to us. Unlike many journals that keep authors at an arm's length, we have an open-door policy and are very author-friendly. I am especially proud of our review process, which generally takes only two weeks to complete. If you have any questions regarding article topics, feel free to contact me.

We are not only looking for authors from Texas, but we are also interested in receiving articles from authors outside of Texas. In fact, in our previous issues, you'll find articles from authors who live in states such as Arizona, Iowa, Maryland, Mississippi, Montana, North Dakota, and Oklahoma to name just a few.

Our readership is diverse and we mail journals to every state in the country. In addition, we have international subscribers that reside in a variety of countries such as Canada, Australia, England, Scotland, Africa, and the Netherlands.

Lee Ann Paradise
Managing Editor
Texas Journal of Rural Health
Texas Tech Univeristy Health Sciences Center
Lubbock, Texas

The Center for Rural Health Initiatives

Mike Easley
Executive Director
Center for Rural Health Initiatives
Austin, Texas

Guest Editorial

The Center for Rural Health Initiatives is a unique state agency, because it has among its duties and powers wording such as, "educate the public and recommend appropriate public policies regarding the continued viability of rural health care delivery in this state;" "promote and develop community involvement and community support in maintaining, rebuilding and diversifying local health services;" and "promote and develop diverse and innovative health care service models in rural areas." From all of this I glean that the Center has the duty to be creative, innovative, and proactive when carrying out its mission. Therefore, over the next year we plan work to:

1. *Identify areas of critical need.* There are pressing health care needs in most of rural Texas. However, with limited resources, it is important to address areas in order of importance. For example, the physician to resident population is too high in rural Texas, but it is not too high in all rural Texas. There are pockets with an adequate number of physicians and even a few areas with an oversupply. We need to focus on areas of critical need and bring resources to bear on those problems rather than "shotgunning" all rural counties. This is a prime example where one size does not fit all.

2. *Recognize and measure the economic impact of health care in rural Texas.* The economic impact of health care in rural Texas is not fully appreciated. In many counties, health care may be one of the largest industries. We need better tools to help us monitor and assess the economic impact of health care. As we can do this, we can better understand how health care impacts local economies to better explain and support the need for local control.

3. *Recruitment/retention of primary care physicians, nursing, and other allied health professionals.* Rural communities have a difficult time recruiting and retaining health care professionals. Numerous studies have demonstrated the most effective way to successfully recruit and retain providers in rural areas is training residents of rural communities and returning them to these communities to practice. We need more scholarships and loan forgiveness programs to educate these rural scholars.

4. *Provision of trauma/EMS services.* A significant amount of Trauma/EMS service in rural counties is provided by volunteers. These volunteers struggle greatly to maintain the quality and viability of their services. Additional funding is needed to meet this need.

5. *Access to health care.* Over 50% of the babies born in this state have the cost of delivery paid by Medicaid. At the same time, 22% of all babies born in rural Texas have late or no prenatal care. Rural counties have more children and elderly people living on an income that is less than the poverty level as compared to their urban counterparts. Income status is a prime predictor of access to health care, which is exacerbated when combined with a shortage of providers and the fact that some rural counties have not only lost population, but have also seen a loss in per capita income. We need more economic development to raise the income levels of our rural counties.

6. *Telemedicine.* These applications offer great potential in terms of reduced staff costs and travel as well as quality improvements in care. However, we need planning to ensure that the implementation of telemedicine meets the needs of providers in a rural setting and results in cost savings.

7. *Aging facilities.* Many rural/small hospitals were built originally 25 to 30 years ago with federal funds. Since then, they have moved from inpatient care to outpatient services as a primary focus of patient care services. Thus, many of the buildings, which have aged considerably, are no longer suited for their purpose. Rural hospitals need access to capital for major renovation or construction projects.

8. *Informing community leaders about the role and importance of health care in their localities.* We have not done a good job giving them the information they need to understand the impact, both economically and socially, of health care in their communities.

Over the last ten years, there has been a lot of progress made in improving the status of health care delivery in rural Texas. The rate of closure of rural hospitals has slowed and there are new programs to educate and recruit providers to rural areas. Perhaps most importantly there is an increased awareness of rural Texas as a unique part of the state with unique needs.

INTERVIEW WITH BRAD GIBBENS

Lee Ann Paradise
Managing Editor
Texas Journal of Rural Health
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INTERVIEW

Brad Gibbens, M. P. A., is the Associate Director of the University of North Dakota (UND) Center for Rural Health, UND School of Medicine and Health Sciences. Mr. Gibbens is also an assistant professor at the medical school. The center is one of the oldest state rural health offices in the country. It was formed in 1980 by the North Dakota legislature and the medical school. Mr. Gibbens serves as the Director of the State Office of Rural Health (SORH) and is the Chair of the North Dakota Medicare Rural Hospital Flexibility Steering Committee. The "Flex" grant is administered by the center.

Mr. Gibbens has worked in rural health, at the center, for 15 years. During that time he has concentrated on health policy, community development, and grant development activities. He served for seven years on the National Organization of State Offices of Rural Health (NOSORH) Board of Directors. He received the NOSORH Award for Distinguished Service in 1999. Mr. Gibbens is also an active member of the National Rural Health Association (NRHA). He has both his undergraduate and graduate degrees from UND. He is a native North Dakotan, growing up on a durum wheat farm near Cando, North Dakota.

LP: What are the health care challenges that face rural communities in North Dakota?

BG: There are many challenges, even threats facing rural communities in North Dakota. Some are directly tied to health issues (e.g., access to services, maintaining viable local/area health systems, provider reimbursement, workforce supply, and physical plant needs), but a couple are more pervasive. They impact the community as a whole be it the school system, down-town business, local government, religious community, or local/area health system. I am referring to demographics and economics and will direct my remarks to them.

North Dakota is a small state. The 2000 census finds approximately 642,000 residents. While nationally 20% of the population is classified as rural, in North Dakota 49% is rural. North Dakota also experienced the smallest percentage increase in population of the 50 states, about half of 1%. While the newest census numbers have not been compiled and released for county level analysis, we do know that from 1990 to 1999, 47 of North Dakota's 53 counties lost population. The six counties to gain population were either more urban or had a significant American Indian population. The loss of young people to urban areas in North Dakota or even to other states is a major threat to small-town, rural North Dakota. The irony is that North Dakota ranks very high on three quality of life measures (ranking in the top five states for children graduating from high school, people pursuing post-secondary education, and SAT scores); however, too many of these highly motivated and educated young people find jobs and careers in the other 49 states. We have our own "brain-drain." Here's a few other quick facts: while the rural population is declining numerically, the percentage of older rural North Dakotans is increasing; both the rural poverty and unemployment rates exceed the urban rates; and rural per capita income trails urban income. Maybe one statistic, more than others, shows the uniqueness of my state. North Dakota has approximately 364 incorporated towns; 52% have a population of 200 people or less. It is difficult to maintain a health system, school, church, business sector, or local government at that level.

In addition to the poverty, unemployment, and income differentials noted above, other economic factors include more limited economic diversity in the rural areas and heavy reliance on land based industry (e.g., agriculture, coal, and oil). There are also difficulties in recruiting and developing new businesses.

Demographic and economic factors have direct and indirect implications for rural health. They influence not only the demand and supply of health services, but also the type of health services necessary to meet area needs; they influence the reimbursement streams (e.g., an aging population and patient base leads to more reliance on Medicare payments); they affect workforce demand and supply; they shape the ability of communities to offer local resources (e.g., fund raising); and, maybe most importantly, they impact

attitude (e.g., is our town struggling, is it dying?). In many respects that "attitude" factor is the most important issue facing any rural community, be it in North Dakota or Texas. I firmly believe that the only people who can save rural North Dakota, are rural North Dakotans. Those of us who work in universities, state health departments, and health oriented associations, even if we are from rural areas, can help through our skills and abilities; however, only the people living there have the real moral authority to step up to the plate to act, to direct, to lead.

LP: How does the UND Center for Rural Health attempt to meet those challenges?

BG: As I stated in the first question, we can help. We can work with community leaders; we can offer advice and technical assistance. But, rural communities need to take the lead and exercise authority to galvanize community sentiment, community will, and set a direction based on community derived visions and goals. As an office, we can't change our macro economic and demographic facts and trends. We do, however, try to share such facts with rural providers. We encourage them to deal with these issues directly in the context of strategic planning, board education, or community forums. We definitely educate rural health care providers and community leaders on the duality and mutual dependency of rural health development and community development. In a rural community, health care is a primary contributor to the economic composition of a town; concurrently, the overall economic, governmental, educational, and religious composition of the town shape and influence the health care sector. Sometimes, community and economic leaders need to be reminded of the significance of the health sector and health leaders must recognize how other community sectors influence their area. A SORH can help communities develop this focus. It is important to try to establish partnerships between the community and the SORH.

Specifically, we are in the "information business." The UND Center for Rural Health uses a variety of information vehicles to disseminate current policy and health system information, demographic/economic statistics, grant opportunities, program development opportunities, and other sources of information to rural hospitals, clinics, nursing homes, tribal health units, ambulance units, and public health districts. We offer seven computer generated fax instruments: Rural Health Updates, Tribal Health Updates, FLEX Updates, EMS Updates and EMS Fact Sheets, Rural Health Policy Briefs (developed for the North Dakota Legislature), and the Creative Corner (marketing/PR/communications information). The fax numbers for about 90% of the rural providers are entered into a data base, which allows a computer-generated rapid response on most issues. The rest are hand faxed or mailed. In addition, there is a statewide and national newsletter, Focus on Rural Health; an annual health conference, Dakota Conference on Rural and Public Health; an office Speaker's Bureau (for rural community/civic organizations, hospital/nursing home boards, annual

meetings, etc.); work shops (e.g., grant writing); a variety of grant writing information; a rural health library; and other specific documents. Just about all of our information can be accessed through our website: http://medicine.nodak.edu/ruralhealth.

The second way we attempt to help rural communities falls into a community or technical assistance category. This involves a number of activities such as the following: community assessments, strategic planning, key informant interviews, focus groups, internal personnel audits, grant development (including proposal critiques), and facilitating community forums. Staff at a SORH do not need to know everything. You do need, at times, to know other people who have knowledge and skills you do not possess. Then you need to ask for their help.

LP: Because most providers are urban based, how do some of the nationally set standards affect patient care?

BG: This is a geographically expansive, culturally diverse, and economically stratified country. It is very hard, seemingly impossible at times, to create nationally based health care policy that has the same impact in different parts of the country. Its not only the difference between rural and urban, but also the differences that exist in one rural area to another. What works or doesn't work in rural North Dakota may be different than what does or doesn't work in rural New York. Many states, particularly those west of the Mississippi, make distinctions based on the type of rural areas. In other words, there is "rural" and there is "very rural." This latter area is generally called "frontier." In hospital reimbursement, rural hospitals are still typically reimbursed at a lower level than an urban hospital for the same service. From a rural hospital perspective, much of our federal health policy efforts have been directed at trying, through incremental policy adjustments, to restructure reimbursement in order to positively impact the "bottom-line." We have Medicare Dependent Hospitals, Sole Community Hospitals, and now Critical Access Hospitals— yet, we still struggle to hit upon the right formula, the right "update factor," the right regional/national blend.

The impact, in many cases, on patient care is there is less money available for rural providers to tap into to either provide services or to pay for services. There is less money available to attract and retain professionals. It is harder to find the resources, personnel, and finances to meet federal mandates. We see that subtle changes, such as the efforts awhile back to modify the definition of health professional shortage areas, can have profound implications depending on where you are in the country. That issue also showed the power of rural health advocacy as federal rule makers were forced to go back to the drawing board.

LP: In your last response, you mentioned the recent development of the Critical Access Hospital (CAH). How widespread is the CAH program in North Dakota and what is the potential impact of the program on the state?

BH: CAH or Flex (short for Medicare Rural Hospital Flexibility program) is very

widespread in North Dakota. Presently, there are 13 CAHs in North Dakota out of a total eligible number of 37 hospitals. The remaining rural hospitals have sole community hospital status. When discussing CAH, it is important to recognize this effort as a legitimate option for a number of rural hospitals; however, it is not, nor will it be, the final answer for all rural hospitals. It needs to be seen as part of a continuum of organizational arrangements for rural hospitals. Some rural hospitals will benefit from a cost-based reimbursement system, or they will benefit from enhanced health professional staffing options, or they will benefit from network development arrangements. But, some will not. We need to continue to experiment with options.

The Flex Steering Committee involves representatives from the university based Center for Rural Health, the state Department of Health, and the North Dakota Healthcare (hospital) Association. The federal grant is administered by the center; however, the decision-making process involves all three organizations working together. This process brings the expertise, skills, and strengths of all three partners to bear on assisting rural hospitals.

In the first year, we provided direct grant dollars to 13 rural hospitals to be used for financial assessments, network development, and local health task force development. Network development involves a number of activities, including, but not limited to, the following: consultant assistance, legal assistance, equipment acquisition, emergency medical services, health personnel education, health personnel recruitment/retention, program/service diversification, telemedicine, quality assurance, specialized feasibility studies, and other areas. Task force development is meant to assist rural hospitals in forging stronger relationships with the community. This is not meant to dilute the authority of the hospital board, but it is intended to bring additional community voices into the forefront of discussing local health needs and options. We encourage collaboration between the hospital with other health care providers (in town or in other towns) along with the education, business, government, and religious sectors.

Community-oriented technical assistance from the steering committee is widely available and used. During the first year, 21 rural hospitals received assistance such as community assessments, community forums, key informant interviews, board and/or staff meetings, personnel audits, claims data analysis, grant development, and other assistance.

I think the overall potential in North Dakota is significant. We will see the formation of stronger and more viable hospital networks; greater community awareness and involvement with the local hospital; and hopefully more stable health systems with better reimbursement streams. The technical assistance we offer will help hospitals understand their environments better and relate to their communities better. We can also help them to take advantage of new opportunities. I feel it is interesting that at the hospital level, Flex builds partnerships; at the state

relationship between the steering committee members. It is a nice byproduct.

LP: Please discuss the various ways your office addresses health issues related to the Native American population in North Dakota. Do you believe that the Native American population faces special health challenges?

BG: To answer you second question, first, I would say yes. The mortality rate for Native American people is higher than the United States population as a whole. For example, the age adjusted death rate for accidents is 165% higher than the overall population. Diabetes has a 154% higher rate and suicide is 43% higher. The two leading causes of death are heart disease and accidents. While improvements have been made in Native American health status, including life expectancy, Native American people still face significant issues in health status and access, housing, education, transportation, and a whole host of areas.

In North Dakota, the Native American population is approximately 5% of the state's population. Indian people compose the largest minority group in the state. From a rural perspective, one of my colleagues who works in a tribal health unit in North Dakota once reminded me that when you think of a rural area what is more remote than an Indian reservation? She is right. All of the access issues, financial concerns, service development needs, transportation problems that we typically discuss as rural health issues are, in many cases, magnified at the reservation level. As a SORH, we represent all rural health concerns be they from a community that is primarily Norwegian or German in heritage or Chippewa. Rural health is rural health.

As a SORH, we address Native American health concerns in two ways: information and technical assistance. Our annual rural health conference includes sessions that deal directly with Native American health issues, particularly access and program development. This also offers an opportunity to non-Native American providers to learn more about another group's issues. We also send out to tribal contacts something called Tribal Health Updates. These generally provide information on grant related subjects and opportunities. We also make ourselves available to conduct grant proposal critiques. The technical assistance is addressed primarily through a collaborative program called the National Resource Center on Native American Aging. It is a collaborative effort involving the UND Native American Programs and the Center for Rural Health. Funded by the Administration on Aging, the resource center offers educational sessions, training, community assessments, and research. It is important to note that this is a national project. For example, the Health and Social Needs Assessment for Native Elders has an aggregate data file from surveys conducted with 20 different tribes from around the country. The Geriatric Leadership Seminars were held at 14 locations attracting 132 tribes and over 300 native elder providers.

LP: What role can cultural sensitivity play in the treatment of Native Americans and minorities in general?

BG: It can play both a positive and significant role. I think it is important to realize that "one size does not fit all." There are natural, human differences based on geographical location, cultural heritage, religion, and other factors. Rural health advocates frequently joke that if you've been to one rural community, well... you've been to one rural community. The point is that no two towns are the same. Yet, policy makers, particularly those with more of an urban-bent, seem to want to generalize a rural health solution that will fit all rural communities. The same holds true, I feel, when we approach Native American concerns or try to push all minority people into the same category. There are over 500 recognized tribes in American. They have unique and distinct histories, religious beliefs, political processes, and social norms. People need to try to be more aware and listen to the uniqueness. For me, cultural sensitivity represents a belief in trying to understand another person's life, their culture, and their heritage. It isn't easy. And it isn't meant to be easy. But you try.

To put this in a more practical or hands-on way, some of this can be achieved by working together. An important aspect to the health and social needs assessment process, as practiced by the resource center, is an emphasis on tribal skill development. The survey process entails tribal training on needs assessments, focus groups, interviewing, data collection, and overall community empowerment. It is the old notion that if you give a person a fish they will eat for a day, but if you teach them how to fish, then they can eat for a lifetime.

LG: In your opinion, is enough being done nationally to address the health needs of Native Americans?

BG: No. Look at the statistics that were cited earlier on native-to-non-native mortality rates. On virtually any health indicator Native American health statistics stand out. Progress has been made. For example, Native American life expectancy has increased by 12 years since 1973; however, so much more needs to happen. In general, rural health providers — be they a private, non-profit hospital, a public health unit, or a tribal health unit — have solutions to their own unique set of problems and circumstances. The federal government or the state of North Dakota does not have to dictate or mandate solutions. They do, however, have a moral obligation to offer assistance, help create opportunity, and to work in partnership with communities.

One of things I've learned through the Rural Health Outreach grant program, offered by the federal Office of Rural Health Policy, is tribal health providers have a number of good ideas, an understanding of their health issues, and are very dedicated health professionals. Outreach grants embody the concept of working together for the common good. This is accomplished by: 1) creating opportunity through the development of a community health oriented grant program so tribes can address pressing health access issues;

address pressing health access issues; 2) offering assistance through SORHs that can provide background information, facilitate local grant process planning, and critique proposals; and 3) nurturing the development of community partnerships that are built through local and/or area community and provider networks. This is just one example of how we need to address the health needs of Native Americans from a national perspective.

LP: Another key issue your office focuses on is emergency medical services (EMS). How do those services differ in the rural communities of North Dakota versus urban communities in your state?

BG: EMS always seems to be the forgotten child in rural health. Whether taken for granted, sometimes ignored, or just misunderstood, EMS seems to take a back seat to other rural health issues such as provider shortages (particularly physician and nurse shortages) and hospital viability. They get the attention. Yet, EMS is a very important member of the rural health family. When ever there is a serious crisis like a car accident or farm accident 30 miles from the hospital or physician, EMS is the first one on the scene. EMS has a true community focus. In North Dakota, over 90% of the EMS personnel are volunteers. They understand the need for community involvement. EMS doesn't even get the same financial treatment. They are usually doing some form of community fund drive (in North Dakota, a community spaghetti dinner or a Lutefisk dinner are common). Actually, a recent survey done by our office found that over 90% of our urban emergency medical technicians (EMTs) received some form of monetary compensation, but only about 50% of the rural EMTs received compensation.

In North Dakota, EMS is taken very seriously. EMS providers are viewed as essential providers and even as safety net providers. In rural North Dakota, you can be many, many miles from a hospital or clinic and you need a system that can quickly respond to an emergency. While the standards to be an EMT-basic, EMT-intermediate, or EMT-paramedic are the same whether you are in an urban center or a rural organization, there are noted differences between rural and urban EMS. Through a program developed in our office, we have gained some new insights into the differences between rural and urban EMS.

One of the programs of the UND Center for Rural Health is Rural Emergency Medical Services Initiative (REMSI). It is funded by the Otto Bremer Foundation of Minneapolis and Dakota Medical Foundation, Fargo. REMSI addresses three functions: assessment, technical assistance, and policy. Under the assessment function, a series of studies have been implemented to help our state EMS association, state EMS division in the health department, and state policy makers to better understand rural EMS in North Dakota. A few key

system include the following: rural EMTs are older (median age 41 vs 33); rural EMTs are more likely to be female (52% vs 25%); rural EMTs have lived in their present community longer (median number of years 20 vs 12); and rural EMTs entered the EMS field at an older age (median age 32 vs 23). Additionally, rural EMS systems rely more heavily on EMT-basics than do urban areas (57% of rural EMTs are certified at the basic level while 13% of urban EMTs have this certification). Conversely, urban systems rely more heavily on EMT-paramedics (77% of urban EMTs are paramedics while only 7% of rural EMTs have this certification). A major rural health policy issue relates to the recruitment and retention of EMTs. REMSI studies found that 72% of the rural EMS units had a high level of difficulty in recruiting personnel; only 22% of urban units identified the difficulty level as high. Retention is more of a rural problem, too, as 37% of rural units had a high level of difficulty in retaining personnel while 19% of urban units identified the difficulty level as high.

LP: On a local and national level, what effect, if any, do you think the Bush administration will have on rural health care?

BG: I suppose the simple answer is, time will tell. At the beginning of any new administration there is always hope tempered by concern or fear balanced by optimism. This is especially true when an administration change also means a change in control due to political party and ideology. It also means a change in the Secretary of Health and Human Services and many key agencies and divisions below the Secretary level.

I hope what we see is a continuing exploration of health policy that can be constructive for rural communities, rural providers, and rural health in general. Rural community leaders need to work with their state officials, including congressional offices, to keep rural health on the national agenda. Seek out your hospital or rural health association, join the National Rural Health Association (NRHA), send information or meet with your congressional members, and do what you can to tell your own local story. Make people listen. Be involved. The worst attitude is a feeling that you don't matter, or that you can't make a difference, which is a defeatist attitude.

When people do take up the cause of rural health, positive things can and do happen. The Critical Access Hospital or Flex program was created because of strong leadership from the National Organization of State Offices of Rural Health (NOSORH), the NRHA, the American Hospital Association, and other groups working together with state hospital and rural health associations, community leaders, and local providers. There was strong leadership in Congress, including my North Dakota delegation of Senator Conrad, Senator Dorgan, and Congressman Pomeroy. Flex shows that the rural health community can come together with a common goal and act. We have to. No one will do it for us.

LP: What is the one word that comes immediately to your mind that describes the current state of rural health care in the United States today?

BG: Struggling. Always struggling. There is progress such as a recognition that rural health is distinct and deserves its own focus. But there are setbacks, too, such as struggling over three years to rectify some of the negative consequences of the Balanced Budget Act of 1997. At the community level, it seems to be one of survival – reimbursement, resources, community awareness, developing an openness to accept change. At the state level, it appears to be identifying a proper role – how to assist communities, at what level, in what ways, and how to address, in North Dakota, our demographic and economic problems? At the national and federal level, it is both survival and role. Survival, based on working with rural health advocates to create vehicles of opportunity. Role, based on developing national, state, private association, and rural community partnerships to address rural health issues through mutual respect, a proper level of autonomy, and a balance of resources. At all levels the struggle for rural health entails commitment, leadership, and advocacy.

My best advice to all people concerned with rural health in their communities and state is to keep pushing. Don't be complacent or defeatist; don't take a "gloom and doom" stance. Don't accept as inevitable the demise of rural America. If we do, then the negative will happen. Push for the things you believe in and advocate for rural America – then we stand a chance.

High Prevalence of Overweight Children in a Rural Texas School-based Clinic

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Notes From the Field

Abstract

The prevalence of overweight children was documented at a rural school-based clinic. Body mass index was calculated using height and weight records in 67% of the school population during the 1998 to 1999 school year. Overall, 20% of the females and 18% of the males were classified at risk of becoming overweight (BMI >85th-95th percentile), while 22% of the females and 19% of the males were classified as overweight and at risk for obesity (BMI ≥95th percentile).

Key words: body mass index, rural schools, overweight children. (Texas Journal of Rural Health 2001; 19(2): 16-21)

Introduction

The increased prevalence of overweight children and adolescents is of major concern in our nation. An upward trend in the prevalence of overweight children has been documented in nationally representative surveys conducted from 1963 to 1994. Troiano and Flegal (1998) described that body mass index (BMI) distribution from national surveys showed a dramatic increase in overweight prevalence (BMI >95th percentile) between the National Health Examination

Survey (NHES) II or III and the National Health and Nutrition Examination Survey (NHANES) III from 4% to 11%. The most significant increase occurred after 1980. An additional 14% of the children from the NHANES III data had a BMI between the 85th and 95th percentile, placing them at risk for becoming overweight. Data from the NHANES III (Troiano & Flegal, 1998) also revealed that the overweight prevalence among Hispanic children and adolescents was higher (15%) than for non-Hispanic Whites (10%). Reference data from the Hispanic Health and Nutrition Examination Survey (HHANES) showed that overall, the BMI among Mexican-Americans was higher than Whites in the NHANES II for both genders and at almost all ages (Roche et al., 1990). The differences were significantly different ($p<0.05$) for the 90th percentile level after four years of age for both genders. The data suggested a greater predisposition of total body fat among Mexican-American children than for White children.

According to the Bureau of State Health Data and Policy Analysis (1998), approximately 28% of the Texas population is Hispanic. Pawson, Martorell, and Mendoza (1991) described the Hispanic population as the second largest minority group in the United States and one of the fastest growing. Because of its rapid growth rate, the minority population in our nation has been characterized as the "emerging majority" (Smith, 1999). The high number of those uninsured as well as limited access to health facilities and language barriers are some of the obstacles facing the Hispanic population. In addition, this population has unequivocally elevated frequencies of obesity-related chronic diseases such as non-insulin-dependent diabetes mellitus, cardiovascular diseases, and hypertension (Pawson, Martorell, & Mendoza, 1991). Considering the association between obesity and chronic disease risks, childhood obesity poses a significant health concern for these children as they age (Dietz, 1998; Bronner, 1996). As overweight and obesity in children reaches critical proportions, it is important to identify groups at greatest risk. There is very limited information on the prevalence of overweight and obese children living in rural farming communities. Therefore, the purpose of this descriptive investigation was to determine the prevalence of overweight children from a predominantly Mexican-American population, who received services from a rural school-based clinic.

METHODS

Setting

The Hart Independent School District (HISD) serves a largely rural area of Castro County in the Texas Panhandle. The HISD student population of nearly 500 children is predominately Hispanic (85%) and medically under-served. The HISD houses a school-based health clinic funded by the Maternal and Child Health Services Block Grant Program. This comprehensive school-based health clinic provides primary medical care, psychosocial, and dental services to approximately 460 children and adolescents.

DATA COLLECTION

The protocol for this study was approved by the Texas Tech University Committee for the Protection of Human Subjects. Height and weight data were collected from the medical records of all school-age children seen at the Hart school health clinic during the 1998 to

1999 school year. Most of the visits to the clinic were related to injuries, immunizations, common viral and bacterial infections, fever, and other emergency care complaints. Weights were determined using a calibrated balance beam scale. Students were dressed with regular school clothes, but no jackets or extra clothing. Heights were measured using a wall-mounted stadiometer without shoes. Body mass index (body weight in kg/height in m^2) was calculated for each child and used to categorize them into five percentile groups according to national gender and age-specific reference standards (Must, Dallal, & Dietz, 1991) as follows <5th, 5th-10th, >50th-85th, >85th-95th and >95th. Children with a BMI between >85th-95th percentile were considered at risk of becoming overweight and those with a BMI equal or greater than 95th percentile were considered overweight and at risk for obesity. This classification has recently been recommended by The Expert Committee on Evaluation and Treatment of Overweight Children and Adolescents (Barlow & Dietz, 1998). The prevalence of overweight among HISD children participating in the clinic was assessed. Descriptive statistics were used to characterize the sample studied. The prevalence of those who were overweight by age group and gender is described using BMI percentiles, and mean BMI values with 95% confidence intervals.

RESULTS

During the 1998 to 1999 school year, 306 students aged 6 to 19 were seen by the Hart school-based health clinic staff. This represents 61% of the HISD enrollment. Of those students seen in the clinic, 82% were Mexican-American, 10% Caucasian, and 8% African-American, which is highly reflective of the overall HISD demographics. During each visit to the clinic, the student's body weight and height were recorded. The current height and weight of each child was complied for the 1998 to 1999 school year. The body mass index (BMI) was calculated, and age and gender specific BMI percentiles (Must, Dallal, & Dietz, 1991) were determined for each child.

Table 1 illustrates the percent distribution of the BMI percentiles arranged by age group and gender. According to recommendations from The Expert Committee on Obesity Evaluation and Treatment, children with a BMI between the 85th and 95th percentile, are considered at risk of becoming overweight (Barlow & Dietz, 1998). Data from the NHANES III showed that 14% of the children

Table 1. Distribution of Body Mass Index Percentiles by Age Groups and Gender

Age Group (Years)	Gender	Percent of Students (%)				
		<5th	5th-50th	>50th-85th	>85th-95th	>95th
6 to 12	Female (n=71)	2.8	14.1	35.2	22.5	25.3
	Male (n=75)	2.7	16	45.3	17.3	18.7
13 to 19	Female (n=82)	0	17.1	46.3	17.1	19.5
	Male (n=78)	5.1	17.9	39.7	17.9	19.2

and adolescents had a BMI between >85th and 95th percentile (Troiano & Flegal,1998). In our sample, approximately 20% of the females and 18% of the males were within this range. Therefore, when compared to national figures, our data suggest a high overweight risk. Children with a BMI greater than the 95th percentile are classified as overweight and at risk for obesity (Barlow & Dietz, 1998). Results were compared to national figures for Mexican-American children, as our sample was mostly representative of this population. Our data once again revealed a higher prevalence of overweight than national figures. Of those visiting the school-based clinic, 22% of all females and 19% of all males were classified as overweight and at risk for obesity (BMI > than 95th percentile). Data from the NHANES III (Troiano & Flegal,1998) revealed that 14% of the Mexican-American females and 16% of the Mexican-American males were in the 95th percentile for BMI.

Overall, our data revealed that 39% of the students screened at the school-based clinic had a BMI that exceeded the 85th percentile, in comparison to only 3% who could be classified as underweight (<5th percentile of the BMI). Therefore, the data suggest a high risk for overweight and obesity in this population.

Mean BMI by age and gender, along with

Table 2. Mean and Confidence Interval (CI) of Body Mass Index By Age and Gender

Age (Years)	n=	Females Means (CI)	n=	Males Mean (CI)
6	13	17.5[a] (15.2-19.9)	8	17.0[b] (14.7-19.2)
7	10	17.7[b] (14.6-20.7)	9	16.9 (15.1-18.6)
8	9	18.2[b] (15.8-20.6)	9	17.0 (16.0-18.0)
9	12	19.0 (16.8-21.1)	15	20.4[b] (16.9-23.9)
10	7	20.5[b] (17.7-23.2)	10	24.5[a] (14.5-34.6)
11	10	21.9[b] (17.5-26.2)	10	22.2[b] (17.4-26.9)
12	10	23.2 (19.1-27.2)	14	20.1 (18.0-22.2)
13	15	22.8 (20.1-25.5)	18	21.6 (18.9-24.3)
14	9	21.1 (19.3-22.8)	13	20.8 (18.5-23.1)
15	18	25.1[b] (22.2-28.0)	20	25.2[b] (21.0-29.4)
16	21	25.4[b] (22.5-28.4)	9	27.5[b] (20.9-34.2)
17	14	24.3 (21.8-26.9)	13	24.6 (21.9-27.3)
18	4	25.3 (10.9-39.8)	3	26.7[b] (12.2-41.2)
	152		151	

(CI) = 95% confidence interval
[a] >95th percentile
[b] >85th percentile

confidence intervals, were calculated and are presented in Table 2. The nineteen-year-old age group was excluded from the table due to the small sample size. For both genders, 7 out of 13 age groups had a mean BMI >85th percentile. Among females, the mean BMI for those six years of age was >95th percentile. Likewise, males 10 years of age had a mean BMI >95th percentile. The mean BMI for each of the age groups was higher when compared to the mean BMI for the same age groups among Mexican-Americans from the HHANES (Roche et al., 1990).

DISCUSSION

Our findings revealed a disturbingly high prevalence of overweight and potentially obese children and adolescents among those visiting a school-based clinic in this rural community. While the school-based clinic plays a vital role in providing emergency and primary medical care as well as psychosocial and dental services, the outreach resources and expertise to address the issue of overweight children are insufficient. Increased knowledge concerning the factors contributing to being overweight in this specific population must be the first step in developing a successful intervention program.

This study emphasizes the need for further documentation of the prevalence of overweight and obese children in rural communities. In addition, further research must be pursued to identify the magnitude of the problem, the contributing factors, and ways for successful intervention. Comparisons with urban populations are also needed to determine how differences in environment, socio-economic factors, and accessibility to urban conveniences influence the problem. Public health officials can use these data to set priorities in rural communities and to establish health promotion and chronic disease prevention programs.

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Partnering with Clergy in School-based Interventions Following a Rural School Shooting

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Abstract

When the community of Pearl, Mississippi experienced a school shooting, local religious leaders were among the first to respond. Clergy and youth ministers were integrally involved in the counseling organized by the Pearl Public School District. The role of religious leaders in disaster response efforts is discussed within the context of general disaster response philosophy as well as within the context of the Mississippi culture. The local faith community was observed to play an important role in holistic recovery efforts, and enhanced the impact of the school staff and mental health professionals in this regard.

Key words: clergy, mental health, Mississippi, psychological counseling, rural, school shooting, trauma recovery. (Texas Journal of Rural Health 2001; 19(2): 22-29)

Introduction

When coordinating mental health disaster response services, there are several general principles that apply across situations. Survivors need to be sheltered from further danger and from unnecessary exposure to gore and voyeurism. Acute distress should not be misinterpreted as chronic pathology; overtreating/medicalizing acute stress can do

more harm than good (Solomon, 1999). Outside agencies often play a pivotal role in the immediate aftermath before the community regains its balance, but the emphasis should always be on directing needs to local community support systems as soon as feasible. An excellent manual on these general principles integrates the work of several major disaster response agencies and is available on the Internet (Young, Ford, Ruzek, Friedman, & Gusman, 1998).

In each situation, however, factors specific to that situation and community play a large role in determining the most appropriate response. Sensitivity to local cultural norms and collaboration with local community leaders are crucial (Anguilera & Planchon, 1995; Shelby & Tredinnick, 1995). Acute preventative interventions should take into account the social processes and rituals that a particular cultural community relies on for post-trauma healing, such as the Native American practice of the sweat lodge (Raphael, Wilson, Meldrum, & McFarlane, 1996).

LOCAL CONTEXT

In the case of the October 1997 shooting at the high school in Pearl, Mississippi, several local contextual factors shaped the design of the acute interventions organized by the school system in the hours and days following the tragedy. Pearl (population 26,000) is a close-knit community in central Mississippi. As is true in many smaller communities, what a person says may be given a lot more credence if the listener "knows your daddy" than if the speaker is viewed as an outsider.

Pearl is located in the heart of the Bible Belt. As the city's official website proudly states, "Religion is a high priority to Pearl residents. That's why there are 33 churches in the city of all [Christian] denominations, which are devoted to worship, education, and service to the individual and community" (City of Pearl, 2000). Religious faith plays a major role in many community events. For example, prayer before local government meetings, school ball games, and civic group luncheons is a longstanding tradition. In response to the recent Supreme Court ban on student-led prayer at school ball games, the Pearl School Board immediately began looking for alternatives, such as having the school band open home games by playing the hymn Amazing Grace (Metz, 2000a). The School Board received more calls from parents upset about the prayer ban than about any other recent issue. Pearl is not an outlier in this regard; other area school boards are also considering various alternative forms of religious expression (Johnson, 2000; Metz, 2000b). In a mass mailing (disseminated to local constituents at taxpayer expense), Congressman Shows (2000) states, "We need to encourage, not discourage, the values promoted by religious practice. We should encourage prayer in schools or wherever people feel so moved to exercise their right to pray."

Regional support for allowing religious expression in schools is further evidenced by recent events in Carriere, Mississippi, located near New Orleans and the Mississippi Gulf coast. When the high school recently held a five-hour Christian evangelical revival, American Atheists, Inc. challenged the legality of the event. Investigation is pending, but "there has been an overwhelming show of support in the form of e-mails, letters, and phone calls to the school" (Associated Press, 2000).

Within this cultural context, it is not surprising that when a fellow student opened fire on students gathered in the interior courtyard of Pearl High School, local pastors

and youth ministers were quickly sought out by many students and faculty. Churches organized same-day memorial services and prayer meetings. Local clergy flooded school phone lines with offers of assistance. It was immediately apparent that these community religious leaders held a position of esteemed trust among survivors of the tragedy, and were very experienced in assisting local families through grief and hard times. In contrast, many of the available mental health professionals had little prior experience helping healthy people cope with such raw grief and stress, having devoted most of their careers to work with more chronically distressed clients. This is discussed in greater detail in a related article by Dr. Lyons that appeared in the previous issue of the *Texas Journal of Rural Health* (Lyons, 2001). Consistent with the overall goal of facilitating (rather than supplanting) existing support systems, school administration endorsed the inclusion of local religious leaders in the counseling sessions planned for the two days following the shooting.

BACKGROUND ON THE ROLE OF CLERGY IN HEALTH CARE AND DISASTER RESPONSE

Chatters, Levin, and Ellison (1998) discuss some of the challenges inherent to religion-public health partnerships. Differing assumptions and world-views, turf and role conflicts, standards regarding separation of Church and State, and informed consent issues are among the potential pitfalls listed. Conversely, Chatters and colleagues (1998) note that the "community legitimacy" of local churches makes them powerful forces in preventative interventions, coping, and community support. There is a rapidly expanding body of literature on the relationship between religious faith and both mental and physical health in adult populations (Ellison & Levin, 1998), but this topic has been largely ignored in research on adolescent health (Wallace & Forman, 1998). However, one study on the perceptions of adolescents found that church—along with family and friends—was perceived as a caring environment, whereas school was perceived to be an environment low in caring (Jensen & Jensen, 1998).

The decision to include the local faith community in disaster response efforts is not without precedent. In their chapter on planning a mental health disaster response, Lebedun and Wilson (1989) emphasize the need to integrate with and facilitate existing community efforts, including the faith community. Young (1989) specifically lists community mental health workers, local critical incident debriefing teams, clergy, teachers, and victim service providers as the most appropriate groups to help conduct debriefings following incidents of community violence such as workplace shootings. Budd (1999) reports on the integral role Air Force chaplains play on critical incident stress response teams. The VA National Center for Post-traumatic Stress Disorder (PTSD) devoted an entire issue of its *Clinical Quarterly Newsletter* to addressing spirituality in the treatment of post-traumatic stress disorder (Decker, 1995). Although national VA guidelines for disaster mental health teams (Young et al., 1998) limit participation to licensed mental health professionals, local policies at sites such as Jackson, Mississippi place disaster mental health under the direction of the Chaplain Service. The American Red Cross (ARC) currently has 138 spiritual care providers trained to respond to disasters, and is developing a protocol for further recruitment and training of local clergy nationwide (Bowencamp, 2000). A newly-tested ARC strategy of pairing clergy with mental health workers and medical examiners

to deliver death notifications following a disaster was found to be successful (Aguilera & Planchon, 1995). Writing about their experiences on a post-hurricane ARC team in south Florida, Shelby and Tredinnick (1995) report that religious conceptualizations of the hardships imposed by the hurricane were common, and presented a dilemna for mental health counselors not used to dealing with such issues.

It is generally accepted that local religious leaders have much to offer during disaster relief efforts. As the field of disaster, mental health continues to mature; the remaining question seems to be how to best delineate the relative roles of the faith community and mental health professionals in practice.

ROLE OF CLERGY IN SESSIONS AT PEARL SCHOOLS

Clergy were invited to be on site at the Pearl Public School District offices on the day after the shooting during the debriefing sessions for school personnel. All teachers were strongly encouraged to attend one of the debriefings. Details regarding the debriefing/counseling sessions for teachers and students are available in Dr. Lyons' earlier article, published in the previous issue of the *Texas Journal of Rural Health* (Lyons, 2001). Clergy were not included in the actual debriefing sessions, but were available in the surrounding area to talk with any interested individuals. Since such contacts were individual and initiated by the interested staff person, the author and school administrative team did not ask clergy to place any restrictions on what could be discussed.

The sessions for students were held at the high school, 48 hours after the shootings (a Friday). Student participation was voluntary. The role of the clergy was clearly defined. A member of the local faith community was present in each student homeroom. Also assigned to each homeroom were the usual homeroom teacher and a mental health professional. During the course of their own debriefing the previous day, teachers had received information about normative reactions to trauma and effective coping strategies. The goals and structure for the sessions with students had also been explained. The author reviewed similar information with the mental health workers and clergy prior their sessions with students. Clergy understood that their agreed-upon role was to comfort and support rather than to preach. All participating clergy agreed to abide by the following restrictions:

1. No preaching, public praying, or citing of specific religious texts;
2. Any responses to questions about moral or faith issues would be answered in an ecumenical manner;
3. Services offered by local churches were included in the list of resources that could be discussed with students, but must be included among an array of options without any specific invitations.

A chaplain/critical incident stress debriefing team member reviewed the stipulations with clergy just prior to their Friday session with students.

Several clergy requested to be at the school the following Monday when regular classes resumed. This request was approved, with the previous rules still applicable.

CONCLUSIONS

All feedback the author and school administrators received regarding the interventions provided was positive. No comments regarding the involvement of community religious leaders were received. Clergy expressed satisfaction with their ability to contribute to the school-based sessions, even though they had been precluded from using key professional "tools" such as praying with the person or quoting scriptural passages. Currently, the local faith community is organizing critical incident stress management training sessions for local clergy to further expand their credentials and expertise in preparation for other potential crisis events (Mitchell, 2000).

The author's impression as she observed the sessions for staff and students was that the availability of local clergy added to the participants' acceptance of the sessions and was a source of comfort for a number of individuals. One staff member was quite tearful and asked a number of "Why?" questions. As a result of talking with local pastors after the group debriefing, she evidenced greater composure. She continued to question how someone could commit such violence, but expressed an acceptance of what had occurred and a readiness to find ways to cope with her grief.

The presence of both their usual homeroom teacher and a local pastor/youth minister seemed to facilitate students' openness in discussing their feelings and accepting encouragement and advice. Students were observed to direct most of their questions and remarks toward the teacher or local religious leader, rather than to the mental health professionals (most of whom were from neighboring communities and strangers to the students). There was a strong sense of shared community experience, i.e., "we'll get through this tragedy together," which was very positive and recovery-directed. The mental health clinicians were able to add their own expertise to the discussion and watch for any acute mental health needs. In many classrooms, the greatest impact of the clinicians appeared to be giving confidence to the teachers and clergy by nodding agreement with the way in which the discussions developed.

No formal outcome data were collected. However, absenteeism did not escalate in the months following the shooting and scores from standardized achievement tests administered a few weeks after the shooting led to a school ranking in the highest possible accreditation category; therefore, no adverse impact on attendance or test performance was reported (Balentine, 2000). Pearl High School students and the community of Pearl express strong pride in their collective perception of having overcome a tragedy that might have crippled another community (Harden, 1999). It is speculated that the decision to use outside mental health personnel in a supportive role only, and draw so heavily on the ability of local school and religious leaders to lead the recovery effort, played a major role in both the rapid return to positive functioning and the local pride that has been so apparent. National magazine and television crews have returned to Pearl over the past few years, with plans to do follow-up stories on the aftermath of the shooting. They have left rather disappointed that people did not have a lot to say; the stories never aired or made the magazine. Occasionally, the confessed and convicted shooter is interviewed for a newsmagazine segment on murder sprees or youth violence, but otherwise you rarely hear anything in the media about the shooting in Pearl. In the author's opinion, becoming a non-story is one of the most powerful indices of successful recovery.

When the topic of partnering with clergy in school-based interventions was raised recently at a national conference (Hammond & Lyons, 2000), audience reaction was mixed, with some individuals expressing surprise that such a format would have been allowed in a public school or that it would have been successful. Would the same format for collaboration between teachers, clergy, and clinicians work as well elsewhere? Not necessarily. In locations where religious beliefs are less central to the local culture, there might be less acceptance of clergy playing a central role in school-based disaster relief activities. In communities with greater religious diversity or where there are tensions among faith groups, the selection and optimal matching of clergy with student/teacher groups could easily be problematic.

Should clergy have been given more latitude regarding their role in the school-based sessions? Among adults, the appraisal of negative events as punishments by God has been associated with poorer physical and mental health (Koenig, Pargament, & Nielsen, 1998). Children have also been found to sometimes interpret negative situations as punishment from God (Ebmeier, Lough, Huth, & Autio, 1991). By asking clergy not to pray with students or quote scripture to them during the counseling sessions, did we reduce their ability to effectively minister to students on this and related areas of concern? Perhaps. However, in light of the ongoing national debate regarding the separation of Church and State, it was felt that a broader role could not be granted for sessions to be held within a public school building and staffed by personnel from various government agencies. In a different environment (e.g., a parochial school or church-affiliated hospital), the role of the clergy could perhaps be even more fully integrated. As with any other facet of disaster relief, sensitivity to cultural norms is absolutely essential.

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Reaching the Hard-To-Reach: Innovative Responses to Domestic Violence

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Abstract

The purpose of this investigation is two-fold: (1) to report on the efficacy of an innovative domestic violence training program for migrant farm worker women; and (2) to present findings from data gathered during a two-year period by the trained migrant farm worker advocates. The data provide strong evidence for the effectiveness of the training program. Using standardized interview forms, the trained advocates collected domestic violence data from 502 migrant farm worker women. The reported rate of physical and/or sexual abuse was 50%. Alcohol use by intimate partners significantly increased the risk for women of experiencing physical, sexual, and emotional abuse.

Key words: domestic violence, migrant farm workers, rural health, women. (Texas Journal of Rural Health 2001; 19(2): 30-41)

Introduction

The past two decades have seen a flourishing of public awareness, program, and service development in the area of domestic violence. A grassroots "shelter movement" has helped create a network of housing and

counseling services for abused women and their children (Dziegielewski, Resnick, & Krause, 1996). However, progress has been uneven. Most of the changes have taken place in urban metropolitan areas. Rural communities largely have not shared in the benefits. Hard-to-reach populations within rural communities such as migrant and seasonal farm workers remain largely untouched by developments in domestic violence service delivery despite growing evidence of the magnitude of domestic violence experienced within such communities.

Responding to this need to more actively address domestic violence experienced by migrant farm workers, the Migrant Clinicians Network (MCN) launched an experimental program to provide a basic level of domestic violence services to farm worker women in 1998. (MCN provides networking, education, accreditation, and research services to clinics that serve migrant and seasonal farm workers.) The three-year program involved recruitment and domestic violence training of farm worker women to serve as domestic violence advocates within their communities. The first year focused on developing strategies for recruiting and training farm worker women. During the second year, the focus shifted to using the data gathered by these newly trained advocates to assess the needs of the communities that were to be served.

The purpose of the present investigation is twofold: (1) to report on the efficacy of the innovative training program initiated by MCN with the migrant farm worker women; and (2) to contribute to the growing literature on the magnitude of domestic violence within the migrant farm worker community and to our understanding of related factors.

DOMESTIC VIOLENCE WITHIN HARD-TO-REACH POPULATIONS

Numerous studies suggest that domestic abuse occurs among all racial, ethnic, and socioeconomic groups (Bachman & Saltzman, 1995; Centerwall, 1984; Straus, Gelles & Steinmetz, 1980; Walker, 1984). Despite this growing body of knowledge, little research has focused on domestic violence in rural areas, particularly among hard-to-reach populations such as rural residents who migrate and are members of racial/ethnic minority groups. Van Hightower, Gorton, and DeMoss (2000) recently reported findings from their investigation of predominantly Latina farm worker women conducted in health clinics in a nine-state area. They found that 19% of the women reported being physically or sexually abused (a rate similar to a 17% rate of domestic violence injuries reported in a nationwide United States Department of Justice survey of emergency room admissions (Rand, 1997). Another recent study of immigrant women in California found that 25% to 35% had been victims of domestic abuse (Hogeland & Rosen, 1991). Thus, there is documented evidence regarding the prevalence of domestic violence within the farm worker community.

Beyond needing more reliable information as to the prevalence or magnitude of domestic violence within this particular hard-to-reach population, additional information also is needed regarding factors contributing to the abuse. Some of these potential factors have begun to be identified in the existing literature. First and foremost, writings on hard-to-reach populations concur that isolating circumstances often contribute to increased

rates of domestic violence as well as under reporting of abuse. Pinn and Chunko (1997) maintain that low income women, and those who live in isolated conditions (that is, who reside in remote areas, do not own telephones, do not speak English) are at the highest risk for all types of violence. Undocumented farm workers in particular often face a high degree of both physical as well as psychological isolation. After studying 25 incarcerated Hispanic women who had been battered, Bonilla-Santiago (1996) argued that it is their undocumented status that keeps these women isolated and trapped within violent homes. Similarly, one analysis of immigrant Latinas revealed that the rate of battering was highest among undocumented or conditional resident Latinas who were married to citizens of the United States or lawful permanent residents (Anderson,1993), a relationship which is common among migrant farm worker women. Finally, rural residency itself is an isolating factor that influences family abuse and access to domestic violence services. In his analysis of policy responses to domestic violence in rural settings, Websdale (1997) concluded that physical isolation associated with the rural milieu provides batterers with opportunities to engage in the most brutal forms of battering.

Websdale's (1997) analysis points to a second critical contributing factor: limited access to health care and social services. He argues, based on his policy analysis, that rural battered women encounter acute difficulties in using potentially supportive domestic violence services (1997).

Others as well have begun examining this limited access or use of health care or social services. Fishwick (1998) maintains that lack of anonymity is an important factor discouraging rural women from reaching out for help. As an example, because a responding police officer may be an acquaintance or friend of the abuser, a call for assistance might result in greater jeopardy for the woman seeking help. Bonilla-Santiago (1996) further suggests that because of language and cultural barriers, most of the Latina women she interviewed received no assistance or protection from police, legal aid, welfare, family counseling agencies, or community mental health centers. She also found that Latinas who are illegal residents of the United States have the greatest difficulty receiving help.

Beyond isolation and limited access to services, other factors, often predominant among migrant farm workers, also significantly contribute to the domestic violence within their community. For example, Olavarrieta and Sotelo (1996) report that Mexican women residing illegally in the United States often fear deportation, which prevents them from reporting episodes of domestic violence or seeking help. Gagne's (1992) case study of spousal abuse and social control of women in a rural Appalachian community found that the social structure of that setting facilitated family abuse. Within that community, a patriarchal social structure, cultural norms that objectified and devalued women, and geographic isolation established a social context that permitted men to exercise violent social control over women (Gagne, 1992).

In sum, factors such as physical and psychological isolation, limited access to health care and social services, cultural expectations and norms, and fear of deportation all may be critical factors contributing to the yet unknown level of domestic violence among migrant farm worker women. Equally critical factors such as culturally enforced fear of one's partner, limited knowledge of services available and appropriate actions to take, and substance abuse have yet to be investigated within the migrant worker community as they relate to the prevalence of domestic violence.

Despite the uncertainty as to the prevalence of domestic violence within rural and hard- to-reach populations, and the limited understanding of the constellation of factors contributing to the abuse, there is consensus among researchers that the needs of domestic violence survivors in these populations are not being adequately met.

INNOVATIVE INTERVENTION EFFORTS

Designing programs to meet the needs of hard to reach survivors has been a daunting challenge for domestic violence service providers and activists. The prevailing model for domestic violence services has a battered women's shelter as its focal point. Other services (hotlines, criminal justice, counseling) supplement and strengthen the shelter, on which their own services are heavily dependent. Individuals and groups concerned with domestic violence typically coalesce around the goal of opening a shelter and continue their advocacy work in close association with the shelter. Because shelters are expensive enterprises, small towns and rural areas often do not have them available. For marginal populations in rural areas, traveling across several counties or many miles to an unfamiliar urban area to reach a battered women's shelter can be an overwhelming prospect. Likewise, without a shelter, domestic violence coalitions, if they exist at all, tend to be weak and poorly organized (Van Hightower & Dorsey 2000). New models of services are slowly emerging for rural areas, but little research has yet been done on the effectiveness of these new programs.

Responding to the need for identification and evaluation of alternative rural domestic violence programs, a project funded jointly by the Administration for Children and Families, Department of Health and Human Services, and the Injury Prevention Research Center at the University of Iowa (Correia, 1999), conducted a nationwide review of rural domestic violence programs. The project report described nine programs that were particularly effective in responding to the unique needs of battered women in rural communities. Two related characteristics emerged as common to each of the programs. The first was collaboration among domestic violence service providers and other systems, including law enforcement, the courts, child welfare agencies, and schools. The second was active community participation. Local residents and organizations worked closely together to formulate programs to address unique local needs. This report concludes that: "There are untapped human resources in rural communities. If organized, these community members have much to offer to create an atmosphere intolerant of violence, and to provide non-judgmental services to battered women and their children" (Correia, 1999).

One of the specific programs reviewed, *Lideres Campesinas* (farm worker leaders), which operates in California, mobilizes grassroots farm worker women to take leadership roles in addressing pressing community issues, including domestic violence. In her analysis of *Lideres Campesinas,* Rodriguez (1998) found that the farm worker women, when given training and information, could become effective advocates for survivors within their own communities. In 1998, the MCN designed a Texas farm worker program, patterned largely off the *Lideres Campesinas* program, but with a focus limited to domestic violence. (Funding for the MCN project was provided by the Centers for Disease Control and Prevention, Family, and Intimate Violence Prevention Team.) What follows is a brief description of

this innovative program, *No Hay Mal Que Por Bien No Venga* (Every Cloud has a Silver Lining).

Program Description

No Hay Mal Que Por Bien No Venga was designed to recruit and train migrant farm worker women to become domestic violence advocates for their communities. The first year of the three-year program involved recruitment and domestic violence training of migrant farm worker women. Women recruited from three different regions across Texas participated in a two-day intensive training program on domestic violence, myths about domestic violence, legal issues, guidelines for working with abused farm worker women, finding available resources within their communities, and pointers for educating and organizing within their communities. In addition, the advocates received training on how to gather information from farm worker women in their communities regarding the prevalence of the problem, knowledge about domestic violence, and factors possibly contributing to domestic violence. During the second and third years of the project, the trained farm worker women gathered information regarding the needs of their local communities as well as provided information and referrals as needed. The purpose of the present investigation is to summarize these activities and the resulting information gathered during the first two years of the project.

METHODOLOGY

The present study reports on two phases of the overall program. Phase I is comprised of the initial recruitment and training of the domestic violence advocates. The purpose of the Phase I investigation is to examine the efficacy of the training itself in preparing the trainees to serve as advocates within their own communities. Phase II assesses the data gathered by the trained advocates to better determine the magnitude of domestic violence among migrant farm workers and examine factors contributing to the problem.

Training Participants

Recruitment of farm worker women for the program was done with the assistance of local agencies such as Migrant Health Promotions, Inc., Texas Migrant Council, Inc., an area family crisis center, and local health departments. The women were recruited from three sites along the Texas-Mexico border, all with large communities of migrant farm workers. Seventy-five women completed all or a portion of the training (and received compensation). Table 1 summarizes the key demographic characteristics of the trainees. As Table 1 suggests, of those trained, 17 (23%) had less than a high school education; however, the majority of trainees had attended high school (62%) or college (11%). With respect to income, the largest portion of the trainees (37%) reported an income of less than $10,000 annually. Of all trainees, only a limited few (4%) reported incomes of over $25,000. In addition, the vast majority of these trainees (85%) reported that they regularly migrate to other regions of the country. Finally, approximately half (48%) of the trainees serve as *promotoras* (promoters of health) in their communities, and 28 (37%) of the participants report having received some form of domestic violence training in the past.

Of the 75 participants who completed the training, 13 women (17%) ultimately volunteered to participate in the Phase II data

Table 1. Descriptive Characteristics of 75 Migrant Farm Worker Women Trainees

Education Level	Frequency	Percent
None	1	1.4%
Grade School	3	4.1%
Middle School	13	17.3%
High School	47	62.3%
College	6	8.0%
Advanced Degree	2	2.7%
Missing	3	4.0%
Language		
Spanish	29	39.2%
English	25	33.8%
Both	20	27.0%
Missing	1	1.3%
Income Level		
Under $10,000	27	37.0%
$10,000-$15,000	15	20.5%
$15,000-$20,000	3	4.1%
$20,000-$25,000	5	6.8%
Over $25,000	3	4.1%
Missing/NA	22	30.1%
Migrant Status		
Yes	64	85.1%
No	11	14.9%
Previous Domestic Violence Training		
Yes	28	37.0%
No	43	58.1%
Missing/NA	4	5.4%
Experience as a Promotora		
Yes	36	48.0%
No	36	48.0%
Missing	3	4.0%

gathering process. These 13 advocates were provided additional training on the process of data collection and were compensated for their time spent collecting data in their communities, filing reports, and participating in the training.

Phase I Data Gathering Procedures

Using pre-training tests and post-training instruments, the following were evaluated: (1) improvement in knowledge about domestic violence as a result of the training; (2) the relationships among socioeconomic status, formal education level, and knowledge improvement; and (3) the influence of pre-training knowledge and experience on post-training knowledge. Both the pre-training and post-training instruments consisted of a series of six open-ended questions to assess trainee knowledge of issues related to domestic violence. Issues addressed through these questions included: (1) types of abuse suffered at the hands of spouses or significant others; (2) existing myths or beliefs about domestic violence; (3) characteristics of the cycle of violence; (4) legal options for battered migrant women in Texas; (5) resources available for migrant women in Texas; and (6) key elements of an individual safety plan. All questions were asked in both English and Spanish and could be answered in either language or both (depending on the participant's preference). Both the pre-test surveys and the post-test surveys were completed by the trainees on-location during the training session.

Each of the six domestic violence questions in both the pre-training and post-training tests were given a numerical score based upon the number of correct responses to each question. Because of the unlimited number of possible responses that could be given to the first question (i.e., regarding types of abuse), the score for the question equaled the total number of correct responses. For the remaining questions, the maximum scores were limited to the number of responses specified. That is, participants could earn a maximum of 12 points for their responses to Questions 2-6, as they were directed to provide a specific number of responses (e.g., "list *two* myths" or "describe the *three* phases in the cycle of violence").

Phase II Data Gathering Procedures

During Phase II, data were collected through interviews conducted by the trained domestic violence advocates with women in their own base communities and during migrations. These standardized interviews were based on a bilingual (English and Spanish) form with icons depicting the particular behavior in question. (The Domestic Violence Assessment Form was originally developed by Dr. Judith McFarlane, College of Nursing, Texas Women's University, Houston, TX, and with permission, adapted for use by MCN.) Such icons have been found to be quite useful when gathering information from women who are not literate. Along with information regarding the location of the interview and age of the interviewee, information was gathered regarding the following: (1) use of alcohol or drugs ("Does your husband/boyfriend/partner use alcohol or drugs?"); (2) physical abuse ("During the last year were you physically abused [hit, kicked, slapped] by another person?" "Who mistreats you?"); (3) forced sexual relations ("Have you been forced to have sexual relations in the last year?"); (4) perpetrator of forced sexual relations ("Who forced you?"); (5) fear of abuser ("Are you afraid of your husband, boyfriend, partner, ex-husband, or

other person mentioned before?"); and (6) preparation of a safety plan ("Have you prepared a safety plan?"). It should be noted that for questions regarding drug/alcohol use, physical abuse, forced sexual relations, and fear, the women were asked to respond simply "yes" or "no."

DATA ANALYSIS

Data analysis was done using the Statistical Package for the Social Sciences (SPSS) for Windows. For Phase I, statistical analysis was used to determine first, the significance of the training on overall improvement of scores between the pre-training tests and the post-training tests; second, the significance of socioeconomic characteristics on test score improvement; and third, the significance of pre-training knowledge on test score improvement. Test score improvement was calculated for each participant by subtracting the individual's pre-training knowledge score from her post-training knowledge score. Average test score improvement represents the mean of individuals' improvement scores (not simply the difference between the average pre-training test score and the average post-training test score). For Phase II, the data gathered through the use of the icon forms were analyzed to determine the frequency of abuse among the women who were surveyed, the characteristics associated with that abuse, and level of knowledge of female migrant farm workers regarding issues related to domestic violence.

RESULTS

Phase I: Training

The purpose of the Phase I evaluation was to assess: (1) whether or not there was a significant improvement in knowledge about domestic violence as a result of the training; (2) the influence of socioeconomic status and formal education level on knowledge improvement; and (3) the relationship between the level of knowledge and the experience of the women prior to participating in their training and their level of knowledge following the training. Each of these are discussed briefly below.

First, overall the training resulted in significant improvement in the level of knowledge regarding domestic violence across participants. Examination of the data indicates a statistically significant relationship between the training and score improvement ($t = 9.701, p < 0.01$). That is, there is a significant difference between the participants' average pre-training knowledge scores (mean = 4.89; range = 0 - 14) and their average post-training scores (mean = 8.97; range = 2 - 16). The average improvement score (representing the mean of individual improvement scores) was 4.25.

Second, the relationship between demographic characteristics (e.g., education and income) and both pre-training and post-training scores were examined. Income was significantly related to pre-training knowledge scores ($F = 2.980, p < 0.01$). Education level was not related to pre-training scores. In addition, neither income nor education level were related to post-training knowledge scores. These findings would suggest that despite differences among the participants prior to the training, these differences did not significantly enhance or detract from the training itself.

Finally, although pre-training knowledge scores indicate significant differences across the participants, post-training scores indicate that the training brought the trainees to a comparable level of knowledge concerning domestic violence. Specifically, both previous domestic violence training as well as experi-

ence as a *promotora* (promoter of health) are significantly related to pre-training knowledge scores, but are not significantly related to post-training knowledge scores.

Phase II: Prevalence and Factors Related to Domestic Violence

Beyond gathering data regarding the prevalence of domestic violence within the migrant farm worker community, the purpose of the second phase was to investigate the relationship between domestic violence and (1) the relationship between the victim and the perpetrator of forced sexual relations (e.g., husband, boyfriend, stranger); (2) the use of alcohol or drugs by the interviewee's husband/boyfriend/partner; (3) the extent to which the interviewee is fearful of abuser; and (4) the extent to which the interviewee had considered a safety plan.

Overall, the 13 advocates interviewed 502 migrant farm worker women in their base communities and during their farm worker migrations. The women that were interviewed ranged in age from 18 to 75 years old, with an average age of 33 years. Within each community the interviews were conducted in a variety of locations, including the advocates' homes (38% of the interviews), at the laundromat (16%), at work (10%), in a store (8%), and at a clinic (7%) among others.

Of the 502 women interviewed, 234 (47%) reported being physically abused and 129 (26%) reported having been forced to engage in sexual activity during the previous year. Nineteen of the women reporting forced sexual contact did *not* report being a victim of physical abuse. When combined, over half the women reported experiencing physical abuse and/or forced sexual contact during the previous year. In addition, both physical and sexual abuse are being experienced by migrant farm worker women of all ages (refer to Table 2 below).

Next, data were gathered to examine factors potentially related to domestic violence. Emotional abuse, often expressed as fear, is a common element of domestic violence. Of the 502 women interviewed, 38% (n=191) express fear of their partners. Among those reporting physical abuse, 73% (n=160) report being fearful of their partners. Likewise, 79% (n=93) of those reporting sexual

Table 2. Percentage of Respondents Reporting Physical and Sexual Abuse by Age Group

Age Group	% Reporting Physical Abuse	% Reporting Forced Sexual Contact
Under 20 yrs old	46%	35%
20 - 29 yrs old	40%	22%
30 - 39 yrs old	52%	25%
40 - 49 yrs old	46%	22%
50 - 59 yrs old	40%	20%
Over 59 yrs old	40%	20%

NOTE: Chi Square = 179.8, df = 5, $p<0.01$; post hoc analysis indicates significant differences between women in their 20s and 30s with respect to experiencing physical abuse or forced sexual contact and women in other age groups.

abuse express fear. Although reports of fear are considerably more common among women reporting physical or sexual abuse, it should be noted that 6% (n=30) of women who report neither physical nor sexual abuse also express fear of their partners. A calculation of relative risks indicates that women who report physical or sexual abuse are 12.2 times and 13.2 times (respectively) more likely to express fear of partners than women who do not report physical or sexual abuse.

Finally, of the women interviewed, 54% (n=271) reported that their partners used alcohol or other drugs. Among those who experienced physical abuse, sexual abuse, or fear, the rate of alcohol and drug use was considerably higher. Of the cases that reported physical abuse, 82% reported alcohol or drug use. Of the cases of reported sexual abuse, 86% reported use of alcohol or drugs. Among the women who expressed fear of their partners, 83% had partners who used alcohol or drugs. Of those women who expressed fear and were neither physically nor emotionally abused, only 34% reported alcohol or drug use by their partners. Relative risks were calculated across these relationships. In general, women reporting either physical abuse or fear are 2.4 times more likely to report use of alcohol or drugs by partners than women who do not report abuse. Women reporting sexual abuse are 2.5 times more likely to report substance use by their partners than women who do not report abuse.

DISCUSSION

The data provide strong evidence for the effectiveness of the training. Overall, the training resulted in significant improvement in the level of knowledge of the participants. Demographic characteristics of the women had no significant impact on the ability of the trainees to acquire and share knowledge on domestic violence. Post-training scores indicate that the training brought group participants to a comparable level of knowledge.

The training portion of the project suggests the feasibility of developing an advocacy program by recruiting and training members within hard-to-reach populations. Lower socioeconomic status and, in many cases, limited English language skills proved not to be a hindrance on the women's ability to successfully learn basic information related to domestic violence.

In the second year of the program the 13 trained advocates interviewed a total of 502 women in their home communities and while migrating. Thirty-eight percent of the interviews took place in the homes of the

Table 3: The Relationship Between Abuse and Drug/Alcohol Use

Type of abuse (or level of fear of abuse) reported	**% Indication drug/alcohol use by partners**
Physical Abuse	82%
Forced Sexual Contact	86%
Expressed Fear of Partner	83%
No Physical/Sexual Abuse or Fear Reported	34%

advocates, but other common locations were laundromats, work sites, parks, stores, and clinics. The ability to make contact with farm worker women in the course of their everyday lives might suggest a reason for the high rate (50%) of reported physical and/or sexual abuse. In addition, these data may suggest the efficacy of having indigenous community members gather this sensitive information. The rate of abuse found in this survey is substantially higher than what has been found in earlier studies. With this exception, the findings of this study corroborate findings of earlier domestic abuse studies. That is, domestic abuse (1) takes place in all age groups; (2) most abuse is perpetrated by husbands; (3) emotional abuse or fear is typically part of the pattern of abuse and is sometimes found independent of physical or sexual abuse; and (4) alcohol use is associated with physical, sexual, and emotional abuse.

The goal of *No Hay Mal Que Por Bien No Venga* (Every Cloud has a Silver Lining) was to develop a basic level of domestic violence services for a particularly hard-to-reach population, migrant farm worker women. Results from the first two years suggest that recruiting and training indigenous farm worker women to be domestic violence advocates offers promising possibilities. The data gathered in Phase II provide evidence that the advocacy program may have a profound impact on correcting a problem of under reporting deemed widespread by many researchers (Anderson, 1993; Bonilla-Santiago, 1996; Gagne, 1992; Websdale, 1997).

In the course of interviewing women, the advocates confronted complex situations that called for services and technical assistance that often were not available. For instance, they discovered that domestic shelters or health care providers often were not accessible, bilingual services were unavailable, sometimes providers were unwilling to serve undocumented workers, and criminal justice responses were unreliable. An initial plan to have support teams of social service providers available for the advocates proved not to be feasible during the course of migration. As a result, the advocates relied heavily on phone conversations with MCN staff and on their own common sense in dealing with difficult situations. Even with significant hurdles to overcome, recruiting, training, and utilizing indigenous farm worker women as domestic violence advocates offers a practical approach to developing domestic violence services within the migrant farm worker community.

Year three (Phase III) of the program will continue with the community needs assessment, but also will focus on improving advocacy skills, leadership skills, and developing better support services for the advocates. It is anticipated that the trained advocates will continue their active involvement in developing services for survivors of domestic violence among the migrant farm worker population. Evaluation is on-going in an effort to continue learning about and documenting the efficacy and impact of the training described above.

ACKNOWLEDGMENTS

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WELFARE REFORM: POLICY IMPLICATIONS FOR HEALTH

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POLICY AND LAW

ABSTRACT

The Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA) (Pub. L. 104-193), as amended, is the welfare reform law that established the Temporary Assistance for Needy Families (TANF) program. The policy implications of the legislation have the potential to directly affect the health of this already at-risk population. Much like public health specialists, researchers, and policy advocates, nurses need to monitor the effects of welfare reform on the health of these vulnerable individuals and families.

Key words: health policy, low-income reform, TANF, welfare reform. (Texas Journal of Rural Health 2001; 19(2): 42-48)

BACKGROUND

The Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA) (Pub. L. 104-193), as amended, is the welfare reform law that established the Temporary Assistance for Needy Families (TANF) program. TANF is a block grant program designed to make dramatic reforms to the nation's welfare system by moving recipients into work and turning welfare into a

program of temporary assistance. TANF replaced the national welfare program known as Aid to Families with Dependent Children (AFDC) and the related programs known as the Job Opportunities and Basic Skills Training (JOBS) program and the Emergency Assistance (EA) program (United States Department of Health and Human Services, 2000a)

Throughout the 1980s and early 1990s, efforts were at work to alter the welfare system of this country (Kneipp, 2000). There was increasing recognition that AFDC and associated programs did little to reduce poverty and actually created a cycle of dependency. With the sweeping reform legislation of 1996, each state became accountable for moving welfare recipients to self-sustainable work with a federal mandate of a sixty-month lifetime limit of benefits. The goal was to ensure that all families get the essential support they need to get a job, succeed at work, and move out of poverty (United States Department of Health and Human Services, 1999a). The 1997 Balanced Budget Act will distribute a total of $16.5 billion to the states through the year 2002 in welfare-to-work grants (Perez-Johnson & Hershey, 1999). Mandated requirements for state participation, along with economic bonuses and penalties, are tied to the federal legislation. This article looks at how Texas implemented the welfare reform program and the policy implications for the health of the population affected.

In 1995, the Texas legislature foresaw the impending federal legislation mandating welfare reform and passed House Bill 1863. This legislation consolidated 28 workforce-related programs from ten different state agencies and created one new agency: The Texas Workforce Commission (Texas Workforce Commission, 2000a). The Texas Workforce Commission established large grant programs for employment assistance and self-sufficiency. Texas applied for, and received, a federal five-year waiver to implement its own welfare reform initiative: Achieving Change for Texans (ACT) (Texas Workforce Commission, 2000b). Implementation of ACT began in May of 1996 and while it was modeled after what was assumed to be the coming federal model, it allowed Texas to implement welfare reform without conforming to the requirements that would soon be mandated.

House Bill 1863 for Texas welfare reform received bipartisan support in 1995. Through legislation, Texas transfers major portions of its $106,401,411 yearly cash assistance budget to 28 local workforce development boards (LWDB) (Texas State Formula Grant, 1999). Service delivery responsibilities of implementation, coordination among service providers, and establishing linkages with employers, labor organizations, community, and faith-based groups are maintained by the LWDB (Texas Workforce Commission, 2000a). Assistance was limited to 12, 24, or 36 months of cash benefits depending on the level of education and work experience. Those with the lowest education and work experience (i.e., less than ten years of schooling) qualify for 36 months of assistance. Those that are considered more employable (i.e., high school graduate or GED) are limited to 12 months of cash assistance. Categories of exemptions are defined, such as having a disabled family member or being a victim of abuse, which allow for flexibility in administering the plan.

Representative Naishtat, Chairman House Committee on Human Services, along with other leading representatives, led the fight to apply more flexible requirements in the Texas plan. Groups concerned with poverty, children, and domestic violence also supported more lenient requirements and additional support services. Governor George W. Bush, and others, supported much stricter guidelines for participation and mandated

work requirements than even the federal regulations would require (Smith, 2000).

POLICY ALTERNATIVES

Texas chose to move quickly and develop its own reform legislation, exempting it from most of the federal guidelines until 2002. However, after March 2002, Texas will be required to follow federal requirements for participation such as the sixty-month lifetime maximum benefit and reduced exemption criteria. While Texas has chosen to allow more flexibility in its current plan, it is noted that Texas ranks 47th in the amount of cash assistance it provides recipients (Smith, 2000). Federal grant money was set based on the criteria of rates poverty and TANF caseloads in 1995. The funding remains constant until 2002 (United States Department of Health and Human Services, 2000a). Other states have chosen to implement stricter guidelines and criteria than the federal mandates require (United States Department of Health and Human Services, 1999b).

In March 2002, Texas will have to move into compliance with federal guidelines. Currently, those mandates include a sixty-month lifetime maximum on cash benefits. Regulations do allow states a maximum of 20% of their caseload to be exempt due to family hardship (as defined by the state) or a family with someone who has been battered or subjected to extreme cruelty (United States Department of Health and Human Services, 2000a). Each state must meet two separate work participation rates (single-parent and two-parent families) that reflect how well it succeeds in engaging adults in work activities. There are also financial bonus incentives for states that are considered "high performance" states (United States Department of Health and Human Services, 2000a). How these requirements and incentives will affect policy in Texas remains to be seen. Recently, a new pilot program has been developed and recently implemented in Texas. The Employment Retention and Advancement Project is under the Texas Department of Human Services and involves intensive case management. Four pilot sites were started January 2000, but initial outcome measures show that participation is much higher when recipients are actively engaged and supported toward self-sufficiency (Smith, 2000).

POLICY CONSEQUENCES

Again, the vision of welfare reform was to ensure that all families get the essential supports they need to get a job, succeed at work, and move out of poverty. The idea was to move people quickly into paying jobs while supporting issues of transportation and child care and then focus on education for job and wage advancement (Kneipp, 2000). Businesses are offered tax credits for employing long-term welfare recipients (United States Department of Labor, 1999). Personal responsibility was the slogan. A consistent message is delivered and enforced: "Government assistance is intended to be temporary. Texans are responsible for the support of themselves and their families. Work is the goal" (Texas Workforce Commission, 2000b). The Texas Workforce Commission training manual suggests wording to be used with applicants and recipients, "When you work, you are a positive influence on you child" and "You are expected to use your skills and talents to support your family" (Smith, 2000). This message is delivered as soon as someone walks in the door of a LWBD and is consistently enforced throughout the application process and while receiving assistance. Creators of the federal guidelines

also envisioned welfare reform would have significant effects on decreasing the rates of childhood poverty and the number of unwed mothers. It was also envisioned that the rate of childhood immunizations and well child check-ups would increase (Smith, 2000; United States Department of Health and Human Services, 2000a) even though data has consistently failed to show a correlation between these indicators and the receipt of welfare assistance (Haveman & Bershadker, 2000; Smith, 2000).

Proponents and advocates for women and children's groups worried that benefits would be cut off before self-sufficiency could actually be attained. Studies conducted from both an economic and a social science perspective have demonstrated that meeting the goals of self-sufficiency under the proposed mandates were highly unlikely (Haveman & Bershadker, 2000). Studies prior to 1996 had demonstrated the revolving door nature of welfare recipients (Harris, 1996) and the majority of research indicated that job placement strategies did not lead to sustained economic self-sufficiency for women (Kneipp, 2000). The ability to return to cash assistance benefits when unemployed has been an important "survival mechanism" for many low-income women, because they ordinarily do not meet the eligibility criteria for receiving unemployment insurance income support (United States House of Representatives Committee on Ways and Means, 1998).

What has actually occurred since the passage of welfare reform? From January 1994 to September 1998, the number of families receiving AFDC nationally (and then TANF) declined by 43%, from 5.05 million to 2.90 million (United States Department of Health and Human Services, 2000b). In Texas, current numbers are 50% less than in 1995 (peak year) and funding levels will remain constant until the year 2002. Texas benefits total $480 million allocated by the 1995 numbers and the yearly grant amount remains constant as an incentive for states to decrease welfare rolls and keep the excess. Funding for Texas during the waiver period is not based on successfully meeting criteria or addressing barriers to employment (Smith, 2000).

How is welfare reform affecting the health of the recipient population? There has been a 50% decrease in Texas Medicaid rolls since welfare reform started (Smith, 2000). Historically, Medicaid, AFDC, and food stamps were tied together. It was very uncommon to get one without the others. Welfare reform has contributed to an increase in the number of low-income people without insurance. In 1997, an estimated 1.25 million low-income people nationally became uninsured as a result of welfare reform with children accounting for two-thirds of those numbers (Klein, 2000). Garrett and Holahan (2000) found that a year or more after leaving welfare, 49% of women and 30% of children were uninsured. African-American children (58%) are more likely to go uninsured than White children (41%) (Klein, 2000). Most of the children who lost Medicaid coverage in 1997 probably were still eligible for Medicaid and should not have lost their coverage (Klein, 2000). According to a recent report by the Texas Comptroller, public and private organizations spend approximately $1,000 per uninsured individual per year (Lopez, Bauman, & Herrick, 2000). This increase in the number of uninsured results in a cost shifting, not necessarily a savings, for state budgets as the public health sector is typically the "safety net" provider for uninsured individuals (Lopez Bauman & Herrick, 2000).

It is a violation of federal law to discourage someone from applying or receiving Medicaid coverage or food stamps. With the aggressive message of "personal responsibility" that is delivered to potential applicants as they come through the door, Texas may be

violating federal law (Smith, 2000). Texas is not the only potentially guilty party. New York City job centers were found to be illegally discouraging people from applying for food stamps, Medicaid, and cash assistance with the same type of message by a federal court (Welfare New, 1999). To correct the problem, Texas House Bill 820 was passed requiring the Department of Human Services to look at former TANF recipients to identify if they are still eligible for Medicaid or food stamps (Smith, 2000). The Texas Department of Human Services is also looking at developing an Office Standards Work Group to look at the application procedures in place and a new application form is currently being pilot tested for ease of use (Smith, 2000). Currently, the Texas legislature is considering bills that would simplify the Medicaid application procedure (Berger, 2001).

In addition, while welfare reform allows for child care subsidies, a national survey indicates that 43 states feel they probably are not meeting all of the demands for child care that came with the changes in welfare reform (Children's Defense Fund, 1998). As Kneipp (2000) points out, there are more significant barriers to women achieving self-sufficiency than employment. Representative Sylvester Turner's office staff offers one example: a 19-year-old girl with a history of abuse and rape with a baby nine months of age was fired from her job, because she was unable to be "on call" because of child care issues. The local "board" offered bus fare to come to their office, but it was summer and 110 degrees, which was too hot to take the baby out and across town for an all day appointment. When Representative Turner's office tried to intercede, they found that the phone "just rings and rings" at the local workforce development board. They do not know what finally became of the girl or her child (Smith, 2000).

OUTCOMES

Is welfare reform working? That depends on how you define "working." If we measure getting individuals off cash assistance, then the program is a success. If we measure helping individuals to become self-sufficient, then the program looks much less successful. Most people in Texas are cycling back onto TANF rolls within a year (Smith, 2000). And even if self-sufficiency is the measure of success, Kneipp (2000) argues,

"Accepting . . .economic self-sufficiency to tell the story of how women fare in the wake of significant transformation in the United States welfare system is not only shortsighted, but leaves other important factors that contribute to women's overall health and well-being invisible and the effects of public policy remain obscure."

Some studies are examining the effects of welfare policy changes on other aspects of women's lives such as how it has influenced Medicaid and other health insurance coverage, child care, and domestic violence. The Institute for Women's Policy Research has implemented a Welfare Reform Research Coordination Project allowing investigators to more readily access the extensive amounts of information on the subject (Institute for Women's Policy Research, 2000). The Department of Health and Human Services has devoted an additional $5 million to study the outcomes of welfare reform (United States General Accounting Office, 1999) and there are an estimated 28 federal agencies or national organizations currently conducting research on AFDC, TANF, or more generally, welfare-to-work programs (Welfare Information Network, 2000). As the welfare rolls are reduced and the recipients that remain represent a larger portion of the chronically

unemployable, the effects of welfare reform on the most marginalized individuals of society will become increasingly evident (Klein, 2000; Kneipp, 2000; Smith, 2000). In addition, differences in urban and rural areas remain to be examined. Aggregating "rural" and "urban" data may miss important differences, needs, or policy effects of under-served rural communities (Kneipp, 2000).

What becomes of the men, women, and children affected by welfare reform remains to be determined. Certainly, the policy implications of the legislation have the potential to directly affect the health of this already at-risk population. Currently, our country is experiencing a period of economic well-being and growth. What happens when the economy is not as favorable? Whether sufficient supports are in place to assist individuals in achieving true self-sufficiency seems unlikely at this point. While the old system perpetuated a cycle of dependency, the stipulations of the new reforms may not be a significant improvement. A more intensive intervention program with sufficient support systems and case management, such as the new pilot program in Texas, will likely be required to actually move individuals from welfare to sustainable self-sufficiency. Policy implications on the health of this aggregate needs to be monitored so that policy adaptations can be implemented if necessary.

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Population Density and Mortality in the Panhandle

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Research

Abstract

The premature mortality rate is associated with poverty rates in the Panhandle region of Texas. In contrast, the age-adjusted mortality rate is not related to poverty rates, population density, ethnicity, or the supply of primary care physicians. In addition, it is above national standards. Poverty rates are higher in rural counties, the supply of primary care physicians is lower, and proportions of Blacks and Hispanics are lower.

Key words: mortality rate, Panhandle, population density, poverty rates, rural counties, rural health, Texas. (Texas Journal of Rural Health 2001; 19(2): 49-60)

Introduction

The age-adjusted mortality rate is commonly used as an overall indicator of population health (Friis & Sellers 1999). Assuming that it is a valid measure of health, it becomes incumbent on the public health system to monitor variations in adjusted death rates and to analyze its determinants. The purpose of this study is to examine adjusted mortality rates in the Texas Public Health Region 1, which includes the Panhandle of Texas. In

addition, other demographic characteristics of those counties are described, especially rurality as measured by population density.

The determinants of health are 1) environment, 2) human biology, 3) lifestyle, and 4) the health care system (Dever, 1991). Environment includes physical and social dimensions, ranging from air and water pollution to poverty. Lifestyle includes all of those behaviors that influence personal health, including smoking, exercise, diet, and risk-taking. Lifestyle is associated with demographic and social characteristics such as ethnicity, gender, poverty, and age. Human biology affects the individual's response to exposure to disease agents. Both genetics and social circumstances play a role in determining risk. Finally, the health care system also affects health. Adequate health care services can be critical in preventing the progression of disease.

Rural areas can be expected to differ from cities in regard to environment, human biology, lifestyle, and health care systems. This, at least, is the issue investigated in this report.

METHODS

Adjusted death rate, population density, percent poverty, percent black, percent Hispanic, and primary care physicians per 100,000 were selected for analysis because of their theoretical relevance to population health status. The units of analysis were the counties in Region 1. Data were obtained from the federal Health Resources and Services Administration.

Specifics on the variables are as follows:

The adjusted death rate is the number of deaths in 1998 per 100,000 population adjusted for age using the year 2000 as the standard.

Years of potential life lost is the number of life years lost per 100,000 population in 1998 for all causes of death. A life expectancy of 75 years is assumed.

The premature mortality rate is the number of deaths at ages younger than 75 per 100,000 population.

Population density is calculated by dividing the 1997 population estimate by land area in square miles.

Poverty level is the percentage of persons living below the poverty level in 1995.

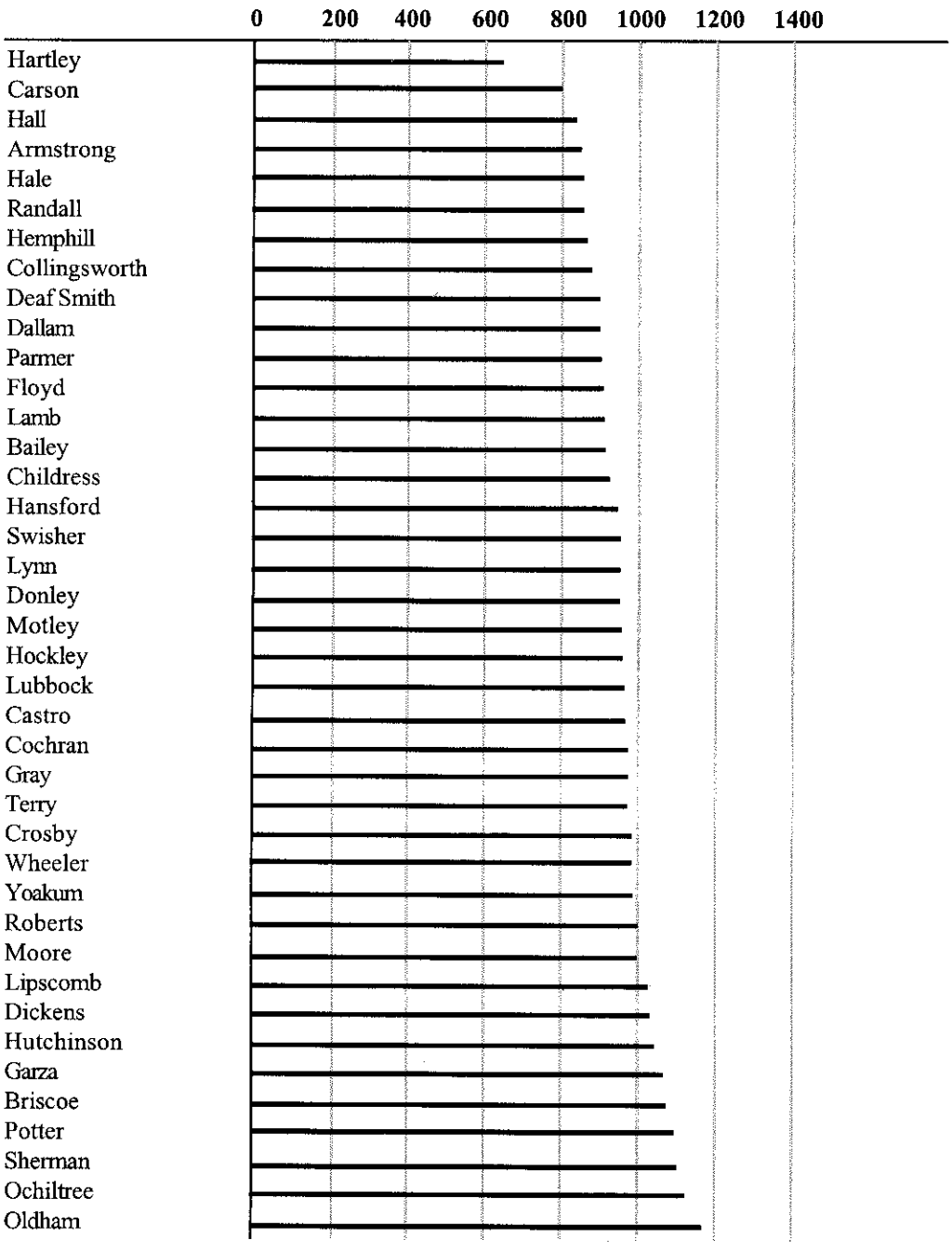
Percent Hispanic and *Percent Black* are computed using population estimates for 1997.

The *primary care physician rate* was defined as the number of active, non-federal physicians per 100,000 persons in 1997. The primary care specialties are general or family practice, general internal medicine, pediatrics, and obstetrics and gynecology.

Each variable was examined graphically by rank-ordering counties and displaying them in Figures 1 – 6. One county (King County) was dropped from the analysis because of its small population; no mortality rate was computed for it. Two outliers were replaced by the mean value for that variable: Hall County's premature mortality rate was replaced with 435.54 and Donley County's adjusted death rate was replaced with 951.67

The relationships between death rates and the other variables were analyzed using ordinary least squares regression. In addition, regression analysis was used to analyze the relationship between population density and the other county characteristics (i.e., percent Black, percent Hispanic, percent in poverty, and primary care physicians per 100,000.). EpiInfo 2000 was used for the analysis.

Figure 1. Adjusted Death Rate in Region 1 Counties



FINDINGS

The distribution of the age-adjusted mortality rates among the 40 counties studied was 950.8. Rates ranged from 639 to 1167.7. The distribution of the rates is depicted graphically in Figure 1. Rates do not vary a lot from one county to the next. In fact, only two counties differ from the mean by more than two standard deviations: Hartley County, which is the lowest, and Oldham County, which is the highest.

Years of potential life lost (YPLL) per 100,000 population range from 1754 (Armstrong County) to 15,455 (Collingsworth County). The mean is 7581 and the standard deviation is 2896. The three counties with the highest rates are Dickens, Roberts, and Collingsworth (see Figure 2).

The premature mortality rate has a mean of 429 and a standard deviation of 142.2. County rates range from 138 (Armstrong) to 932 (Dickens). The three counties with the highest rates are Hall, Roberts, and Dickens (see Figure 3).

Population densities are low for most of the counties, but much higher for Randall, Potter, and Lubbock (see Figure 4). Densities range from a low of 1.0 to a high of 256.0 (see Table 1). In the Panhandle of Texas, identification of rural counties is not difficult, because the drop-off in population densities is quite dramatic.

The percentage of the population in poverty displays a different pattern (see Figure 5). The mean (19.1) is in the middle of the distribution, which ranges from 3.5 to 29.0. None of the urban counties fall into the worst ten of Region 1 counties when it comes to poverty rates.

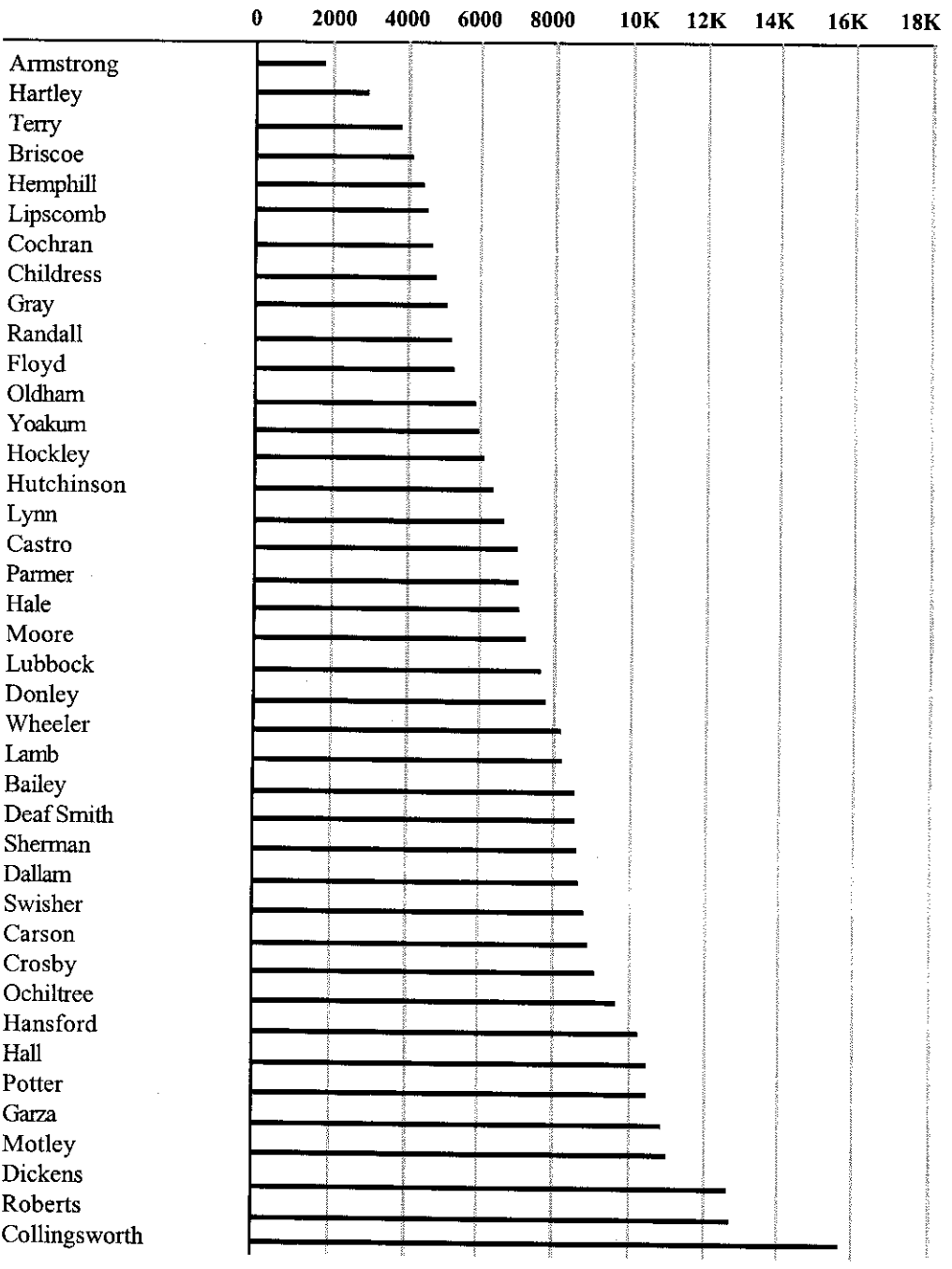
The percentage of the county population that is Hispanic varies dramatically around the region (see Figure 6). It ranges from 3.5 to 54.2. The mean is about 27%. The percentage of the population that is Black is smaller than the percent that is Hispanic. It ranges from zero to 10.2% with a mean of only 3.6%. Two of the most urban counties (Lubbock and Potter) are in the top three of counties in regard to percent Black (see Figure 7).

The availability of primary care physicians varies dramatically across the counties in Region 1. The mean is 40.2 per 100,000 residents, but ten counties have zero. Lubbock has over 120 and Potter has over 180 (see Figure 8). Of course, these two counties serve as regional health care centers and serve patients from more rural counties.

Table 1. Descriptive Statistics (N=40)

Variable	Mean	SD	Min	Max
Adjusted Mortality Rate	951.9	97.7	639.0	1167.7
YPLL	7581.7	2896.1	1754.0	15455.0
Premature Mortality Rate	429.0	142.2	138.1	931.7
Population Density	20.6	45.4	1.0	256.0
Percent Poverty	19.1	7.5	3.5	29.0
Percent Hispanic	26.8	15.8	3.5	54.2
Percent Black	3.6	2.8	0	10.2
Primary Care MDs/100,000	40.2	39.6	0	182.2

Figure 2. Years of Potential Life Lost per 100,000 in Region 1



Regression analysis of the age-adjusted mortality rate produced no significant findings. None of the predictor variables were found to be associated with mortality, either singly or in a multivariate model. The same null result was obtained from the analysis of YPPL. However, significant results were achieved when premature death rate was used as the dependent variable. The explained variance (R-squared) was 0.24. Two predictor variables were significant. Using a one-tailed test, a 1% increase in the poverty rate was associated with a 12 unit increase in the premature death rate. A higher percentage of Hispanics was associated with lower premature death rate. This was significant at $P<0.01$.

Analysis of population density produced a much different result, however. The overall explained variance (R-square =0 .43) was substantial. All four of the predictor variables were significant. Increasing the availability of primary care physicians by one per 100,000 persons was associated with a 0.345 increase in population density. This was statistically significant using a one-tailed test. Increasing the percentage of Black residents was associated with a large increase in density (b=10.4). Percent Hispanic was associated with a smaller increase (b=1.1). An increase in the poverty rate, however, was associated with a large reduction in population density (b=-4.7). In other words, rural counties have a larger share of poor persons than urban counties.

DISCUSSION

The low variation in age-adjusted mortality rates around the Panhandle suggests that the public health care system has been successful at achieving equity in population health status, at least in regard to this indicator. Whether age-adjusted mortality is the best indicator of population health can be argued, however. In fact, the Institute of Medicine (Durch, Baily, & Stato, 1997) did not include it in its list of proposed indicators for a community health profile. The premature mortality rate (deaths prior to age 75 per 100,000 population) has been suggested by some to be a superior measure. Years of potential life lost also has been used extensively (Dever, 1991). And the premature death rate has been used primarily in Canada (Roos et al., 1999).

Table 2. Regression Analysis of Premature Death Rate and Population Density (N=40)

	Premature Death Rate		Population Density	
	B	**p**	**B**	**p**
R-Square	0.24		0.43	
Intercept	374.022	0.000	29.421	0.102
PCPs/100,000	0.056	0.936	0.346	0.060
Percent Poverty	12.105	0.070	-4.689	0.006
Percent Hispanic	-5.906	0.011	1.109	0.059
Percent Black	-4.312	0.769	10.398	0.007

Figure 3. Premature Death Rate in Region 1 Counties

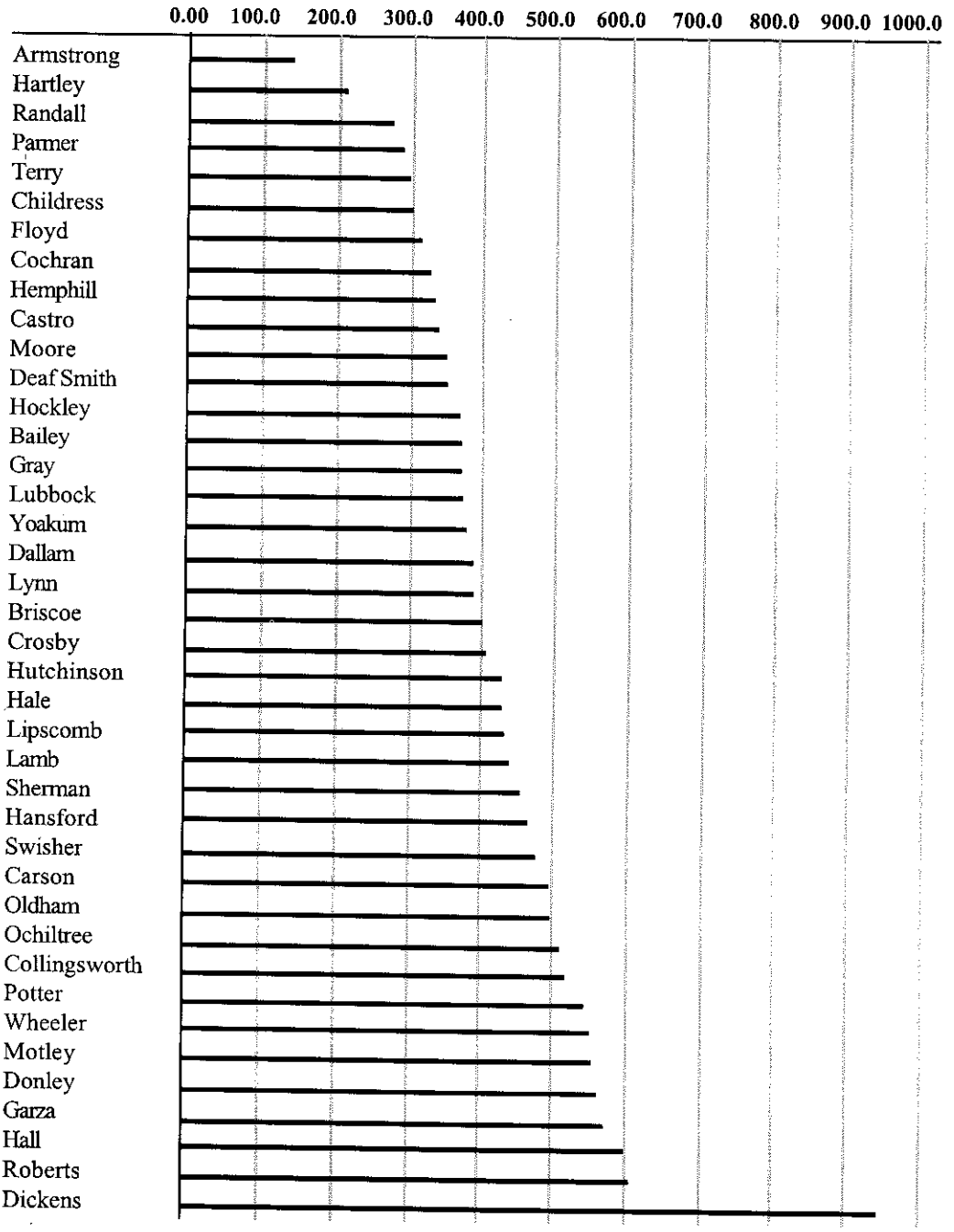


Figure 4. Population Density in Region 1 Counties

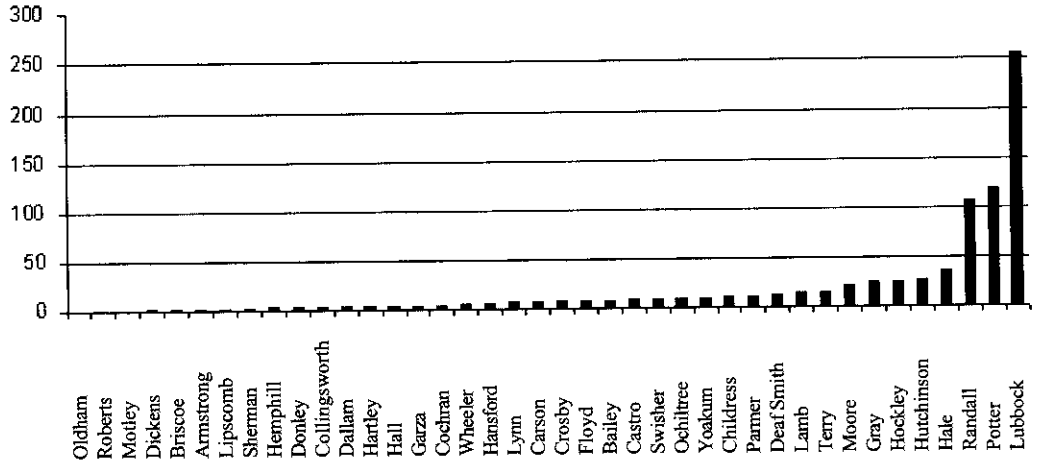
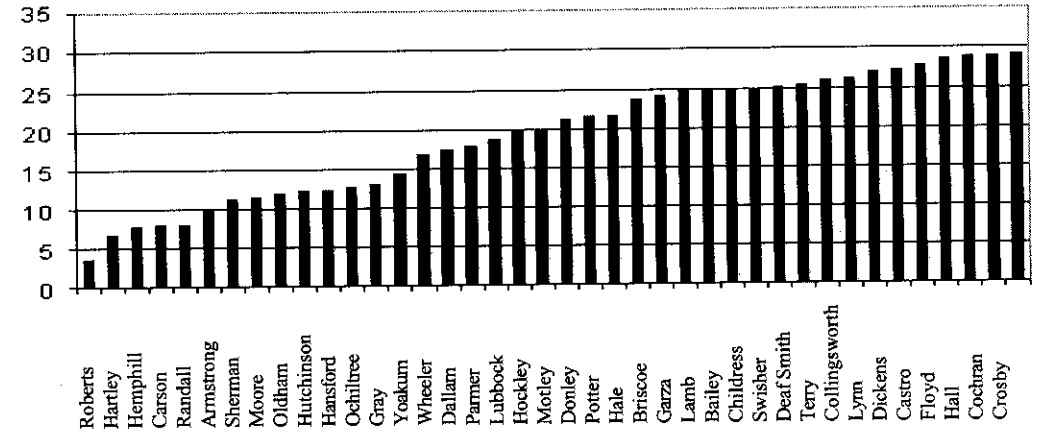


Figure 5. Percent Poverty in Region 1 Counties



Analysis of premature mortality revealed that in this region poverty rates were associated with early mortality and a higher percentage of Hispanics in the population was associated with fewer early deaths. The latter finding may be explainable by the "healthy migrant" theory that some epidemiologists have developed in regard to Hispanics

Figure 6. Percent Black in Region 1 Counties

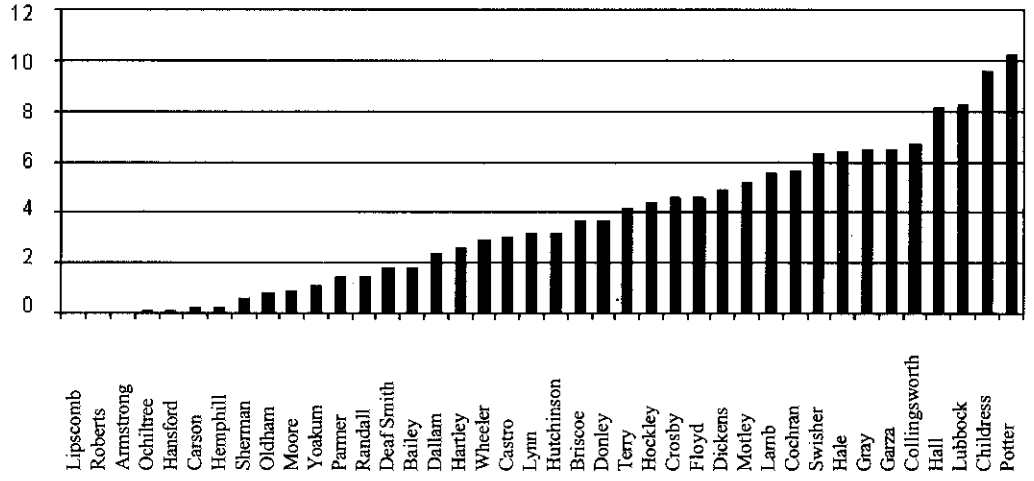
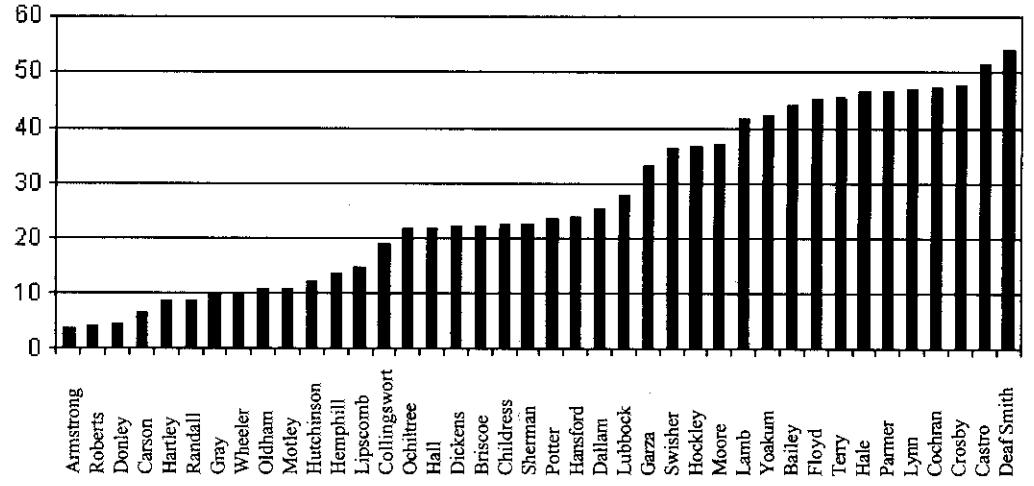


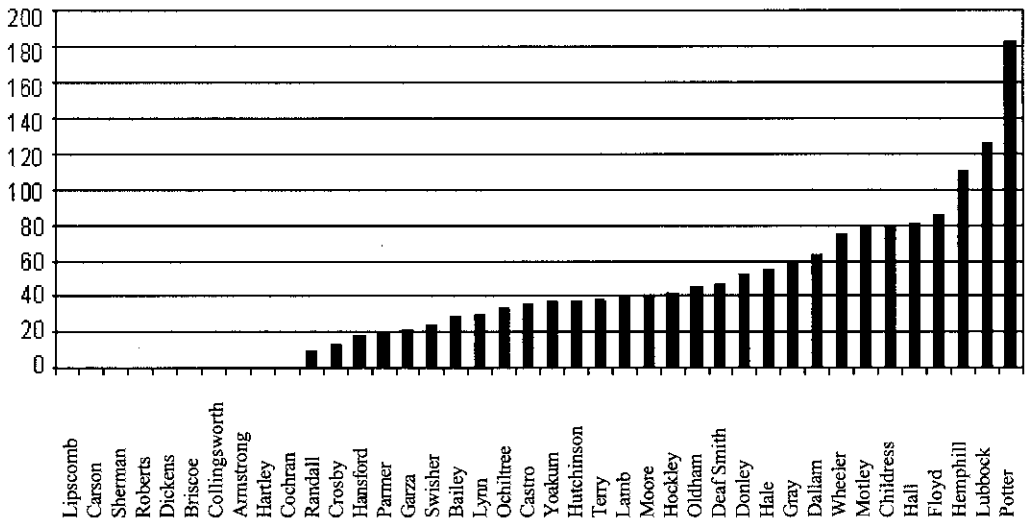
Figure 7. Percent Hispanic in Region 1 Counties



(Abraido-Lanza, Dohrenwend, Ng-Mak, & Turner, 1999; Zuvekas, Wells, & Lefkwotz, 2000). The relationship between poverty and premature death is less surprising. Clearly, any efforts to reduce premature deaths should involve targeting poor populations.

Whether minimization of mortality rates is an appropriate social goal is worthy of

Figure 8. Primary Care Physicians in Region 1 Counties



discussion. The number of years of healthy life people can expect is more important to some than the total number of years a person can expect to live. However, no local data are available on the number of well-years.

Quality of life may be more important than quantity. Social scientists and epidemiologists have attempted to develop measures of quality of life for several generations (McDowell & Newell, 1987). However, no agreement as yet has been reached on how to measure quality of life. Even if a consensus on this matter was achieved, collecting data to measure it at the local level would remain problematic.

One could argue that poverty levels are associated with the quality of life. After all, if one lacks adequate housing, nutrition, or education then self-actualization may be difficult. On the other hand, poor people can and often are happy – perhaps happier than the affluent. Ultimately, public health researchers are pushed back to standard indicators such as mortality rates when they assess the performance of health systems.

Using age-adjusted mortality rates as the peformance indicator, we must conclude that Region 1 has achieved a fair degree of equity in population health, despite pockets of poverty in rural areas. In fact, the association between poverty and rurality raises the question, why is the age-adjusted mortality rate not associated with rurality or poverty rates in this region? The answer must lie in the relative insensitivity of area-wide mortality rates to risk factors affecting individuals. Poor people may indeed be at greater risk of death, and poor people in rural areas are no exception. However, the increased risk for some individuals is not great enough to affect the overall county death rate. Use of the premature death rate yields a different perspective and for this reason the premature death rate perhaps should be added to the standard set of indicators.

Even though little variation in age-adjusted mortality rates is discernable around the region, the levels of age-adjusted death rates remain high. The median for United States counties is 923.2 per 100,000, but the average for the Panhandle is 951. Therefore, we might conclude that regional equity has been achieved, but overall performance on this indicator is substandard.

On a related note, it is interesting to observe that the supply of primary care physicians is not related to mortality rates in this region. Several explanations arise. First, the number of primary care physicians masks the fact that some work more hours than others. Second, some people visit a physician when they are in urban areas, perhaps while doing their shopping. And third, use of physician time increases when people are sick. To the extent that medical care is ameliorative rather than preventive, there would be no reason to expect that the availability of physicians will reduce the county death rate.

Nevertheless, access to primary care remains an important public health goal. Treatment of acute illness is important to quality of life, even if we have no readily available way of monitoring its impact at the population-level.

CONCLUSIONS

The premature mortality rate is a useful indicator of population health and should be used to monitor performance of the health system. Long-term efforts are needed to reduce the level of premature deaths around the region. Suggestions for long-term strategies include the following:

Environment: reduce poverty and income inequality, improve housing, improve nutrition, and increase educational levels.

Biology: identify genetic risks, encourage prevention, and arrange for early treatment.

Lifestyle: promote exercise, better nutrition, and reduced cigarette smoking, especially among the poor.

Health care system: encourage primary care providers to address lifestyle, genetic risk, social risk, and environmental risk among their patients. Physicians will need to be supplemented by non-physician primary care providers in order to carry out this strategy.

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HANTAVIRUS PULMONARY SYNDROME: A RURAL MYSTERY

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REVIEW

ABSTRACT

In May 1993, a mysterious pulmonary illness broke out in the "Four Corners," an area of the Southwest shared by New Mexico, Arizona, Colorado, and Utah. Half of the young, and formally healthy, people infected would soon die of acute respiratory failure. The Centers for Disease Control and Prevention (CDC), the Indian Health Services (IHS), and four State Departments of Health (Arizona, Colorado, New Mexico, and Utah) began an in-depth investigation, with the assistance of the Navajo Nation Division of Health. By November 1993, a new hantavirus, Sin nombre virus (SNV), was isolated, and the disease it caused was named hantavirus pulmonary syndrome (HPS). The main host of SNV was discovered to be the deer mouse (*Peromyscus maniculatus*).

Since 1993, HPS has been found throughout the United States as well as several other countries, defining it as a pan-American disease. Researchers have also discovered that there are several hantaviruses that can cause HPS as well as other hosts. With an increased risk of exposure to infected animals in rural areas, HPS can be a real concern for rural citizens. Diagnosis and supportive treatment must be conducted quickly to avoid mortality, thus exemplifying the need for better understanding of this rare, but deadly, disease. This article reviews HPS in detail,

discussing its background and the most recent updates.

Key words: disease control, Four Corners, hantavirus, hantavirus pulmonary syndrome, HPS, rural, Sin nombre virus. (Texas Journal of Rural Health 2001; 19(2): 61-77)

INTRODUCTION

Hantaviruses belong to the *Buyaviridae* viral family (CDC, 2001a; Schussler et al., 1999; Mertz, Hjelle, & Bryan, 1998; Hart, Trees, & Duerden, 1997). Belonging to one of the groups of zoonostic viruses, hantaviruses can be transferred from animal to human beings. The hantaviruses appear to cause a chronic, subclinical infection in the rodent hosts (Goodman & Griego, 1998). Transmission typically occurs from a human coming into contact with the aerosolized feces, saliva, and/or urine deposited by infected rodents (Simpson, 1998; Texas Department of Health 1998).

Named after the river in the Korean peninsula where it was first encountered, the prototype hantavirus was called the Hantaan virus. In 1951, thousands of soldiers in the Korean conflict fell victim to what is now called hemorrhagic fever with renal syndrome (HFRS) (Schussler et al., 1999; Simpson, 1998; Hjelle, 1999). HRFS causes the kidneys to function improperly, and in severe cases, can cause circulatory difficulties such as bleeding, fluid accumulation in the lungs, and shock. Other less virulent viruses that could cause HFRS were discovered in the following years, including Belgrade, Puumala, and Seoul (CDC, 2001a; Hjelle, 1999).

Found mostly in Asia and Europe, these hantaviruses have seasonal outbreaks, typically occurring during the late fall/early winter in Asia and the months ranging from late spring to early fall in Europe (Mertz et al., 1998). Agricultural activities during these time periods are the most likely cause for increased contact with infected animals. Unlike the hantaviruses that would be discovered in the Americas, the mortality rate for those in Asia and Europe averaged less than 10% (CDC 2001a).

Before the 1990's, no known hantaviruses in North America were attributed with causing human disease (Simpson, 1998). That changed May 1993 in the southwestern United States when the "Four Corners" (an area region sharing the borders of four states: Arizona, Colorado, New Mexico, and Utah) suffered several deaths linked to an unexplained pulmonary illness (CDC, 2001b; Schussler et al., 1999; Kreeger, 1994). This would be the first, and most publicly, recognized incident of hantavirus pulmonary syndrome (HPS).

FOUR CORNERS AND THE VIRUS WITH NO NAME

On May 14 a young, Navajo man was admitted to the Indian Medical Center in Gallup, New Mexico (Kreeger, 1994). Suffering from shortness of breath, the physically fit man died from progressive respiratory failure after only a short period of time. It was soon discovered while reviewing the case that the man's fiancée had also died a few days previously after exhibiting similar symptoms. Dr. James Cheek of the Indian Health Service (IHS) would later say, "I think if it hadn't been for that initial pair of people that became sick within a week of each other, we never would have discovered the illness at all (CDC, 2001b)."

Patricia McFeeley, a pathologist for the New Mexico Office of Medical Investigations (OMI), conducted an autopsy on the young man and his fiancée the evening of the man's death. The results were eerily familiar to the results of an autopsy she had performed only a month earlier. She immediately reported her findings to the New Mexico Department of Health (Kreeger, 1994). Three days later, May 17, Dr. Bruce Tempest of the IHS notified health authorities after identifying five deaths attributed to acute respiratory failure (Hjelle, 1999; CDC 2001b). The state health departments of Colorado, New Mexico, and Utah, the IHS, the University of New Mexico (UNM), the Navajo Nation, and the CDC Special Pathogens Branch came together to examine the cases more thoroughly. Several difficulties hindered the progress of their investigation, including the challenge to mobilize resources during the Memorial Day weekend, resistance to autopsy procedures by the Native American people, and stress from intense media coverage (Levy & Simpson, 1994). By the end of the month, over a dozen people died of similar pulmonary symptoms with the disease's mortality rate reaching 76% (Simpson, 1998).

Although several people died from acute pulmonary distress in the same manner as the initial victim, the source of this infection remained a mystery. Testing failed to link the deaths to any known diseases. After careful examination of the evidence and symptoms presented during their investigation, researchers were able to dismiss possible causes such as poisonous materials or a new strain of influenza. However, even as they continued to narrow the field, they found themselves no closer to discovering the true cause of the illness (CDC, 2001a).

In the last days of May, samples from the New Mexico Department of Health were sent to the flu branch of the CDC. In turn, these specimens were passed on to Special Pathogens Branch because of the disease's high mortality rate (Kreeger, 1994). This would be the lucky break in the case. Research on hantaviruses from the United States Army Medical Research Institute for Infectious Diseases would also prove invaluable to the investigation. While conducting serologic tests for hemorrhagic fevers, the CDC Special Pathogens Branch, discovered that the serum samples contained antibodies that reacted to known species of hantavirus: Hantaan, Puumala, and Seoul (Schussler et al., 1999; Hjelle, 1999; Simpson, 1998). On June 4, 1993, Stuart Nichol, chief of the Special Pathogens Branch molecular biology section, and colleagues confirmed through further analysis of virus genes at the molecular level that the disease was an unknown hantavirus (Kreeger, 1994).

Acting on the knowledge that all other known hantaviruses were transmitted to humans by rodents, researchers focused their attention to the rodent population in the Four Corners area. Nearly 1,700 rodents were captured and dissected for analysis between June and August, 1993. Of the several types of rodents found to be infected with hantavirus, the predominant host (30%) was identified as being the deer mouse (*Peromyscus maniculatus*). After a case-controlled investigation, it was determined that contact with the infected animals was significantly higher in the victim's homes. By November 1993, the unknown hantavirus was isolated. The virus would eventually be named the Sin nombre virus (SNV), or "the virus with no name," and the disease it caused became known as HPS.

Joshua Lederberg of Rockefeller University in New York commented on the accomplishment achieved by the working relation-

ship of local, state, and federal organizations to overcome the difficulties faced during the Four Corners incident. "The discovery of a hantavirus infection with pulmonary syndrome is one of the success stories of the integration of medical care, public-health oversight, and molecular diagnostic technologies... That such an outbreak was [quickly] detected on the Navajo territory is at least partly a reflection of a governmental structure for health care, and prompt communications among medical officers of that health service (Kreeger, 1994)." To put this remarkable accomplishment into perspective, the isolation of the original hantavirus, Hantaan, took decades while the SNV was isolated in only a matter of months (CDC, 2001b).

Oral Traditions and El Niño

An intriguing parallel note to the Four Corners' outbreak is its prediction by Navajo elders in 1992, a year before the hantavirus was even detected by modern medicine (CDC 2001c; Schussler et al., 1999). According to their oral traditions, the mouse was considered to be a carrier of an ancient illness. Rodent blooms (years when weather conditions help create high rodent populations) were analogous to outbreaks of disease. Due to poor living conditions, the chance rodent-human contact increased with these rodent blooms as mice came into hogans for food and shelter (CDC, 2001c; Mertz et al., 1998). This ancient medicine discussed HPS diagnosis and prevention techniques with surprising accuracy.

Spartan living conditions exist in the Four Corners region even today, thus perpetuating continued contact with infected rodents. In the fall of 1992, El Niño weather events created the perfect conditions for a large rodent bloom in the Four Corners. Unusually high precipitation drove the deer mouse population up considerably, and contact between infected rodents and humans increased. It would only be a matter of time before people began to succumb to the SNV. The 1993 outbreak would soon become only one of the many recorded in the Navajo oral tradition, some of which dated back as far as 1918 (CDC, 2001c).

HANTAVIRUS PULMONARY SYNDROME

The Host

The primary reservoir for hantaviruses attributable to HPS are rodents, which cast off the viruses in their feces, urine, and/or saliva. It is currently believed that although an animal can remain infected for its entire lifecycle, the hantavirus does not cause harm to the rodent host (Meyer & Schmaljohn, 2000). While the deer mouse remains the prevalent reservoir for SNV, three other rodent hosts have been identified, each with their own distinct hantavirus (CDC, 2001a; Young et al., 1998). Using the knowledge gained since 1993, health organizations have been able to quickly confirm and isolate these new hantaviruses, which include (Butler & Peters, 1996; Young et al., 1998):

- the Bayou virus (found in the rice rat - *Oryzomys palustris*);
- the Black Creek Canal virus (found in the cotton rat – *Sigmodon hispidus*); and
- the New York-1 virus (found in the white-footed mouse – *Peromyscus leucopus*).

In addition to these hantaviruses, several others have also been identified throughout the Americas, although none have been linked to human illness as yet (CDC, 2001a). The broad range of the various rodent populations (see Figure 1) cut across all

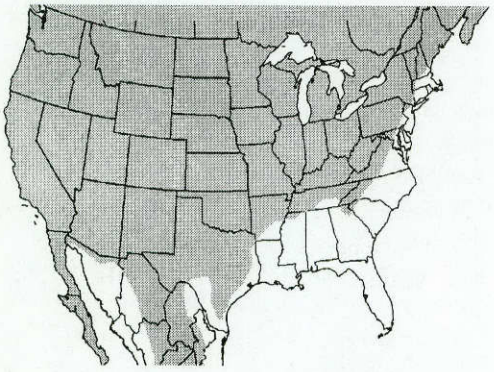
adjoining states with the possibility of contact with infected animals existing in all of them. Canada, Mexico, Central America, and South America are also at risk (Young et al., 1998), making HPS a pan-American problem.

The Illness

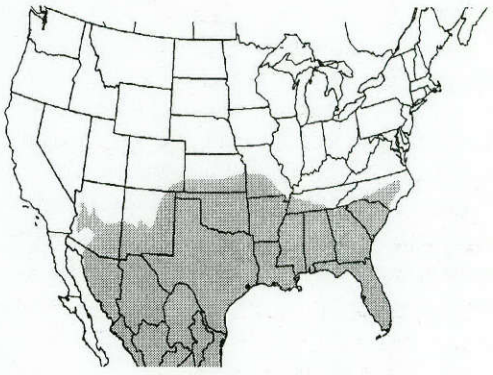
The risk of exposure to hantaviruses causing HPS is proportionally related to the density of rodent populations in and near human habitations (Mertz et al., 1998). The rise and fall of rodent populations is associated with seasonal, environmental, and meteorological factors and fluctuations. Exposure to the hantavirus occurs through the inhalation of aerosolized excreta, usually when the dust is disturbed through human activity. Other possible forms of transmission may include direct contact between infected

Figure 1. Host Rodent Distribution in the United States

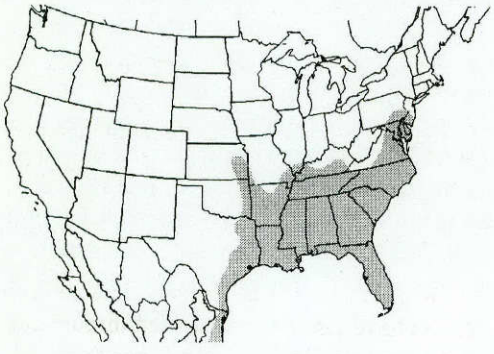
Peromyscus maniculatus - Sin nombre virus



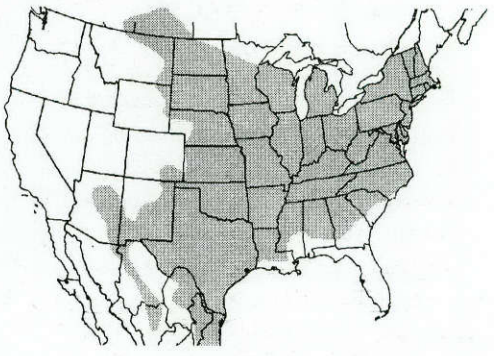
Sigmodon hispidus - Black Creek Canal virus



Oryzomys palustris - Bayou virus



Peromyscus leucopus - New York-1 virus



Distribution information adapted from Centers of Disease Control & Prevention (2000). *Epidemiology of HPS Slideset.* [On-line]. Available: http://www.cdc.gov/ncidod/diseases/hanta/hps/noframes/epislides/episls.htm.

particles and mucus membranes and broken skin. While exposure can occur in the home, at work, or during recreational activities, the majority of documented exposures have taken place when humans entered and/or cleaned rodent infected rooms and buildings (such as attics, feed storage areas, and animal shelters) (CDC, 2001d; Mertz et al., 1998; Young et al., 1998). Three-quarters of the patients suffering from HPS infection have been residents of rural areas (CDC, 2001e; Goodman & Griego, 1998). Person-to-person transmission of hantaviruses has not been documented, but there is surfacing evidence that indicates this may no longer be true (see *Hantavirus Pulmonary Syndrome in the South and Central America).*

Initial symptoms of HPS, closely resembling influenza, appear between a week to 28 days after exposure (Werker & Artsob, 1998; Texas Department of Health, 1998). This can make the diagnosis of the illness difficult, because the HPS symptoms may imitate the symptoms of less deadly viral infections. The most common presenting symptoms of HPS are:

- Cough;
- Dizziness;
- Fever;
- Headache;
- Muscle aches (myalgia);
- Nausea/vomiting/diarrhea;
- Tachypnea; and
- Tachycardia.

Arthralgia (joint pain) may also occur. Rhinorrhea (runny nose) is rare, and less common symptoms (< 5%) can include: meningism, otalgia (ear ache), pleuritic pain, sinusitis, and sore throat (Simpson, 1998). This prodromal phase of the illness may last from three to six days, and upwards of 12 in some cases (Schussler et al., 1999; Goodman & Griego, 1998).

After the prodromal phase, the infected person may feel better for a very brief period of time; less than two days (Excite Health, 2001). This moment of "relief" changes as the patient enters the cardiopulmonary phase of HPS (also known as the "shock" phase). Shortness of breath and the development of a cough mark this phase. Pulmonary edema of a noncardiogenic nature rapidly manifests, usually within one to two hours of onset. In severe cases, cardiovascular collapse and shock accompany the edema. Hospitalization becomes vital to the patient's survival, with approximately 75% of those infected requiring mechanical ventilation. Bleeding internally, the patient's lungs fill with fluid and respiratory failure can ensue. Though in most cases death occurs within 24 hours of hospitalization, time of death can be as short as one to two hours after the first signs of the cardiopulmonary phase. The mortality rate for HPS remains quite high with approximately 50% of the cases resulting in death (Mertz et al., 1998; Young et al., 1998; Schussler et al., 1999; Excite Health, 2001).

Should a patient survive through the cardiopulmonary phase of HPS infection, recovery can occur quite swiftly. Diuresis is the usual indication that the patient has moved into the convalescent phase of the disease. Unlike adult respiratory distress syndrome, prolonged respiratory failure does not appear to result from HPS. This allows the majority of patients to be extubated within 12 to 24 hours, and the possible requirement of supplemental oxygen to be given for only a few days (2 to 4) after that. Unless liver functions display abnormalities, the convalescent phase can end in only a few days. Should irregularities be found, however, this phase may last several months. Data from

Figure 2. Common Indications for Diagnosis of Hantavirus Pulmonary Syndrome

Physical Examination

Crackles or fine rales observed during lung examination
Hypotension (Abnormally low blood pressure; indicates advanced stage of HPS)
Tachycardia (rapid heartbeat)
Tachypnea (rapid breathing)

Laboratory Findings (Hematology)

Atypical lymphocytes (immunoblasts)
Elevated hematocrit
Elevated WBC
Left shift on WBC differential
Low platelet count

Laboratory Findings (Chemistry)

Elevated LDH
Elevated AST (SGOT)
Elevated AST (SGPT)
Low albumin

Radiographic Findings

Bilateral interstitial infiltrates (moderate to rapid progression)

long-term, patient follow-ups suggest that patients surviving HPS make complete recoveries (Goodman & Griego, 1998; Mertz et al., 1998).

Diagnosis and Treatment

The insidious nature of HPS creates great difficulty for diagnosis and treatment of the disease. This can prove tragically fatal because of the speed at which death occurs after the onset of the cardiopulmonary phase. Misdiagnosis is common, because patients suffering from HPS exhibit symptoms easily attributable to other more innocuous illnesses. This is also perhaps why cases of HPS are still being discovered retrospectively.

Early diagnosis of HPS is vital for the patient's well being. The results found from the examinations outlined in Figure 2 can help differentiate HPS from other infections. Determining if the patient has had contact with rodents is an excellent indicator of possible HPS infection. A diagnosis of HPS

can be confirmed through the identification of immunoglobulin M (IgM) and IgM antibodies to hantavirus antigens in serum samples or discovery of viral RNA in infected tissue through reverse transcription polymerase chain reaction analysis (Werker & Artsob, 1998; Simpson, 1998).

At the current time, there is no vaccine against HPS. Due to the rarity of the disease, a broad antibiotic treatment should be administered even before HPS can be confirmed. Treatment of a supportive nature remains the only medical course for health professionals when dealing with HPS infection. Mechanical ventilation using precautions to avoid alveolar overdistension, is required in almost all HPS patients. Observation of hemodynamic and fluid levels, oxygenation, and respiratory support in an intensive care setting are essential to successful treatment. The majority of patients require a flow-directed pulmonary artery catheter for proper monitoring of their cardiac index, pulmonary wedge pressure, and systemic vasular resistence. Drugs, such as Ribavirin, need to be administered within the first few hours of the cardiopulmonary phase, and even then their effectiveness with regard to HPS has been debated (Schussler et al., 1999; Mertz et.al., 1998; Levy & Simpson, 1994).

Health professionals treating HPS encounter a difficult balancing act while maintaining hypotension and avoiding further complications with pulmonary edema. Inotropic agents, such as dobutamine or dopamine, should be used upon the onset of the edema. However, intravenous fluids and agents with principally vasoconstrictor effects, such as norepinephrine, should be avoided due to increased systemic vascular resistance and the possibility of worsening the pulmonary edema (Young et al., 1998; Simpson, 1998; Goodman & Griego, 1998).

One treatment modality being considered for HPS patients is extracorporeal membrane oxygenation (ECMO). Originally used with neonates suffering from compromised respiratory functions, ECMO is believed to be a viable option because it can simultaneously address the combination of cardiogenic shock and pulmonary capillary leaks. ECMO provides enough cardiovascular support to help the patient survive to the convalescent phase, where the chance for rapid recovery is greatly increased. Successful use of ECMO for treating HPS patients has been conducted on a minor level (Schussler et al., 1999; Simpson, 1998; Goodman & Griego, 1998; Levy & Simpson, 1994).

HANTAVIRUS PULMONARY SYNDROME IN THE AMERICAS

Hantavirus Pulmonary Syndrome in the United States

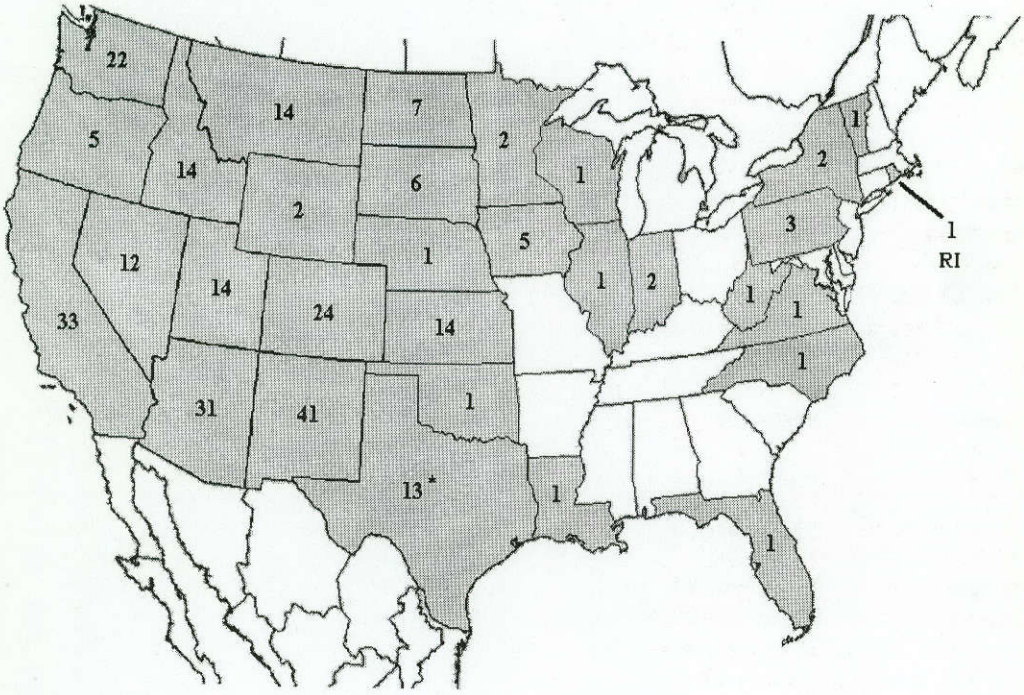
Since May 1993, approximately 280 cases of HPS have been reported in the United States. As of December 7, 2000, the CDC reported this number to be 277 (CDC, 2001e). Data from some states (such as Texas), however, suggest this number may be higher (Rawlings, 2001). Therefore, this article will detail HPS in Texas separately from the information provided by the CDC (see *Hantavirus Pulmonary Syndrome in Texas*). Retrospective cases (i.e., before the 1993 outbreak) are also being discovered; the earliest confirmed case took place during the summer of 1959 in Utah (Mertz et al., 1998). Thus, the number of confirmed cases of HPS is continually expanding.

Cases of HPS have been reported in 31 states (see Figure 3), focusing mainly in the western half of the country. Males (60%) make up the predominant number of cases for

HPS infection. Seventy-seven percent of HPS patients have been White; however, most other races have been affected (African-Americans: 2%; American-Indians: 20%; and Asians: 1%). Hispanics, as ethnicity is considered separate from race, make up approximately 11% of the cases of HPS (CDC, 2001e).

Three-quarters of all cases of HPS have occurred in rural areas, including state parks and campgrounds. The CDC has conducted studies to track the presence of hantavirus-infected animals in the national parks such as the 1994 study of 39 national parks in the northeastern half of the United States (SLACK Incorporated, 1998). Hantavirus infected rodents have been located in approximately 20 national parks, but this

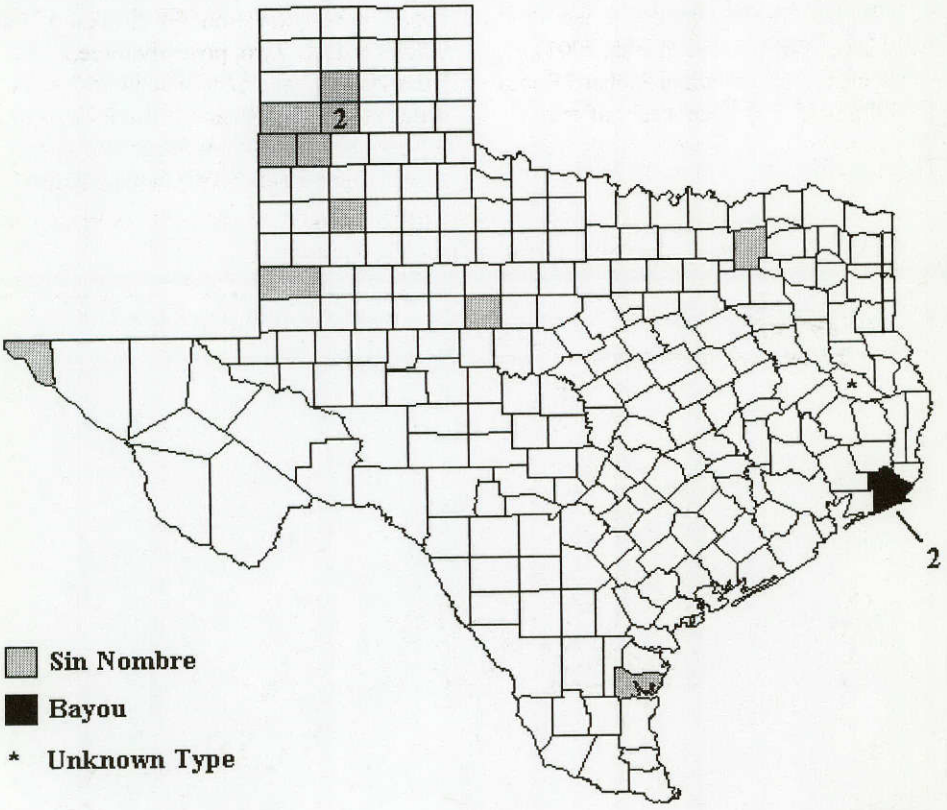
Figure 3. Number of Cases of HPS Infection in the United States to December 2000



* The number of cases for Texas is no longer current. Please consult *Hantavirus Pulmonary Syndrome in Texas.*

Adapted from Centers for Disease Control & Prevention (2001). Hantavirus Pulmonary Syndrome Cases. [On-line]. Available: http://www.cdc.gov/ncidod/diseases/hanta/hps/noframes/caseinfo.pdf.

Figure 4. Number of Cases of HPS Infection in Texas to 2000



Date	Counties	Patient	Results
6/1993	Angelina	58-year-old Female	Died
3/1994	Kleberg	29-year-old Female	Survived
6/1995	Deaf Smith	15-year-old Male	Died
10/1995	Jefferson	23-year-old Male	Survived
4/1996	Potter	25-year-old Male	Died
8/1996	Gaines	26-year-old Female	Died
8/1996	Jefferson	54-year-old Male	Survived
1/1997	Hunt	50-year-old Male	Died
5/1997	Randall	26-year-old Male	Survived
7/1997	El Paso	51-year-old Female	Survived
9/1997	Taylor	16-year-old Male	Survived
4/1999	Castro	51-year-old Male	Survived
11/1999	Parmer	46-year-old Male	Survived
3/2000	Lubbock	12-year-old Female	Survived
5/2000	Randall	26-year-old Female	Survived

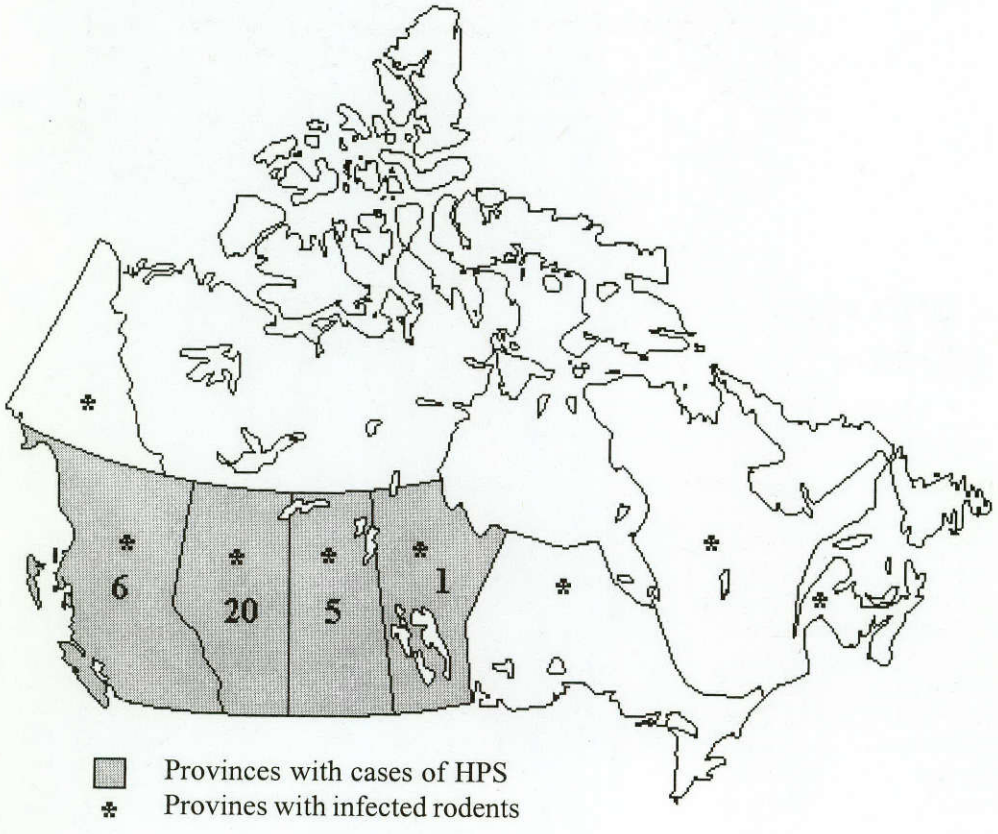
Data provided by Julie Rawlings (2001). Personal Communication.

number could be significantly higher. Although campers and hikers run a higher risk of exposure than most, surprisingly the number of cases directly linked to these activities is very low (Excite Health, 2001). One such case occurred when Richard Boom died of HPS infection three weeks after a family excursion to the Sierra Nevada area (Knapp, 1995).

Hantavirus Pulmonary Syndrome in Texas

Demographically, HPS cases in Texas appear to be quite similar to the rest of the United States. Two, possibly three, hantaviruses have been discovered in the state since 1993: Sin nombre and Bayou. The primary hosts in this region are the deer mouse (Sin nombre virus), white-footed

Figure 5. Number of Cases of HPS Infection in Canada to 1999



Data obtained from Dredot, M. A., Artsob, H., & Werker, D. (2000). Hantavirus pulmonary syndrome in Canada, 1989-1999. *Canada Communicable Disease Report*, 26(8), 65-69.

mouse (Sin nombre virus), rice rat (Bayou virus), and the hispid cotton rat (Bayou virus) (Texas Department of Health, 1998). The mortality rate for HPS cases is 33%. While the information from the CDC reports 13 cases of HPS infection in Texas since December 2000, the Texas Department of Health has reported 15 confirmed cases (Rawlings, 2001). Figure 4 displays these cases in greater detail.

Hantavirus Pulmonary Syndrome in Canada

The first case of HPS in Canada occurred in 1994 in the province of British Columbia.

Figure 6. Number of Cases of HPS Infection in South America to 1998

Data obtained from Young, J. C., Mills, J. N., Enria, D. A., Dolan, N. E., Khan, A. S., & Ksiazek, T. G. (1998). New world hantaviruses. *British Medical Bulletin*, 54(3), 659-673.

Between then and December 1999, 32 confirmed cases have been reported. Although the case fatality rate has been somewhat lower (38%), the demographics of HPS in Canada run parallel to those in the United States. Western Canada appears to be the focus of all these cases, with the majority occurring in Alberta (currently 20, with clusters originating in the southeast and southwest of the provincial capital - Edmonton). Similar to the Untied States, HPS cases fluctuate in accordance to the rise and fall of the rodent populations. Retrospective cases are still being identified, some as early as 1989 (Werker & Artsob, 1998; Drebot, Artsob, & Werker, 2000). Figure 5 details the existence of HPS in Canada.

Hantavirus Pulmonary Syndrome in South and Central America

Updated information on HPS in South and Central America is difficult to find, but cases have been identified in Argentina, Brazil, Chile, Paraguay, Panama, and Uruguay (CDC, 2001f). Twelve confirmed cases of HPS were identified in Panama as of March 2000 (CDC, 2000). According to reports from January 1998, 205 cases have been confirmed in South America, with the majority (133) appearing in Argentina (see Figure 6) (Young et al., 1998). Undoubtedly, since that time, these numbers have increased.

Hantaviruses in South America differ from those in North America not only in reservoirs, but epidemiology as well (Young et al., 1998). Previous to 1996, it was believed that person-to-person transmission did not exist, and had never been recorded. However, during an outbreak of the Andes virus in southern Argentina, data surfaced indicating person-to-person transmission. Persons who had previous contact with HPS patients, but never visited the area of the outbreak became ill from HPS (CDC, 2001f; Wells et al., 1997).

PREVENTION

The easiest way to avoid transmission of the hantaviruses and the HPS infection is to limit possible contact with the virus-host, namely rodents. Avoiding activities that can bring you into contact with infected animals is the first step to prevention. Care should be taken during activities such as:

- Agricultural activities in field crops;
- Living in previously vacant cabins or dwellings;
- Cleaning of animal shelters, barns, and other such buildings;
- Disturbing rodent nests or areas while hiking or camping;
- Inhabiting buildings with rodent populations; and
- Living in or visiting areas known for rodent blooms (CDC, 1993).

Discouraging rodents from living in or near human habitations will greatly reduce the risk of exposure to HPS infection. This can be done through a variety of means, including rodent-proofing dwellings, traps, cleanliness in and around the home, and keeping lawns and brush as short as possible. Potential nesting sites (woodpiles, debris, etc.) should be kept a minimum of 100 feet from the home. Potential food sources (such as pet food or garbage) should be managed properly. Gravel and other barriers around a house or mobile home can help prevent rodents from burrowing into crawl spaces beneath the dwelling.

Possible infected areas, such as cabins or toolshed, should be cleaned as carefully as possible. Heavy rubber gloves, protective clothing (such as overalls, rubber boots, and

safety glasses), and a respirator mask should be worn while performing cleaning activities to prevent infection. Disinfect dead rodents, nests, and droppings /before/ they are handled. The CDC provides an excellent guideline of prevention:

- Air out closed buildings 1 hour;
- Disinfect places rodents have been, then clean up;
- Repair screens and holes or cracks in walls;
- Wear rubber gloves;
- Trap and disinfect rodents;
- Disinfect and clean up rodent nests and droppings;
- Put materials in 2 trash bags, then throw away, burn, or bury
- Formula for the disinfectant solution: 1 and 1/2 cups chlorine bleach to every gallon of water; or use household spray disinfectant (CDC, 2001g).

A POSSIBLE RISK

Approximately three to five million migrant and seasonal farmworkers (MSFW) travel throughout the United States each year (National Center for Farmerworker Health, 2001). Entire families follow migratory streams through the United States as they move from job to job. Two of the three traditional migratory streams (the Midwest and the West Coast), pass through geographical areas known for a higher prevalence of animals infected with HPS. The harsh lifestyle and work conditions of the MSFWs place them in danger of continued contact with HPS infected rodents.

"Most farmworkers live in substandard housing, in areas not served by potable water or drainage facilities... Areas where farmworkers work and live suffer from an acute shortage of health manpower and health resources," says Frank Vasquez, the Executive Director of the Hildago County Health Care Corporation (McKenzie & Kugel, 2000).

The unsanitary and crowded conditions of such homes make for an increased risk of exposure to infected animals. Due to the crowded living conditions, there is the possibility of more than one family member becoming infected as happened in the Four Corners' outbreak. When housing is unavailable, MSFWs may even sleep in tents, open fields, and ditches (National Center for Farmworker Health, 2001), all of which are prime locations for rodent populations. Due to the seasonal fluctuation of the farmworker population, many homes may be left unoccupied during the "off-season." When the farmworkers return and clean up the vacated buildings, they place themselves at further risk. In addition to poor housing, MSFWs conduct agricultural activities in crop fields, which are known for the presence of rodents.

Another factor to be considered is the lack of access to proper health care for the MSFW population (McKenzie & Kugel, 2000). Considering the speed at which HPS attacks its host and requires immediate medical attention, this could pose serious problems should infection occur. Lack of insurance, poverty, and questionable immigration status could make individuals fearful to seek out medical assistance or prevent them from obtaining the proper medical care (Migrant Health Program, 1997). To make matters worse, Migrant Health Centers can only serve the medical needs of less than 15% of MSFWs in the United States (McKenzie & Kugel, 2000; Migrant Health Program, 1997).

Considering the high risk level of HPS exposure to MSFWs and their lack of medical care, it appears likely that cases of HPS could be found in this rural population. Respiratory problems are common maladies among MSFW

children (Migrant Health Program, 1997). Also, the transitory nature of MSFWs makes it extremely difficult to document such cases. One can only guess how many deaths due to respiratory difficulties could actually be attributed to HPS infection. A more in-depth study of the incidences of HPS among the MSFWs is not only indicated, but vital to further the understanding of this disease.

SUMMARY

Hantaviruses have been in North America for quite some time. It is only recently that we could properly identify them. It is unknown how many fatalities due to pulmonary edema and respiratory complications have actually been caused by HPS. Retrospective cases continue to surface as health professionals study medical documents from before 1993. Former beliefs, such as the non-existence of person-to-person transmission of HPS, are being questioned. Treatment modalities remain supportive in nature, and the morality rate for HPS remains high. In many ways, HPS and the hantaviruses that cause it remain as much a mystery now as it was during the Four Corners' outbreak. This viral puzzle can been solved only through continued communication and intensive study.

Although rare, HPS infection can pose a serious problem for rural health professionals. Three-quarters of all of the cases occur in rural areas, prompting a better understanding of HPS by health professionals in these areas. HPS can prove dangerous, if not fatal, in a very short time. Treatment requires intensive medical care to be quickly delivered. In a rural setting, lengthy transportation times for patients to a critical care facility can cause serious complications. Misdiagnosis of HPS is common because its symptoms are so similar to other less deadly diseases. Rural doctors may not possess the equipment required to confirm the disease, making diagnosis even more difficult. All these complications take more time, something an HPS patient does not have.

Rural physicians may also deal with MSFWs, who are at great risk of possible exposure to HPS. Migrant Health Centers should be fully aware of the dangers of HPS as they are most likely to have initial contact with infected individuals. The need for further study of the prevalence of HPS among MSFWs is great, because their lifestyle places them at an increased risk of being in constant contact with infected animals. This transitory population could be the location of the next large outbreak.

HPS will continue to be a threat to rural communities long into the new millennium. It should not be ignored simply because of its rarity. Ignorance of its existence can easily cost the life of an infected patient. Physicians need to be aware of the warning signs of HPS, especially thosetreating patients in the southwest United States. Until a "cure" can found for this deadly disease, diagnostic knowledge will remain the best, if not the only, weapon in the rural doctor's arsenal against HPS.

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