

Z  
π 300.6  
T 312J  
21:4

~~BA~~  
Free

# Texas Journal of Rural Health

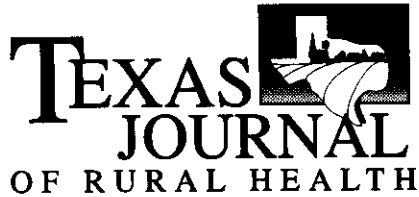
Government Publications  
Texas State Documents  
✓ FEB 17 2004  
Dallas Public Library



VOLUME XXI, NUMBER 4  
2003



VOLUME XXI, NUMBER 4  
2003



---

M I S S I O N   S T A T E M E N T

---

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."*

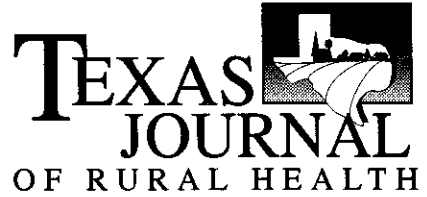
---

The Texas Journal of Rural Health (ISSN 1049-0211) is published by Texas Tech University Health Sciences Center, Preston Smith Library, 3601 4th Street – Suite 244, Lubbock, Texas, 79430, (806) 743-1204. Copyright © 2003 by Texas Tech University Health Sciences Center. For subscription information please contact the office at the address above. No part of this periodical may be reproduced without the written consent of the Texas Tech University Health Sciences Center.

---



**James E. Rohrer, Ph.D.**  
Editor  
Professor  
Division of Health Services Research  
Department of Family and Community Medicine  
Texas Tech University Health Sciences Center  
Lubbock, Texas



**Lee Ann Paradise**  
Managing Editor  
Texas Tech University Health Sciences Center  
Lubbock, Texas

**Jason Robert Fryer**  
Editorial Assistant  
Texas Tech University Health Sciences Center  
Lubbock, Texas

---

## THE EDITORIAL BOARD

---

**Tyrone F. Borders, Ph.D.**  
Assistant Professor  
Division of Health Services Research  
Department of Family  
and Community Medicine  
Texas Tech University Health Sciences Center  
Lubbock, Texas

**Paul P. Brooke Jr., Ph.D., F.A.C.H.E.**  
Dean and Professor  
School of Allied Health  
Texas Tech University Health Sciences Center  
Lubbock, Texas

**Ceretha S. Cartwright, Dr.PH.**  
Director of Research  
Altherex & Co.  
Odessa, Texas

**Peter Hilsenrath, Ph.D.**  
Professor  
School of Public Health  
University of North Texas  
Health Science Center  
Fort Worth, Texas

**Richard Hoeth, F.A.C.H.E., C.A.E.**  
Vice President  
Rural Health/Membership  
Texas Hospital Association  
Austin, Texas

**Andrew James, Dr.PH., J.D., L.L.M.**  
Professor  
College of Pharmacy and Health  
Texas Southern University  
Houston, Texas

**Patti J. Patterson, M.D., M.P.H.**  
Vice President for Rural & Community Health  
The Marie Hall Chair in Rural Health  
Medical Director  
Center for TeleMedicine/TeleHealth  
Texas Tech University Health Sciences Center  
Lubbock, Texas

**Steve Shelton, M.B.A., PA-C**  
Executive Director  
East Texas Health Education Center (AHEC)  
Galveston, Texas

---

## THE EDITORIAL BOARD

---

**Ted Sparling, Dr.PH.**

Associate Professor  
Department of Health Care Administration  
Trinity University  
San Antonio, Texas

**Robt. J. "Sam" Tessen, M.S.**

Executive Director  
Office of Rural Community Affairs  
Austin, Texas

**Darryl Williams, M.D., M.P.H.**

Director  
Office of Border Health  
Project Director  
Hispanic Center of Excellence  
Texas Tech University Health Sciences Center  
El Paso, Texas

Authors interested in submitting articles for publication should send them to:

Lee Ann Paradise  
Managing Editor: Texas Journal of Rural Health  
Texas Tech University Health Sciences Center  
Preston Smith Library  
3601 4th Street – Suite 244  
Lubbock, Texas 79430  
(806) 743-1204

## 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. Authors must provide the statistics associated with each graph.
- **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:**

- Microsoft Word for DOS versions 3.0-5.0
- Microsoft Word for Windows version 2.0-6.0
- PageMaker 5.0-6.0 Stories
- WordPerfect for Windows 5.0-6.0

**Graphics can be converted from:**

- GIF files
- JPEG files
- PICT files

# **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**

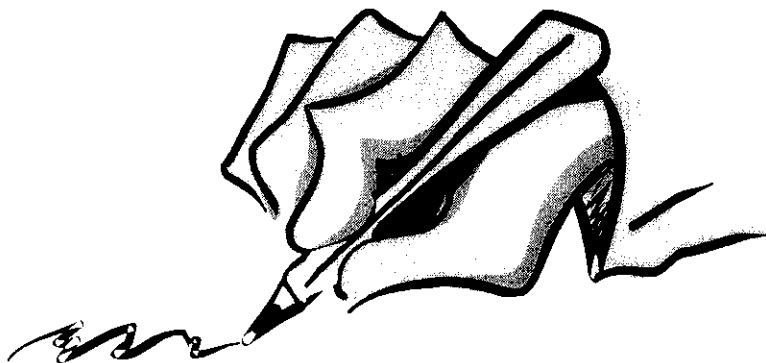
The article will be sent to the author in page-proof (galley) form only if major changes are required within the text. In that event, the author usually signs “approval for printing with/without changes.” Beyond this, no other changes can be made.



---

# 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 specifically looking for articles to go into the following sections:

- Notes From the Field
- Policy and Law
- Research

Topics of special interest:

- Nursing Shortages
- Rural Health Policy

Papers should be submitted to the Managing Editor as outlined in the "Instructions for Authors."

# TABLE OF CONTENTS

## EDITOR'S COMMENTS

<i>James E. Rohrer, Ph.D.</i> .....	1
-------------------------------------	---

## NOTES FROM THE FIELD

### Motor Vehicle Occupant Safety in a Rural State

<i>John A. Lundell, M.A.</i> .....	2
------------------------------------	---

### Creating a Hardy Work Environment: Can Organizational Policies Help?

<i>Sharon Judkins, R.N., Ph.D., Leslie Furlow, R.N., Ph.D.</i> .....	11
--	----

### A Sanitation Assessment of a Rural Ethiopian Village

<i>Fetene Gebrewold, Ph.D., Donald R. Johnston, Ph.D.</i> .....	18
---	----

### Training Physicians to Provide HIV Medical Care Along the Texas-Mexico Border: The Continuous Mentored Patient Care Model

<i>Gary Sinclair, M.D., Yolanda Cantu, M.P.H., Sandi Duggan, M.A., Charles Robert Smith, L.S.W., L.C.D.C.</i> .....	27
---	----

### Perceptions of the Texas Genetic Services System and Genetic Information Needs of Health Care Providers: A Web-based Survey

<i>Mary Sylvia Tijerina, Ph.D., Katherine Selber, Ph.D., Virginia Rondero Hernandez, Ph.D.</i> .....	35
--	----

## POLICY AND LAW

### Factoring NDs into the HPSA Equation: A Policy Consideration

<i>Donald Patrick Albert, M.A., Ph.D., Ferry Butar Butar, M.A., M.S., Ph.D.</i> .....	44
---	----

### Commentary on Factoring NDs into the HPSA Equation: A Policy Consideration

<i>Darryl M. Williams, M.D., M.P.H.</i> .....	53
---	----

## RESEARCH

### School-Year Employment Among Hispanic High School Students in Rural South Texas: Prevalence and Patterns

<i>Nancy F. Weller, M.P.H., Dr.P.H., Karen Basen-Engquist, M.P.H., Ph.D., Sharon P. Cooper, Ph.D., Steven H. Kelder, M.P.H., Ph.D., Susan R. Tortolero, Ph.D.</i> .....	57
---	----

## BOOK REVIEW

### Review of "The Pill Book (10<sup>th</sup> edition)"

<i>Lee Ann Paradise</i> .....	72
-------------------------------	----

### Review of "West Texas: A Portrait of Its People and Their Raw and Wondrous Land"

<i>Jason Robert Fryer</i> .....	74
---------------------------------	----

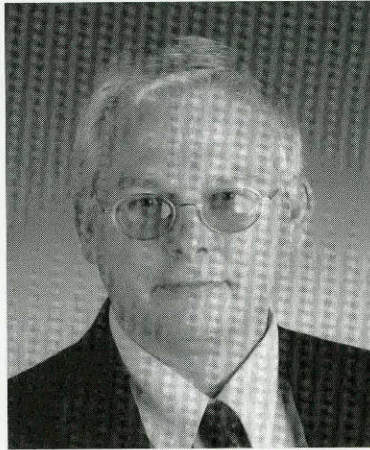
WALKABILITY

In fiction, we often read idealized descriptions of residential neighborhoods. In these idyllic communities, a park always is a few blocks away. The kids hang out on playground equipment or toss a ball around. A friendly policeman keeps an out for strange adults.

Also found in this scenario are several small retail establishments, all located within a few blocks of our homes. We walk, or send the kids, to the corner grocery for milk or sugar. We walk to nearby cafes and restaurants and news stands. These places lure us out of the house, away from the television. They improve our health because we walk more than we otherwise would. They provide jobs in low key friendly environments. And entrepreneurs can achieve their goals by starting and nurturing these small businesses.

This fantasy of a healthy neighborhood is bittersweet to contemplate, since most of us live in very different worlds. Most of our small town neighborhoods don't have sidewalks, much less parks. Children play in the street, if they want to toss a ball around. Their mothers might think they are safer in the house in front of the television. Mothers certainly worry about the children when they are out of view in a park, for fear of predators. Neighborhoods usually don't have grocery stores or cafes within walking distance. People jump in their cars and dodge traffic to get to work. When they get home, there is no place to which they can safely walk.

Is it any wonder that people, children and adults, sit on the couch and get fatter every year?



**James E. Rohrer, Ph.D.**

Professor  
Division of Health Services Research  
Department of Family  
and Community Medicine  
Texas Tech University Health Sciences Center  
Lubbock, Texas

But wait—is the walkable neighborhood really out of reach? Why can't we re-invent the healthy community? An often forgotten fact is right under our noses: we live in a democracy and thus *we can control local land use policy*. We can insist that zoning be used to create healthy neighborhoods. We can make adequate community policing a priority. The sad reality is this: our unhealthy neighborhoods are a direct result of what we as a people wanted from government a generation ago. The hopeful reality follows directly: we can ask for, and receive, something different, something better, something healthy. And creating better neighborhood environments may have more positive impact on community health than anything else we might try.

# MOTOR VEHICLE OCCUPANT SAFETY IN A RURAL STATE

John A. Lundell, M.A.  
*Deputy Director*  
*The University of Iowa*  
*Injury Prevention Research Center*  
*Iowa City, Iowa*

## NOTES FROM THE FIELD

### ABSTRACT

Unintentional injuries, in particular those resulting from motor vehicle crashes, are a major public health problem in the United States. Persons living in rural areas are at greater risk for injury than urban residents due in part to the fact that motor vehicle occupant restraint usage is lower in those areas. This article describes the results of an annual observational survey of child passenger and driver occupant restraint usage in Iowa and compares rates in rural and urban locations. It also addresses the child's location in the vehicle (front seat versus rear seat) and relates placement trends to the increasing awareness of dangers involving children and air bag safety devices.

Key words: motor vehicle accidents, occupant safety, rural health, rural Iowa. (Texas Journal of Rural Health 2003; 21(4): 2-10)

### INTRODUCTION

It is widely recognized that injuries represent a huge public health burden on America. Unintentional injuries are the leading

cause of death to United States residents ages 1-34 and the fifth leading cause for all ages. In 1995 in the United States, 59 million episodes of injuries were reported and accounted for 12% of all medical spending (Institute of Medicine [IOM], 1999). As noted by the IOM, unintentional injuries and violence account for approximately 30% of all lost years of productive life before age 65- more than losses from heart disease, cancer, and stroke combined.

Using national mortality data, Baker, O’Neill, Ginsburg, and Li (1992) have shown that a wide variety of fatal unintentional injuries are more common in rural than in urban communities. The ratio of rural-to-urban fatality rates was 2:1 or greater for a wide variety of injuries including motor vehicle crashes, unintentional firearm injuries, electrocutions, and house fires. Moreover, rural residents typically do not have the same access to emergency medical services, acute care, and rehabilitation as urban residents.

Much of the increased risk for injuries in rural areas is related to motor vehicle crashes. Of 48,700 total motor vehicle deaths in 1987, 31,200 (64%) were classified as rural. A review of 1985-1990 data in FARS (a United States Department of Transportation [DOT] crash

database) for Kansas, Nebraska, and the Dakotas showed that the motor vehicle crash fatality rate in the most rural counties was almost double the rate in urban counties (Muelleman & Mueller, 1996). Baker, Whitfield, and O’Neill (1987) suggested that a number of factors could explain this striking difference including higher travel speeds in rural areas, poorer roads, less seat-belt use, more use of high-risk utility vehicles, travel in open pickup trucks, and poorer access to trauma care. More recently, the 2003 Iowa Health Fact Book (University of Iowa and Iowa Department of Public Health, 2003) reported that motor vehicle traffic mortality from 1999-2000 for children ages birth through 14 years nearly doubled for the most rural counties as compared to the counties containing a community over 50,000 in population (see Table 1.)

Iowa Child Passenger Restraint Survey

In 1985, the Code of Iowa was modified to require all children under the age of three to be protected in a child safety seat whenever they are transported. Children between the ages of three and six must be secured in a safety seat or by a safety belt. This law also

**Table 1. Age 0-14 Motor Vehicle Crash Mortality Iowa, 1990-2000**

Population of County	Number of Counties	Number of Deaths	Deaths per 100,000 Population
< 10,000	18	22	6.9
10,000-20,000	45	104	7.1
> 20,000 (non-MSA)	26	103	5.5
Metropolitan Statistical Areas	10	109	3.7

Source: University of Iowa and Iowa Department of Public Health, 2003

applies to non-residents traveling within Iowa. The law’s parameters have remained unchanged despite several attempts by injury prevention advocates to convince the Iowa General Assembly to strengthen it.

To determine compliance with the law and target educational efforts, the Governor’s Traffic Safety Bureau (GTSB), a division of the Iowa Department of Public Safety, has funded an observational survey each year since 1988, using funds from the National Highway Traffic Safety Administration (NHTSA). The Iowa DOT’s Office of Driver Services conducted the surveys until 1995, when the GTSB contracted with The University of Iowa Injury Prevention Research Center (UI IPRC).

METHODS

Survey Procedures

All motor vehicles carrying children, except full-size vans, are included in the survey. Full-size vans are not included due to the difficulty of viewing the occupants inside. Mini-vans and pickups have been included since 1993.

Fortunately the UI IPRC has been able to hire the same two temporary summer employees to conduct the observational survey each summer since 1996, thus increasing the validity of comparing survey results across years. In accordance with Iowa’s child passenger safety legislation, the survey includes all children judged to be under age six. Surveyors record restraint usage, by seating location, (front or rear) for children judged to be under age three and for children ages three through five. Children under three are counted as restrained if they appear appropriately buckled into a child safety seat,

while those three through five are counted as appropriately restrained if they are in a seat belt or a child safety seat/booster seat secured by a seat belt. Given that these survey findings are from an observational, drive-by type of survey rather than a more invasive safety-seat clinic survey, children identified in this survey as appearing “appropriately restrained” may well be improperly restrained from a technical perspective. It is obviously not possible to identify issues such as locking clip use or belt tightness in this observational survey.

This observational survey of child passenger restraint usage is conducted each summer at the same 37 locations across Iowa (a few additional sites have been added to better represent the state’s population),

**Table 2. Child Passenger Restraint Usage—Children Under Age 6 in Iowa (1988 to 2003)**

Year	Cities	Primary	Interstate	Statewide
1988	44.3%	58.8%	48.1%	<b>45.9%</b>
1989	50.9%	57.3%	48.6%	<b>51.3%</b>
1990	49.8%	63.4%	56.1%	<b>50.8%</b>
1991	60.7%	63.2%	72.9%	<b>61.3%</b>
1992	62.6%	66.2%	62.0%	<b>62.8%</b>
1993	55.1%	69.8%	56.8%	<b>56.0%</b>
1994	68.2%	75.5%	75.8%	<b>69.4%</b>
1995	72.1%	79.0%	80.1%	<b>73.4%</b>
1996	68.3%	70.6%	76.0%	<b>69.1%</b>
1997	69.6%	70.9%	75.6%	<b>70.3%</b>
1998	72.6%	76.5%	74.1%	<b>73.2%</b>
1999	74.2%	76.1%	78.5%	<b>74.8%</b>
2000	78.3%	81.9%	81.2%	<b>79.0%</b>
2001	77.2%	87.7%	86.4%	<b>79.2%</b>
2002	75.9%	74.6%	83.0%	<b>76.2%</b>
2003	83.1%	88.4%	87.1%	<b>84.1%</b>

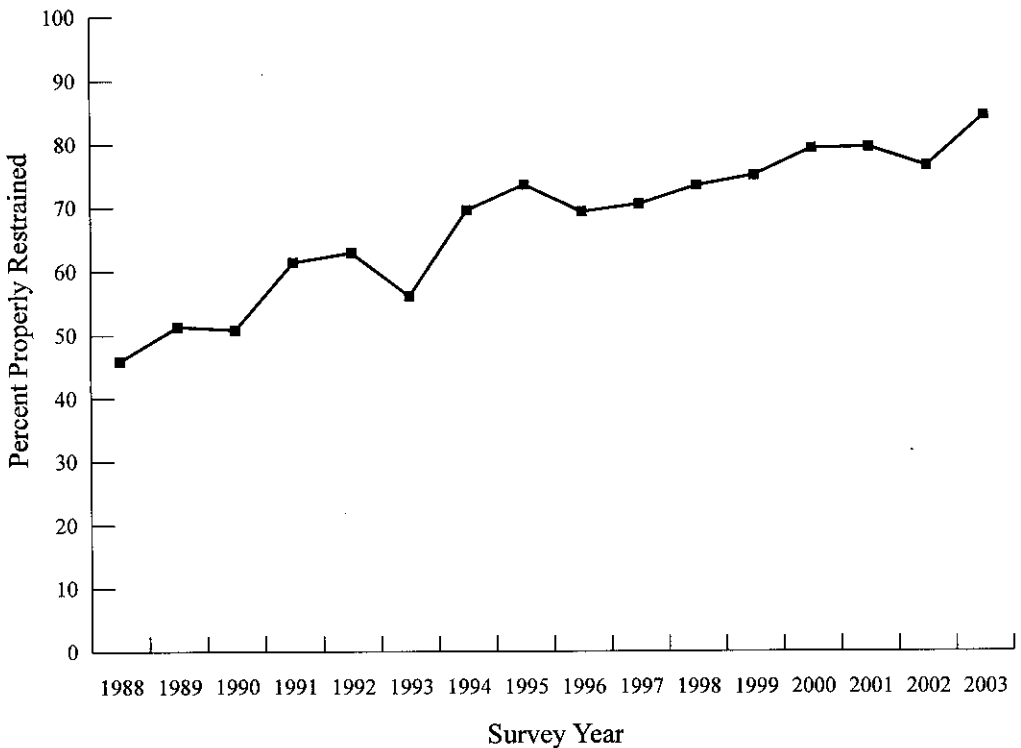
thereby providing a wealth of longitudinal information on occupant restraint practices in a predominately rural state.

In 2003, as in previous years, observations were made within 30 towns and cities, four interstate locations, and three primary highway locations. Approximately four to five hours were spent at locations in urban areas and six to eight hours at rural locations. Time periods varied generally between 7:30 a.m. and 5 p.m. Survey sites in cities and towns were located near business districts, malls, grocery stores, or discount stores. Interstate and primary sites were located at controlled intersections such as exit ramps, rest areas or where highways intersected at traffic signals or signs.

Analysis

Observational data sheets from the surveyors were tallied for each location and the results entered into a Microsoft Excel spreadsheet. Excel was then used to compile statistics on restraint usage at each location by age and seating location in the vehicle. This information was also grouped by survey location: towns/cities, primary highways, and interstate highways. Except for the comparison of year-by-year statewide results, the analysis consisted of aggregating four years (2000-2003) of survey data in an attempt to reduce year-to-year variability at individual survey locations.

**Figure 1. Percent of Children Under 6 Years of Age Appropriately Restrained in Iowa**



**Table 3. Percent of Children Restrained by Age 2000-2003**

Age	Observed	Restrained	Percent
<3 years	8,958	8,211	91.7%
3-5 years	13,974	10,073	72.1%
<b>Total 0-5 years</b>	<b>22,932</b>	<b>18,284</b>	<b>79.7%</b>

**RESULTS**

In the 2003 survey, a total of 5,772 children estimated to be under the age of six were observed in motor vehicles at the 37 locations across the state. A total of 4,854 children (84.1%) were judged to be appropriately restrained. This 84.1% usage rate was an increase of 7.9% from the 2002 survey and the highest total since the survey’s inception in 1988 (see Table 2 and Figure 1).

Since Iowa’s child restraint law requires children younger than three years of age to be secured in a child safety seat, surveyors record them separately. In the 2000-2003 period, children in this younger age group were much more likely to be appropriately restrained (91.7%) than the three-to-five year olds (72.1%) (see Table 3).

The National Highway Traffic Safety Administration has recognized that drivers and passengers in rural areas are less likely than their urban counterparts to use proper occupant restraint devices, and the Iowa Child Passenger Restraint Survey confirms this difference. Table 4 displays the restraint rates for the four smallest and largest survey locations 2000-2003.

The 2000-2003 survey data were further analyzed by dividing the communities into quartiles of increasing population. (The four

interstate locations were excluded from this analysis.) The communities were grouped into those with fewer than 2,500 people, 2,500-9,999, 10,000-49,999, and 50,000 or higher. The information in Table 5 indicates that the smaller communities have much lower restraint usage than Iowa’s larger communities.

**Table 4. 2000-2003 Child Restraint Usage for the Four Smallest and Largest Survey Locations**

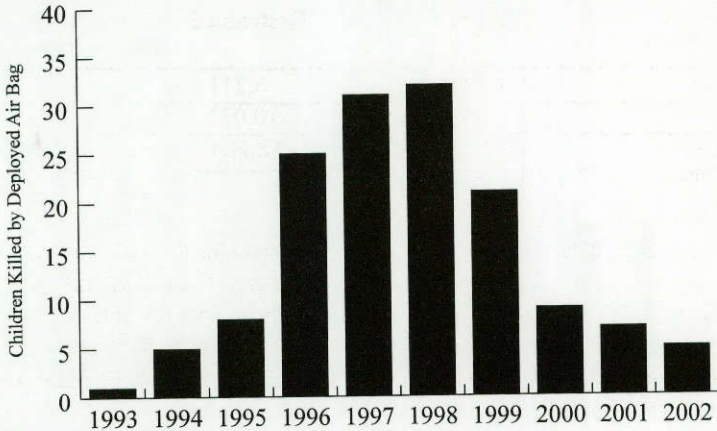
Location	Population	Percentage Restrained
<i>Smallest</i>		
Armstrong	1,153	71.4%
Guthrie Center	1,713	66.0%
Sigourney	2,330	57.8%
Pocahontas	2,352	69.3%
<i>Largest</i>		
Des Moines*	217,042	84.2%
Waterloo**	112,307	83.9%
Cedar Rapids	110,243	81.7%
Davenport	103,264	79.0%

\* Includes the three Des Moines and the West Des Moines locations.

\*\* Includes the Cedar Falls and Waterloo locations.



**Figure 2. Confirmed Number of Children Killed by Deployed Motor Vehicle Air Bags**



Source: National Highway Traffic Safety Administration, 2003.

If possible, surveyors were also requested to note whether the driver of the vehicles carrying the children was wearing a seatbelt. As displayed in Table 5, the most rural survey locations had the lowest rate of drivers using seat belts, whereas the urban communities had the highest.

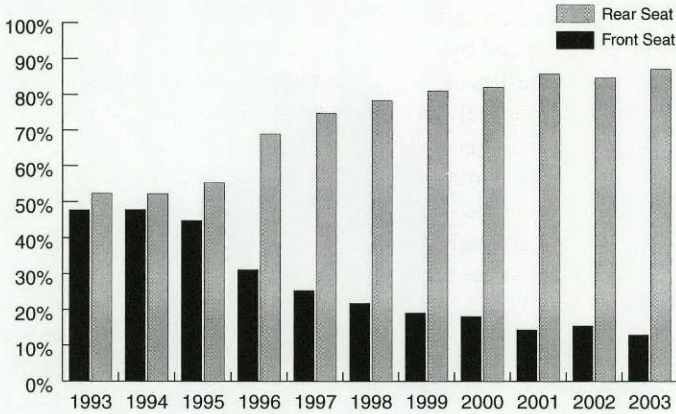
*Front Seat versus Rear Seat Placement*

Since the mid-1990s, a vigorous public awareness campaign has recommended that all children be restrained in the rear seat of motor vehicles if possible. Not only are children generally safer riding in the rear seat, but the increasing prevalence of passenger-side air bags in motor vehicles has made the safety of children in front seats a critical issue

**Table 5. 2000-2003 Restraint Usage by Population Group**

Population Group	Number of Communities	2000-2003 Percent Children Appropriately Restrained	2000-2003 Percent Drivers Using Seatbelts
<2,500	4	65.2%	64.9%
2,500-9,999	9	74.5%	76.5%
10,000-49,999	7	83.2%	85.5%
≥50,000	13	83.3%	86.2%

**Figure 3. Front Seat vs. Rear Seat Placement**



with NHTSA. Concerns have been heightened by well-publicized airbag-inflicted injuries to infants and children riding in vehicles with passenger-side airbags. In May 1996, NHTSA launched the Air Bag Safety Campaign, a public-private coalition of automakers, insurance companies, suppliers, and safety groups, to educate the public about safe transportation in vehicles with air bags. The launch was followed in November of that year with a NHTSA requirement that bold new labels with explicit air bag safety warnings be installed in all new vehicles and on child safety seats. Since then additional efforts have included air bag on-off switches in vehicles and research by automakers into reduced-power airbags. Despite these efforts, the number of children killed by airbags was tragic and attracted significant media attention. Using NHTSA data, Figure 2 depicts the number of confirmed child deaths from air bags, starting with the first in 1993, to a high of 32 in 1995, down to five in 2002.

Analysis of the Iowa Child Passenger Restraint Survey since 1993 clearly depicts

the success of efforts to encourage placement of children in the rear seats of vehicles. Table 6 and Figure 3 display the percentage of children under six years of age in the front and rear locations. These numbers include all children, whether they were judged to be appropriately restrained or not. In 1993, 52%

**Table 6. Front Seat vs. Rear Seat Placement**

Year	Front Seat	Rear Seat
1993	47.7%	52.3%
1994	47.8%	52.2%
1995	44.8%	55.2%
1996	31.1%	68.9%
1997	25.3%	74.7%
1998	21.7%	78.3%
1999	19.0%	81.0%
2000	18.0%	82.0%
2001	14.3%	85.7%
2002	15.4%	84.6%
2003	12.9%	87.1%

of the children were in the rear seat, but this proportion jumped to nearly 70% three years later after the number of child fatalities had increased to 25.

The aggregated 2000-2003 data on child seating location were further analyzed by dividing the communities into quartiles of increasing population similar to the analysis conducted for observed child passenger restraint use. The results indicated a similar urban-rural contrast with children in the smaller communities placed at greater risk in the front seat a higher percentage of the time (see Table 7).

CONCLUSIONS

Increased risk for unintentional injuries to persons living in rural communities has been well documented. Contributing to this heightened risk is a lower rate of motor vehicle occupant restraint use for both children and adults traveling in rural communities compared to their urban counterparts. While the annual state of Iowa observational survey of child passenger and driver restraint use indicates that a record percentage of occupants were buckling up in 2003, it also clearly indicates the relatively lower usage rates in rural communities. When examining

the placement of children in motor vehicles in the front versus rear seat, the good news is that since the air bag safety concerns were raised in the mid-1990s a steady increase in the number of children placed in rear seats has been witnessed. However, once again, a smaller percentage of children are riding in the rear seat in rural areas as compared to the larger communities. This analysis emphasizes the need for development of initiatives to encourage increased motor vehicle safety practices in the nation's rural areas.

ACKNOWLEDGMENT

This research was supported in part by the Iowa Governor's Traffic Safety Bureau and by the National Center for Injury Prevention and Control/CDC, grant # CCR721682-02.

The author would like to recognize Ms. Adele Bonney whose editorial skills were invaluable in the preparation of this manuscript.

REFERENCES

Baker, S. P., O'Neill, B., Ginsburg, M. J., & Li, G. (1992). *The Injury Fact Book (Second Edition)*. New York: Oxford

Table 7. 2000-2003 Percent of Children in the Rear Seat by Population Group

Population Group	Number of Communities	2000-2003 Percent of Children in Rear Seat
<2,500	4	75.2%
2,500-9,999	9	80.5%
10,000-49,999	7	85.6%
≥ 50,000	13	88.8%

MOTOR VEHICLE OCCUPANT SAFETY IN A RURAL STATE

University Press.

- Baker, S. P., Whitfield, R. A., & O'Neill, B. (1987). Geographic variations in mortality from motor vehicle crashes. *New England Journal of Medicine*, 316, 1384-1387.
- Institute of Medicine (1999). *Reducing the burden of injury: Advancing prevention and treatment*. Washington, DC: National Academy Press.
- Muelleman, R. S., & Mueller, K. (1996). Fatal motor vehicle crashes: Variations of crash characteristics within rural regions of different population densities. *Journal of Trauma*, 38, 315-320.
- National Highway Traffic Safety Administration (2003). Air bag fatality summary report and tables (2nd quarter). [Online]. Available: [http://www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/SCI/2Q\\_2003/ABFSISR.pdf](http://www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/SCI/2Q_2003/ABFSISR.pdf).
- University of Iowa and the Iowa Department of Public Health. (2003). *2003 Iowa Health Fact Book*. Iowa City, IA: Author.

# CREATING A HARDY WORK ENVIRONMENT: CAN ORGANIZATIONAL POLICIES HELP?

Sharon Judkins, R.N., Ph.D.  
*Director*  
*Nursing Administration Program*  
*The University of Texas*  
*Arlington, Texas*

Leslie Furlow, R.N., Ph.D.  
*President/Senior Consultant*  
*AchieveMentors, Inc.*  
*Tolar, Texas*

## ABSTRACT

The concept of hardiness has consistently proven to be a method of improving overall coping and decreasing stress. High hardy organizations will attract and retain a higher proportion of hardy individuals. Rural health leaders are challenged to work toward development of institutional policies that will boost and sustain hardiness among staff. Rewards of improved patient and staff satisfaction and decreased turnover rates will likely result.

Key words: hardiness, health care, organizational policy, rural nursing, stress reduction. (Texas Journal of Rural Health 2003; 21(4): 11-17)

## INTRODUCTION

Health care is facing the most severe personnel shortage in history not only in nursing, but also among allied health workers. As both urban and rural areas struggle with increasing demand for services, rural areas traditionally take the hardest hits with higher percentages of at-risk populations and fewer numbers of available personnel to fill job vacancies (Eldridge & Judkins, 2003). Now, more than ever, retention of quality staff is the key to meeting institutional staffing needs while attempting to maintain financial viability.

Significant impact related to this key issue stems from stress-induced employee problems. American organizations are estimated to experience stress-related losses from \$4.2 to \$60 billion a year due to absenteeism, reduced productivity, and direct and indirect medical expenses (Benton, 2000). In effect, when stress and burnout are experienced, staff miss more days from work and are less productive (Sortet & Banks, 1996). Consequently, assisting employees to deal with issues such as stress and burnout (emotional exhaustion) has enormous benefits to organizations as costs are reduced and quality of work life is improved.

One major area of expense associated with stress involves high turnover rates. Estimates of turnover costs range from \$30,000 to \$60,000 per staff member depending on need and job position. Costs include recruitment and orientation of new staff, loss of experienced staff, and periods of short staffing accompanied by overtime or use of temporary staff (McConnell, 1999; Bledgen, Vaughn, & Goode, 2001).

In searching for opportunities to diminish the negative effects of stress, hardiness emerges as a strong preference. Hardiness has been found to not only reduce stress, but also help in developing coping skills that benefit both individuals and organizations. In health care, links have been found between hardiness and stress and burnout (Fusco, 1994; McCranie, Lambert, & Lambert, 1987; Rowe, 1998), job satisfaction (Little, 1995; Tierney & Lavelle, 1997), and issues related to retention, turnover, and absenteeism (Martin, 1995; Noble, 1993). High hardy staff nurses have been found to be more resistant to stress, strain, and burnout (Rich & Rich, 1987; Collins, 1996; Simoni & Paterson, 1997). Among nurse managers, high hardiness was linked to lower levels of stress and higher

problem-solving coping skills (Judkins, 2001). In fact, some nurses may be *tougher* than others with hardiness being the key to preventing emotional exhaustion and turning stressful events into meaningful challenges (Bryant, 1994).

So, you ask, "How do health care agencies enhance hardiness among employees and reap untold benefits to the organization?" The answer is the focus as we address how organizational policies can help produce a high hardy work force, and help maintain a work environment that sustains high hardiness

## BACKGROUND

Introduced in 1979 by Kobasa, hardiness has emerged as a positive mediating variable in the stress-coping response. Kobasa found that male executives with higher levels of hardiness (defined as commitment, control, and challenge) experienced less stress and physical illness, were more engaged, and felt more in control over their work environment. Later, Kobasa, Maddi, and Kahn (1982) determined that hardiness protects against stress in two ways: by altering perceptions of stress and by mobilizing effective coping strategies. Hardy individuals have been found to be goal-oriented people approaching life with interest and excitement, seeing themselves as active determinants of the consequences of change (Kobasa, 1979; Rowe, 1999). The three elements of hardiness bear description.

### Commitment

Commitment is the tendency to be involved in life's events. Committed individuals are invested in themselves and their

relationship to the social context; they will confront and engage others while creating a nurturing environment. Committed persons do not give up easily under pressure and their relationships involve proactive behavior rather than passivity or avoidance (Kobasa et al., 1982). Among RNs, organizational commitment is highly related to job satisfaction (McNeese-Smith, 1995). Thus, administrators seeking organizational commitment could benefit from high hardy individuals especially in the context of recruitment and retention of high quality staff.

### Control

Control is the propensity to feel that one is in control of the situation, and actions and consequences are the result of individual responses. Control enhances stress resistance perceptually by increasing the likelihood that an event will be experienced as a result of one's actions. This notion implies a perception of having influence through the exercise of imagination, knowledge, skill, and choice (Kobasa et al., 1982). Control appears responsible for the development of broad and varied responses to stress, which can be drawn upon even in the most threatening of circumstances (Bartone, Ursano, Wright, & Ingraham, 1989). Such responses to stress may steer individuals through the pitfalls of organizational life in a manner conducive to both the health of the organization and the individual (Turnipseed, 1999). By possessing control, individuals bring stability and hope to organizations.

### Challenge

Challenge is a belief that change rather than stability is the norm. Individuals high in

challenge will be stimulated by change and react with openness, flexibility, and innovation (Turnipseed, 1999). Challenge will lead to attempts to transform one's self and thereby grow, rather than conserve and protect the former existence (Kobasa et al., 1982). Aversion to change can be a real problem for organizations as the political system continues to reform the health care economy (Turnipseed, 1994). This problem may be avoided as high challenge members are energized by change and thus give an advantage to high hardy organizations.

## HARDINESS AND ORGANIZATIONAL POLICIES

Deliberate intentions by leaders/managers are the only way for staff to attain high levels of hardiness. Since various studies have supported hardiness as a contributing factor in reducing emotional exhaustion and in buffering the effects of stress (Maddi, 1999; Simoni & Paterson, 1997; Turnipseed, 1999), instituting agency policies is a first step in establishing an effective, high-hardy work environment. Policies empower employees to act and give teeth to the importance of the actions that must follow. One effective step is to offer educational opportunities that help to improve individual hardiness. As an example, Judkins and Ingram (2002) reported an increase in hardiness scores following stress-coping, hardiness-promoting activities. Maddi (1987), Rowe (1999), and Tierney and Lavelle (1997) found similar results. However, to sustain high hardiness scores reinforcement over a longer period of time is required (Maddi, 1987; Rowe, 1999). Thus, a policy of ongoing hardiness training should be established as part of staff development.

Hardiness training among all employees can create a work environment that will attract and retain staff. This action may have a significant financial impact on the organization as job satisfaction and retention increase, and turnover rates decrease. Larrabee and colleagues (2003) assert that, among nurses, control of practice and empowerment were strong predictors of job satisfaction and that high hardy nurses felt more empowerment. McNeese-Smith (1995) found that enabling staff to act and challenge processes were significant predictors of job satisfaction and organizational commitment. As staff feel more in control and possess a strong sense of commitment, unexpected vacancies may be reduced along with the need to use premium staff or overtime. Using this approach can create a win-win for both patients and agencies as continuity increases while costs diminish.

Promoting control can take the form of providing an environment where staff, especially nurses, feel a sense of influence over their practice. A self-scheduling policy would permit control of work and off time. Policies allowing nurses to practice to the extent of their skills and abilities are keenly encouraged. Collaborative practice committees should be established whereby physicians and nurses work together to establish standards of care that incorporate nursing judgment and that determine what interventions can be implemented and when. Larrabee and colleagues (2003) suggest that collaboration with physicians and managers is a significant contributor to highly satisfied RNs in the work force.

Another way of increasing control is to provide an open administrative communication system that shares information and requests input. As control is exercised, it will continue to grow in other areas of practice

and decision-making. Upenieks (2003) affirms that a work environment that supports an autonomous climate, shared governance, and participatory management upholds nursing satisfaction. As previously emphasized, high satisfaction translates to decreased turnover and reduced agency costs once again benefiting all stakeholders.

Commitment is built by providing support and building trusting relationships. By encouraging personal involvement in daily organizational life, commitment by staff becomes a natural outgrowth. Organizational leaders can increase commitment by being a person rather than a suit. By sharing personal successes and failures with protégés, administrators can mentor growth and lead by example. This will translate to managers who can mentor commitment in staff. Policies that increase individual self-esteem through encouraging group involvement and support can also augment commitment, as can establishing interdepartmental mentor models that pair new managers with seasoned managers in other departments. Training sessions for all managers in the same venue may also increase group cohesiveness and strengthen interdepartmental and organizational relationships.

Turning obstacles into opportunities is the essence of challenge. Change is the only constant in health care today. Capitalize on that reality. If given all the facts, staff will often respond rather than react. Develop policies that promote participation in change such as encouraging staff to participate on key committees within the organization. Whenever possible provide information in advance of a change(s) and elicit potential methods of incorporating the change into practice. Treat change as evolution rather than negative intrusion and involve as many staff as possible. Develop policies that



encourage and reward risk-taking behaviors rather than risk-avoidance. Most health care agencies only pay lip service to this approach. When risk-taking behavior fails to produce the desired results, blame placing and punishment often follow. For the risk-taker, this can result in stepping back from seeking or contributing creative solutions. Agency leadership must be willing to allow challenges to the status quo if staff are to become active, vital members of the organization.

#### SUMMARY

After 20 years of theory, research, and practice, hardiness has consistently proven to be a method of decreasing stress and improving overall coping (Maddi, 2002). Application of hardiness to health care workers provides sound direction in developing and maintaining healthy environments for those who lead (Pappas, 1995). Further, as organizations strive to become hardy, they will attract and retain a higher proportion of hardy individuals (Maddi, 2002). Hardiness promoting policies will enhance outcomes such as patient and staff satisfaction and likely diminish turnover rates. Many organizations pay consultants enormous fees to change the culture. By developing a high-hardy environment, administrators can reap the same benefits at a fraction of the cost. Armed with this information, organizational leaders should focus on developing institutional policies that will boost and sustain hardiness among staff. The rewards will be immeasurable.

#### REFERENCES

- Bartone, P. T., Ursano, R. J., Wright, K. M., & Ingraham, L. H. (1989). The impact of a military air disaster on the health of assistance workers: A prospective study. *Journal of Nervous and Mental Disease*, 177, 317-328.
- Benton, J. C. (2000). Washington's repetitive stress over ergonomics rules. *CQ Weekly*, 58, 401-406.
- Blegen, M. A., Vaughn, T. E., & Goode, C. J. (2001). Nurse experience and education: Effect on quality of care. *Journal of Nursing Administration*, 31(1), 33-39.
- Bryant, E. (1994). When the going gets tough. *Canadian Nurse*, 90(2), 36-37, 39
- Collins, M. A. (1996). The relation of work stress, hardiness, and burnout among full-time hospital staff nurses. *Journal of Nursing Staff Development*, 12(2), 81-85.
- Eldridge, C. R., & Judkins, S. K. (2003). Rural nurse administrators: Essentials for practice. *Online Journal of Rural Nursing and Health Care*, 3(2).
- Fusco, P. S. (1994). *Hardiness, coping style, and burnout: Relationships in female hospital nurses*. Dissertation Abstracts International. (Microfilms 161, No. 3894). Denton, TX: University of North Texas.
- Judkins, S. K. (2001). *Stress, hardiness, and coping strategies among mid-level nurse managers: Implications for continuing higher education*. Dissertation Abstracts International, 63(129), 06A. (UMI No: 3056800). Denton, TX: University of North Texas.
- Judkins, S. K., & Ingram M. (2002). Decreasing stress among nurse managers: A long-term solution. *Journal of Continuing Education in Nursing*, 33(6), 259-

- 264.
- Kobasa, S. C. (1979). Stressful life events, personality and health: An inquiry into hardiness. *Journal of Personality and Social Psychology*, 37, 1-11.
- Kobasa, S. C., Maddi, S. R., & Kahn, S. (1982). Hardiness and health: A prospective study. *Journal of Personality and Social Psychology*, 42, 168-177.
- Larrabee, J. H., Janney, M. A., Ostrow, C. L., Withrow, M. L., Hobbs, G. R., & Burant, C. B. (2003). Predicting Registered Nurse job satisfaction and intent to leave. *Journal of Nursing Administration*, 33(5), 271-283.
- Little, S. C. (1995). *Organizational climate and job satisfaction in mid-level nurse managers*. Unpublished doctoral dissertation, University of Texas, Austin, TX.
- Maddi, S. R. (1987). Hardiness training at Illinois Bell Telephone. In J. P. Opatz (Ed.), *Health promotion evaluation* (pp. 101-116). Stevens Point, WI: National Wellness Institute.
- Maddi, S. R. (1999). The personality construct of hardiness: I. Effects on experiencing, coping, and strain. *Consulting Psychology Journal: Practice and Research*, 51(2), 83-94.
- Maddi, S. R. (2002). The story of hardiness twenty years of theorizing, research, and practice. *Consulting Psychology Journal: Practice and Research*, 54(3)173-185.
- Martin, B. J. (1995). *Coping, hardiness, health status, and absenteeism in staff*. Unpublished doctoral dissertation. University of Illinois Health Sciences Center, Chicago, IL.
- McConnell, C. R. (1999). Staff turnover: Occasional friend, frequent foe, and continuing frustration. *Health Care Manager*, 18(1), 61-70.
- McCranie, E. W., Lambert, V. A., & Lambert, C. E. (1987). Work stress, hardiness, and burnout among hospital staff nurses. *Nursing Research*, 36(6), 374-378.
- McNeese-Smith, D. (1995). Job satisfaction, productivity, and organizational commitment: The result of leadership. *Journal of Nursing Administration*, 25(9), 17-25.
- Noble, J. E. (1993). *Examination of hardiness as a predictor of nurse retention*. Unpublished doctoral dissertation. The Union Institute.
- Pappas, S. H. (1995). Creating an environment to support hardiness and quality patient care. *Seminars for Nurse Managers*, 3(3), 115-118.
- Rich, V. I., & Rich, A. R. (1987). Personality hardiness and burnout in female staff nurses. *Image: Journal of Nursing Scholarship*, 19(2), 63-66.
- Rowe, M.M. (1998). Hardiness as a stress mediating factor of burnout among healthcare providers. *American Journal of Health Studies*, 14(1), 16-20.
- Rowe, M. M. (1999). Teaching health-care providers coping: Results of a two-year study. *Journal of Behavioral Medicine*, 22(5), 511-527.
- Simoni, P. S., & Paterson, J. J. (1997). Hardiness, coping, and burnout in the nursing workplace. *Journal of Professional Nursing*, 13(3), 178-185.
- Sortet, J. P., & Banks, S. R. (1996). Hardiness, job stress, and health in nurses. *Hospital Topics*, 74(2), 28-33.
- Tierney, M. J., & Lavelle, M. (1997). An investigation into modification of personality hardiness in staff nurses. *Journal of Nursing Staff Development*, 13(4), 212-217.
- Turnipseed, D. L. (1994). An analysis of the

- influence of work environment variables and moderators of the burnout syndrome. *Journal of Applied Social Psychology*, 25(9), 782-800.
- Turnipseed, D. L. (1999). An exploratory study of the hardy personality at work in the health care industry. *Psychological Reports*, 85, 1199-1217.
- Upenieks, V. V. (2003). What constitutes effective leadership? *Journal of Nursing Administration*, 33(9), 456-467.

# A SANITATION ASSESSMENT OF A RURAL ETHIOPIAN VILLAGE

Fetene Gebrewold, Ph.D.  
*Associate Professor*  
*Department of Community Health and*  
*Health Services Management*  
*Western Illinois University*  
*Macomb, Illinois*

Donald R. Johnston, Ph.D.  
*Associate Professor and Chair*  
*Health Administration Program*  
*Chapman University*  
*McCord, Washington*

## ABSTRACT

This article reports the results of a descriptive study designed to explore the interrelated variables of health such as general sanitation practices, personal hygiene, water scarcity and quality, living conditions, behavior, and the general health knowledge of the adult rural Alemaya village community in Ethiopia, East Africa. Data indicate that the Alemaya rural community suffers from a high illiteracy rate, lack of health care services, soil erosion, chronic food shortages, road and transportation problems, and poverty.

Key words: health care, rural Ethiopia, sanitation. (*Texas Journal of Rural Health* 2003; 21(4): 18-26)

## INTRODUCTION

In many developing countries, there is a high risk of premature mortality and morbidity due to interrelated factors including the environment, living conditions, general sanitation practices, water supplies, nutrition, and primary health knowledge. This is especially true of Ethiopia where adult health problems impose a major burden on health care services, families, communities, and the society. Adults (18 years of age and older) in developing countries have a high risk of

morbidity, chronic impairment, and early death. The impact on society is great, because it is primarily the adults who are economically productive, biologically reproductive, and responsible for the support of children and elderly dependents. However, reliable and comprehensive data on the incidence and prevalence of major adult health problems in many regions of Ethiopia and other Third World countries are scarce. Other household surveys of general morbidity pointed to high levels of acute morbidity of adults in developing countries (Feachem, Kjellstrom, Murray, & Philips, 1992). According to World Bank surveys in Cote d'Ivoire, Peru, and Ghana, 33% to 45% of the adults claimed to have been ill in the past month (Murray, Feachem, Philips, & Wills, 1992).

In this study, the rural Alemaya village community was selected as a model in assessing health needs in Ethiopia. Alemaya reflects much of the country's health problems because it is a rural community that suffers from severe soil erosion, a high illiteracy rate, and chronic food shortages. All the basic services, roads, health services and education, and particularly potable water and electricity are either poor or non-existent. Disease levels and mortality rates are high.

To accomplish the research survey, the following specific objectives were developed:

- To identify health problems in the rural Alemaya farming community population.
  - To assess the number of households who have running water.
  - To identify current methods of household waste disposal practices in the rural Alemaya community.
  - To assess the general environmental and sanitation conditions in the rural Alemaya community.
- To evaluate the educational levels of household parents.
  - To determine the income levels of household parents.

## METHODS

Alemaya is a small community located in the southeastern province of Harraghe, approximately 510 kms east of the capital city, Addis Ababa. Surrounding the town of Alemaya is the rural farming community where the study was conducted. The Alemaya Agricultural University assists the agricultural community through education that includes instruction regarding better farming methods. Quality seeds, vegetables, poultry, cows for better milk, and quality meat are also provided.

Without the cooperation of Dr. Desta Hamito, president of Alemaya University, and Dr. Belay Kassa, academic vice president, gathering data would have been extremely difficult. Both Drs. Hamito and Kassa were instrumental in providing housing, transportation vehicles to the survey site, and library and computer access during the project assessment period. The local health center was also helpful by providing us with a rural community map that accurately identified the targeted community areas. The Alemaya city government also played a key role in writing a letter to the rural farming community associations as to the purpose of the survey and encouraged cooperation during the travel and interview period.

Demographic factors such as age, gender, race, marital status, occupation, and lifestyle were included in the survey. A convenience sample of 151 rural Alemaya residents was selected for the study. Data were collected through house-to-house visits. The head of

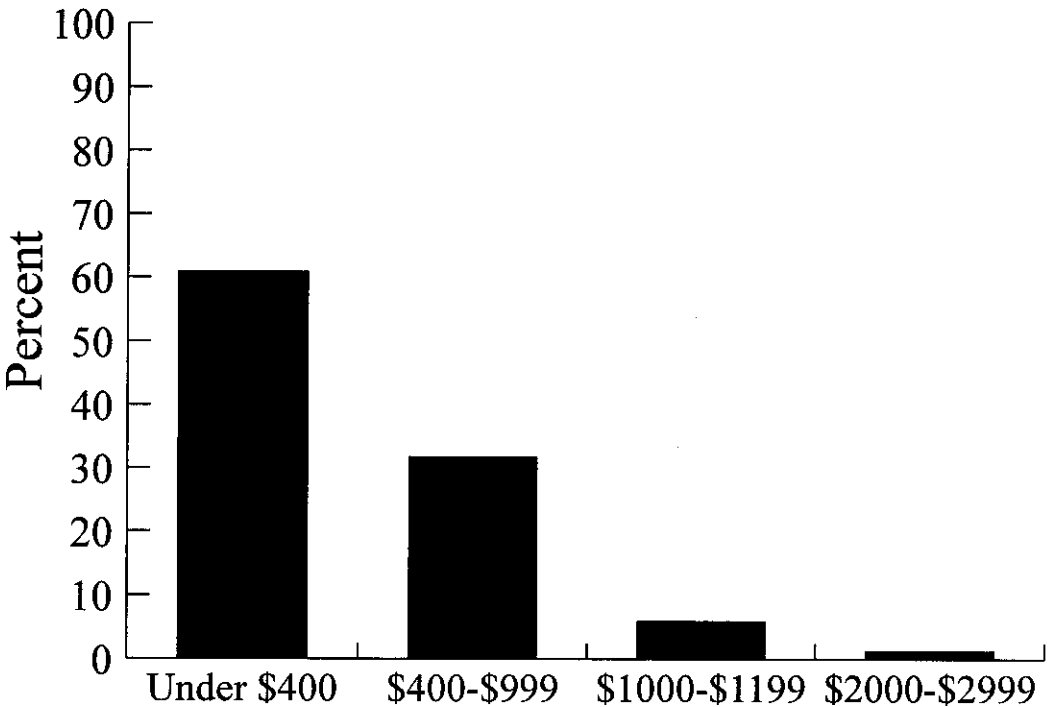
each household was interviewed using a standard questionnaire. Before conducting the proposed project, the instrument was pretested for validity and reliability. In addition to the demographic variables, the prepared questionnaire dealt with issues such as water quality and use, literacy, and types of illnesses. Information on environmental health issues included: housing conditions (nature of the houses, presence of domestic animals, and illumination) and waste disposal techniques (presence and usage of latrines and water supply).

To assist with the interview process, 20 people from the local health center and students from the Alemaya University, Department of Health Science, were selected and trained to properly administer the questionnaire and conduct an interview. The principal investigator checked all the questionnaires for accuracy and validity. The data were then entered, edited, and analyzed using the SPSS statistical program.

---

**Figure 1. Annual Family Income in United States Funds**

---



## RESULTS

Responses to the survey questionnaire were obtained from the Alemaya rural farming community to assess their overall health and environmental conditions. The results of the responses are presented in this section.

Respondents were asked to describe their marital status as to whether they were married, divorced, or single. Of the 151 family households surveyed, an overwhelming majority of 142 (94.0%) stated that they were married, whereas only 1 (0.7%) indicated being divorced. Two (1.3%) of the respondents said they were single and 6 (4.0%) said they were either widowed or separated. The Alemaya rural farming community generally derives its income from farming. As an agrarian society, the majority of individuals in the household surveyed were self-employed. In fact, 142 (94%) of the respondents indicated they were self-employed, whereas 8 (5.3%) of the respondents indicated they were unemployed. Only 1 (0.7%) respondent indicated employment by others.

To determine total annual household or family income, respondents were also asked to estimate their annual income.

According to Figure 1, 92 (60.9%) of the respondents earned an annual family income of under \$400 dollars, whereas 48 (31.8%) earned from \$400 to \$999, and 9 (6.0%) earned up to \$1,199 dollars per year. Only 2 (1.3%) of the respondents indicated earning between \$2,000 and \$2,999 a year (\$1 United States dollar=8.20 Ethiopian Birr).

Respondents were also asked if they had water shortage problems. One hundred seventeen (77.5%) of the respondents in the survey stated they had water shortage problems, whereas only 34 (22.5%) indicated otherwise. Besides the shortage of water, the source of water supply is another challenging

problem faced by the Alemaya farming community. When asked where they got most of their water supply, the majority of the respondents 76 (50.3%) stated they drew water from an open water hole and 32 (21.2%) of the respondents said they drew their water from a river. The remaining 43 (28.5%) drew water from a water pipe. In addition, the community as a whole had to walk long distances to obtain water for drinking. Fifty-four (35.8%) of the respondents in the survey spent 15 minutes walking one way to get to the water source. Forty-three (28.5%) of the respondents spent 30 minutes walking one way to get to the water source and 33 (21.8%) of the respondents had to walk 1½ hours one way to reach the water source. On the other hand, it took more than 2 hours one way for 21 (13.9%) of the respondents to obtain water. Therefore, according to the survey, the rural Alemaya community spends a considerable amount of time walking to obtain water for drinking.

Clearly, both urban and rural dwellers in Ethiopia experience shortages of water supply. In particular, clean potable water is quite scarce. According to Self-help Development International (2003), the availability of water is one of the most pressing problems throughout the Alemaya project areas. Women are forced to travel great distances every day to find water, which is often of poor quality.

A major health issue related to the water shortage, water supply, and distance it takes to travel to the nearest water source is the quality of potable water used for drinking in the community. Most often, this body of water is not fit for human consumption and is not covered or protected on site, and most often not boiled before drinking. In addition, animals (domestic and wild) use the same water source causing contamina-

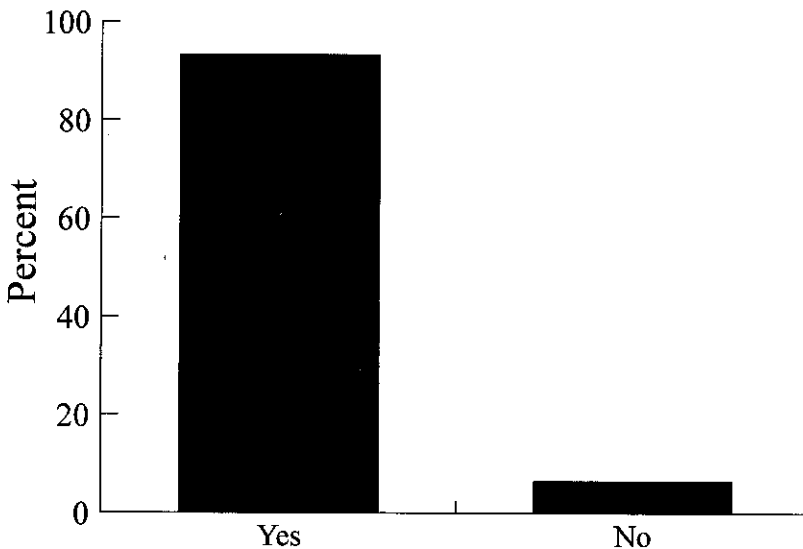
tion to drinking water, which may contribute to waterborne pathogens and illnesses resulting in parasitic diseases and diarrhea in children and adults residing in the rural community including the surrounding areas.

According to the survey 71 (47%) of the respondents stated they were sharing their drinking water source with both domestic and wild animals, whereas 80 (53.0%) stated that domestic and wild animals were not sharing the same water. Waterborne diseases, such as typhoid fever and cholera, are still widespread in less developed areas of the world (Hales, 2003).

Respondents were also asked to identify what methods they use to dispose of refuse, including feces. An overwhelming 141 (93.4%) of the respondents indicated using an open field to dispose of their refuse and feces (see Figure 2). Ten (6.6%) did not use an open field for disposing refuse and feces, but it is not clear whether they use a latrine, an outhouse, or both as a method of disposing feces.

Bacteria, viruses, and parasites can spread by water and cause disease. Most of these diseases are considered communicable, because they can spread from one person to another via contaminated water or other vectors. Eighty percent of all the diseases and over one-third of the deaths in developing countries are caused by consumption of contaminated water (United Nations, 1993). According to the United Nations (1997), an estimated 1.4 billion people still do not have access to safe drinking water and 2.9 billion do not have access to adequate sanitation. This inadequate access to water and sanitation contributes to millions of childhood diseases each year from diarrhea. Most pathogens come from animal or human feces, which is a result of unsanitary excreta disposal. As Yassi and colleagues (2001) stated: "Waterborne diseases arise from the contamination of water by human or animal feces or urine infected by pathogenic viruses or bacteria, which are directly transmitted

**Figure 2. Percentage of People Using Open Field Disposal**





when the water is drunk or used in the preparation of food.”

Water is distributed very unevenly around the world and those areas with less access have had much greater problems with hygiene and quality of water. In addition, when water is scarce, the quality often tends to be poor and the effects of pollution have an even greater impact because there are no alternatives. The question then becomes obvious: What can be done to improve sanitation conditions at home and protect sources of water? A simple solution such as boiling water is a very effective way to treat water for drinking and other uses. Low cost excreta disposal, such as digging a pit for latrine use, can prevent further contamination and spread of pathogens. Concerted efforts during the 1980s brought improved water and sanitation services to many of the world’s poorest people, both in the rural and urban communities. However, by 1990, the progress of the decade was not enough.

To make matters worse, 97 (64.4%) of the fathers indicated that they had no formal education. Twenty-six (17.2%) had a primary school education, 20 (13.2%) had completed an adult literacy program, and only 8 (5.2%) had a secondary education. In comparison, 126 (83.4%) of the mothers indicated that they had no formal education. However, 11 (7.3%) had a primary school education and 14 (9.3%) completed an adult literacy program. None of the mothers indicated that they had a secondary education.

## DISCUSSION

Poverty is clearly associated with adult morbidity. Some determinants and causes of adult ill health are closely associated with the general condition in which individuals live.

For example, malnutrition and micro-deficiency diseases are causes that may indirectly increase susceptibility to many infections. Unhealthy domestic environments are associated with a variety of communicable diseases such as diarrhea, pneumonia, and tuberculosis.

A cross-sectional survey of a rural peasant association in southwestern Ethiopia demonstrated a significant lack of proper sanitation and personal hygiene. Ninety percent of the households shared living space with domestic animals, less than 10% of the households were equipped with a latrine, and nearly 40% of the water was obtained from unprotected springs and rivers. In the area of housing condition or construction, virtually all the houses surveyed were tukul-type (circular hut with thatched roofs, mud walls, and earth floor) (Kebede et al., 1995). The improvement of housing conditions is an item of concern with considerable implications for the health and well being of citizens. The census data in Ethiopia indicated that the dwelling units in the country were below standard and lack adequate living space and even the most basic sanitary facilities (Layne, 1993). Similarly, in the developing countries, 80% of all sickness was attributed to unsafe or inadequate water supplies and sanitation, and people with water-related diseases occupied half of the hospital beds (Teka et al., 1991). Adults comprise the great majority of the labor force, and it is expected that adult ill health would have a deleterious effect on productivity. In most countries where data are available, the majority of hospital costs are for adults and the elderly.

A leading cause of morbidity and mortality throughout the developing world is diarrhea. Dysentery may be simply defined as diarrhea containing blood. Modes of transmission include person-to-person contact, and

contaminated water and food. Epidemics usually occur in impoverished areas with the highest age-specific incidence occurring among adults and the highest fatality rate occurring among children. Similarly, Ethiopia's critical health problems are communicable diseases caused by poor sanitation and malnutrition, which are exacerbated by a shortage of trained manpower and health facilities. According to Dr. Kebede Tadesse, Minister of Social and Administrative Affairs, "the health status of Ethiopia is one of the worst in the world because of backward socioeconomic development, poor environmental quality, high fertility rate, repeated natural and man-made disasters, and inadequate health services" ("Health care situation dismal," 1997). The leading cause of hospital deaths in Ethiopia includes dysentery and gastroenteritis (11%), tuberculosis (11%), pneumonia (11%), and malnutrition and anemia (7%) (Philips, Feachem, Murray, Philips, & Kjellstrom, 1993). However, more information is needed on adult mortality and morbidity in the poorest countries, particularly those in sub-Saharan Africa and South Asia. Basic research in developing countries in the pathology of diseases or on the nature of association between adult diseases and their risk factors is difficult to justify in most cases. Thus, adult health must be a priority on the agenda of a developing country's health policymakers and researchers. A great number of diseases in most developing countries are caused by infectious human excreta and by other wastes constantly contaminating food and water. When consumed, these cause illness and sometimes death. An important policy of the World Health Organization (WHO) is to develop an educational program for health professionals that will enable them to respond directly to the specific health needs of the communities

they serve.

Clearly, poverty is a critical element in most of the households surveyed, because it contributes to poor health and illness. For example, a comprehensive household panel survey conducted in Ethiopia indicated that the analysis of the structure of poverty shows that asset ownership, education, and the type of crops planted as well as their location to be important factors with regard to growth and poverty (Bigsten, Kebede, Shimeles, & Tadesse, 2002; Philips et al., 1993). Ethiopia is one of the poorest countries in the world with a GDP per capita income around \$110 U.S. Agriculture continues to dominate the economy. Ethiopia continues to suffer from spells of drought. For example, Vidal (2003) reported the worsening of the draught condition and that one in three people in Ethiopia are now malnourished. According to Kriner (2003), the Horn of Africa is suffering from three consecutive years of drought and relief agencies are desperately trying to secure routes to areas that have yet to receive aid, and the condition of the children is very serious.

## RECOMMENDATIONS

Adults comprise the great majority of the labor force in Ethiopia, and it is to be expected that adult ill health and poverty will have an effect on productivity and family income. The construction and use of garbage pits and pit latrines, and the availability of safe water supplies and schools are of paramount importance to rural Alemaya. Clearly, a problem of this magnitude with complex and multifaceted dimensions cannot be solved overnight, but simple, inexpensive measures such as chlorination for ridding water of disease-causing microorganisms in house-

holds without piped water could improve water quality. Personal hygiene training to safeguard potable water supplies and use of fertilizers to increase agricultural productivity could mitigate the problems of hunger, disease, and sanitation. These are hardly high tech strategies, yet combined they would save millions of lives. It is important for the Ethiopian government to provide or subsidize services with full community participation to alleviate these problems. This should be one of the Ethiopian government's top priorities. To facilitate the intervention, the findings of this research will be shared with the Ethiopian provincial health departments and local health policymakers in Alemaya.

#### CONCLUSION

The findings of the adult community health survey of a rural Alemaya village in Ethiopia show the prevalence of poverty, shortages of water, unprotected water supplies, diseases, illiteracy, poor housing conditions, and environmental and sanitary problems. The intent of this survey is to encourage the Ethiopian governmental planners to reevaluate their current rural health policy and institute appropriate interventions to improve the health and well being of the rural Alemaya farming community.

#### REFERENCES

- Bigsten, A., Kebede, B., Shimeles, A., & Tadesse, M. (2002). *Growth and poverty in Ethiopia: Evidence from household panel surveys. Working papers in economics, No. 65*. Goteborg, Sweden: Department of Economics Goteborg University.
- Feachem, R. G. A., Kjellstrom, T., Murray, C. J. L., & Philips, M. A. (1992). *The health of adults in the developing world*. New York, NY: Oxford University Press for the World Bank.
- Hales, D. (2003) *An invitation to health* (8<sup>th</sup> ed). Pacific Grove, CA: Brooks/Cole Publishing Company.
- Health care situation dismal, says government official. (1997, May 12). *AIDS Weekly Plus*, pp. 16-17.
- Kebede, S., Fisihatsion, T., Tesfaye, W., Asres, T., Kemal, N., Dubale, T., Tadios, Y., Anmaw, T., Worku, M., & Turner, J., (1995). Epidemiologic health survey of a rural peasant association in Southwestern Ethiopia. [On-line]. Available: <http://www.medicine.mcgill.ca/mjrm/issues/v01n02/health.html>.
- Kriner, S. (2003). Ethiopia's famine threat increases. [On-line]. Available: <http://www.disasterrelief.org/Disasters/000414Ethiopia2>.
- Layne, T. (1993). *The transitional government of Ethiopia, office of the prime minister, national policy of Ethiopia, Addis Ababa*. Addis Ababa, Ethiopia: Author.
- Murray, C. J. L., Feachem, R. G. A., Philips, M. A., & Wills, C. (1992). Adult morbidity: Limited data and methodological uncertainty. In Feachem, R. G. A., Kjellstrom, T., Murray, C. J. L., & Philips, M. A. (1992). *The health of adults in the developing world* (pp. 113-160). New York, NY: Oxford University Press.
- Philips, M., Feachem, R., Murray, C., Philips, M., & Kjellstrom, T. (1993). Adult health: A legitimate concern for developing countries. *American Journal of Public Health*, 83 (11), 1527-1530.

A SANITATION ASSESSMENT OF A RURAL ETHIOPIAN VILLAGE

- Self-help Development International (2003). Eastern highlands of Ethiopia east of Addis Ababa: Water. [On-line]. Available: <http://www.selfhelpintl.ie/selfhelp/Main/Alemaya.htm>.
- United Nations (1993). *Agenda 21: The United Nations programme of action from the Rio conference in 1992*. New York, NY: Author.
- United Nations (1997). *World urbanization prospects: The 1996 revision*. New York, NY: Author.
- Vidal, J. (2003). Ethiopia's worst famine in 20 years. [On-line]. Available: <http://www.guardian.co.uk/famine/story/0,12128,939065,00.html>.
- Yassi, A., Kjellstrom, T., de Kok, T., & Guidotti, T. L. (2001). *Basic environmental health*. New York, NY: Oxford University Press.

TRAINING PHYSICIANS TO PROVIDE HIV MEDICAL  
CARE ALONG THE TEXAS-MEXICO BORDER:  
THE CONTINUOUS MENTORED PATIENT CARE MODEL

Gary Sinclair, M.D.  
*Assistant Professor*  
*Division of Infectious Diseases*  
*The University of Texas*  
*Southwestern Medical Center*  
*Dallas, Texas*

Yolanda Cantu, M.P.H.  
*Assistant Professor*  
*Division of Community Pediatrics*  
*The University of Texas*  
*Health Science Center*  
*San Antonio, Texas*

Sandi Duggan, M.A.  
*Public Health Analyst*  
*Office of Science and Epidemiology*  
*Health Resources Service Administration*  
*HIV/AIDS Bureau*  
*Rockville, Maryland*

Charles Robert Smith, L.S.W., L.C.D.C.  
*Executive Director*  
*Valley AIDS Council*  
*Harlingen, Texas*

ABSTRACT

The HIV epidemic is expanding along the Texas-Mexico border, but few physicians in the region have the necessary knowledge and skills to manage the disease. In this article, a training program is described that successfully enabled physicians in three Community Health Centers (CHCs) along the border in south Texas to care for HIV infected individuals.

Key words: HIV/AIDS, patient care, physician training, rural health, Texas-Mexico border (*Texas Journal of Rural Health* 2003; 21(4): 27-34)

INTRODUCTION

Providing quality HIV medical care along the Texas-Mexico border poses unique challenges, particularly in regard to the physician workforce. Most physicians who specialize in treating patients with HIV prefer to practice in more urban communities where HIV prevalence is greater. Most generalist physicians (internists and family practitioners) view HIV as a "specialist's disease." The relatively small number of patients along the border makes it difficult for physicians who might like to treat HIV positive patients to maintain skills in HIV disease management.

Furthermore, opportunities for HIV related Continuing Medical Education are scarce as compared to communities with larger numbers of HIV infected individuals.

In July of 2000, the Valley AIDS Council (VAC), the sole HIV/AIDS service provider for the three southernmost counties of Texas, received funding to develop new and innovative methods to improve HIV service delivery along the Mexico border. As part of this initiative, a unique education and training program was developed for Community Health Center (CHC) physicians in the south Texas region. The program is based on an activity called "Continuous Mentored Patient Care," which is the major activity through which physicians are trained in the United States. In this article, the development, implementation, and initial evaluation of this program is described.

## PROJECT CONTEXT

### Description of the Region

The project was implemented in the three-county region along the Texas-Mexico border, which is commonly referred to as the Lower Rio Grande Valley (Hidalgo, Willacy, and Cameron Counties). Since the beginning of the HIV epidemic in Texas, these counties have reported 336 cases of HIV and 1143 cases of AIDS (Texas HIV/STD Surveillance Report, 2002).

The area has experienced a rapid population explosion over the last decade with a growth of 28% in 10 years (United States Census, 2000). The estimated 1990 population of the region was 661,370 (United States Census, 2000). The estimated year 2000 population of the region was 924,772 (United States Census, 2000). Poverty is endemic with

34% of the three-county region living at or below the poverty level, as compared to 15% for Texas as a whole (Texas Department of Health, 2000a; Texas Department of Health, 2000b; Texas Department of Health, 2000c; Texas Department of Health, 2000d). As in most impoverished regions, the area is medically under-served. Direct care physicians number 1 per 920 residents, as compared to 1 per 625 residents for the state of Texas taken as a whole (Texas Department of Health, 2000).

### History of the HIV Health Care System in the Region

In the beginning of the HIV epidemic, it was anticipated that the Health Resources Service Administration through its Bureau of Primary Health Care would utilize the National Network of Community Health Centers (CHCs) to play a major role in HIV care, especially for the indigent. While this did occur in many communities in the United States, the CHCs in the Lower Rio Grande Valley, already overburdened with the existing epidemics of diabetes, tuberculosis, hypertension, and depression, proved reluctant to take on the challenge of yet another epidemic. This created a need for an alternative provider of HIV services.

In response to this need, the Valley AIDS Council, headquartered in Harlingen, Texas, was created in 1987 and ultimately became the major HIV service provider in the Lower Rio Grande Valley. All Valley AIDS Council services, including medical care, are centralized in one office. The Valley AIDS Council maintains one full-time physician that provides outpatient services exclusively. Inpatient care is provided by local hospitals. Patients are cared for by staff physicians in consultation with local infectious disease

specialist physicians when appropriate. Local infectious disease specialist physicians provide only a small percentage of HIV outpatient management for the population.

The Valley AIDS Council is widely regarded as having provided excellent services to clients since 1987. However, with over 200 new cases from 1998 to 2000, there was concern regarding whether the system

would be able to meet the needs of patients (Garcia, 2001). Thus, there has been substantial interest on both a local and national level to recruit CHCs into the HIV care system.

**Table 1. Development and Implementation of the Project**

<b>Time</b>	<b>Activity</b>	<b>Participants</b>
July 2000	Identification of key participants	<ul style="list-style-type: none"> <li>• Project evaluators (UTHSCSA)</li> <li>• Valley AIDS council (VAC)</li> </ul>
August-September 2000	Development of intervention (multiple meetings)	<ul style="list-style-type: none"> <li>• Project evaluators</li> <li>• VAC physician</li> <li>• CHC physicians</li> <li>• TOAETC specialist physician</li> </ul>
October 2000	Initial didactic training	<ul style="list-style-type: none"> <li>• VAC physician</li> <li>• CHC physicians</li> <li>• TOAETC specialist physician</li> <li>• Project evaluators</li> </ul>
October 2000	Physicians see patients together at VAC	<ul style="list-style-type: none"> <li>• VAC physician</li> <li>• CHC physicians</li> <li>• TOAETC specialist physician</li> </ul>
December 2000	Newly identified patients offered the option of participating in study	<ul style="list-style-type: none"> <li>• VAC staff</li> </ul>
January 2001	CHC physicians begin to care for HIV patients	<ul style="list-style-type: none"> <li>• CHC physicians</li> </ul>
January 2001 and ongoing	CHC physician consults with TOAETC specialist physician by phone, fax, and e-mail (24/7 availability)	<ul style="list-style-type: none"> <li>• CHC physicians</li> <li>• TOAETC specialist physician</li> <li>• Project evaluators (cc'ed on faxes and e-mails)</li> </ul>
February 2001 and quarterly thereafter	TOAETC specialist physician visits CHC physicians—HIV patients seen together	<ul style="list-style-type: none"> <li>• CHC physicians</li> <li>• TOAETC specialist physician</li> <li>• Project evaluators (present during visits)</li> </ul>

**PROJECT DESCRIPTION**

The project was developed and implemented as a cooperative effort between the Valley AIDS Council, the Texas Oklahoma AIDS Education and Training Center (TOAETC), and three CHCs located along the Texas-Mexico border. A team from the University of Texas Health Science Center in San Antonio (UTHSCSA) Division of Community Pediatrics provided evaluation services.

*Description of the Project*

A timeline for the development and implementation of the project is shown in Table 1. Initially two CHCs were recruited for

the project: Nuestra Clinica de Valle (NCDV) in Hidalgo County and Brownsville CHC in Cameron County. A third CHC in Maverick County, United Medical Center of Eagle Pass, was also recruited into the process. Though it is not part of the Lower Rio Grande Valley health care system, United Medical Center serves an epidemiologically similar population. Each CHC identified one physician and one nurse within its existing infrastructure who would be responsible for the project. The Valley AIDS Council’s existing system of social and adjunct health services supported the work of the CHC clinical teams.

The TOAETC, a Health Resources Service Administration funded entity mandated by the Ryan White CARE Act, was responsible for developing and implementing an educa-

**Table 2. Continuous Mentored Patient Care**

<b>Role of the Trainee Physicians</b>	<b>Role of the Experienced Physicians</b>
• Takes primary responsibility for the panel of patients	• Makes himself/herself available to trainee physicians 24/7
• Performs an initial evaluation	• Reviews initial evaluation of trainee*
• Formulates a preliminary assessment of problems	• Reviews trainee assessment*
• Formulates a preliminary plan of care	• Reviews trainee plan*
• Reviews the assessment and plan with a more experienced physician*	
• Monitors the patient and informs the more experienced physician if things do not seem to be going according to plan	• “Spot checks” patients and evaluates whether or not progression is occurring as expected *
• Gains gradual independence and decreases reliance on the more experienced physician	• Provides continuous feedback, information, and suggests useful references for self-education to trainees
• Begins to assume training responsibilities for the less experienced physicians	• Allows the trainee to gradually become independent

\*Initially, these activities occur with regularity. As the trainee gains skill, reviews occur less regularly and with less stringency.



tional program that would meet the project's needs.

Multiple meetings that included the three CHCs, the Valley AIDS Council, and an infectious disease specialist physician, hereafter referred to as "infectious disease specialist," from the TOAETC occurred during August and September of 2000. A training program was designed to simulate the way in which western physicians are trained during internship and residency. This involves a small core of traditional didactic teaching methods, but relies primarily on what can be termed "Continuous Mentored Patient Care." Table 2 describes the role of each project physician during this process. In the "Continuous Mentored Patient Care Model," the trainee is assigned primary responsibility for the health and well being of a panel of patients, but is supervised by more experienced physicians.

The training process began in October of 2000 and consisted of 6 hours of didactics including the following lectures:

- 1) Recognizing and Diagnosing HIV Infection across the Spectrum;
- 2) HIV 101: Treatment Issues for the Non-Specialist Provider;
- 3) Salvage Therapy and Resistance Testing;
- 4) Case Studies in Initial and Salvage Therapy.

These were developed and delivered by the infectious disease specialist from the TOAETC.

After the lectures, all participants spent 1.5 days seeing patients at the Valley AIDS Council with both the Valley AIDS Council physician and the TOAETC infectious disease specialist present.

Starting in December of 2000, all newly identified HIV positive patients in the Lower

Rio Grande Valley were offered the opportunity to participate in the project and to receive care from the CHC HIV provider nearest their home.

Since it was not anticipated that the Eagle Pass region would accrue many new clients during the project period, existing clients who lived in the vicinity of Eagle Pass were given the option of relocating their care from the UTHSCSA (usual care for the Eagle Pass region) to their local CHC-United Medical Center of Eagle Pass.

The CHC physicians began caring for these patients in January 2001. "Continuous mentoring" for the CHC physicians was provided by the TOAETC infectious disease specialist in the form of quarterly visits to their practices where he would see as many of their HIV patients as possible, and provide guidance regarding their medical management. In addition, the TOAETC infectious disease specialist made himself available to the CHC physicians for HIV related consultation 24 hours per day. Consultations occurred via telephone, fax, and e-mail. Urgent consultations were initiated by paging the TOAETC infectious disease specialist.

#### Confidentiality and Informed Consent

All participants strictly adhered to confidentiality protocols previously developed by the Valley AIDS Council and the partner CHCs. Project physicians were instructed to delete all patient specific identifiers from e-mail and fax communications. Informed consent was obtained on all participants through human subjects protection protocols approved by the UTHSCSA Institutional Review Board.

FINDINGS OF THE FIRST TWO YEARS

Changes in Health Care Utilization Patterns

All three CHCs began to assume primary care responsibilities for HIV infected patients during the first two years of the project. Table 3 describes the changes in the use of HIV primary care at the CHCs during the project period. This is the first successful attempt to engage the CHCs along the Texas-Mexico border since the beginning of the HIV epidemic.

Utilization of the TOAETC Consultation Services by the Project Physicians

The CHC physicians made extensive use of the TOAETC infectious disease specialist. Table 4 summarizes the consultation activity occurring during the period. Even though the CHC physicians were only seeing a total of 33 patients, 52 distance encounters (via telephone, fax, pager, and e-mail) between the CHC physicians and the TOAETC infectious disease specialist were logged during the first two years of the project. Most of the 33 patients were actually seen in person by the TOAETC infectious disease specialist on one of his quarterly trips to the CHCs. Consulta-

tion length varied from as short as five minutes to greater than one hour. Many consultations involved multiple modalities (e.g., faxed laboratory data followed by a telephone conversation and/or e-mail). Consultations were described as urgent, if the consult was initiated by paging the TOAETC infectious disease specialist. Interestingly, the Valley AIDS Council physician, though more experienced than the CHC physicians, also decided to use the newly available consultation service that the project provided.

DISCUSSION

The project has demonstrated that CHC physicians who practice along the Texas-Mexico border are capable of caring for HIV infected patients, provided they are given significant amounts of support from expert HIV physicians in a manner similar to what they experienced during internship and residency. In fact, a training model has been developed that can be used for physicians who practice in CHCs along the Texas-Mexico border. Despite previous reluctance, it is clear that at this stage of the epidemic, this intensive physician-training program has a significant impact on the willingness and

**Table 3. Use of HIV Primary Care at Local CHCs (Number of Unique Patients)**

	Fall 2000	Fall 2001	Sum 2002
VAC-Harlingen, Texas	411	460	501
Nuestra Clinica de Valle			
CHC-Pharr, Texas	0	4	10
United Medical Center of			
Eagle Pass-Eagle Pass, Texas	0	7	10
Brownsville CHC-Brownsville, Texas	0	12	13

ability of the border CHCs to care for HIV infected patients. The project model presented in this article could also work in other areas where access to HIV specialists is limited.

However, it is important to view the results with caution. Despite eager, willing, and committed nurses and doctors, two years of intensive effort resulted in redistribution of only a small fraction of the total HIV caseload of the Lower Rio Grande Valley to the CHCs. An analysis of barriers to patient accrual within the context of the project is ongoing, and will provide insights for further refinements in the educational program.

It is unclear how long this intensive period of support will be necessary to enable the CHC physicians to shoulder a significant portion of the HIV care along the Texas-Mexico border. The HIV Medical Association (HIVMA) has suggested that to be an HIV qualified physician an individual should be able to show (within the past 24 months) continuous professional development through “direct and continuous medical care to a minimum of 20 patients who are infected with HIV... and ... a minimum of 30 hours of ... continuing medical education in the diagnosis and treatment of HIV-infected patients” (Infectious Diseases Society of America, 2001). This project may help define the term “HIV qualified physician” by seeing at what point the CHC physicians become

less reliant on consultative services, and more able to care for the HIV infected patient independently.

Finally, projects such as this need to monitor patient safety. At the present stage, the low number of patients enrolled in the “alternative” to usual care makes statistical comparisons invalid. As patient volumes at the CHCs increase, patient morbidity and mortality as well as secondary endpoints such as CD4 counts and HIV RNA levels will be monitored to ensure that a quality system of care is being created at the CHCs.

#### ACKNOWLEDGMENTS

This project was supported by grant #H97HA00187 from the Health Resources Service Administration’s Special Projects of National Significance (HRSA/SPNS). The publication’s contents are solely the responsibility of the authors and do not necessarily represent the official view of HRSA or the SPNS program.

Dr. Sinclair received salary support from the TOAETC. He also received an unrestricted educational grant from Bristol Myers Squibb.

We are indebted to Dr. Lois Eldred for her thoughtful critique of the manuscript.

**Table 4. Number of Consultations (Routine/Urgent)**

	Routine	Urgent	Total
VAC physician	22	1	23
CHC physicians	36	16	52
Total	58	17	75

REFERENCES

- Garcia, F (2001). Developing HIV/AIDS health care in the United States-Mexico border. [On-line]. Available: <http://www.ou.edu/border/presentations/>.
- Infectious Diseases Society of America (2001). Definitions of an experienced HIV provider. [On-line]. Available: <http://www.hivma.org/HIV/HIVMA/HIVMAPositionHIVSpecialist.htm>.
- Texas Department of Health (2000a). Selected facts for Cameron County. [On-line]. Available: <http://www.tdh.state.tx.us/dpa/cfs00/Camero00.pdf>.
- Texas Department of Health (2000b). Selected facts for Hidalgo County. [On-line]. Available: <http://www.tdh.state.tx.us/dpa/cfs00/Hidalg00.pdf>.
- Texas Department of Health (2000c). Selected facts for Willacy County. [On-line]. Available: <http://www.tdh.state.tx.us/dpa/cfs00/Willac00.pdf>.
- Texas Department of Health (2000d). Selected facts for Texas. [On-line]. Available: <http://www.tdh.state.tx.us/dpa/cfs00/texas00.pdf>.
- Texas HIV/STD Surveillance Report (2002). [On-line]. Available: <http://www.tdh.state.tx.us/hivstd/stats/pdf/qr20024.pdf>.
- United States Census (2000). [On-line]. Available: <http://www.census.gov>.

# PERCEPTIONS OF THE TEXAS GENETIC SERVICES SYSTEM AND GENETIC INFORMATION NEEDS OF HEALTH CARE PROVIDERS: A WEB-BASED SURVEY

Mary Sylvia Tijerina, Ph.D.  
*Assistant Professor*  
*School of Social Work*  
*Texas State University*  
*San Marcos, Texas*

Katherine Selber, Ph.D.  
*Associate Professor*  
*School of Social Work*  
*Texas State University*  
*San Marcos, Texas*

Virginia Rondero Hernandez, Ph.D.  
*Assistant Professor*  
*Department of Social Work*  
*California State University*  
*Fresno, California*

## ABSTRACT

In this article, the findings of an electronic survey of medical and allied health practitioners are reported. The survey concerned their perceptions of the statewide genetic services system and information needs relative to utilizing that system. Respondents viewed the system as fragmented in terms of service availability and accessibility. Qualitative data cited lack of services in rural areas. Information needs identified included genetic-related clinical skills and lack of knowledge about available services. Recommendations are offered for enhancing the services delivery system.

Key words: genetic services, health care providers, rural areas, Texas. (*Texas Journal of Rural Health* 2003; 21(4): 35-43)

## INTRODUCTION

Recent advances in the field of genomics offer potential for innovations in the prevention and treatment of genetic disorders and hold implications for heightened public awareness of genetic conditions and increased utilization of genetic services. Such developments also serve to underscore the importance of a functional, coordinated system of genetic services that is responsive

to the needs of affected individuals and families.

A comprehensive approach to strengthening the existing statewide system of genetic services involves the systematic analysis of the concerns, needs, and priorities of various stakeholder groups with the greatest investment in the delivery of these services. One such entity, providers of care to individuals and families affected by genetic conditions, is the focus of this study. The electronic survey described in this article represents one component of a three-part research project funded by the state health authority to collect data for the development of a statewide strategic plan for genetic services. The remaining components of the project consist of (1) focus groups with providers and consumers of genetic services and (2) an analysis of the strategic plans of an array of human service agencies potentially serving individuals and families affected by genetic conditions.

The purpose of this exploratory survey was two-fold: (1) to gather perceptions of medical and allied health providers about the existing genetic service delivery system, and (2) to identify the information and education needed by practitioners in order to care for patients with suspected or diagnosed genetic conditions. By better understanding the informational needs of practitioners, improvements can be made in the system by targeting areas for health promotion as well as initiating education and training efforts.

## BACKGROUND

Increased demand for genetic information and advice from consumers suggests that medical practitioners increasingly will need to be knowledgeable about genetics. According

to the American Medical Association, 50% of Americans report they are somewhat or very likely to take advantage of genetic testing and 72% believe that their primary care physicians can interpret genetic test results (Mitka, 1998; Karanjawala & Collins, 1998). However, research suggests that this confidence may be misplaced. General practitioners report difficulty assessing the genetic risk of their patients as well as a tendency to overestimate the genetic risk (Fry et al., 1999; Emery, Watson, Rose, & Andermann, 1999). Other studies have found that physicians misinterpreted nearly one-third of the predictive test results for colon cancer and that fewer than 20% of the patients actually received appropriate genetic counseling (Giardiello et al., 1997; Karanjawala & Collins, 1998).

General practitioners also report a lack of confidence in their ability to cope with increased demands for genetic advice (Watson, Shickle, Qureshi, Emery & Austoker, 1999; Geller et al., 1993). A contributing factor may be the overwhelming quantity of data being generated on the subject in some fields such as cancer research. The volume of information and speed at which it is being generated can challenge the capacity of most physicians to integrate and apply the information into their clinical practice (Taylor & Kelner, 1996).

A lack of professional training in genetics may be another reason why some physicians lack the confidence to provide genetic advice. According to the Journal of the American Medical Association, many practicing physicians have received limited training in genetics (Stephenson, 1998). Consequently, health care professionals who do not specialize in genetics have been found to vary greatly in terms of their knowledge about the same genetic abnormality (Abramsky, Hall, Levitan, & Marteau, 2001) and report a lack of

confidence in their ability to provide such services as a result (Emery & Hayflick, 2001; Geller & Holtzman, 1995; Watson et al., 1999). Among general practitioners, lack of confidence in their role has been found to result in inappropriate referral practices (Fry et al., 1999).

Even when physicians report adequate knowledge of genetics, this self-assessment does not necessarily carry over to their clinical practice. Hunter and colleagues (1998) found that although a majority of physicians reported adequate knowledge of genetics, only a minority of those respondents felt sufficiently confident to provide genetic counseling for simple genetic scenarios. Knowledge was found to have an important influence on referrals to genetic services and on attitudes toward genetic screening and prenatal diagnosis. Furthermore, the study found relatively poor knowledge of available services. Thus, in addition to genetics knowledge and enhanced clinical skills, knowledge of available resources and appropriate referral procedures may affect practitioners' ability to perform their roles effectively.

## METHODOLOGY

**Web-based:** Based on its accessibility and efficiency, web-based technology was selected as the medium for the present exploratory study (Flowers, Bray, & Algozzine, 2000; Sheenan & McMillan, 1999). Survey Solutions™, a commercial software package produced by the Perseus Development Corporation, was selected for the current study due to its ease of use, low cost, and availability of technical support. Additionally, the software allows anonymity of responses since it does not deposit "cookies" on survey

respondents' computers.

**Instrument Development:** Survey domains were derived from a review of the literature and subsequently prioritized in collaboration with the state health authority for development of the final survey instrument. Survey items focused on the types and levels of knowledge that practitioners believe are important to make effective use of the current genetic service delivery system, specifically knowledge related to making appropriate referrals for genetic services (e.g., knowing when to refer patients for services and where to refer them). Other items included: practitioners' sources of genetic information; perceptions about the availability of genetic services; barriers encountered in referring patients to genetic services; and demographic items about respondents and their professional practice. The 30-item instrument consisted of closed-ended and open-ended questions.

**Sampling Design:** The population of interest was medical and allied health professionals in Texas who provide care to persons with suspected or diagnosed genetic conditions. The population included 576 physicians, nurses, genetic counselors, dietitians, physical or occupational therapists, and social workers. A purposive, progressive sampling technique was used to identify potential respondents via several sources primarily including recommendations from a network of principal contacts representing regional or state leadership in the field of genetic services and referrals from the state health authority as well as web searches of health care providers and professional associations. Direct invitations to complete the online survey were emailed to the sample and included a link to the URL address of the survey.

## RESULTS

### Respondents

A total of 86 usable responses were received. The progressive nature of the sampling design precludes the determination of a precise response rate; however, based on the number of direct invitations emailed, the response rate was 15%. The majority of respondents were male, white non-Hispanics practicing in a state health planning region that also included a major teaching hospital. Genetic counseling was most often identified as the focus of the respondents' professional practice, followed by social work, clinical genetics, and pediatrics. Smaller numbers of respondents reported their fields of practice as early childhood intervention, health education, public health, and genetics research. A majority of respondents had been practicing professionally less than five years and had completed more than five years of formal academic training in genetics. One-third of the sample reported that their practice was almost exclusively related to genetics, whereas a slightly smaller proportion estimated that less than 10% of their practice pertained to genetics.

### Types and Levels of Knowledge Related to Genetic Services

Levels of genetic knowledge were assessed by asking respondents to indicate how knowledgeable they believed practitioners are about each of the 15 items. Response options ranged on a five-point scale from "not at all knowledgeable" to "very knowledgeable." Practitioners were perceived as "very or somewhat knowledgeable" about:

- Recognizing the symptoms of common

- genetic conditions;
- Knowing where to find information about genetic conditions;
- Taking adequate family histories;
- Identifying conditions for which genetics counseling is appropriate; and
- Knowing when to refer patients for genetic services.

Elements about which practitioners were perceived as "not very or not at all knowledgeable" included:

- Putting family history information into heredity patterns;
- Maintaining currency with the genetics literature;
- Recognizing psychosocial problems that require referral;
- Knowing the limitations of genetic testing;
- Knowing how to interpret genetic testing results;
- Helping patients to understand test results; and
- Knowing what services are available for persons with genetic conditions.

In addition to the closed-ended response options, an open-ended item invited respondents to identify other types of knowledge important for practitioners who provide services to individuals and families with potential or diagnosed genetic conditions. Most frequently cited were knowledge needs related to referring patients to genetic services, e.g., knowledge about available resources and support for specific genetic conditions, how to access and/or pay for these services, and how to prepare families on what to expect from an office visit with a genetic practitioner compared to "the typical doctor's appointment." Also cited were knowledge needs related to genetic



conditions such as:

- Knowledge of genetic syndromes;
- Probabilities of transmission; and
- Implications of genetic conditions” such as the emotional repercussions on the family.

*Relative Importance of Types of Knowledge*

Respondents were asked to select from the list of 15 elements the five most important types of knowledge for practitioners and to rank those five items from “most important” to “least important.” The items most frequently

**Table 1. Weighted Ranking of Genetic Services Identified Among Top Five Most Important**

Type of Knowledge	Weighted Score*	Rank Order Among Top 5
Recognizing the symptoms of common genetic conditions	233	1
Knowing when to refer patients for genetic services	232	2
Identifying conditions for which genetics counseling is appropriate	128	3
Identifying conditions for which genetics testing is appropriate	115	4
Knowing what services are available for persons with genetic conditions	76	5
Taking adequate family histories	59	6
Helping patients to understand test results	51	7
Knowing where to find information about genetic conditions	40	8
Knowing the limitations of testing	37	9
Assessing the patient’s/family’s understanding of information provided	36	10
Knowing how to interpret genetic test results	29	11
Putting information gathered into heredity patterns	25	12
Maintaining currency with the genetics literature	24	13
Making decisions about when follow-up is necessary	19	14
Recognizing psychosocial problems that require referral	12	15

\*Weighted score was calculated using values where 5=Most Important to 1=Fifth Important.

ranked as “most important” were “recognizing symptoms of common genetic disorders” and “knowing when to refer patients for genetic services” (see Table 1).

#### Sources of Genetic Information

Respondents were asked to indicate their most likely source of information about genetic services. In terms of general overall genetics knowledge, most frequently reported that their sources were: “genetic specialists,” “the Internet,” and “continuing education/conferences.” Less likely sources were: “books or journals” and “professional associations.” With regard to case consultations, the majority of respondents reported that they would turn to a genetic specialist as their primary source of genetics information.

#### Service Availability and Access

Respondents were asked whether they believed genetic services were, for the most part, available for persons residing in their geographic area. (In order to preserve anonymity, geographic area was measured according to the state health service regions.) Response options were “yes,” “no,” and “somewhat.” Most of the respondents reported that services are either available or “somewhat” available in their geographic region. Qualitative comments cited the uneven geographic distribution of services. Other comments identified socio-economic factors as limiting patients’ ability to access services with the majority of those specifically citing lack of insurance coverage or insurance exclusions for genetic services as barriers to service access.

#### Barriers to Practitioners’ Ability to Make Referrals for Genetic Services

Respondents were asked if they encountered barriers in referring individuals and families to genetic services; response options were “yes,” “no,” and “somewhat.” More than one-third of the respondents indicated they had experienced to some degree barriers in referring individuals and families for genetic services. Qualitative comments about perceived barriers to making referrals for genetic services most frequently cited the lack of financial resources to cover the cost of the services. An additional barrier to referral included the practitioners’ lack of knowledge about what services are available.

#### Qualitative Responses

In addition to the standardized survey items, the survey included an optional, open-ended question inviting comments about any other information that might help the state health authority understand the types of knowledge needed by service providers to enhance genetic services for individuals and families. Qualitative responses centered around four themes: (1) suggested educational approaches such as enhancing professional curriculum and using continuing education options; (2) specific service needs such as increased numbers of genetic counselors, increased use of technology for earlier diagnosis, and supportive services for families, including case management, psychological counseling, and education; (3) barriers to the utilization of existing services; and, (4) cost of services or financial concerns such as uneven geographic distribution of services across the state, lack of knowledge about how to access services, lack of support staff, and lack of financial incentives to enter the field of

practice.

## DISCUSSION

This web-based exploratory survey sought to examine the perceptions of medical and allied health professionals regarding the current statewide genetic services delivery system and factors related to their ability to utilize this system in providing care for their patients. Despite the limitations posed by the low overall response rate and low percentage of physician respondents, the aim of the survey study was to obtain an initial understanding of what the respondents' perceptions were with regard to their knowledge of genetics.

The respondents' perceptions of practitioners as knowledgeable about risk assessment, but less knowledgeable about the clinical application of genetic information are consistent with previous findings (Hunter et al., 1998; Acheson, Zyzanski, & Stange, 2001; Chappell, Campion, & May, 1997). This suggests that while a majority of physicians report having adequate knowledge of genetics, only a minority actually feel confident in applying that knowledge in their clinical practice.

Given that the majority of the respondents reported they were practicing in regions corresponding to the location of major urban areas and teaching hospitals, it is not surprising that the majority reported that at least some level of genetic services were available in their regions. Nevertheless, more than half of respondents perceived practitioners as "not very" or "not at all" knowledgeable about services available for persons with suspected or diagnosed genetic conditions. Qualitative responses cited the uneven geographic distribution of genetic services

and the implications for families living in rural areas. In addition to uneven geographic access, lack of services for economically disadvantaged, uninsured, and under-insured families were identified both as a barrier to practitioners' ability to make referrals as well as to families' ability to access services. These findings suggest that even if the types of services currently available in some areas of the state were expanded into rural areas and marketed to increase practitioners' knowledge of their availability, cost could potentially continue to function as a barrier to services.

Taken together, the findings regarding practitioners' lack of knowledge about available services and their preference for expedient, computer technology-based sources of information suggest the need for a state-wide, web-based resource directory that would offer readily available information about the continuum of genetic services available by geographic area. Such a user-friendly database could be accessible by practitioners and consumers alike. Similarly, computer-based or web-based educational materials may be the most effective medium for disseminating genetic information to assist physicians in making referrals to genetic services. Examples of educational materials that could be disseminated in this fashion include well-articulated referral guidelines, information about specific genetic conditions, and information summaries or case histories to guide clinical decisions. Also needed are educational materials that focus on skills development such as interpreting the results of genetic tests and communicating the information to individuals and their families.

*Rural Impact*

Although the survey did not systematically inquire about issues particular to rural areas, qualitative responses to the survey conveyed a clear perception that the geographic distribution of genetic services and resources across the state is uneven, leaving rural or less heavily populated areas at a disadvantage. These findings are particularly interesting considering that only one-third of the sample reported that their practices were located in regions other than those including major metropolitan areas. The rural impact of the current statewide system of genetic services emerged in qualitative comments offered in response to the open-ended survey items inquiring about the availability of genetic services in the respondents' geographic region and a final, optional question inviting comments on any issue that might assist the state health authority in enhancing the genetic services system. In addition to placing limitations on the providers' ability to refer patients to genetic services, the lack of services in rural areas was perceived by respondents as presenting extra burdens for individuals and families in terms of cost, time, and effort required for travel to obtain services.

CONCLUSION

The results of this exploratory survey have implications for the professional education of allied health practitioners. For example, in social work education, few schools include content on genetics in courses within the professional foundation or concentration curriculum (Stoesen, 2002). Unless there is a health care concentration or specialty within the program, information and

skills in this area frequently are not available to most students. Although genetics can play a critical role in the behavior and development of all individuals and families served by social workers (Bernhardt & Rauch, 1993), only those students electing field placements in this specialty can hope to obtain information. Further, perceptions of practitioners as less than knowledgeable in recognizing psychosocial problems requiring referral and in knowing what resources are available to address psychosocial needs of individuals and families suggest an important role in the genetic services system for social workers whose training includes psychosocial assessment and linking individuals to available services.

Finally, implementation of educational strategies such as those described can help medical and health practitioners become more confident and effective in their use of the service delivery system, thereby enhancing the service experience for individuals and families affected by genetic conditions.

REFERENCES

- Abramsky, L., Hall, S., Levitan, J., & Marteau, T. M. (2001). What parents are told after prenatal diagnosis of a sex chromosome abnormality: Interview and questionnaire study. *British Medical Journal*, 322, 463-466.
- Acheson, L. S., Zyzanski, S. J., & Stange, K. C. (2001). What genetic issues do family physicians encounter? *American Journal of Human Genetics*, 69(4), 445.
- Bernhardt, B., & Rauch, J. B. (1993). Genetic family histories: An aid to social work assessment, *The Journal of Contemporary Human Services*, 74(4), 195-206.
- Chappell, A., Campion, P., & May, C. (1997).

- Clinical terminology: Anxiety and confusion amongst families undergoing genetic counseling. *Patient Education and Counseling*, 32, 81-91.
- Emery, J., & Hayflick, S. (2001). The challenge of integrating genetic medicine into primary care. *British Medical Journal*, 322(7293), 1027-1040.
- Emery, J., Watson, E., Rose, P., & Andermann, A. (1999). A systematic review of the literature exploring the role of primary care in genetic services. *Family Practice*, 16(4), 426-445.
- Flowers, C. P., Bray, M., & Algozzine, R. F. (2000). Accessibility of schools and colleges of education home pages for students with disabilities. *College Student Journal*, 34(4), 550-556.
- Fry, A., Campbell, H., Gudmundsdottir, H., Rush, R., Porteous, M., Gorman, D., & Cull, A. (1999). GPs' views on their role in cancer genetics services and current practice. *Family Practice*, 16(5), 468-474.
- Geller, G., & Holtzman, N. (1995). A qualitative assessment of primary care physicians' perceptions about the ethical and social implications of offering genetic testing. *Qualitative Health Research*, 5(1), 97-116.
- Geller, G., Tambor, E. S., Chase, G. A., Hofman, K. J., Faden, R. R., & Holtzman, N. A. (1993). Incorporation of genetics in primary care practice. Will physicians do the counseling and will they be directive? *Archives of Family Medicine*, 2(11), 1119-1125.
- Giardiello, F. M., Brensinger, J. D., Petersen, G. M., Luce, M. C., Hyland, L. M., Bacon, J. A., Booker, S. V., Parker, R. D., & Hamilton, S. R. (1997). The use and interpretation on commercial APC gene-testing for familial adenomatous polyposis. *New England Journal of Medicine*, 336, 823-827.
- Hofman, K. J., Tambor, E. S., Chase, G. A., Geller, G., Faden, R. R., & Holtzman, N. A. (1993). Physicians' knowledge of genetics and genetic tests. *Academic Medicine*, 68(8), 625-632.
- Hunter, A., Wright, P., Cappelli, M., Kasaboski, A., & Surh, L. (1998). Physician knowledge and attitudes towards molecular genetic (DNA) testing of their patients. *Clinical Genetics*, 53(6), 447-455.
- Karanjawala, Z., & Collins, F. (1998). Genetics in the context of medical practice. *The Journal of the American Medical Association*, 280(17), 1533.
- Mitka, M. (1998, April 6). Genetics research already touching your practice. *American Medical News*, p. 3.
- Sheenan, K., & Miller, S. (1999). Response variation in e-mail surveys. *Journal of Advertising Research*, 39(40), 45-54.
- Stephenson, J. (1998). Group drafts core curriculum for "what docs need to know about genetics." *Journal of American Medical Association*, 279(10), 735-736.
- Stoesen, L. (2002, May). Genetics: Science takes on a human face. *NASW News*, p. 3.
- Taylor, K. M., & Kelner, M. J. (1996). The emerging role of the physician in genetic counseling and testing for heritable breast, ovarian and colon cancer. *Canadian Medical Association Journal*, 154(8), 1155-1158.
- Watson, E., Shickle, D., Qureshi, N., Emery, J., & Austoker, J. (1999). The "new genetics" and primary care. *Family Practice*, 16(4), 420.

# FACTORIZING NDs INTO THE HPSA EQUATION: A POLICY CONSIDERATION

Donald Patrick Albert, M.A., Ph.D.  
*Assistant Professor*  
*Department of Geography and Geology*  
*Sam Houston State University*  
*Huntsville, Texas*

Ferry Butar Butar, M.A., M.S., Ph.D.  
*Assistant Professor*  
*Department of Mathematics and Statistics*  
*Sam Houston State University*  
*Huntsville, Texas*

## POLICY & LAW

### ABSTRACT

Naturopathic physicians (NDs) provide services similar to primary care physicians, and it is argued that NDs should be counted within the formulation used to designate health professional shortage areas (HPSAs). Counting NDs as primary care physicians would reduce the number of shortage areas in all states that currently license NDs. Future expected growth in the profession would further improve availability to care in nonmetropolitan and frontier counties. Since numerous federal programs allocate funding based on shortage designation, lowering the number of HPSAs would reduce federal expenditures, while improving access to care.

Key words: HPSA, naturopathic physicians, rural health policy. (*Texas Journal of Rural Health* 2003; 21(4): 44-52)

### INTRODUCTION

Could NDs alleviate the paucity of primary care physicians in HPSAs? With 902 whole counties and 12,393 portions of counties (i.e., census tracts, areas, and minor civil divisions) designated as HPSAs by the Bureau of Health Professions (2003), the number of HPSAs is phenomenal. This article encourages

policymakers to include NDs into the mix of physicians considered to offer primary care services, and based on this addition, to recalculate the practitioner-to-population ratios of all HPSAs. Currently, primary care physicians are defined as doctors of medicine (MDs) and doctors of osteopathy (DOs) providing direct patient care in the following specialties: general or family practice, general internal medicine, pediatrics, and obstetrics and gynecology. This article proposes a simple and cost effective methodology of recalibrating HPSA formulation by considering NDs as primary care physicians, at least in those states where NDs have gained legal status through licensing statutes. Because the number of NDs has been increasing and this trend is expected to continue, the idea of utilizing NDs in HPSAs to improve access to care ought to be considered.

### NATUROPATHIC PHYSICIANS

Naturopathic medicine is gaining acceptance and support along several fronts:

- 1) Twelve states (see Table 1) have legitimized the scope and practice of NDs with the latest being Kansas in 2003 (Albert & Butar, in press-a);
- 2) The general public is becoming more knowledgeable and accepting of alternative therapies (Smith & Logan, 2002); and,
- 3) More insurance companies are covering naturopathic services (Alliance Legislative Workbook, 2003).

In addition to these forementioned states, California will become a licensed state effective January 1, 2004. This is due to the recent passing of SB 907 – The Naturopathic Act (California Association of Naturopathic

Physicians, 2003). California’s success will provide naturopathic licensing additional momentum as licensure continues to spread across the United States.

Naturopathic medicine was “almost to the point of complete extinction” (Baer, 2001) in the early 1970s. In the 1980s and 1990s, naturopathic medicine underwent “a process of organizational rejuvenation and moderate growth” (Baer, 2001). Six principles form the philosophy and practice of naturopathic medicines; these include:

- The Healing Power of Nature;
- Identify and Treat the Causes;
- First Do No Harm;
- Doctor as Teacher;
- Treat the Whole Person; and
- Prevention.

Since these are rather straightforward, no elaboration is given here; however, readers might consult Smith and Logan (2002) for a more comprehensive account of the principles

---

**Table 1. States Licensing Naturopathic Physicians**

---

- Alaska
- Arizona
- Connecticut
- Hawaii
- Kansas
- Maine
- Montana
- New Hampshire
- Oregon
- Utah
- Vermont
- Washington

Source: American Association of Naturopathic Physicians, 2003.

of naturopathic medicine. Ironically, the popularity of alternative medicine might thwart the continued growth of naturopathic medicine. Baer (2001) points out that competition from traditional naturopaths (i.e. graduates of correspondence schools), and cooptation by licensed biomedical practitioners, such as physicians and registered nurses, of natural therapies pose a threat to the future growth of naturopathic medicine.

### Educational Requirements

NDs receive rigorous education and training at the graduate and post-graduate level. In the United States, there are four naturopathic colleges; these include Bastyr University (Seattle, Washington), the National College of Naturopathic Medicine (Portland, Oregon), Southwest College of Naturopathic Medicine (Tempe, Arizona), and the University of Bridgeport College of Naturopathic Medicine (Bridgeport, Connecticut). The first three listed are accredited, and the fourth is a candidate for accreditation by the Council on Naturopathic Medical Education (CNME). Baccalaureate degrees are required for entrance into these schools, and graduate students can expect to spend between four and five years, including a clinical internship, to complete such degrees as naturopathic doctor or doctor of naturopathic medicine, both referred to as ND degrees. Citing the four-year track and curriculum for the doctor of naturopathic medicine at Bastyr University, both biomedical and naturopathic courses are woven together. For example, the curriculum includes such standard biomedical courses as biochemistry, human physiology, histology, human anatomy, embryology, neuroscience, human pathology, immunology, pharmacology, gastroenterology, dermatology, oncology, gynecology, radiographic interpretation,

and diagnostic imaging together with naturopathic courses such as naturopathic clinical theory, massage, hydrotherapy/physiotherapy, fundamentals of ayurvedic medicine, homeopathy, botanical medicine, naturopathic manipulation, healing systems, and others (Bastyr University, 2003a). Some naturopaths, also known as lay or traditional naturopaths, receive their knowledge and training through correspondence courses and other unorthodox avenues. Traditional naturopaths are unable to meet state licensing criteria required of NDs; for example, these naturopaths lack the educational credentials required to take the Naturopathic Physicians Licensing Examinations (NPLEX), and should not to be confused with NDs. A description of NDs by Bastyr University (2003b) is quoted below to help clarify this point further:

“American NDs receive extensive training in and use of therapies that are primarily natural (hence the name naturopathic) and nontoxic, including clinical nutrition, homeopathy, botanical medicine, hydrotherapy, physical medicine, and counseling. Some NDs have additional training and certification in acupuncture and midwifery. These contemporary NDs, who have attended naturopathic medical colleges recognized by the United States Department of Education, practice medicine as primary health care providers and are increasingly acknowledged as leaders in bringing about progressive changes in the nation’s medical system.”

### NDs as Primary Care Physicians

One might argue that NDs should be considered primary care physicians along with general and family practitioners, pediatricians, general internists, and obstetricians and gynecologists. Indeed, NDs “view



themselves as general family practice physicians, and, therefore, would refer patients experiencing conditions outside the general scope of a general practice” Hough, Dower, and O’Neil (2001). While the legal scope of practice for NDs varies from state to state, most NDs are allowed to perform hydrotherapy, colonic irrigation, physiotherapy, naturopathic manipulation, electrotherapy, gynecology, botanical medicine, nutrition, and homeopathy. States differ on the prescriptive authority vested with NDs. For example, NDs are permitted to prescribe drugs in some states (Arizona, Montana, Oregon, Utah, and Washington), have limited prescription authority in other states (Maine, New Hampshire, and Vermont), or are not allowed to prescribe drugs at all in other states (Alaska, Connecticut, Kansas, and Hawaii). Most states allow NDs the authority to order and perform X-rays and to engage in obstetrics (only with a certificate in Montana, New Hampshire, Oregon, and Washington). Most states do not allow NDs to practice acupuncture outright except Maine and New Hampshire. Arizona, Kansas, and Vermont allow NDs to perform acupuncture with the appropriate certification (Hough, Dower, & O’Neil, 2001; Kansas State Board of Healing Arts, 2003).

### Safety and Efficacy

Much discussion exists as to the safety and efficacy of complementary medicine, and rightly so. While it is not the authors’ intention to review issues of safety and efficacy here, several studies have been conducted with outcomes in defense of naturopathic therapies. Hough, Dower, and O’Neil (2001) reported on several randomized clinical trials noting positive outcomes on the use of physiotherapy, chiropractic, and

exercise for chronic low back pain; acupuncture and electroacupuncture for fibromyalgia; and omega-3 fatty acids, feverfew, and magnesium supplements for migraines. One major clearinghouse for clinical trials on treatments and therapies (i.e., acupuncture, botanicals, supplements, etc.) for various diseases and conditions is available online through the National Center for Complementary and Alternative Medicine (2003), and would be a starting point for a more rigorous review.

### Health Professional Shortage Areas

The Office of Shortage Designation uses a three-step process to identify shortage areas. These include:

- 1) Defining a rational service area, for example, counties;
- 2) Computing its population-to-practitioner ratio; and
- 3) Determining whether resources in contiguous services areas are excessively distant, overutilized, or inaccessible (Lee, 1991).

For example, counties with population-to-practitioner ratios of at least 3,500:1 and are inaccessible (greater than 30 minutes travel time for the patient) meet the criteria for shortage designation. More detailed guidelines for designating HPSAs are available from the Office of Shortage Designation (2003).

Nevertheless, the HPSA and medically under-served areas (MUAs), another shortage system, have been largely criticized for using “outdated, inaccurate, and incomplete information” and “flawed” methodologies that overstate the magnitude of primary care physician shortages (General Accounting Office, 1995). Twenty years ago, Berk,

Berstein, and Taylor (1983) wrote, “that shortage area designation has little direct effect on indicators of access and use.” Further, populations differ across a range of demographic characteristics such as age, gender, income, and ultimately health care requirements vary between populations. Therefore, determining shortage status based on physician-to-population ratios is problematic (Pathman, 1991).

In its *Report to Congressional Committees*, the General Accounting Office “recommend[s] that the Congress remove legislative requirements for HPSA or MUA designation as a condition of participation in federal programs.” Instead, the Congress should direct the Secretary of HHS to incorporate the necessary screening requirements into the conditions of participation of each program that will best match the type of program strategy with the type of access barrier existing for specific underserved populations” (General Accounting Office, 1995). Nine years later the HPSA and MUA systems are still the vanguard of shortage designation, so much for recommendations.

One specific problem identified in the General Accounting Office report was that when shortage determinations were made, all the primary care resources weren’t considered. For example, physicians employed by the federal government or assigned to shortage counties in fulfillment of obligations incurred through NHSC scholarships or loans are excluded from the count of primary care physicians. Further, United States-trained foreign physicians with a J-1 visa waiver, nonphysician providers, physician assistants, nurse practitioners, nurse-midwives, and specialist physicians who provide primary care are not considered when tallying primary care resources. In 1994, there were 2,539 primary care providers in shortage areas

including National Health Service Corps (NHSC) physicians (1,147), foreign physicians with a J-1 visa waiver (538), physician assistants and nurse-midwives (854). Considering these providers would have reduced the national shortage of primary care providers up to 50% (General Accounting Office, 1995). Another more recent study observed that 31% (based on 453 returned surveys) of nurse practitioners worked in HPSA counties (Kippenbrock, Stacy, Tester, & Richey, 2002). While the suggestion to count other health care professionals among an inventory of primary care resources is not a new idea, as these last two studies have shown, adding NDs to the list would further justify that a full accounting be undertaken.

Other studies (Cooper, Laud, & Dietrich, 1998; Cooper & Stoflet, 1996), while not referencing HPSAs *per se*, have advocated that alternative medicine clinicians be “tallied” because of “the substantial overlap provided by physicians, alternative clinicians (chiropractors, naturopaths, and practitioners of oriental medicine), and other nonphysicians” (Cooper & Stoflet, 1996). Further, Cooper and Stoflet (1996) estimated that the supply of alternative clinicians will increase 88% from 1994-2010 as compare to just 16% for physicians over the same time period. Since chiropractors will locate in smaller sized places than medical doctors (Gesler, 1988), the projected increase in chiropractors might mean more health care providers for HPSAs.

## GEOGRAPHY OF NATUROPATHIC MEDICINE

### State Licensing

Since 1986 seven states, five between 1991 and 1996, have enacted legislation licensing NDs. The most recent addition to this list is

Kansas where legislation became effective January 1, 2003. California will enact licensing legislation on January 1, 2004. The American Association of Naturopathic Physicians (AANP), perhaps a bit optimistically, expects all 50 states to license NDs by 2008 (American Association of Naturopathic Physicians, 2003). Naturopathic medicine is gaining awareness and acceptance among the general public (Smith & Logan, 2002) and insurance carriers, and therefore, one would expect this to influence legislators from nonadopting states to consider licensure.

Alaska, Arizona, Connecticut, Hawaii, Kansas, Maine, Montana, New Hampshire, Oregon, Utah, Vermont, and Washington currently license NDs. Licensing legislation is spatially clustered in within New England, and more loosely, the West. It is strikingly obvious, that the Midwest, South, Southeast, and the Mid-Atlantic states are literally "behind the curve" when it comes to licensing NDs. Of the 12 states with licensing legislation, just seven states have single counties designated as HPSAs for primary medical care (Alaska, Arizona, Kansas, Montana, Oregon, Utah, and Washington). However, all licensed states have sub-county geographic units (i.e., census tracts) with HPSA designation, so the inclusion of NDs in the shortage designation has universal applicability.

#### Concentration and Distribution

Previous studies on the geographic distribution of NDs support the notion that NDs are not improving physical access (distance) to care, while somewhat improving overall availability to primary care physicians. For example, NDs marginally improved person per primary care physician ratio in Arizona and Washington by 13% and 19%, respectively. However, little improvement in accessi-

bility (distance to care) was noted when a multiple regression analysis found a significant correlation between the number of NDs and the proximity to medical schools and high population density (Albert & Butar, in press-b). Data indicating the location of NDs in Arizona, Connecticut, and Oregon confirm the concentration of naturopathic physicians in urban areas (Albert & Butar, 2002).

#### Diffusion Studies

The number of NDs is increasing dramatically throughout the United States, and particularly in states that provide licensing requirements for NDs. Note Washington's 53% increase in licensed NDs from 1995 to 2002, and Arizona's phenomenal jump of 38% from October 2000 to November 2001 (Albert & Butar, in press-b). If these trends continue into the foreseeable future, then perhaps NDs will diffuse into smaller-sized counties and eventually filter into shortage counties. Williams (2000) observed such top-down hierarchical diffusion of naturopaths in Ontario and British Columbia. She noted a 75% increase in NDs for towns and villages in Ontario with populations over 2,000 between 1984 and 1994. During the same time period, she also noted that a 100% increase of NDs in small-sized cities (20,000 to 29,999 people) in British Columbia. That NDs will filter out of the larger metropolitan centers to smaller-sized places is supported by the Williams' study; the degree to which this will improve availability in shortage counties is unknown (Williams, 2000).

In order for the supply of NDs to continue at its amazing clip, other states must eventually pass licensing legislation. One study simulated the adoption of state licensing of NDs using spatial autocorrelation statistics, an adopter/nonadopter proportion based of

neighborliness, and the logistic curve (Albert and Butar, in press-a). A spatial autocorrelation technique (joins-counts) was employed to assess the diffusion type (contagious or hierarchical) in operation. Using the logistic curve and a neighborliness ratio, 11 states were predicted to pass licensing statutes to complete its early majority stage (i.e., the 50% adoption level). According to Albert and Butar (in press-a), California, Idaho, Nevada, North Dakota, Massachusetts, Rhode Island, New York, Colorado, New Mexico, Wyoming, and Minnesota were predicted to adopt during the next legislative wave. If this occurs as predicted, the western one-third of the United States, and all of New England will consist of two solid blocks of licensed states. In fact, as mentioned earlier, California has already done so, and will have joined the licensed states as of January 1, 2004. How long this will take is uncertain; however, the American Association of Naturopathic Physicians is gearing, one might say somewhat optimistically, for adoption by all 50 states by 2008 (American Association of Naturopathic Physicians, 2003).

### CONCLUSION

If this profession continues to expand, as most indicators suggest, then the impact of NDs on the reduction of shortage counties is apt to be staggering. As new states adopt licensing requirements, the number of NDs in these states would also subsequently rise. Since numerous federal programs (i.e., National Health Service Corps, Medicare Incentive Program, Community Scholarship Program, Title VII/VII Health Professions Education and Training Grant Programs, Rural Health Clinic Program, Indian Health Profes-

sions Scholarship Grant Program, Title III Mental Health Clinical Traineeship, and Title X Family Planning Services Program) allocate funds using the HPSA system (General Accounting Office, 1995), savings would be realized, and perhaps substantial savings as well, if NDs were factored into the HPSA equation. Counting NDs as primary care physicians would not solve the problem of shortage areas completely; there would still be shortage areas, just less of them. Reducing the number of shortage counties would translate in financial savings or at least a redirection of resources to the most needy and under-served counties. Reallocating services to the most vulnerable populations would be tantamount to improving the delivery of primary care services to those counties with the least number of providers per population.

### REFERENCES

- Albert, D. P., & Butar, F. (2002). Feasibility of using telephone, association, and licensure directories to examine the geographic distribution of naturopathic physicians in Oregon, Arizona, and Connecticut. *Geography Online*, 20(4), 1-8.
- Albert, D. P., & Butar, F. (in press-a). Diffusion of Naturopathic Licensing in the United States and Canada. *Complementary Health Practice Review*.
- Albert, D. P., & Butar, F. (in press-b). Distribution, concentration, and health care implications of naturopathic physicians in the United States. *Complementary Health Practice Review*.
- Alliance Legislative Workbook (2003). Naturopathic services and insurance coverage. [On-line]. Available: <http://>

- [www.allianceworkbook.com/isindex.htm](http://www.allianceworkbook.com/isindex.htm). American Association of Naturopathic Physicians (2003). Find an ND. [On-line]. Available: <http://www.naturopathic.org/>.
- Baer, H. A. (2001). The Sociopolitical status of U.S. Naturopathy at the dawn of the 21<sup>st</sup> century. *Medical Anthropology Quarterly*, 15(3), 329-346.
- Bastyr University (2003a). Program tracks and curriculum for doctor of naturopathic medicine 2003-2004. [On-line]. Available: <http://www.bastyr.edu/academic/profiles/naturopath/curriculum.asp?track=4>.
- Bastyr University (2003b). The history of naturopathic medicine. [On-line]. Available: <http://www.bastyrcenter.org/services/nd/history.asp>.
- Berk, M. L., Bernstein, A. B., & Taylor, A. K. (1983). The use and availability of medical care in health manpower shortage areas. *Inquiry* 20, 369-380.
- Bureau of Health Professions (2003). Ad-hoc database query selection. [On-line]. Available: <http://belize.hrsa.gov/newhpsa/newhpsa.cfm>.
- California Association of Naturopathic Physicians (2003). Natural medicine now. [On-line]. Available: <http://www.naturalmedicineno.org/index.html>.
- Cooper, R. A., & Stoflet, S. J. (1996). Trends in the education and practice of alternative medicine clinicians. *Health Affairs*, 15(3), 226-238.
- Cooper, R. A., Laud, P., & Dietrich, C. L. (1998). Current and projected workforce of nonphysician clinicians. *JAMA*, 280(9), 788-793.
- General Accounting Office (1995). *Report to congressional committees. Health care shortage areas: Designation not a useful tool for directing resources to the underserved*. Washington, DC: Government Accounting Office.
- Gesler, W. M. (1988). The place of chiropractors in health care delivery: A case study of North Carolina. *Social Science & Medicine*, 26(8), 785-792.
- Hough, H. J., Dower, C., & O'Neil, E. H. (2001). *Profile of a profession: Naturopathic practice*. San Francisco, California: University of California, Center for the Health Professions.
- Kansas State Board of Healing Arts (2003). Chapter 65, Article 72 Naturopathic Doctors. [On-line]. Available: <http://www.ksbha.org/statutes/ndact.html>.
- Kippenbrock, T., Stacy, A., Tester, K., & Richey, R. (2002). Nurse practitioners providing health care to rural and underserved areas in four Mississippi Delta States. *Journal of Professional Nursing*, 18(4), 230-237.
- Lee, R. (1991). Current approaches to shortage designation. *The Journal of Rural Health*, 7(4), 437-448.
- National Center for Complementary and Alternative Medicine (2003). Clinical trials. [On-line]. Available: <http://www.nccam.nih.gov/>.
- Office of Shortage Designation (2003). Health professional shortage area designation criteria. [On-line]. available: <http://bhpr.hrsa.gov/shortage/hpsacrit.htm>.
- Pathman, D. E. (1991). Estimating rural health professional requirements: An assessment of current methodologies. *The Journal of Rural Health*, 7(4), 327-346.
- Smith, M. J., & Logan A. C. (2002) Naturopathy. *Complementary and Alternative Medicine*, 86(1), 173-185.
- Williams, A. (2000). The diffusion of alternative health care: A Canadian case study of chiropractic and naturopathic

FACTORING NDs INTO THE HPSA EQUATION

practices. *The Canadian Geographer*,  
44(2), 152-166.

## COMMENTARY ON FACTORING NDS INTO THE HPSA EQUATION: A POLICY CONSIDERATION

Darryl M. Williams, M.D., M.P.H.  
*Executive Director  
Office of Border Health  
Texas Tech University  
Health Sciences Center  
El Paso, Texas*

### COMMENTARY

In this issue of the *Texas Journal of Rural Health*, Albert and Butar propose that an increased role for naturopathic physicians in Health Professions Shortage Areas (HPSAs) and Medically Under-served Areas (MUAs) might serve to improve access to health care and at the same time reduce the federal expenditures in these communities. This is an interesting idea, but one that poses additional questions. First, who exactly are naturopathic physicians and do they have the requisite skills to provide primary health care services to the target populations? Second, what are the geographic and licensing limitations of this proposal? Third, is it reasonable to expect that naturopathic physicians will establish practices within HPSAs and MUAs? And finally, will increasing the number of practitioners in HPSAs and MUAs have the effect of decreasing federal expenditures in these communities?

Naturopathic physicians are recognized by the designation, ND, and distinguish themselves from other naturopathic practitioners by their preparation and education. Their approach to patient care is based upon six basic principles:

- 1) The body has the inherent ability to establish, maintain, and restore health;
- 2) Illness does not occur without cause;
- 3) Illness is a purposeful process of the

- organism;
- 4) Health and disease are conditions of the whole organism;
- 5) The physician must work to create a healthy, sensitive interpersonal relationship with the patient; and
- 6) The ultimate goal should be prevention.

Treatment modalities include nutrition, use of herbal products, homeopathy, manipulation, massage, Oriental medicine (such as acupuncture), hypnotherapy and biofeedback, and minor surgery (Taylor, 2003). The effectiveness of many of these treatments has not been established, but the National Institutes of Health have created the Center for Complementary and Alternative Medicines to study the efficacy of many of these modalities. It is ironic that in recent years, there have been increasing federal expectations by the Food and Drug Administration (FDA) for the demonstration of both efficacy and safety of conventional medications and medical devices while botanicals and nutritional supplements have been excluded from FDA oversight with regard to either safety or efficacy since the enactment of the Dietary Supplement Health and Education Act in 1994. At least some of the treatments utilized by NDs have been validated. There is also evidence that NDs provide primary care services and especially disease prevention care to many individuals (Cherkin et al., 2002). Careful studies are needed that compare the effectiveness and outcomes of care provided by NDs with that provided by osteopathic and allopathic physicians as well as other health care providers such as nurse practitioners. Such comparative studies have been done with primary care physicians and nurse practitioners and have shown that nurse practitioners are able to provide high quality care that is comparable to care by physicians

(Monahan, 1999; Moody, Smith, & Glenn, 1999).

It is estimated that there are over 1000 NDs in the United States, and currently there are fewer than 200 new graduates each year (Cooper & Stoflet, 1996). Many of them have received their training from one of five schools of naturopathic medicine in the United States and Canada. These schools require graduation from a four-year undergraduate program that includes courses in biology, mathematics, and physical sciences. The ND curriculum is at least four years long and includes courses with similar titles to those offered in schools of osteopathic and allopathic medicine. However, in some instances, individuals have been granted the ND from a correspondence program. In the twelve states that license naturopathic physicians, these differing credentials can be sorted out. In many other states, NDs may practice without a formal licensing process and so for the potential patient it is more difficult to determine the practitioner's credentials (Eisenberg et al., 2002). Most of the states with licensing requirements, as well as the naturopathic medical schools, are located in the West. Texas does not have a licensing process for NDs. Further, even though the supply of NDs is expected to grow rapidly in the future, the numbers remain relatively small. It thus seems unlikely, as Albert and Butar have suggested, that NDs can fill the gaps in provider services in HPSAs and MUAs. Since many of these shortage areas are in poor rural communities with an under-employed and under-insured population, it is also not clear that NDs will be more likely to establish practices than their MD and DO counterparts. Early advocates for the role of nurse practitioners and physician assistants argued that these practitioners would be more likely to locate in rural areas



than physicians. Recent studies fail to demonstrate convincingly that this is so (Baldwin et al., 1998; Kippenbrock, Stacy, Tester, & Richey, 2000, 2002; Larson, Palazzo, Berkowitz, Pirani, & Hart, 2003; Strickland, Strickland, & Garretson, 1998).

Albert and Butar may be right that our current definitions and measures are unreliable surrogates for identifying communities with unmet health care needs. Finding suitable alternatives has been an elusive goal for many years (Goldsmith & Ricketts, 1999). Nevertheless, the underlying purpose for such measures is to identify and correct inadequate access to health care. Adequate access is dependent upon available services and funding resources – either insurance or government payer systems – to support those services. Providing equal access to health care, a stated goal of the United States Department of Health and Human Services, will require much more than expanding the number of practitioners of any discipline providing care in under-served communities.

REFERENCES

Baldwin, K. A., Sisk, R. J., Watts, P., McCubbin, J., Brockschmidt, B., & Marion, L. N. (1998). Acceptance of nurse practitioners and physician assistants in meeting the perceived needs of rural communities. *Public Health Nursing*, 15(6), 389-397.

Cherkin, D. C., Deyo, R. A., Sherman, K. J., Hart, L. G., Street, J. H., Hrbek, A., Davis, R. B., Cramer, E., Milliman, B., Booker, J., Mootz, R., Barassi, J., Kahn, J. R., Kaptchuk, T. J., & Eisenberg, D. M. (2002). Characteristics of visits to licensed acupuncturists, chiropractors, massage therapists, and naturopathic physicians. *Journal of the American Board of Family Practice*, 15(6), 463-472.

Cooper, R. A., & Stoflet, S. J. (1996). Trends in the education and practice of alternative medicine clinicians. *Health Affairs*, 15(3), 226-238.

Eisenberg, D. M., Cohen, M. H., Hrbek, A., Grayzel, J., Van Rompay, M. I., & Cooper, R. A. (2002). Credentialing complementary and alternative medical providers. *Annals of Internal Medicine*, 137(12), 965-973.

Goldsmith, L. J., & Ricketts, T. C. (1999). Proposed changes to designations of medically under-served populations and health professional shortage areas: effects on rural areas. *Journal of Rural Health*, 15(1), 44-54.

Kippenbrock, T., Stacy, A., Tester, K., & Richey, R. (2000). The distribution of advanced practice nurses in Arkansas: gaps in the care of rural under-served populations. *Journal of the American Academy of Nurse Practitioners*, 12(11), 457-461.

Kippenbrock, T., Stacy, A., Tester, K., & Richey, R. (2002). Nurse practitioners providing health care to rural and under-served areas in four Mississippi Delta states. *Journal of Professional Nursing*, 18(4), 230-237.

Larson, E. H., Palazzo, L., Berkowitz, B., Pirani, M. J., & Hart, L. G. (2003). The contribution of nurse practitioners and physician assistants to generalist care in Washington State. *Health Services Research*, 38(4), 1033-1050.

Monahan, J. H. (1999). Nonphysician clinicians in the health care workforce [comment]. *Journal of the American Medical Association*, 281(6), 511.

Moody, N. B., Smith, P. L., & Glenn, L. L.

COMMENTARY

(1999). Client characteristics and practice patterns of nurse practitioners and physicians. *Nurse Practitioner*, 24(3), 94-103.

Strickland, W. J., Strickland, D. L., & Garretson, C. (1998). Rural and urban nonphysician providers in Georgia. *Journal of Rural Health*, 14(2), 109-120.

Taylor, E. (2003). Ask NOAH about: Complementary and alternative medicine. [Online]. Available: <http://www.noah-health.org/english/alternative/alternative.html#Naturopathic>.

# SCHOOL-YEAR EMPLOYMENT AMONG HISPANIC HIGH SCHOOL STUDENTS IN RURAL SOUTH TEXAS: PREVALENCE AND PATTERNS

Nancy F. Weller, M.P.H., Dr.P.H.  
*Instructor*  
*Department of Family and*  
*Community Medicine*  
*Baylor College of Medicine*  
*Houston, Texas*

Karen Basen-Engquist, M.P.H., Ph.D.  
*Associate Professor*  
*Department of Behavioral Sciences*  
*M.D. Anderson Cancer Center*  
*Houston, Texas*

Sharon P. Cooper, Ph.D.  
*Professor/Dean*  
*School of Rural Public Health*  
*Texas A & M University*  
*Bryan, Texas*

Steven H. Kelder, M.P.H., Ph.D.  
*Associate Professor*  
*School of Public Health*  
*The University of Texas*  
*Health Science Center*  
*Houston, Texas*

Susan R. Tortolero, Ph.D.  
*Assistant Professor*  
*School of Public Health*  
*The University of Texas*  
*Health Science Center*  
*Houston, Texas*

## RESEARCH

### ABSTRACT

Working during the school year may be associated with adverse health effects among students. This article describes employment patterns among secondary students in rural South Texas where many poor, minority youth reside. Anonymous surveys were conducted in regular classrooms. The prevalence of current/recent work was 53% (n=1,608). Fewer Hispanics reported working than whites/other ethnicities. Fifty percent, regardless of the demographic subgroup, reported working primarily for spending money. Parents should monitor weekly work hours among these youth.

Key words: employment, health patterns, high school students, rural Texas. (Texas Journal of Rural Health 2003; 21(4): 57-71)

### INTRODUCTION

During the past few decades, increasing numbers of school-going youth have joined the formal labor force of the United States (Institute of Medicine, 1998; National Institute for Occupational Safety and Health, 1997; Bureau of Labor Statistics, 2000; Ruhm, 1997; American Academy of Pediatrics Committee on Environmental Health, 1995; Landrigan,

1993; Miller, 1995). Parents and policymakers observing this development assumed that part-time employment provided beneficial effects, such as teaching responsibility, punctuality, and money management (Institute of Medicine, 1998; Ruhm, 1997). Stressing the virtues of youth employment in the last 20 years, legislators passed bills that improved the employment prospects of school-going youth. This endorsement of part-time work during high school has contributed to the substantial numbers of students employed during the academic year (Institute of Medicine, 1998; National Commission on Youth, 1980; President's Science Advisory Committee, 1974).

As the numbers of working students increased, several investigators challenged the benefits of part-time work during adolescence and began documenting the serious drawbacks (Institute of Medicine, 1998; Steinberg & Cauffman, 1995). Of concern was determining the threshold number of hours worked per week (15 hours weekly for younger students; 20 hours for older students) past which the risks of working outweighed the benefits (Steinberg & Cauffman, 1995). Although growing evidence suggested that long hours of weekly work might be negatively associated with scholastic and health outcomes (work-related injury, substance use, decreased school performance, school disengagement, and school dropout), few reports of the employment status and weekly work intensity of school-aged youth are available (Steinberg & Cauffman 1995; National Institute for Occupational Safety and Health, 1999; Children's Safety Network at Education Development Center, 1995; Steinberg & Dornbusch, 1991). Further, no known information is available on the work situations of subpopulations of minority and poor youth from rural geo-

graphic areas in the southwestern United States.

This article reports the findings of a cross-sectional study on work prevalence with regard to high school students, a large proportion of whom are Hispanic, economically disadvantaged, bilingual students who live in rural areas of South Texas close to the United States-Mexico border. This research examined the circumstances surrounding school-year work in order to prioritize prevention efforts to reduce negative health and psychosocial effects in young workers.

## METHODS

### *Sample*

Data in this descriptive, cross-sectional study were collected as part of the Safe and Drug Free Schools (SDFS) Program's regular assessment of the prevalence of substance use among Texas Education Agency Region II students who represented 23 high schools in 11 contiguous counties in South Texas. This data collection provided an opportunity to examine issues of employment in relation to health and other behaviors.

The SDFS program coordinator recruited all 42 school districts in these counties for participation in the assessment. Thirteen districts declined participation due primarily to time constraints. Participating and non-participating districts were located in small towns and rural areas except for a single, small urban area of one-quarter million population in the nonparticipating group. The distribution of the educational status of parents and student ethnic characteristics was quite similar among participating and non-participating districts. About 60% of students in the participating districts were eligible to

receive free or reduced cost lunches; the median number of Hispanic students in the participating districts was 73% (Texas Education Agency, 1993).

The total student population in the participating high schools was 12,770. At the larger schools, classes were randomly selected by grade from a master list of second period classes using a random number table. In schools with fewer than 200 students, all students were surveyed. The number of students eligible to complete the survey was 8,973. A total of 7,221 9<sup>th</sup>- through 12<sup>th</sup>-graders, representing 80.5% of eligible respondents, were surveyed. This analysis includes only 10<sup>th</sup> and 12<sup>th</sup> graders because of our interest in documenting the changes in work patterns between the sophomore year when youth can legally work and the senior year when most students report working part-time (Steinberg & Cauffman, 1995). The number of 10<sup>th</sup> and 12<sup>th</sup> graders who responded was 1,898 and

1,667, respectively. Cases with missing data on one or more variables were excluded (501), leaving the number of completed surveys from 10<sup>th</sup> and 12<sup>th</sup> grade students at 1,625 and 1,439, respectively (N=3,064). Of the 3,064 respondents, 1,608 students reported working for pay.

The study protocol and survey instrument were approved by the University of Texas Health Science Center Institutional Review Board (HSC-SPH-95-018). During the week prior to survey administration, parents received a passive informed consent form explaining the study and providing an opportunity to decline participation by returning a signed consent. Following the Center for Disease Control and Prevention's (CDC) Youth Risk Behavior Study (YRBS) protocol, teachers received instruction packets and administered the survey during the students' regular classes (Kolbe, Kann, & Collins, 1993). The survey was anonymous;

**Table 1. Description of Variables and Characteristics of Survey Measures**

Variable	Coding	Source
<b>Work (Dependent &amp; Independent Variable)</b>		
Weekly work hours	Actual hours ranging from 1-31+	Temple*
<b>Other Dependent Variables</b>		
Weekly homework hours	Actual hours ranging from 0-7+	Temple
Weekly hours non-school extracurricular activity	Actual hours ranging from 0-15+	Self
Weekly hours school extracurricular activity	Actual hours ranging from 0-31+	Self
Hours weeknight sleep	Actual hours 1=10 + to 8=3 or less	Bradley
Hours weekend sleep	Actual hours 1=10 + to 8=3 or less	Bradley
Weekday afternoons with friends	Actual days 1=0 to 6=5 days	MTF
Type of job	Range from 1=never to 8	Temple
Motivation for working	Range from 1=never to 8	Temple

\* Temple University psychology department, EP Bradley Hospital Sleep Research Laboratory, Safer Choices, Institute for Social Research Monitoring the Future Survey. Reliability information for these measures is not available.

students recorded their responses directly on a computer-scannable answer sheet.

### *Analysis and Measures*

Survey questions were selected from instruments previously used in other major studies of adolescent development including the Temple University Department of Psychology: School-Year Work Questionnaire; North Carolina Teens at Work Questionnaire, East Carolina University; Massachusetts SENSOR Project Teens at Work Questionnaire; Institute for Social Research Monitoring the Future Survey, University of Michigan; and School Sleep Habits Survey of EP Bradley Hospital (Weller, Basen-Engquist, Cooper, Kelder, & Tortolero, 1995a-e). Table 1 provides a description of the variables, their coding, and source.

**Outcome Measures.** Current weekly work hours were defined as "hours a week usually spent working at your paying job" (Weller, 1997). This item was obtained from the Temple University Psychology Department's School-year Work Questionnaire (Weller et al., 1995b). The mid-point of each response level was used to express weekly work hours as an eight-level variable with the following categories: not employed, employed 1-5 hours, 6-10 hours, 11-15 hours, 16-20 hours, 21-25 hours, 26-30 hours, and 31 or more hours. Number of school-day afternoons spent with friends, hours of sleep, weekly hours in extracurricular activities, and weekly hours of homework were treated as dependent variables for some analyses.

**Independent Variables.** Current or recent (within the past six months) weekly work status was treated as an independent variable for some analyses with the following categories: not employed, employed 1-10 hours, employed 11-20 hours, and employed 21 or

more hours. Since the employment patterns of young workers vary considerably with frequent movement in and out of the labor force, the amount of current/recent weekly work hours usually spent at a paying job(s) was considered an indicator of how many weekly hours a student usually worked – a typical school-year work pattern.

Demographic variables included the student's self-reports of gender, grade, race/ethnicity, and maternal/paternal educational status (a measure of socioeconomic level). Race/ethnicity was collapsed into three categories: non-Hispanic white, Hispanic, and all other race/ethnic groups combined (black, Asian/Pacific Islander, American Indian/Alaskan Native, and mixed race). Maternal and paternal educational status was indexed into three groups: one/both did not graduate high school, both graduated high school, and one/both graduated college or one attended graduate school.

**Methods of Analysis.** The relationships between the outcome measures and independent variables were analyzed using SPSS 8 for Windows 95 statistical package (SPSS<sup>R</sup> for Windows, 1995). Analysis of variance (ANOVA) techniques were used to test the mean difference between typical weekly work hours and the demographic variables. Frequencies and crosstab techniques with chi-square procedures examined differences in the type of job and reasons for working by the demographic variables. Multivariate analysis of covariance (MANCOVA) examined the differences between student activities by weekly work intensity level. Post-hoc Scheffe tests examined contrasts for the significant dependent variables among 1) workers in adjacent hours categories in the MANCOVA, and 2) students belonging to different demographic subgroups (ANOVA).

RESULTS

**Characteristics of the Overall Sample.**

The sample consists of 3,064 high school students with very similar distributions of males (51%) and females (49%) and 10<sup>th</sup> (53%) and 12<sup>th</sup> graders (47%). More than one-half of the sample was classified as Hispanic (54%), and slightly more than one-third white (37%). All other racial/ethnic groups comprised 9%. Almost two-thirds of the students had parents whose educational backgrounds did not extend past high school (63%).

**Prevalence and Intensity of Work.**

Table 2 presents the prevalence and intensity of school-year employment by the demographic subgroups and for the overall sample. Fifty-three percent of the sample reported current or recent (within the last six months) employment in a part-time job. Of the employed, 43% worked 1-10 hours weekly, 25% worked 11-20 hours weekly, and 32% worked more than 20 hours weekly.

Among workers, significant differences were observed in the mean work hours by grade and parent education. Seniors worked

**Table 2. Weekly School Year Work Hours for South Texas High School Students**

	Do Not Work (n=1,456)	Work 1-10 Hours (n=708)	Work 11-20 Hours (n=388)	Work 21+ Hours (n=512)	Mean (SD) Weekly Work Hours*	Number of Workers
<b>Overall Sample (N=3,064)</b>	47%	23%	13%	17%	15 (10)	1,608
<b>Gender</b>						
Male	42%	25%	14%	20%	15 (10)	880
Female	53%	22%	12%	13%	14 (10)	728
<b>Grade</b>						
10th	52%	28%	9%	11%	12 (10) <sup>^^</sup>	787
12th	43%	17%	17%	23%	17 (10)	821
<b>Race/Ethnicity</b>						
White	40%	27%	14%	19%	15 (10)	686
Hispanic	53%	20%	12%	15%	15 (10)	773
Other	47%	24%	12%	17%	15 (11)	149
<b>Parent Education#</b>						
College graduate	47%	26%	11%	16%	14 (10) <sup>^</sup>	609
High school grad	45%	24%	14%	17%	15 (10)	440
< High school	50%	19%	13%	18%	16 (10)	559

\* Among workers.

# < High school grad=one/both parents did not graduate high school; High school grad=both parents graduated high school; College graduate=one/both graduated college and one attended graduate school

Significance for Means (ANOVAs): ^^ = <0.0001; ^ = <0.01.

significantly more hours per week (17 hours) than sophomores (12 hours), and students having parents who did not graduate from high school worked significantly more hours per week (16 hours) than students having parents who graduated from college (14 hours). Testing for distinctions in work hours by the interaction of race/ethnicity and parent education revealed no significant interaction.

**Type of Job by Demographic Groups.**

Table 3 presents the types of employment for all working students and by the demographic

subgroups. We found significant differences in the type of job by gender, grade, race/ethnicity, and parent education. Overall, students were more likely to work in restaurants (23%), childcare (18%), retail stores (17%), and factory/office/skilled jobs (15%) than in other types of jobs.

Forty percent of the females worked in childcare; another 25% reported working in restaurants. While most males worked in restaurants (22%), yardwork (21%), and agriculture (19%), a smaller percentage also

**Table 3. Type of Current or Recent Job by Demographic Factors of South Texas High School Students**

	Restaurant	Retail	Yardwork	Childcare	Construction	Agriculture	Factory	Total
<b>Overall Workers (N=1,608)</b>	23%	17%	12%	18%	4%	11%	15%	100%
<b>Gender</b>								
Male	21%	13%	21%	4%	8%	19%	14%	100%
Female	24%	17%	3%	40%	1%	2%	14%	100%
<b>Grade</b>								
10th	17%	10%	17%	29%	5%	12%	10%	100%
12th	28%	21%	8%	12%	4%	9%	18%	100%
<b>Race/Ethnicity</b>								
White	18%	13%	13%	24%	4%	14%	15%	100%
Hispanic	25%	18%	13%	18%	5%	9%	13%	100%
Other	30%	14%	10%	17%	4%	9%	16%	100%
<b>Parent Education#</b>								
College	18%	14%	13%	23%	4%	14%	15%	100%
High school	19%	18%	13%	19%	6%	10%	15%	100%
< High school	30%	15%	12%	19%	4%	9%	12%	100%

# < High school=one/both parents did not graduate high school; High school=both parents graduated high school; College=one/both graduated college and one attended graduate school.

Gender (Chi-Square = 632.2, df=6, p<0.0001); Grade (Chi-Square=193.3, df=6, p<0.0001); Race/ethnicity (Chi-Square=47.5, df=12, p<0.0001); Parent education (Chi-Square=52.5, df=12, p<0.0001).



worked in other types of jobs, including factory/office/skilled work (14%) and retail stores (13%). A few more students whose parents had not graduated from high school worked in restaurants (30%) than students whose parents were either high school (19%) or college graduates (18%).

**Motivation for Working by Demographic Variables.** Table 4 presents the reasons for working by the demographic variables. We found significant differences in student's

motivations for working by gender, race/ethnicity, and parent education. The most predominant motivation for employment for the overall sample was to earn spending money (50%).

Although only 13% of the students whose parents did not graduate from high school worked to help with family living expenses, the proportion of these students (13%) was more than twice that of students whose parents were either high school (6%) or

**Table 4. Motivation for Working by Demographic Factors of South Texas High School Students**

	Future Education	Family Living Expenses	Spending Money	Friend-related Reasons	Learn Responsibility	Multiple Reasons	Total
<b>Overall Workers (N=1,608)</b>	10%	9%	50%	1%	6%	24%	100%
<b>Gender</b>							
Male	10%	9%	54%	2%	6%	19%	100%
Female	9%	7%	51%	1%	5%	28%	100%
<b>Grade</b>							
10th	8%	8%	55%	2%	6%	23%	100%
12th	11%	8%	51%	1%	5%	23%	100%
<b>Race/Ethnicity</b>							
White	10%	4%	58%	2%	5%	22%	100%
Hispanic	9%	11%	50%	1%	6%	24%	100%
Other	14%	7%	48%	1%	7%	25%	100%
<b>Parent Education#</b>							
College graduate	10%	5%	58%	2%	5%	21%	100%
High school grad	12%	6%	52%	1%	4%	26%	100%
< High school	8%	13%	48%	1%	6%	24%	100%

# < High school=one/both parents did not graduate high school; High school=both parents graduated high school; College=one/both graduated college and one attended graduate school.

Gender (Chi-Square = 31.0, df=7, p<0.0006); Race/ethnicity (Chi-Square=52.1, df=14, p<0.00000); Parent education (Chi-Square=57.1, df=14, p<0.00000).

college graduates (5%).

**Student Activities by Work Intensity Level.** Table 5 presents the mean and standard deviation for student activities (nightly sleep, number of school-day afternoons spent with friends, weekly extracurricular activities, and weekly homework hours) by weekly work intensity level. The results of the MANCOVA indicate significant differences in the means for student activities by weekly work intensity level (Wilks Lambda = 12.3,  $p < 0.01$ ).

Longer hours of weekly work were associated with decreases in hours of weeknight ( $p < 0.01$ ) and weekend sleep ( $p < 0.001$ ) and increases in weekly hours spent in non-school-related extracurricular activities ( $p < 0.05$ ). Non-workers and 1-10 hours/week workers slept more on weeknights (6.8 hours nightly) compared to students working more than 10 hours weekly who slept about 6.5 hours nightly ( $p < 0.0001$ ). Specific differences in mean hours of weekend sleep were noted between non-workers and employed students in all three work intensity levels ( $p < 0.0001$ ). Non-workers slept 7.5 hours nightly; workers slept about 7 hours nightly. Students working 1-10 hours weekly (3.4 hours) and more than 20 hours weekly (3.6 hours) spent more weekly hours in non-school-related extracurricular activities than non-workers (2.9 hours) ( $p < 0.001$ ).

## DISCUSSION

Increasing numbers of school-going youth have entered the formal work force of the United States (Institute of Medicine, 1998; National Institute for Occupational Safety and Health, 1997; American Academy of Pediatrics Committee on Environmental Health, 1995; Landrigan, 1993). Few studies, however, have provided data on the prevalence and intensity

of work in populations including economically disadvantaged youth. This article describes the work patterns of public school students living in a geographic area with high proportions of minority youth with parents whose educational backgrounds did not extend past high school (63%).

**Prevalence of Work.** The findings of this study suggest that labor force activity is a widespread phenomenon among South Texas students with 53% of the students reporting work at a paying job. The results from this study are supported by several other nationally-representative samples, both cross-sectional and longitudinal, including Department of Labor estimates (Bureau of Labor Statistics, 2000) and parent (Manning, 1990) and student surveys (Bachman & Schulenberg, 1992; Light, 1994; Kruse, 1997). While the Department of Labor reports a lower prevalence of school-year work than our estimate, the longitudinal surveys of parents and youth indicate a higher prevalence of school-year employment than that of our study.

The discrepancies between our estimate and others may reflect real differences in employment opportunities nationwide and in rural South Texas or may result from different estimates of employment across surveys, respondent bias, varying definitions and nomenclature, erroneous recall, variance in study design, or other methodological issues. While estimates of employment vary considerably across surveys, research has clearly shown that substantial numbers of high school students, including South Texas youth, combine school with part-time employment.

With respect to ethnic differences in the prevalence of employment, our findings confirmed that Hispanic youth were less likely to be currently employed than white youth.



Other studies have consistently found that minority youth are less likely to be employed than white youth, due largely to family socioeconomic factors, i.e., teens from poorer families who live in economically distressed areas have fewer work opportunities and greater transportation barriers (Institute of Medicine, 1998; Steinberg & Cauffman, 1995; Children's Safety Network, 1995; United States General Accounting Office, 1991; National Safe Workplace Institute, 1991; Steel, 1991). Our results showed, however, that once employed, Hispanic and other races/ethnicities worked as many hours weekly as whites, a finding also supported by the literature (Institute of Medicine, 1998).

**Work Intensity.** Noted as a critical variable in the study of student employment over the last few years is weekly work intensity – the number of hours spent in the labor force each week (Institute of Medicine, 1998; Steinberg & Cauffman, 1995; Steinberg & Dornbusch, 1991). Findings from our study indicate that seniors worked an average of 17 hours weekly, almost the equivalent of a half-time job. Comparable figures are reported by other investigators who have raised concerns about the impact of working long hours on academics, social development, and health (Mortimer, Finch, Ryu, Shanahan, & Call, 1996; Schoenhals, Tienda, & Schneider, 1997; Carskadon, 1990; Carskadon, Mancuso, & Rosekind, 1989). Although we expected to find a negative association between weekly work hours and other adolescent activities, our findings suggest that the amount of time spent at work was unrelated to the amount of time spent on other activities in most cases. Except for slight decreases in hours of weeknight and weekend sleep in employed students, work did not seem to interfere with other adolescent activities measured in this study; in fact, longer hours of weekly work

were associated with more hours of non-school-related extracurricular activities. Several studies reveal, however, that youth have developed compensatory mechanisms that mask the real effects of working long hours (Institute of Medicine, 1998; Steinberg & Cauffman, 1995; McNeil, 1984). The accumulated activity hours for high-intensity workers of a 20-hour per week job, extracurricular programs, homework, and roughly 35 hours of weekly class time certainly suggest potentially negative academic, social, and physical consequences to youth.

In fact, Weller and colleagues (in press) found the following effects to be associated with long hours of weekly employment among South Texas high school students: (1) decreased performance/engagement in school (slightly lower grades, and increased weekly absences and tardies, and sleeping in class), (2) decreased satisfaction with amounts of leisure time and time with friends, and (3) increased health risk behaviors, including use of several substances and psychological stress. Work-related injury was also associated with high intensity work among South Texas high school students (Weller, Cooper, Basen-Engquist, Kelder, & Tortolero, 2003). Other authors, too, have identified adverse health effects of working during the school year (Steinberg & Cauffman, 1995; Steinberg & Dornbusch, 1991; Bachman & Schulenberg, 1992).

**Reasons for Employment.** If a majority of youngsters are working during the academic year and spending long hours on the job, what are the reasons for this phenomenon? Are middle-class and low-income teens under growing economic pressure to help their families with living expenses? Our examination of the role of parent education (an index of socioeconomic status) indicated similar mean weekly work hours for the three parent

education categories. Although students whose parents had grade school educations indicated working solely to support family living expenses more than twice as often as students whose parents had high school (6%) or college educations (5%), the proportion of students endorsing employment to support family living expenses was fairly small (13%). Thus, it does not appear from this evidence that school-year employment is exclusively an activity of youth whose parents are poorly or even moderately educated. We also did not find indications of an interaction between parent education and race/ethnicity. This finding that youth work is a cross-class activity is supported by other studies reporting that weekly work hours vary only slightly as a function of family income, parental occupation, or parent education (Institute of Medicine, 1998; Steinberg & Cauffman 1995; Manning, 1990; Kruse, 1998; United States General Accounting Office, 1991; Steel, 1991).

Why, then, do adolescents work in such great numbers and for such long hours during the school year? Our findings indicate that few youngsters work out of financial need since only a small proportion used their earnings solely for family groceries or housing (9%) or college savings (10%). In contrast, a majority of working students reported working to have money to spend on discretionary items for themselves, like clothes, going out, and car expenses (50% of workers). Other researchers confirm that the chief motivation behind adolescent employment today is to have money for consumer goods (Institute of Medicine, 1998; Ruhm, 1997; Steinberg & Cauffman, 1995; Bachman & Schulenberg, 1992). From this evidence, it appears that the earnings of teens, even mostly low-income youth, are primarily spent on themselves for goods that some would

consider discretionary consumer items.

#### **Type of Work by Demographic Variables.**

Study results support the findings of other research noting differences in type of work as a function of age and gender (Institute of Medicine, 1998). Males were more likely to work in manual labor than girls, who were more likely to work in service positions (Institute of Medicine, 1998; Steinberg & Cauffman, 1995). The proportion of South Texas males employed in agriculture (19%), documented as the most hazardous industry of all, was more than twice the number typically employed in this sector (8%) (Institute of Medicine, 1998; Wegman & Davis, 1999). These youth were possibly employed on family-owned farms and ranches, where federal regulations do not apply and where occupational injuries are more likely to be severe (Institute of Medicine, 1998; Layne, Castillo, Stout, & Cutlip, 1994). The relation between youth work and occupational injury will be explored in a subsequent article.

Most younger workers were employed in informal-sector jobs, such as baby-sitting and yard work, while older workers were more likely to hold formal jobs, including restaurant and retail jobs (Institute of Medicine, 1998; Steinberg & Cauffman, 1995; Children's Safety Network, 1995). From this and other evidence, it appears that restaurant and retail store work — types of jobs known to produce many injuries among young workers — constitute the core of the older adolescent workplace, both in this sample and in others (Institute of Medicine, 1998; Steinberg & Cauffman, 1995; Children's Safety Network, 1995; Castillo, Davis, & Wegman, 1999; Dunn, Runyan, Cohen, & Schulman, 1998).

Contrary to other investigators, we did not find differences in the type of work by parent education subgroups (United States General

Accounting Office, 1991). Several studies have reported that more children from low-income than high-income families work in "hazardous" industries, such as agriculture, mining, manufacturing, and construction, a finding that led us to expect that Hispanic youth would be at greater risk for hazardous types of employment than other teens in this study (Institute of Medicine, 1998; Miller, 1995; Children's Safety Network, 1995; Wegman & Davis, 1999; United States General Accounting Office, 1991). We found, in fact, that a few more adolescents with college-graduate parents (14%) worked in farming/ranching, probably on family-owned interests, than either students whose parents had or had not graduated high school. Students from families with less education were more likely to work in restaurants in this study.

**Limitations.** Several weaknesses in study methodology should be mentioned:

- 1) Our results are based on self-reported data, are subject to accuracy of recall, are not possible to confirm due to the anonymous data collection, and are in need of replication using more objective measures;
- 2) The cut-off points for weekly work hours were arbitrarily set and limited to the categories used in this analysis;
- 3) Private and alternative school students and dropouts were not represented in this sample;
- 4) Questions regarding type of paying job and reasons for working do not include an "other" category; and
- 5) Study generalizability is limited to populations of high school students, a portion of whom are economically-disadvantaged and Hispanic youth from primarily rural geographic areas.

## CONCLUSIONS

This is the first study to examine the prevalence of work in a sample of adolescent workers in rural South Texas. Our results both replicate and contradict the findings of other youth employment studies among very different populations (Institute of Medicine, 1998; Ruhm, 1997; Steinberg & Cauffman, 1995; Children's Safety Network, 1995; Steinberg & Dornbusch, 1991; Manning, 1990; National Safe Workplace Institute, 1991).

In light of our findings and those of other studies, we believe that parents and professionals involved with youth should closely monitor the number of weekly hours that adolescents work while attending school. Since substantial numbers of youth combine school and work, school-based intervention projects targeting, for example, young male agricultural workers, could educate youth about the risks and benefits associated with youth employment. Several of these preventative occupational health education efforts, many of them school-based, have been developed over the past decade (Institute of Medicine, 1998). These programs include occupational health and safety training for adolescents and education regarding child labor laws and worker rights and responsibilities for youth, their parents, professionals, and employers. Further investigation is needed, however, to target such interventions to subpopulations of student employees, to evolve methods and strategies to market these programs to youth, and to rigorously evaluate the effectiveness of these health education efforts to young workers.

REFERENCES

- American Academy of Pediatrics Committee on Environmental Health (1995). The hazards of child labor. *Pediatrics*, 95(2), 311-313.
- Bachman, J. G., & Schulenberg, J. (1992). *Part-time work by high school seniors: Sorting out correlates and possible consequences. Monitoring the Future Occasional Paper 32*. Ann Arbor, MI: Institute for Social Research at the University of Michigan.
- Bureau of Labor Statistics (2000). *Employment and earnings*. Washington, DC: United States Government Printing Office.
- Carskadon, M. A. (1990). Patterns of sleep and sleepiness in adolescents. *Pediatrician*, 17, 5-12.
- Carskadon, M. A., Mancuso, J., & Rosekind, M. R. (1989). Impact of part-time employment on adolescent sleep patterns. *Sleep Research*, 18, 114.
- Castillo, D. N., Davis, L., & Wegman, D. H. (1999). Young workers. *Occupational Medicine*, 14, 519-536.
- Children's Safety Network at Education Development Center (1995). *Protecting working teens: A public health resource guide*. Newton, MA: Education Development Center, Inc.
- Dunn, K. A., Runyan, C. W., Cohen, L. R., & Schulman, M. D. (1998). Teens at work: A statewide study of jobs, hazards, and injuries. *Journal of Adolescent Health*, 22, 19-25.
- Institute of Medicine (1998). *Protecting youth at work: Health, safety, and development of working children and adolescents in the United States*. Washington, DC: National Academy Press.
- Kolbe, L. J., Kann, L., & Collins, J. (1993). Overview of the youth risk behavior surveillance system. *Public Health Reports*, 108(suppl), 2-10.
- Kruse, D. (1998). *Illegal child labor in the United States*. Unpublished paper, Rutgers University of New Jersey.
- Landrigan, P. J. (1993). Child labor: A re-emergent threat. *American Journal of Industrial Medicine*, 24, 267-268.
- Layne, L. A., Castillo, D. N., Stout, N. A., & Cutlip, P. (1994). Adolescent occupational injuries requiring hospital emergency department treatment: A nationally representative sample. *American Journal of Public Health*, 84(4), 657-6.
- Light, A. (1994). *Transitions from school to work: A survey of research using the National Longitudinal Surveys (NLS Discussion Paper, Report No. NLS 94-18)*. Washington, DC: United States Department of Labor.
- Manning, W. (1990). Parenting employed teenagers. *Youth and Society*, 22, 184-200.
- McNeil, L. (1984). *Lowering expectations: The impact of student employment on classroom knowledge*. Madison, WI: Wisconsin Center for Educational Research.
- Miller, M. (1995). *Occupational injuries among adolescents in Washington State, 1988-1991: A review of workers' compensation data (Technical Report Number 35-1-1995)*. Olympia, WA: Washington State Department of labor and Industries.
- Mortimer, J.T., Finch, M. D., Ryu, S., Shanahan, M. J., & Call, K. T. (1996). The effects of work intensity on adolescent mental health, achievement, and behavioral adjustment: New evidence from a prospective study. *Child Development*, 67, 1243-1261.

- National Commission on Youth (1980). *The transition to adulthood: A bridge too long*. New York, NY: Westview Press.
- National Institute for Occupational Safety and Health (1999). *Promoting safe work for young workers: A community-based approach. A resource guide documenting the experiences of three young worker projects* (DHHS (NIOSH) Publication No. 99-141). Cincinnati, OH: Public Health Service.
- National Institute for Occupational Safety and Health (1997). *Special hazard review: Child labor research needs. Recommendations from the National Institute for Occupational Safety and Health child labor working team* (DHHS (NIOSH) Publication No. 97-143). Cincinnati, OH: Public Health Service.
- National Safe Workplace Institute (1991). *Sacrificing America's youth: The problem of child labor and the response of government*. Chicago, IL: Author.
- President's Science Advisory Committee (1974). *Panel on youth. Youth: Transition to adulthood*. Chicago, IL: University of Chicago Press.
- Ruhm, C. J. (1997). Is high school employment consumption or investment? *Journal of Labor Economics*, 15(4), 735-776.
- Schoenhals, M., Tienda, M., & Schneider, B. (1997). *The educational and personal consequences adolescent employment*. Unpublished paper at the Sociology Department University of Chicago.
- SPSS<sup>R</sup> for Windows [Computer Software]. (1995). Chicago, IL: SPSS Inc.
- Steel, L. (1991). Early work experience among white and non-white youths: Implications for subsequent enrollment and employment. *Youth and Society*, 11, 419-447.
- Steinberg, L. & Cauffman, E. (1995). The impact of employment on adolescent development. In R. Vasta (Ed.), *Annals of child development: A research annual* (pp. 131-166). London, UK: Taylor & Francis.
- Steinberg, L. & Dornbusch, S. (1991). Negative correlates of part-time employment during adolescence: replication and elaboration. *Developmental Psychology*, 27(2), 304-313.
- Texas Education Agency (1993). *Snapshot '93: 1992-1993 school district profiles* (DOC# GE417001). Austin, TX: Author.
- United States General Accounting Office (1991). *Child labor: Characteristics of working children* (Publication No. GAO/HRD-91-83BR). Washington, DC: Author.
- Wegman, D. H. & Davis, L. K. (1999). Protecting youth at work. *American Journal of Industrial Medicine*, 36, 579-583.
- Weller, N. F. (1997). *The impact of school-year work on adolescent development*. Unpublished doctoral dissertation at the University of Texas Health Science Center, Houston, TX.
- Weller, N. F., Basen-Engquist, K., Cooper, S. P., Kelder, S. H., & Tortolero, S. R. (1995a). Personal Communication with Kathleen Dunn, MD of the Department of Emergency Medicine, East Carolina University, Greenville, NC.
- Weller, N. F., Basen-Engquist, K., Cooper, S. P., Kelder, S. H., & Tortolero, S. R. (1995b). Personal Communication with Lawrence Steinberg of the Temple University Department of Psychology, Philadelphia, PA.
- Weller, N. F., Basen-Engquist, K., Cooper, S. P., Kelder, S. H., & Tortolero, S. R. (1995c). Personal Communication with



SCHOOL-YEAR EMPLOYMENT: PREVALENCE AND PATTERNS

Letitia Davis, Ph.D. of the Massachusetts SENSOR Project at the Massachusetts Department of Public Health, Boston, MA.

- Weller, N. F., Basen-Engquist, K., Cooper, S. P., Kelder, S. H., & Tortolero, S. R. (1995d). Personal Communication with Mary Karskadon of the E.P. Bradley Hospital, Chronobiology/Sleep Research Laboratory, Riverside, RI.
- Weller, N. F., Basen-Engquist, K., Cooper, S. P., Kelder, S. H., & Tortolero, S. R. (1995e). Personal Communication with the Survey Research Center of the Institute for Social Research at the University of Michigan, Ann Arbor, MI.
- Weller, N. F., Cooper, S. P., Basen-Engquist, K., Kelder, S. H., & Tortolero, S. R. (2003). The prevalence and patterns of occupational injury among South Texas high school students. *Texas Medicine*, 99, 52-57.
- Weller, N. F., Kelder, S. H., Cooper, S. P., Basen-Engquist, K., & Tortolero, S. R. (in press). School-year employment among high school students: Effects on academic, social, and physical functioning. *Adolescence*.

## BOOK REVIEW

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

### REVIEW

**The Pill Book (10<sup>th</sup> edition).** Harold M. Silverman, editor. Bantam Books, New York, 2002. Soft cover, 1216 pages including index. ISBN 0-553-58478-2. Price \$6.99 U.S./\$10.99 CAN.

With the overwhelming number of prescription drugs available today, it has become vitally important for patients to possess a better understanding of their medications. Unfortunately for patients, especially those living in rural communities, access to pharmacists and proper drug information is not always available. Common questions about drug interaction, effectiveness, and proper usage can go unanswered. This lack of knowledge can lead to serious, if not life-threatening, problems. Fortunately, patients can now fill this informational gap by reading *The Pill Book: The Illustrated Guide to the Most-Prescribed Drugs in the United States*.

Organized in alphabetic order, this newly revised 10<sup>th</sup> edition lists 1,500 of the most commonly prescribed drugs in the United States. Based on FDA-approved information and guidelines from leading pharmacists, each drug profile is written in easy-to-understand language and explained in practical terms. Generic drug names, including their pronunciation, are listed with the corresponding brand name in order to assist patients hoping

to save money. Why the drug is usually prescribed and a general information section, which includes how the drug works, help to demystify the complicated world of prescription drugs. Possible side effects are listed by likelihood in the caution and warning section that includes a wealth of safety information with bolded text to draw your attention to key points. Each section on drug interactions has a bulleted list for easy reference; important food interactions are also included. Facts on overdose and addiction potential (when applicable) as well as a section on special information for each profile will be of particular interest to patients taking medications over an extended period of time. Special considerations regarding pregnant and breast-feeding women as well as seniors and those with special needs are addressed in the book. Also useful to many patients will be the 32-page section that includes actual-size color photographs of over 300 pills.

*The Pill Book* has provided useful drug information for millions of consumers over the last 20 years. Now in its updated 10<sup>th</sup> edition, this helpful guide will continue to be an invaluable resource and a perfect addition to any patient's library, especially those in rural communities.

## BOOK REVIEW

Jason Robert Fryer  
*Editorial Assistant*  
*Texas Journal of Rural Health*  
*Texas Tech University*  
*Health Sciences Center*  
*Lubbock, Texas*

### REVIEW

**West Texas: A Portrait of Its People and Their Raw and Wondrous Land.** Mike Cochran and John Lumpkin. Texas Tech University Press, Lubbock, Texas, 1999. Hard cover, 186 pages including foreword. ISBN 0-89672-426-3. Price \$34.95 U.S.

It is known that the delivery of medical treatment can be influenced by cultural and environmental factors. Researchers have revealed that health care professionals can improve their ability to deliver proper medical care by understanding the people that they serve. In other words, to treat a person, you must know a person and that includes knowing the cultural tapestry that shapes his or her everyday life.

In their book, *West Texas: A Portrait of Its People and Their Raw and Wondrous Land*, authors Mike Cochran and John Lumpkin offer readers an in-depth look at the people and history of West Texas. This is no easy task. As they themselves say, "Defining the essence of West Texas is no more difficult than pinpointing its eastern boundary, which is impossible." Using both anecdote and fact, Cochran and Lumpkin take a conversational approach to detailing a region they've grown to love. They explore the good and the bad, the ridiculous and the controversial. From cowboys to government, from weather to religion, from oil to sports, the authors

discuss the factors that shape the West Texan-psyche with wit and eloquence.

Perhaps most importantly, *West Texas* provides future rural health practitioners with a better understanding of the term, "rural." Rather than only detailing cities such as Lubbock and Fort Worth, Cochran and Lumpkin take readers into the frontier and introduce us to towns like Old Glory (estimated population: 60) and Dickens (population: 322). These are real places with real people who have real medical needs. Readers will quickly realize that modalities developed for urban centers will have little relevance in rural communities such as Study Butte; where the high school's graduating class of 1998 numbered two students.

*West Texas* is a thoroughly enjoyable and poignant book, rich with history and color. Health practitioners will find it provides an insightful glimpse into the people that call West Texas their home. Putting the book's practicality aside, *West Texas* makes for an excellent addition to every Texan's library.





**Texas Tech University  
Health Sciences Center  
Texas Journal of Rural Health  
Preston Smith Library  
3601 4th Street – Suite 244  
Lubbock, Texas 79430**

**Non Profit Orgn.  
U.S. Postage  
PAID  
Texas Tech Univ.  
Lubbock, Texas**

Dallas Public Library  
1515 Young St.  
Dallas, TX 75201-5499