

**Economic Impact and Linkages of the Local Health Sector  
On the Economy of White Pine County, Nevada, 2000**



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## Executive Summary

A viable local health care sector plays an important role for sustainable rural economies. In an era when rural economies are struggling to keep pace with their urban counterparts, the health care sector (which includes hospitals, nursing homes, medical personnel, and other medical resources and services) represents a bright spot in the economic landscape. There are four major roles for health care in rural economic development through financial and non-financial linkages: 1) keeping local health care dollars at home and closing the supply-demand gaps, 2) attracting external dollars into the community, 3) attracting and retaining industries, and 4) promoting a healthy and productive workforce.

This study examines the economic impact of the health care sector in White Pine County in 2000. Currently, White Pine County's health sector represents \$17,223,000 in labor income and 526 jobs within the White Pine County economy. However, further opportunities for local health care services may exist in the local economy. If the local health care system expands, there will be a broad range of corresponding economic effects throughout the community. In White Pine County, every health care job creates an additional 0.31 jobs in the local economy. For example, one hundred new health care jobs would generate 31 additional jobs in White Pine County.

## **Preface**

This report is being furnished to the citizens and community leaders of White Pine County. The Nevada Rural Health Works Program is an outreach program of the University of Nevada, Reno; Department of Resource Economics; Cooperative Extension; University Center for Economic Development; Nevada State Office of Rural Health; and Center for Rural Health. The Nevada Rural Health Works Program was contacted to conduct an economic impact study. The Nevada Rural Health Works Program offers information and assistance that rural health care providers, local community leaders, and policymakers need in order to make informed decisions pertaining to local health care. This is carried out through market demand studies, feasibility studies, policy research studies, and economic impact studies. The Nevada Rural Health Works Program combines the health care knowledge and strengths of the Nevada Office of Rural Health with the economic development expertise of the UNR College of Agriculture, Biotechnology, and Natural Resources, Cooperative Extension, and the University Center for Economic Development.

Questions and concerns regarding this analysis should be directed to Dr. Thomas R. Harris, Professor of Resource Economics and Director of the University Center for Economic Development at the University of Nevada, Reno in the College of Agriculture, Biotechnology, and Natural Resources.

## **Introduction**

Over the last two decades, health care services have become a critical engine of growth in rural Nevada. In 1980, health care industry earnings represented 3.5 percent of all industry earnings. By late 2000, health care's share of industry earnings had risen to 4.5 percent in rural Nevada. These statistics indicate that health care is an important economic sector in the state of Nevada. Furthermore, medical transfer payments in 2000, such as Medicare and Medicaid, now represent 2.04 percent of Nevada's personal income. This is in contrast to 1980 when these payments only represented 1.94 percent of the state's total personal income.

Health care services include a wide range of resources, from facilities such as nursing homes to personnel such as physicians. Why are health care services growing so quickly? The health care industry is in part responding to the overall growth in the state of Nevada, as well as the aging of the state's population and the retirement and medical transfer payments from Social Security and Medicare.

Very few rural counties have realized the full potential of local health care as an economic and county development tool. Rural counties have an extraordinary opportunity to improve their local economies and develop health care as a local business. The "warms you twice" adage of wood chopping also can be applied to health care. Every health care service provided locally benefits the rural county twice. First, it improves people's health and second, it improves the economic health of the county.

This report documents the economic impact of White Pine County's health care sector. This impact is measured by the number of jobs and income directly and indirectly associated with the local health care sector. This study is divided into five major sections. The first section describes the role of health care in rural economic development. The second section examines the current status of the local economy and the relative place of the local health care industry. The third section provides a description of the health care sector in White Pine County. The fourth section provides a comparison of the White Pine County health sector to the state of Nevada. The fifth section demonstrates the direct and indirect economic impact of the health care system of the local economy. Finally, the appendix explains the methodology used in this report and provides a review of the literature on the economic role of rural health care.

## **The Role of Rural Health Care in Economic Development**

The role of health care in economic development is based on financial and non-financial linkages with the rest of the county economy. Financial linkages refer to the link between health care providers' expenditures and revenue and other local firms' expenditures and revenue. Health care and other industries often mutually support one another through purchases and sales. These financial linkages create a larger local economy.

Non-financial linkages refer to the health care sector's role in keeping local physicians, promoting a more productive workforce, and attracting and retaining industry. Although these may be measured through financial outcomes, generally the link is more indirect. Nevertheless, a strong health care system can promote economic development in a variety of non-financial ways.

### ***Financial Linkages***

#### **Keeping Local Health Care Dollars At Home**

The most important financial role for local health care system is to "keep local health care dollars at home." There are many sources of local health care dollars including private insurance, consumer out-of-pocket payments, and Medicare and Medicaid transfer payments. If these expenditures leave the county, they represent a real loss of potential jobs and income to local residents. Out-shopping, that is, payment for services that are outside of the local area, remains an important issue for many rural health care providers and rural counties.

However, it is not only health care jobs that are at stake. Health care employers and employees are important purchasers of goods and services supporting many local business establishments. Those people who work in health care, such as nurses, physicians, dentists, and pharmacists, provide an important source of income for other members of the county who may work in housing construction, retail establishments, restaurants, and other local services. Hospitals and other health care facilities are also important purchasers of local inputs, that is, goods and services, such as laundry and waste management services. Also, health care sector activities contribute to the growth of local payrolls and taxes. Increased employment in health care and other areas depends upon capturing the private and public sources of local medical expenditures.

### Exporting Services

If health care providers can attract patients from outside their county, the health care industry can act as an export industry. In essence, the local health care industry exports its reputation and services, while attracting outside patients and outside dollars into the county. This “exporting” may be based on, for example, a state-of-the-art facility or a physician’s reputation. Regardless, “export” or external dollars from these outside patients represent an inflow of new dollars into the county’s economy. These export dollars then allow a county to purchase a wider variety of goods and services from other counties. The spending linkages created by these export or external dollars in turn generate new jobs and sources of income in the county economy.

### Supply-Demand Gaps: Keeping Health Care Dollars at Home

Identification of a county’s supply-demand gap will assist a county in “keeping health care dollars at home.” A supply-demand gap occurs when a local economy does not supply (provide) the goods or services demanded (needed or wanted) by an individual or a county. Consequently, residents are forced to out-shop and make purchases outside their own county. These non-local purchases represent sales leakages from the local economy and reduce the number of potential employment and income opportunities in a county. In some cases, a county cannot provide these goods or services because of market or financial limitations. However, there may be circumstances that allow local businesses to provide the demanded goods or services locally, which would close the supply-demand gap and keep local dollars at home. This potential should be explored by a county to determine if opportunities are being missed. This may be especially true when key demographic or economic changes occur. These changes can generate new opportunities that did not exist in the county previously.

### ***Non-Financial Linkages***

#### Attracting and Recruiting Industry

An often-overlooked aspect of the health care system in economic development is the ability to attract and recruit firms based on lack of availability of county services. Company surveys reveal that managers often look at health care as an important issue in locating facilities. The existence of a strong health care network can lower health care costs for firms and their employees and provide value-added services for firms such as occupational health. Also, retirees and workers are more likely to choose a location that has access to quality health care.

### Promoting a Healthy and Productive Workforce

In today's economy, a productive workforce is critical to attracting new firms and retaining existing firms. The health status of local workers is an important ingredient in productivity. Local health care providers can improve the health and productivity of the local workforce by promoting preventive care, thus leading to long-term economic benefits. On the contrary, if a county's workforce is substantially less healthy than other counties, this may be considered a cost burden by some industries.

The combination of changing demographics, growth in health care service employment, and the increase in medical transfer payment implies that the health care system will be a major player in future economic development in the state of Nevada. Economic development agencies, business groups, and local governments should play a more active role in promoting the health care sector as a key partner and primary sector in generating new economic opportunities.

### **The White Pine County Local Economy**

An examination of the sources of personal income in the community leads to a better understanding of the potential sources of revenue for local health care providers. Table 1 indicates that almost 63 percent of the total personal income for White Pine County was from total earnings by place of residence. Total earnings were adjusted to reflect earnings by place of residence. Table 1 also shows that seventeen percent of the total personal income was from transfer payments, such as social security and Medicare payments. Of White Pine County total personal income for the year 2000, retirement-based transfer payments alone contributed approximately eight percent, while medical payments contributed approximately five percent. Also, dividends, interest, and earnings make up approximately 20 percent of total White Pine County personal income. This, along with the retirement and disability transfer payments, indicates a retirement age cohort with income that can significantly impact the White Pine County economy.

**Table 1. Economic Data for White Pine County, The State of Nevada and the Nation for 2000.**

<b>Source of Income, Earnings, Dividends, Interest and Rents, Transfer Payments</b>	<b>County (\$1,000)</b>	<b>County Percent<sup>1</sup> (%)</b>	<b>Nevada Percent<sup>2</sup> (%)</b>	<b>U.S. Percent<sup>3</sup> (%)</b>
Total Personal Income	192,065	100.00	100.00	100.00
Earnings by Place of Residence	121,897	63.47	68.80	68.84
Dividends, Interest, and Rents	37,946	19.76	21.09	18.29
Transfer Payments	32,222	16.78	10.11	12.87
Total Earnings by Place of Work	126,476	65.85	74.15	73.15
Wages and Salaries	95,654	49.80	59.05	58.16
Proprietor's Income	12,533	6.53	9.12	8.61
Other Labor Income	18,289	9.52	5.98	6.37
Total Transfer Payments	32,222	16.78	10.11	12.87
Retirement and Disability	15,189	7.91	4.91	5.11
Medical Payments	10,385	5.41	3.23	5.09
Other Transfer Payments	6,648	3.46	1.97	2.67

Source: US Department of Commerce. "Regional Economic Information System." Bureau of Economic Analysis: Washington DC, 2002.

<sup>1</sup>Percent of Total County Personal Income.

<sup>2</sup>Percent of Total State of Nevada Personal Income.

<sup>3</sup>Percent of Total U.S. or National Personal Income.

Table 2 shows that per capita income in 2000 for White Pine County was \$21,253, which was higher than the state of Nevada at \$29,506 and the national per capita income level of \$29,469. A disparity in per capita between the county and the state and the nation indicates that the local health sector may be less than expected given the population base of the county. However, growth in per capita income, particularly driven by Medicare and Medicaid, may potentially lead to higher medical expenditures in the county. Growth in industry and private earnings may also lead to greater medical expenditures depending on private insurance coverage.

**Table 2. Per Capita Income for White Pine County, Nevada and the Nation for 2000.**

<b>Category</b>	<b>County Total (\$)</b>	<b>State Total (\$)</b>	<b>U.S. Total (\$)</b>
Per Capita Income	21,253	29,506	29,469

Source: US Department of Commerce. "Regional Economic Information System." Bureau of Economic Analysis: Washington DC, 2002.

The White Pine County economy is comprised of a diverse group of industries including manufacturing, agriculture, retail and wholesale trade, finance, transportation and services. Table 3 indicates the industries that are present in White Pine County based on personal income by industry for the county.

From 1990 to 2000, real earnings by place of work decreased by -8.13 percent. Real earnings were derived from the Gross Product Implicit Price Deflator where all prices are based on 1996 price levels. For the White Pine County economy, the Health Care Services Sector realized the second largest percentage increase in sectoral earning of all sectors in White Pine County. Sectoral earnings for the Health Care Services Sector increased by 49.59 percent, however the Finance, Insurance, and Real Estate Sector, which increased by 112.23 percent, had the largest sectoral increase. In 2000, the Government Sector (federal, state, and local) was the largest economic sector by earnings by place of work. For White Pine County in 2000, the Mining Sector was the third largest sector by place of work earnings. The Mining Sector was the largest sector in 1990, but declined in 2000 from closure of mines.

**Table 3. White Pine County Economy: Personal Income by Industry (Thousands of Dollars).**

<b>Sector</b>	<b>Nominal 1990 (\$1,000)</b>	<b>Nominal 2000 (\$1,000)</b>	<b>Real 1990 (\$1,000)</b>	<b>Real 2000 (\$1,000)</b>	<b>Real Percentage Change (%)</b>
Agriculture	1,436	2,053	1,660	1,926	16.04
Agricultural Services	124	D	143	D	D
Mining	33,934	12,474	39,226	11,704	-70.16
Construction	6,419	5,019	7,420	4,709	-36.53
Manufacturing	882	974	1,020	914	-10.36
T.C. & P.U. <sup>1</sup>	4,242	6,139	4,903	5,760	17.47
Wholesale	5,634	D	6,513	D	D
Retail	12,493	11,634	14,441	10,916	-24.41
F.I.R.E. <sup>2</sup>	2,146	5,611	2,481	5,265	112.23
Services	9,923	14,261	11,470	13,381	16.65
Health Care	2,922	5,385	3,378	5,053	49.59
Government	31,585	60,851	36,510	57,094	-56.38
Earnings by Place of Work	111,740	126,476	129,164	118,668	-8.13

<sup>a</sup> Real values derived with GDP price deflator of 1996 = 100.0.

<sup>1</sup>T.C. & P.U stands for the Transportation, Communication, and Public Utilities Sector.

<sup>2</sup>F.I.R.E. stands for the Finance, Insurance, and Real Estate Sector.

<sup>3</sup>D represents unreported sectoral values because of disclosure problems.

Source: US Department of Commerce. "Regional Economic Information System." Bureau of Economic Analysis: Washington DC, 2003.

Table 4 shows White Pine County's transfer payments by type for 1990 and 2000. Comparing Table 3 to Table 4, it is evident that the growth in industrial earnings was less than the growth in federal and state transfer payments to individuals. While industrial earnings declined by -8.13 percent, the total transfer payments for White Pine County increased by 19.01 percent. The increase in transfer payments is primarily driven by Social Security, Medicare and Medicaid payments. Of the total transfer payments, the medical payments, which includes Medicare and Medicaid, increased by 32 percent. Once again from Table 1, transfer payments represent 17 percent of total personal income. The rapid growth of medical transfer payments signifies the potential for health care expansion and represents an important source of revenue for local health care providers and the county.

**Table 4. White Pine County Transfer Payments (Thousands of Dollars).**

Transfer Payments	Nominal		Real		Real Percentage Change
	1990 (\$)	2000 (\$)	1990 (\$)	2000 (\$)	
Medical Payments	5,752	10,385	6,649	9,744	31.76
Retirement Payments	11,671	15,189	13,491	14,251	5.34
Income (Welfare) Benefits	1,176	3,755	1,359	3,523	61.42
Unemployment Insurance	675	559	780	524	-48.77
Other Transfer Payments	1,909	2,334	2,207	2,190	-0.77
Total Transfer Payments	21,183	32,222	24,486	30,233	19.01

Source US Department of Commerce. "Regional Economic Information System." Bureau of Economic Analysis: Washington DC, 2002.

Real Values derived with GDP price deflator of 1996 = 100.0.

### **White Pine Health Care Access:**

White Pine County is located along Nevada's eastern border between Elko and Lincoln Counties. The county is sparsely settled, and current population is 8,863 over 8,876.6 square miles, a density of one person per square mile. The majority of the population lives in Ely, the county seat, and the neighboring communities of Ruth and McGill. White Pine county population has decreased seven percent over the past ten years, reflected primarily in a twenty percent decrease in the number of children under the age of eighteen. About one in seven persons is age 65 or older. The county's population accounts for approximately 0.4% of the total state population in 2000. White Pine County is not designated an underserved area or population, however the county is designated a Health Professional Shortage Area in primary care, dental and mental health.

The center of the health system is the William Bee Ririe Hospital (WBRH), a fully accredited 43-bed hospital with the Critical Access Hospital designation. The hospital provides 15 acute care beds, two labor and delivery rooms, three intensive care unit beds and one bed for inpatient mental health usage. The hospital provides diagnostic services that include spiral computerized tomographic imaging, magnetic resonance imaging, ultrasound, PACS, in-house microbiology, stress treadmill testing, pulmonary function testing, bone densitometry, colonoscopy, event monitor, sleep study laboratory and endoscopy. Additionally, WBRH provides therapeutic services that include twenty-four hour surgical services including cesarean section services, twenty-four hour anesthesia services including obstetrical epidural services, laproscopic surgery, inpatient intensive and primary care services, observation services, physical and occupational therapy services, lockup room services, chemotherapy services, and twenty-four hour emergency services.

WBRH medical staff includes ten physicians, which are two family practitioners, three internal medicine physicians, a pediatrician, an OB/GYN, and a general surgeon. Additional staff includes certified registered nurse anesthetists, one dietician, one inhalation therapist, two licensed practical or vocational nurses, one physician assistant, sixteen registered nurses, one social worker, and a support staff of 92. The hospital participates in the tele-health/telemedicine high-speed education network with the rural hospital association and the University of Nevada School of Medicine. This link is a two-way, interactive compressed video system providing immediate access to specialists throughout the country helping to serve the community. In

addition to the physicians serving White Pine County on a full time basis, visiting physicians from Reno and Salt Lake City provide monthly consultations and services in cardiology, dental surgery, neurology, ophthalmology, pathology, orthopedics, podiatry, urology, internal medicine, and plastic surgery. WBRH has an excellent program for referral to specialized medical services and facilities in Reno, Salt Lake City, and Las Vegas so that patients from White Pine County have access to programs and physicians including the primary children's unit, burn unit, eye clinic, and cardiology departments in Utah. Additional programs are offered for alcohol and drug services, dental, optometric, pharmacy, psychiatric and rehabilitation.

William Bee Ririe Medical Clinic, (WBRHC) is a hospital based rural health clinic, employing two family practice physicians, one general practice physician, one internal medicine/pediatric physician, three internal medicine physicians, one obstetrician gynecologist, one general surgeon, and one physician assistant open five days a week. In addition to local general surgery and obstetrician gynecologist services, WBRHC provides biweekly or monthly visiting specialty physician services in orthopedics, otolaryngology, podiatry, cardiology, ophthalmology, urology, psychiatry, neurology and endocrinology. Ely has a rural mental health clinic with a licensed social worker, a registered nurse, a service coordinator, and two support staff. A psychiatrist visits two day per month. The mental health clinic has a multi month wait list for services. The VA Rocky Mountain Network (VISN 19) in Denver, Col. is responsible for Veterans health care in the eastern Nevada counties of Elko and White Pine. A contract community-based outpatient clinic is located in Ely at the William Bee Ririe Hospital.

Located adjacent to the hospital is a long-term care facility with 99-bed Medicare and Medicaid certification. A nursing staffing shortage mandates partial use of the total number of beds. The center provides residential activities, clinical laboratory services, dental services, dietary services, housekeeping, mental health, nursing, occupational therapy, pharmacy, physical therapy, physician services, podiatry services, social work, speech and language pathology services, and diagnostic x-ray for the senior residents. The staff is comprised of four full time and one part time licensed practical and vocational nurses, two full time and one part time registered nurses, a director of nursing, a social worker, one full time and one part time activities professionals, two part time licensed practical vocational nurses, two certified nurse aides, nine nurses aides, and a support staff of fifteen. Staff under contract includes a dentist, dietitian,

medical director, pharmacist, physical therapist, podiatrist, and speech pathologist. Medicare and Medicaid patients are admitted.

The Community Health Nurse offers many services on a sliding fee scale for those who qualify, to help defray the cost of Community Health Nursing Programs. Services offered include the cancer screening program, children's special health care services, epidemiology, well baby/child clinic, community health programs, family planning clinic, HIV/AIDS testing and counseling, immunization clinic, sexually transmitted disease clinic, and tuberculosis clinic. Services are limited to the nurse practitioners scope of treatment.

County services are available for those meeting service specific income guidelines. The county provides emergency services to those in need when funds are available. Services offered covered emergency dental assistance, emergency prescription assistance and emergency indigent medical assistance from county funds. The county sponsors a latch key program and recreational day trips for senior citizens. There is a family crisis center with a crisis line. The county supports three senior centers.

White Pine Senior Center provides activities and meals for seniors. Ely is an aging community as the only increasing population segment is the group over age 65. The senior center provides congregate and home delivered meals Monday through Friday, however no service is provided on the weekends. Limited special activities are offered, music on Wednesday mornings and bingo games for hours of operation are from seven am to two pm, Monday through Friday with a lunch is served at noon. There is a need for services and resources for this population groups as there is no assisted living facility, insufficient home health care and insufficient staffing at the senior center and the long-term care facility. There is an Alzheimer's support group.

Public transportation system is not readily affordable by low-income people, restricting their ability to find health care and assistance. There is one program offered by the William Bee Ririe Hospital and Clinic, using the Northeast Nevada Regional Transit Association, to provide free non-emergent medical transportation accommodation once a month to Eureka and Wendover, which is available to patients having scheduled appointments with a physician at the WBRH clinic or have scheduled an appointment for a procedure or patient stay with at WBRH. A life-flight program to transport seriously ill or injured patients to specialized services in the surrounding urban area supports emergency medical services. The bus service provides weekly

round trips to Reno, bi-weekly round trips to Las Vegas, local shuttle services on fixed routes within the Ely area. Transportation services also cover Gill, Ruth, airport, and the prison and include a dial-a-ride program. The Ely bus provides on call service to best determine a travel schedule by destination, travel times, schedules, and methods of fare payment. The service includes wheelchair or other special assistance.

Additional providers of services are one chiropractor, two dentists, two suppliers of durable medical equipment, one optometrist, three pharmacies, one home health service and one mid-wife birthing service. One PhD psychologist, four clinical psychologists, and one psychiatric consultant staff the Community Counseling Center. There is a non-profit organization specializing in substance abuse counseling. The community has a visiting orthodontist and four full service pharmacies. The Ely Shoshone tribe has the NEWE Clinic, an extension from the Owyhee Service Unit in Elko County.

As to percentage of residents uninsured, White Pine County has followed the state of Nevada in a declining share of total residents that are uninsured (Table 5). For White Pine County, the proportional share of residents that are uninsured declined from 17.1 percent in 2000 to 15.0 percent in 2002 (a portion of this drop may be attributable to the implementation of the State of Nevada Children's Health Insurance Program-CHIP). From 2000 through 2002, the percent of county residents uninsured in White Pine County was just below the Nevada state, urban, and rural averages. From 2000 through 2002, enrollment increased in the following programs listed, Medicare, Medicaid, Senior Prescription, HMO Medicare Part B, but decreased in the State of Nevada Children's Uninsured (Nevada Checkup), and was little changed in the HMO Managed Care. From 2000 to 2002, White Pine County Medicare, Medicaid, CHIP and Senior RX enrollments are above the state, urban and rural averages. HMO Managed Care and Medicare Part B participation is below the state, urban and rural averages. As a possible sign of growing poverty, the White Pine County Medicaid program participation is fourth highest in the state.

**Table 5. Proportion of Residents that Are Uninsured for Health Care in the State of Nevada, 2000 through 2002.**

State Uninsured Table - 2002					Public Health Insurance - Percentages of Population Sector											
	Population	2000	2001	2002	1999 Medicare	2002 Medicare	2002 est Medicaid	2003 Medicaid	2002 Nevada Checkup	2003 Nevada Checkup	2002 Senior RX	2003 Senior RX	Managed Care - 2001 Commercial	Managed Care - 2003 Commercial	HMO Medicare 2001	HMO Medicare 2003
Nevada	2,206,022	17.7	17.8	15.8	11.6	11.8	5.9	7.7	4.5	4.1	2.3	3.2	18.2	13.9	38.7	31.8
<b>Rural</b>																
Churchill	25,116	16.5	16.6	14.5	12.1	13.4	7.4	9.1	4.8	4.1	5.2	7.6	0.1	0.6	0.0	0.1
Douglas	44,212	15.9	16.0	14.1	12.9	14.4	3.0	3.7	4.4	5.1	2.8	4.5	3.7	3.8	0.0	0.0
Elko	46,577	19.2	19.2	17.1	5.6	7.3	4.5	6.1	5.8	5.3	5.8	8.1	0.1	0.1	0.0	0.0
Esmeralda	1,125	16.8	16.9	14.9	9.2	14.2	5.9	6.0	6.5	7.1	3.0	5.4	1.1	1.6	2.5	13.6
Eureka	1,384	17.1	16.9	14.8	11.8	17.3	2.4	2.4	2.0	1.2	14.6	12.1	0.0	0.0	0.0	0.0
Humboldt	16,308	19.8	19.8	17.9	7.9	10.0	5.5	6.5	7.6	7.3	7.6	9.5	0.6	0.7	0.0	0.0
Lander	5,547	19.1	19.1	17.0	6.4	8.9	4.3	5.5	4.8	4.2	7.2	9.6	0.0	0.0	0.0	0.0
Lincoln	3,879	16.4	16.3	14.4	17.6	21.5	7.9	10.4	2.2	5.7	6.2	11.6	1.7	2.3	0.0	0.3
Lyon	38,777	16.2	16.2	14.4	16.0	16.2	5.0	6.6	8.9	7.8	6.8	8.3	3.0	2.5	19.5	14.0
Mineral	4,695	16.5	16.6	14.7	16.6	23.8	12.9	15.1	7.7	10.0	8.6	10.6	0.2	3.5	7.7	7.3
Nye	35,039	15.9	15.9	14.0	18.9	22.3	9.4	12.8	4.6	4.6	2.3	2.8	7.6	7.4	52.7	47.9
Pershing	6,937	18.7	18.8	16.9	6.9	7.7	4.8	5.6	4.7	5.1	6.0	0.6	0.0	0.0	0.0	0.0
Storey	3,639	15.2	15.1	13.4	4.2	4.4	1.2	1.4	1.8	1.2	0.7	0.6	3.1	3.1	0.0	0.2
<b>White Pine</b>	<b>8,863</b>	<b>17.1</b>	<b>17.1</b>	<b>15.0</b>	<b>12.4</b>	<b>16.3</b>	<b>8.4</b>	<b>10.1</b>	<b>7.4</b>	<b>6.2</b>	<b>10.8</b>	<b>11.8</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.1</b>
<b>Urban</b>																
Clark	1,549,657	17.9	17.9	15.9	11.2	11.2	6.1	7.9	4.1	3.7	1.4	2.1	19.9	15.5	47.1	38.4
Washoe	359,423	17.5	17.5	15.5	12.0	12.0	5.3	6.7	4.7	4.7	2.7	4.8	23.1	15.2	29.0	23.9
Carson City	54,844	16.5	16.6	14.6	18.0	18.9	6.8	8.6	8.5	7.7	7.3	8.4	19.3	10.9	0.0	0.3
<b>Totals</b>																
State	2,206,022	17.7	17.8	15.8	11.6	11.8	5.9	7.7	4.5	4.1	2.3	3.2	18.2	13.9	38.7	31.8
Rural	242,098	17.2	17.2	15.2	11.3	14.1	5.9	7.3	5.2	5.6	6.3	6.2	1.5	1.8	5.9	13.5
Urban	1,963,924	17.3	17.3	15.3	13.8	14.0	6.1	7.7	5.8	4.0	3.8	2.8	20.8	15.3	25.4	34.5

Sources:  
 State Uninsured: Popoff, CL and DH Judson,. 2002. Great Basin Primary Care Association, Report of the Medically Uninsured in the State of Nevada  
 Medicare County Enrollment as of July 1, 2002 Aged and Disabled 3/2003 Update, <http://www.cms.hhs.gov/statistics/enrollment/county2002/stnv02.asp>  
 Sources: WL-00427 & AME44A, for percentages; and NSWD Summary Spreadsheets, for Medicaid Recipients. September 2003  
 All figures are estimates only and must be qualified as such if used either verbally or in written form.  
 Senior RX supplied from State of Nevada, Dept of Health Resources: Jane Smedes [jasmedes@dhr.state.nv.us], September 2003  
 Nevada Check Up Enrollment Statistics supplied from Nevada Division of Health Care Financing and Policy, October 2003  
 Managed Care Enrollment Supplied by Bureau of Health Planning and Statistics, Nevada State Health Division, Department of Human Resources, First Quarter Report ending March 2003.  
 US Uninsured Rate is at 14.7% from the CPS three year moving average.

### **How Does White Pine County Health Care System Compare?**

The supply of Medical Doctors (MDs) represents a key measure of rural health. Table 6 shows that White Pine County's supply of MDs is above the rural average, but below the state and urban averages. When compared to rural counties surrounding White Pine County, White Pine County's figure of 1.24 MDs per 1,000 population is higher than Elko County's figure of 0.97 MDs per 1,000 population, lower than Eureka County's 1.45 per 1,000 population, higher than Lincoln County's 0.52 per 1,000 population and higher than Nye County's 0.43 per 1,000 population.

The supply of acute care hospital beds per 1,000 population is another key health sector indicator. Table 7 shows in comparison to the state average that White Pine County's 1.69 acute beds per 1,000 population lags behind the state average of 1.94 acute beds per 1,000 population and the urban Nevada average of 2.05 acute beds per 1,000 population, while greater than the rural Nevada average of 1.00 acute beds per 1,000 population. When compared to the surrounding rural counties of Lincoln County (5.16 acute care beds per 1,000 population), Eureka County (0.0 acute care beds per 1,000 population), Nye County (0.40 acute care beds per 1,000 population) and Elko County (1.93 acute care beds per 1,000 population), the supply of acute care hospital beds in White Pine County is above average when compared to neighboring rural Nevada counties with acute care beds.

Tables 6 and 7 demonstrate that White Pine County has a significant rural health care system. White Pine County possesses a hospital, clinics, a health department, nursing home, dentist, mental health, community services, rehabilitation and long-term care and convalescent facilities to meet demands of its residents. Not only can this system meet the medical demands of its residents, the White Pine County health care sector also provides a valuable contribution to the local economy by funneling outside dollars into the community.

**Table 6. MDs Per 1,000 Persons, 2000.**

**MD's, Non-Fed and Fed, Total Active (2000)**

<b>County Name</b>	<b>MD's / 1000</b>
Churchill	1.00
Douglas	1.52
Elko	0.97
Esmeralda	
Eureka	1.45
Humboldt	0.74
Lander	0.54
Lincoln	0.52
Lyon	0.23
Mineral	1.28
Nye	0.43
Pershing	0.29
Storey	
<b>White Pine</b>	<b>1.24</b>
<b>Average Rural Counties</b>	<b>0.82</b>
Clark	1.54
Carson City	2.32
Washoe	2.65
<b>Average Urban Counties</b>	<b>1.76</b>
<b>State</b>	<b>1.66</b>

Source: U.S. Department of Health Resources and Services Administration. "Area Resource Files." Bureau of Health Professions, Health Resources and Services Administration, Rockville, MD, 2002.

**Table 7. Acute Care Hospital Beds Per 1,000 Population.**

<b>County</b>	<b>Acute Care Hospital Beds Per 1,000</b>
Churchill	1.59
Douglas	
Elko	1.93
Esmeralda	
Eureka	
Humboldt	1.35
Lander	1.26
Lincoln	5.16
Lyon	0.36
Mineral	3.19
Nye	0.40
Pershing	0.72
Storey	
<b>White Pine</b>	<b>1.69</b>
<b>Average Rural County</b>	<b>1.00</b>
Clark	1.87
Carson City	2.33
Washoe	2.79
<b>Average Urban County</b>	<b>2.05</b>
<b>State</b>	<b>1.94</b>

Source: U.S. Department of Health Resources and Services Administration. "Area Resource Files." Bureau of Health Professions, Health Resources and Services Administration, Rockville, MD, 2002.  
 State of Nevada Bureau of Licensure and Certification

## **Economic Impact Analysis**

### ***Basic Introduction***

A local economy can be conceived of as a barrel with inflows and outflows. The inflows represent external dollars coming into the county that expand the size and strength of the region's economy. Inflows of external dollars represent, for example, federal and state expenditures, money spent by tourists and other people from outside the county who spend within the local economy. The outflows represent leakages out from the economy that does not create jobs or local income. Outflows include state and federal taxes, non-local purchases of goods and services, and people traveling to other sites for vacation or receiving medical care in another county or urban area. Local taxes are not an outflow as they are spent on creating local public goods such as roads, schools, and police and fire protection.

The economic impact of the health care sector is dependent on a number of factors. In determining the economic impact of a large institution, there are two major purchasing categories to consider: local purchases and non-local purchases. In effect, non-local purchases represent a leakage or loss to a local economy. For health care providers, many purchases by necessity must be made from distant locations. The complex technology and equipment of modern medicine is subject to large economies of scale and is only produced in a few places in the nation. This equipment might include x-ray machines, MRI equipment, and other surgical equipment. Pharmaceutical supplies and drugs are also subject to the same forces. Further, some types of audit, legal, and accounting services must be purchased from urban regions due to the complexity of services.

Employees and other professionals are a major source of economic impact in the local economy. These employees, turned customers, spend large amounts of their income in local retail outlets, housing, automobiles, and other services. These consumer expenditures, in turn, support a large number of local resident service jobs such as mechanics, retail clerks, real estate agents, and bankers.

### ***Economic Impact Multipliers***

The impact of local health care expenditures and health care employee expenditures are called multiplier effects. Multiplier effects are a simplified and compact way of representing these economic effects in a local economy. The multiplier is interpreted as the impact of a one-

unit change in sales, employment, or income that results in a total dollar employment, or income, impact on the local economy. In essence, the multiplier represents the recycling of local dollars and income. This recycling process creates new job opportunities and higher wages for individuals. Leakage of dollars and income out of the county, via taxes or non-local spending, reduces the size of the multiplier effect and reduces the potential size of the local economy.

There are three types of multipliers effects based on the type of economic impact analysis: *direct*, *indirect*, and *induced multipliers* (see Table 8). The *direct multiplier effect* is based on an industry’s initial economic impact on the community. For example, if a manufacturing plant has revenue of \$5 million, then this figure becomes the direct economic impact on the community. The *indirect multiplier effect* is based on industry-to-industry transactions only. For example, health care purchases local laundry, food, landscaping, and floral services. However, the *indirect multiplier effect* does not include the effect of local employee spending on retail and service sectors in the community such as housing, grocery store or video store purchases. Alternatively, the *induced multiplier effect* includes both the industry-to-industry transactions and household purchases, which includes employee spending. In some cases, we may wish to only investigate industry transactions and leave out household purchases. The *total economic impact* is defined as the direct plus indirect plus induced economic effects.

The *direct*, *indirect*, and *induced multiplier effects* can be classified as employment, and income multipliers (see Table 8). Employment multipliers are the impact of a one million dollar change in economic output on the number of jobs in a local economy. Income multipliers represent a one-unit change in economic output on local income.

**Table 8. Health Care Related Economic Impact Multipliers.**

	<b>Direct</b>	<b>Indirect</b>	<b>Induced</b>
Employment Multiplier	Health care jobs	Health care supplier jobs	Local retail and service jobs related to health care employee spending
Income Multiplier	Health care employee income	Health care supplier employee income	Local retail and service income related care employee spending

### ***Economic Impact Results for White Pine County***

The White Pine County health care system is an important component of the local economy. This importance can be measured via the linkages the health care sector shares with other local industries. When there is an increase in health care revenue or employees, these changes feed through local vendors or new employees may purchase homes and spend money in local stores. The health care expenditures and health care employees are important pieces of the economic puzzle.

The employment and income levels in the health sector have a significant impact on employment and income throughout other industries in White Pine County, as is demonstrated when using the IMPLAN Type II Multiplier. For example, the employment multiplier for the Hospital Sector in White Pine County is 1.30. This indicates that for each job created in the hospital sector, another 0.30 jobs are created in other businesses and industries in White Pine County. The direct impact of the 118 employees of the Hospital Sector in White Pine County results in an indirect and induced impact of 35 additional jobs ( $118 \times 0.30 = 35$ ) throughout all businesses and industries in the county. Thus, the Hospital Sector employment in White Pine County has a total impact on county employment at a level of 153 jobs ( $118 \times 1.30 = 153$ ).

Likewise, the total impact of the \$45,590,000 payroll to Hospital Sector employees can be estimated. The income multiplier for the Hospital Sector in White Pine County is 1.37. The multiplier indicates that for each dollar's worth of income generated in the Hospital Sector, another \$0.37 is generated in other businesses and industries in White Pine County. This means that the estimated total impact on income throughout all businesses and industries in the county is \$6,288,000 ( $\$4,590,000 \times 1.37 = \$6,288,000$ ).

Following the same procedures, the total impacts that employment and income levels of the other health sector categories have on income and employment levels throughout the county's economy can be estimated. The total impact of the 402 employees of White Pine County's health sector is an estimated 526 jobs to the county's economy. The health sector income of \$13,244,000 results in a total county income impact of \$17,223,000.

County data indicates that 26.4 percent of personal income is spent in retail stores that collect sales tax. Thus, \$4,546,872 ( $\$17,223,000 \times 26.4\% = \$4,546,872$ ) of retail sales is generated from the health sector. A one-cent sales tax generates \$45,470 for the county.

**Table 9. White Pine County Health Sector Impact on Employment and Income, 2000.**

Health Sectors	Employment	Employment Multiplier	Total Employment Impact	Income	Income Multiplier	Total Income Impact
				-----(\$)-----		
Hospitals	118	1.30	153	4.590	1.37	6.288
Physicians, Dentists and Other Professionals	120	1.45	174	4.862	1.29	6.272
Nursing and Protective Care	99	1.20	19	2.363	1.21	2.859
Other Medical and Health Services	33	1.28	42	0.869	1.27	1.104
Pharmacies	32	1.17	37	0.560	1.25	0.700
<b>TOTAL</b>	<b>402</b>		<b>526</b>	<b>13.244</b>		<b>17.223</b>

## Next Steps

By documenting the importance of health care in attracting business and industry and retirees, and for creating jobs and generating incomes, this report demonstrates the need for a strong health sector in White Pine County. And, as the county's health care sector continues to change, local decision-makers may find it necessary to seek assistance as they work to evaluate, maintain, or expand the health sector. To this end, a resource team consisting of representatives from the Nevada State Department of Health, the Nevada Office of Rural Health, the Area Health Education Center (AHEC) in the community's area, the Nevada Cooperative Extension Service and the University of Nevada Student Health Center is available to provide education and technical assistance. Two primary types of assistance that may be most beneficial to the communities, both vital to maintaining a viable health sector, are strategic health planning and feasibility studies.

### Strategic Health Planning

Strategic health planning is a process that helps local communities identify their health care needs; examine the social, economic, and political realities affecting the local delivery of health care; determine what is wanted and what realistically can be achieved to meet their identified health care needs; and develop and mobilize an action plan based on their analysis and planning. Strategic health planning involves cooperation among people and organizations to pursue common goals. The process is designed to answer three questions:

- (1) Where is the community now?
- (2) Where does the community want to go?
- (3) How will the community get there?

For the strategic health planning process to be most effective, it must be based in the community and driven by the community. Local residents and their leaders must participate—a current knowledge of the health care industry is not necessary. This process is about local people solving local problems. The local hospital and health care providers should have input into the

decision-making and should support and “trust” the outcomes, but not be the main force behind the process. The community must provide the energy and commitment.

The strategic health planning process begins with a group of citizens of a community becoming interested in reviewing and analyzing their health care system, when community leaders can be mobilized to take action, and when a resource team or facilitating group can be identified to assist the community to carry out the process. The resource team (described above) will provide technical assistance that includes the development, presentation and analysis of data and information, surveys, and health services and facilities. It also includes analytical skills, facilitation skills, and strategic planning skills. Using a resource team can be extremely beneficial to the community as the team is trained in the community development process, has health sector expertise, and can bring in other agencies that may be able to provide special technical assistance and other resources.

Counties or communities in Nevada have been involved in the strategic planning process, which takes about nine months and is fairly labor intensive. However, the outcomes have been worth the efforts—the entire community gets involved in the process and positive changes are occurring.

### Feasibility Studies

The strategic health planning process often identifies the need to provide a new health-related service. For example, the community might determine they need adult daycare services or an assisted living facility. Whatever the identified need, all relevant information must be gathered and analyzed before action is initiated. Again, the resource team can be extremely helpful in completing the feasibility study, which includes estimating the need for the service, projecting capital and operating costs, and estimating profit or loss.

Feasibility studies that already have been completed include:

- Emergency Medical Services;
- Physicians;
- Rural Transportation;
- Adult Day Services;
- Free Clinics;
- Outpatient Rehabilitation; and
- Critical Access Hospitals.

### **Conclusion**

If the local citizens and decision-makers are interested in strengthening their local health care system, they are encouraged to contact a member of their state resource team. The team members will help get the community started on strategic health planning and/or a feasibility study. The resource team members can also provide other information such as other programs available to the local community and other agencies that may be of assistance to the community.

**APPENDIX A:**

**REVIEW OF HEALTH CARE SECTOR IMPACTS ON LOCAL ECONOMIES**

## **Review of Health Care Sector Impacts on Local Economies**

There are a wide variety of health care services that include hospitals, physicians and dentists, pharmacies, health clinics, and nursing homes. Each of these sectors contributes to the local economies in which they are located, with hospitals generally contributing the largest portion of the impact. Presented is key literature on the economic impact of health care service in general and of hospitals in particular on regional and local economies.

The literature on the impact of health care services to regional and local economies indicate that 1) health care services contribute as export industries for regions in which they are located, and 2) reduce the region's imports by providing services to local residents, who would otherwise seek services outside the region or local area. Both effects of decreasing imports and increasing exports, stimulate and increase local and regional income. The direct impact of the health care sector to local and regional economies is measured through wages paid to employees, through inputs purchased by the health sectors, and through the spending generated through the multiplier effect.

- (1) Lichty, R. W. Jesswein, and D. McMillan. "Estimating Medical Industry Impacts in a Regional Economy." *Medical Care*, 24(1986): 350-362.**

Lichty et al. (1986) used a simulation model and an input-output model to assess the health care sector impact on the Arrowhead (a seven county area) region in Northeast Minnesota. The model estimated the impact of removing an entire health care sector, as well as the impact of closing one hospital. Obviously, the elimination of the entire health sector had a far more dramatic impact on the region, indicating a loss of 42% from 121,305 to 70,004 of total employment over a period of six years in the baseline if the medical sector was removed. Also, regional gross output declined by 22 percent from \$4,962,141,000 to \$3,866,211,000. A more modest impact was that of a closing hospital with a loss of 1,200 employees and a decline in gross output of 2.1% (from \$4,962,141,100 to \$4,855,977,000) from the baseline, by 1990.

- (2) **McConner, R.J. and A.L. Wellever. “The Economic Impact of a Montana Health Cares.” Department of Agricultural Economics Staff Paper 89-2, Montana State University, Bozeman, 1989.**

McConner and Wellever (1989) examined the impact of a hospital sector on the economy of the state of Montana. An input-output model was used to examine the impact of Montana hospitals on employment, household income, and the level of goods and services produced in the state of Montana. The study revealed a significant hospital impact on total state revenues, salaries, and wages, and on total employment. Total revenues had a 1.60 multiplier from business spending totaling \$402,131,432 in 1987. Similarly, salaries for professional and employment has 1.61 and 1.30 multipliers that totaled indirect impacts of \$196,664,645 and 9,000 jobs, respectively.

- (3) **Lee, Daniel K. “Economic Impact of the Mississippi Medicaid Program on the Economy of Mississippi.” The Center for Policy, Research and Planning, Institute of Higher Learning, State of Mississippi, Jackson, December 1988.**

In terms of a base industry, rural hospitals depend heavily on reimbursements from Medicare and Medicaid and the impact of these federal dollars into the rural communities is very significant. Lee (1988) found that for each state dollar spent on Medicaid, there is a federal match of \$3.69 in Mississippi. From the \$4.69 Medicaid expenditure, \$3.05 was spent on income in terms of wages and salaries. He also applied the state income multiplier of 2.172 to generate a total income impact of \$6.62 on the economy concluding that Medicaid dollars from outside the state economy had significant impact on the overall economy of Mississippi.

- (4) **Moore, C. “The Impact of Public Institutions on Regional Income: Upstate Medical Center as a Case in Point.” *Economic Geography*, 50(1974): 124-29.**

An earlier study by Moore (1974) measured the impact of the Upstate Medical Center on the community of Syracuse, New York. He estimated an income multiplier of 2.63, which means for each dollar of direct expenditure by the medical center, it produced \$2.63 of total expenditure. Moore concluded that large public institutions, such as hospitals have the potential to generate millions of dollars in employment and personal income through, in effect, interregional trade.

- (5) **McDermott, R., G. Cornia, and R. Parsons. “The Economic Impact of Hospitals in Rural Communities.” *Journal of Rural Health*, 7(1991).**

Extensive studies have indeed indicated the importance of health care to regional and local economies, especially hospitals. More recent studies have measured the impact of hospitals particularly in rural areas. McDermott et al. (1991) measured the impact of four small rural hospitals in Utah on their local economies. He found that these hospitals contributed between 4.0 to 9.0 percent of average employment in their local economy, both directly and indirectly.

- (6) **Christianson, J. and Faulkner. “The Contribution of Rural Health Care to Local Economies.” *Inquiry*, 18(1981): 46-60.**

An earlier study by Christianson and Faulkner (1981) examined single-hospital rural counties from Montana, Nebraska, Nevada, Idaho, North Dakota, South Dakota, Wyoming, and Utah to measure the importance of a rural hospital to the community’s income in each respective county. They found that income associated with hospital salaries generated, on average a 1.36 percent of direct benefit to the total county income, and had a multiplied income effect from hospital expenditures ranging from 1.54 to 2.37 percent of total county income. The loss from a hospital closure was less significant ranging from 1.53 to 2.29 percent of total county income.

- (7) **Doeksen, G. and J. Altobelli. “The Economic Impact of Rural Health Care Closure: A Community Simulation.” University of North Dakota Rural Health Research Center, 1990.**

A study by Doeksen and Altobelli (1990) also measured the change in local economic activity in three Texas communities of Crowell, Breckenridge, and Graham if there was a local hospital closure. They found that employment would decrease by 1.1 to 3.0 percent from the baseline for 1994. Similarly, income and retail sales would drop by almost one percent under the same circumstances. This, they concluded, would be detrimental to the local economy.

**APPENDIX B:**

**METHODOLOGY OF ECONOMIC IMPACT ANALYSIS**

## **Methodology of Economic Impact Analysis**

The IMPLAN model was used to generate the economic impact of White Pine County health care. IMPLAN is an input-output model that can be used to examine the economic impact of new industries, loss of an existing industry, fiscal impact analysis and the existence of supply-demand gaps. Model version 2.17 was used in this study with the 2000 Nevada data and structural matrices.

An input-output model is a set of linear equations expressed in matrix form. The so-called Leontief inverse of this matrix reveals “multipliers.” Multipliers express in compact form, the relationship between sectors of an economy. In essence, a change in an industry, household, or government expenditure pattern gets reflected through the multiplier matrix.

A number of important assumptions underlie input-output analysis. First, prices are fixed in the model. This implies that no relative price changes occur in the economy that would affect resource allocation. Typically, economies assume that a price change affects the relative number of quantities of goods and services in an economy. Second, supply factors, such as labor and capital, are always available at the same price. Again, whatever capital or labor is needed by the health care sector will be available to a rural county.

IMPLAN industries are based on a relationship called a production function. A production function specifies the dollar value of inputs used by an industry to create its output. The production function is specified as a series of coefficients, called gross absorption coefficients that reflect the percentage of total inputs coming from a particular industry. In essence, these coefficients are a production recipe for an industry. Industry ingredients, capital and labor, are combined to create a certain dish or output. In this case, lab supplies, surgical equipment, nursing home beds, nurses and doctors, and other factors are combined to create the output called health care.

IMPLAN production functions originally exist based on a national data set. Hospital and other health care providers from across the nation, both urban and rural, are surveyed by the Census Bureau to determine their expenditure purchasing patterns. These national purchasing patterns are used by IMPLAN to create a regional version of a county’s health care production function. However, often this national purchasing pattern is quite different from what actually occurs in a rural health care setting.

This production function is also modified to reflect local versus external purchases of inputs. The distribution of local versus external expenditures is called the regional purchase coefficient. The coefficient is a number between zero and one reflecting the percentage of goods and services bought locally. If an industry purchases an input from outside the county, this purchase is not reflected as an expenditure in other local industries. For example, if a health care provider purchases waste management services from a local provider, that industry in turn expands and hires workers. If waste services are purchased outside the county, the expenditure is lost or leaked out of the local economy. Again, these local versus external purchasing patterns are based on aggregate national conditions and may not accurately reflect local purchasing patterns. It is critical to properly account for local production functions and local purchases by the health care sector.

Before attempting to estimate the economic linkages and impacts of the health care sector on the White Pine County economy, the IMPLAN model used must accurately reflect the local economy. To accurately reflect the White Pine County economy, we employed the Regional Economic Information System (U.S. Department of Commerce, 2002), which contains county sectoral employment and income. Procedures to validate the IMPLAN database using Regional Economic Information System (REIS) data follow procedures outlined by Holland, et al. (1997).

The first step in using REIS data to validate the IMPLAN database is to construct a table based on REIS county-level employment estimates for the same year as the IMPLAN database. This table will be referred to as the REIS Employment Table. This table shows the number of jobs in each sector of the local economy.

Another table is constructed based on IMPLAN-based employment estimates aggregated to correspond to the one-digit REIS scheme on the IMPLAN Employment Table. The REIS Employment Table and IMPLAN Employment Table are reconciled. The reconciled IMPLAN Employment Table should reflect values in the REIS Employment Table. Procedures to allocate verified employment to disaggregated IMLAN sectors and for verification of employee compensation, proprietor income, other property type income, indirect business taxes, and value added are presented in a referenced study by Holland, et al. (1997).

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