

Health Care Costs and Access Disparities in Appalachia

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Prepared by:

PDA, Inc.

Nancy M. Lane, MA
Andrew Y. Lutz, BS
Kimberly Baker, BS

**The Cecil B. Sheps Center for Health Services Research
University of North Carolina – Chapel Hill**

Thomas R. (Bob) Konrad, PhD
Thomas R. Ricketts, PhD
Randy Randolph, MRP
Charles Tran, BS
Christopher A. Beadles, MD

PDA Health Planning • Management Consultants

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UNC
THE CECIL G. SHEPS CENTER
FOR HEALTH SERVICES RESEARCH

HEALTH CARE COSTS AND ACCESS DISPARITIES IN APPALACHIA

January 2012

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This report was prepared by PDA, Inc. in Raleigh, North Carolina in collaboration with The Cecil G. Sheps Center for Health Services Research at the University of North Carolina Chapel Hill. It was developed for the Appalachian Regional Commission under contract CO-16835-2010. The principal authors of this report and the related research study include: Nancy M. Lane, PDA, Inc.; Thomas R. (Bob) Konrad, PhD, Tomas C. Ricketts, III, PhD, Randy Randolph, MRP, Charles Tran, BS, and Christopher A. Beadles, MD from The UNC Sheps Center; Andrew Y. Lutz, BS and Kimberly Baker, BS at PDA, Inc. In addition, this report has been reviewed by David Carrier, PhD of the Appalachian Regional Commission.

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ABOUT THE AUTHORS

PDA, INC.

Nancy M. Lane, MA. Ms. Lane serves as the President of PDA, Inc. and has led health care program development efforts for more than 30 years. With nine years' experience with the Appalachian Regional Commission, she has developed skills in regional health care system design and policy development. Ms. Lane helped to develop the Rural Health Clinics Act, PL 95-210. She has completed health care delivery system research on the Veterans Health Administration and private health care providers.

Andrew Lutz, BS. Mr. Lutz received his Bachelors of Science in Finance from the University of North Carolina at Chapel Hill. He conducts health industry, market and company-specific research, processes documentation and works with space programming and policy review.

Kimberly Baker, BS. Ms. Baker received her Bachelor of Science in Business and Marketing from Western Carolina in Cullowhee, North Carolina. She provides assistance with market analysis, preparing maps describing target populations, and quality control checks.

THE CECIL B. SHEPS CENTER FOR HEALTH SERVICES RESEARCH UNIVERSITY OF NORTH CAROLINA – CHAPEL HILL

Thomas C. Ricketts, Ph.D. Dr. Ricketts is a Professor of Health Policy and Administration and Social Medicine, and the Director of the Health Policy Analysis Unit in the Cecil G. Sheps Center for Health Services Research at the University of North Carolina at Chapel Hill. The focus of his research has been on policy making for the health care workforce and access to care for rural and underserved populations. He was the founding director of the North Carolina Rural Health Research and Policy Analysis Center. Dr. Ricketts is a member of the Institute of Medicine Task Force on the Geographic Wage Index.

Thomas R. (Bob) Konrad, Ph. D. Dr. Konrad is a Senior Fellow at the North Carolina Institute on Aging and served as Co-Director of the Program for Health Services Research at the University of North Carolina at Chapel Hill on Health Professions and Primary Care, with Donald Pathman (PHP&PC) at the Cecil G. Sheps Center. He holds academic appointments as Professor of Social Medicine (School of Medicine), Professor of Health Policy and Administration (School of Public Health), and Research Professor in the Division of Pharmaceutical Policy and Evaluative Sciences (School of Pharmacy). Dr. Konrad is familiar with a variety of health professions databases and data collection strategies, measurements and modeling issues.

Randy Randolph, MRP. Mr. Randolph is an Applications Analyst Programmer for the Cecil G. Sheps Center for Health Services Research at the University of North Carolina at Chapel Hill. As a programmer, he has been an essential team member on various database projects involving the development of metrics and geo-coded data sets and mapping.

Christopher Beadles, MD and **Charles Tran, BS** were graduate students associated with the Sheps Center. Dr. Beadles is pursuing his Ph.D. in health services research. Mr. Tran is pursuing his MPH.

GLOSSARY OF ACRONYMS

ACA	Affordable Care Act
AFDC	Aid to Families with Dependent Children
AHA	American Hospital Association
AHRQ	Agency for Healthcare Research and Quality
AHW	Average Hourly Wage
AMMS	Advanced Maintenance Management System
ARC	Appalachian Regional Commission
ARC_EDI	Appalachian Regional Commission Economic Distress Index
ARF	Area Resource File
ARRA	American Resource Recovery Act
ASEC	Annual Social and Economic
BLS	Bureau of Labor Statistics
BRFSS	Behavioral Risk Factor Surveillance System
CBO	Congressional Budget Office
CBP	County Business Patterns
CBSA	Core-Based Statistical Areas
CDC	Center for Disease Control
CHAI	Combined Health Access Index
CHIP	Child Health Insurance Program
CHSI	Community Health Status Indicator
CMF	Compressed Mortality File
CMMI	CMS Center for Innovations
CMS	Centers for Medicare and Medicaid Services
COBRA	Consolidated Omnibus Budget Reconciliation Act
CPS	Census Population Studies
DDS	Doctor of Dental Surgery
DHHS	Department of Health and Human Services
DSH	Medicaid disproportionate share
ECI	Employment Cost Index
EDI	Economic Distress Index
EMUP	Exceptional Medically Underserved Population
ESRD	End Stage Renal Disease

ESRI	Environmental Systems Research Institute
FDA	U.S. Food and Drug Administration
FMAP	Federal Medical Assistance Percentage
FPL	Federal Poverty Level
FQHC	Federally Qualified Health Centers
FT	Federal Trade Commission
FY	Fiscal Year
GAF	Geographic Adjustment Factor
GDP	Gross Domestic Product
GDSC	Governor's Designation Secretary Certified
GPCI	Geographic Practice Cost Index
GPO	Government Printing Office
GSP	Gross State Product
HCCA	Healthcare Costs, Coverage, and Access Index
HCC	Health Care Cost
HCRA	Health Care Resource Availability
HCUP	Healthcare Costs and Utilization Project
HI	Hospital Insurance
HIC	Health Insurance Coverage
HOSPBEDS	Acute Hospital Beds
HRSA	Health Resource and Service Administration
HSA	Health Savings Account
HWI	Hospital Wage Index
IOM	Institute of Medicine
IPPS	Inpatient Prospective Payment System
IRS	Internal Revenue Source
J-1 Visa	Non-immigrant visa issued by the U.S., esp. for medical or business training within the U.S.
JAMA	Journal of the American Medical Association
KCMU	Kaiser Commission on Medicaid and the Uninsured
KFF	Kaiser Family Foundation
MAX	Medicaid Analytic Extract
MEPS	Medical Expenditure Panel Survey
MSA	Metropolitan Statistical Areas
MUA	Medically Underserved Areas

MUA/P	Medical Underserved Areas & Populations
MUP	Medically Underserved Population
NASBO	National Association of State Budget Officers
NCHS	National Center for Health Statistics
nda	No data available
NHE	National Health Expenditures
NHSC	National Health Service Corps
NIS	National Immunization Survey
NPCP	Non-Primary Care Physicians
NPRM3	Notice of Proposed Rule Making
nrf	No report, survey sample size fewer than 50
OA	Old Age
OCC	Occupational Mix
OHRM	Office of the Actuary Health Reform Model
OMB	Office of Management and Budget
OSCAR	Online Survey, Certification and Reporting
PCP	Primary Care Physicians
PCSA	Primary Care Service Area
PHC	Personal health care
PHCE	Personal Health Care Expenditures
PPACA	Patient Protection and Affordable Care Act
ResDAC	Research Data Assistant Center
RHC	Rural Health Clinic
RIMS II	Regional Input-Output Modeling System
RN	Registered Nurse
RSA	Rural Service Area
RTP	Research Triangle Park
SAHIE	Small Area Health Insurance Estimates
SAMSA	Substance Abuse and Mental Health Administration
SCHIP	State's Children's Health Insurance Program
SES	Socioeconomic status
SGR	Sustainable Growth Rate
SHADAC	State Health Access Data Assistance Center
SID	State Inpatient Databases

SMI	Supplementary Medical Insurance
SSA	Social Security Administration
SSI	Supplemental Security Income
TRH	Tennessee Rural Health
TRICARE	VA and Department of Defense health insurance plan
UNC	University of North Carolina at Chapel Hill
VA	Veterans Administration
VHA	Veterans Health Administration
VISN	Veterans Integrated Service Networks
VISTA	Veterans Health Information Systems and Technology Architecture
WIC	Woman, Infants, and Children Program
YPLL	Years of Potential Life Lost
YPLL_75	Years of Potential Life Lost under age 75 per 100,000 population
ZBP	Zip Code Business Patterns

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EXECUTIVE SUMMARY AND KEY FINDINGS

HEALTH COST AND ACCESS INDEX

The Appalachian Regional Commission (ARC) contracted for development of an index that would consistently measure healthcare access and cost disparities of the Appalachian Region compared with the rest of the United States. The goal was a metric of comparable depth and scope to the ARC Economic Status Index that ARC uses to measure Economic Distress levels in the Appalachian Region. PDA, Inc. and the Cecil G. Sheps Center for Health Services Research of the University of North Carolina at Chapel Hill developed the Healthcare Cost Coverage and Access Index (HCCA), which includes components describing relative availability of health care resources, level of health insurance coverage and cost of providing health services. Sources of data for the index are publicly available and updated annually.

TABLE 1 - HEALTHCARE COST, COVERAGE AND ACCESS INDEX COMPONENTS

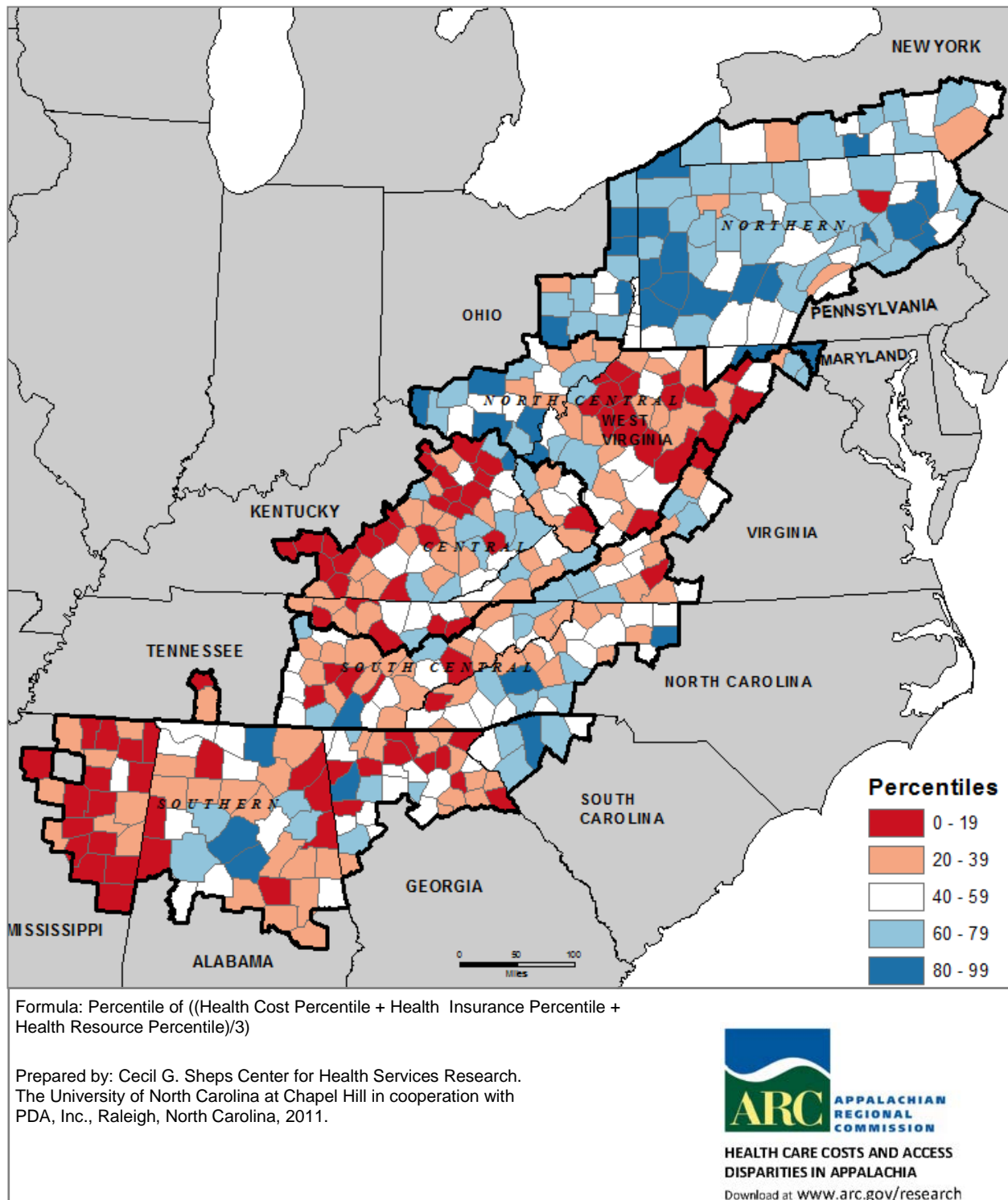
Component Name	Measures	Currency of Data
Health Care Cost (HCC)	CMS Medicare Hospital Geographic Wage Index	2005
Health Insurance Coverage (HIC)	Percentage of Persons Under 65 who report having health insurance	2007
Health Resource Availability (HCRA)	Acute short term hospital beds, primary and specialty physician and dentist supply	2007

The index is designed to show the status of Appalachian counties relative to one another, to other counties in Appalachian states, and to the rest of the counties in the United States. This report describes these county comparisons at the level of the HCCA summary index and each individual component index. All index data are scaled as percentiles of all counties in the U.S.

The report tests relationships of the index and its components to county health status, economic status, and persistent poverty. It also explores medical bankruptcy and the impact of health reform on state budgets.

Figure 1 maps the HCCA Index in the Appalachian Region. The blue to red scale separates counties in quintiles where blue represents good access, coverage, and payment compared to the national average, white indicates the county is close to the national average and red, that its index or measure is well below the national average.

FIGURE 1 – COUNTY HEALTHCARE COST, COVERAGE AND ACCESS INDEX IN APPALACHIA, 2011



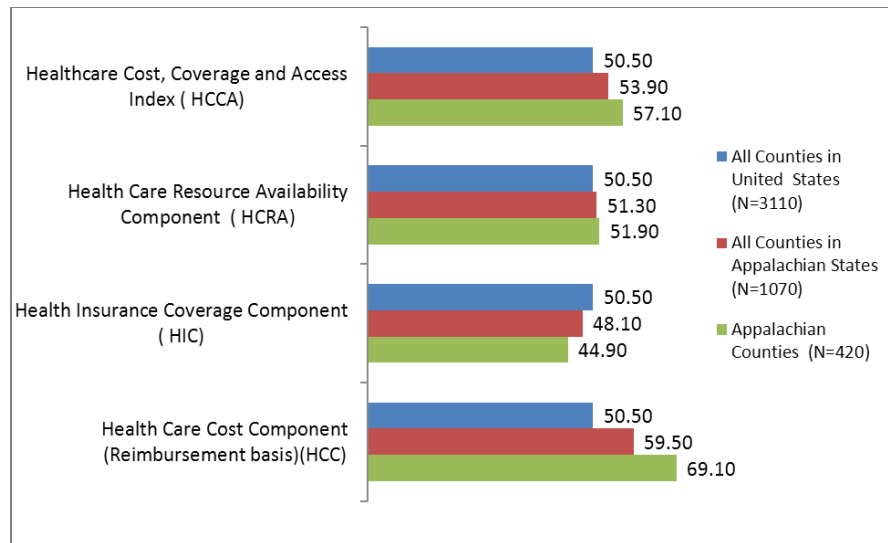
On average, counties in Appalachia ranked slightly below the national norm on HCCA, but pockets of good and poor access occur in Appalachian counties in every state except Maryland and South Carolina.

KEY FINDINGS

HEALTHCARE COST, COVERAGE, AND ACCESS INDEX

The HCCA shows Appalachian counties have, in the aggregate, more healthcare cost, coverage, and access disparities than their respective states' or the United States' average. For the health care payment and health care resources components of the HCCA, the average values for counties in the Appalachian Region are worse than all counties in the United States. Insurance coverage in the region is slightly better than the U.S. average; this is helped by high Medicare Disability enrollment and high Medicaid participation.

FIGURE 2 – AVERAGE OF HCCA INDEX AND COMPONENTS BY GEOGRAPHIC GROUP



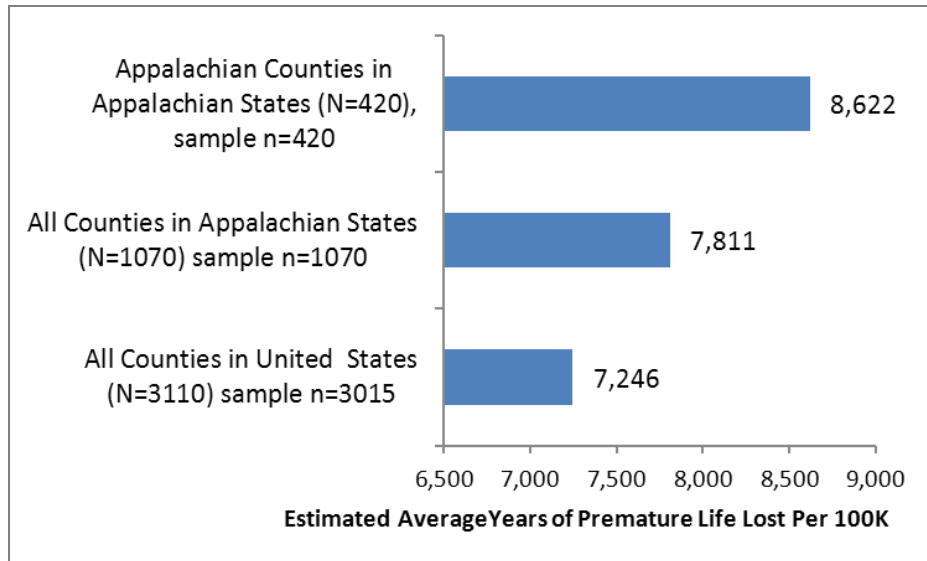
Values are national percentiles with highest representing least desirable score

Close to half of ARC counties (48 percent) ranked in the lowest quintile of healthcare reimbursement summarized by the cost component (HCC). The mean percentile for Appalachian counties was 31.87 compared to 49.54 for the U.S. The HCC is based on the Centers for Medicare and Medicaid (CMS) Hospital Geographic Wage Index, which, in turn sets the baseline for payment by most other payers, government and private. The Appalachian Region's rates on the index are among the lowest in the U.S.

TESTS OF RELATIONSHIPS BETWEEN THE HCCA AND HEALTH AND ECONOMIC STATUS

Preventable mortality rates, measured in age-adjusted Years of Potential Life Lost from preventable causes for people younger than 75, per 100,000 people (YPLL_75), is often used to compare health status among different groups. The County Health Rankings project (www.countyhealthrankings.org) publishes these by county. This index, though controversial, is recognizable by a lay audience, and its use as a measure of health outcomes is supported by the National Center for Health Statistics in its summaries and discussions of comparative health outcomes. This project benchmarked YPLL rates for the three groups: 1,070 counties in the Appalachian states, 420 counties in the Appalachian Region, and all US counties and county equivalents. Rates for the Appalachian Region county group were about 19 percent higher than for all U.S. counties, indicating that residents of Appalachian counties die younger from preventable causes.

**FIGURE 3 –COMPARISON OF ESTIMATED PREVENTABLE MORTALITY RATES IN 2005-2007
AVERAGE OF YEARS OF POTENTIAL LIFE LOST UNDER AGE 75 PER 100,000 POPULATION**



Source: University of Wisconsin County Health Rankings, Premature mortality was estimated with the equation: County YPLL_75 / 100K x county population 2008 / 100,000. Mortality was summed for all counties and divided by the total population times 100,000

The research team looked at relationships of this health status measure to the ARC Economic Distress Index (ARC_EDI) and to measures of healthcare cost and access, (HCCA and its components). Because of the high rate of enrollment in Medicare Disability support in the Appalachian Region, the research team also examined relationship between YPLL_75 rates and Medicare Disability enrollment.

Regardless of geography, there is high correlation between premature mortality and both the ARC_EDI and the level of county population enrolled in Medicare Disability. Table 2 shows a relative preventable mortality score for the geographic groups for 2005 through 2007. As would be expected, the U.S. has a mean of 49.5 on a 99 percentile scale. The Appalachian mean score is 19 percent lower than the U.S.

When we examined groups of counties, we found that preventable mortality rates were highly correlated with the HCCA and the health cost component, HCC. High preventable mortality was associated with low HCCA and low healthcare cost. There was no correlation between YPLL_75 rates and the health insurance component (HIC) in the Appalachian counties, and some correlation between the health resources component (HCRA) and YPLL_75 in the three comparison geographies. However, there is high correlation between low reimbursement (HCC) and poor health outcomes (YPLL_75). At the county level, some areas with high insurance had low resource access and cost scores, indicating that health insurance coverage alone is not the key to good care access, but access to healthcare resources may affect preventable mortality.

We found that for all counties in the United States and for counties in Appalachian states, there were positive relationships among the YPLL_75, the ARC_EDI, the HCCA, and components (HCC, HIC, and HCRA). This means that where there is economic distress, there is poor health and factors that are associated with less access to healthcare. Conversely, where there is a better economy there are better health outcomes.

TABLE 2- CORRELATION OF HCCA AND ITS COMPONENTS, THE ARC_EDI, AND MEDICARE DISABILITY ENROLLMENT WITH PREMATURE MORTALITY

Location (number of counties)	Mean YPLL-75 (std. dev.)	Community Health Status: Medicare Disability Enrollment	Economic Distress: ARC EDI	Proposed Index and components			
				HCCA	HCC	HIC	HCRA
United States (n=3110)	49.5 (28.9)	.669	.669	.490	.465	.284	.288
Appalachian states (n=1070)	60.74 (26.8)	.755	.735	.487	.492	.188	.301
Appalachian Region (N=420)	63.9 (21.0)	.728	.560	.301	.368	-.040 NS	-.209

Correlations between YPLL_75: per 100,000 Population--Averaged over 2005-2007 and expressed as a percentile Disability expressed as enrollees per population. All other indices and components scaled such that 1 is best and 100 is worst.

These associations are strong; in technical terms, they are highly statistically significant. The probability that they are due to chance is less than one in a thousand ($p < .001$). Taken together this pattern is very consistent with the notion that there is an underlying relationship between general socioeconomic factors, the robustness of the healthcare system, and overall population health status when measured at the county level. Moderately strong relationships (above 0.45) exist between the HCCA and both the established measure of economic distress (ARC_EDI) and the measure of population health status (YPLL_75). Further, the relationships between the HCCA and the YPLL_75 and ARC_EDI are greater than the relationships between any of the HCCA components and the two validating measures. For detail of this analysis, please see Appendix M. The HCCA Index is validated statistically by the correlations among each of the HCCA components. Statistical correlations are low, but positive, suggesting that the components are tapping related, but distinct aspects of the healthcare system.

INFLUENCE OF SOCIOECONOMIC STATUS ON RELATIONSHIPS BETWEEN HCCA AND HEALTH STATUS IN APPALACHIA

The research team explored the overall influence of socioeconomic status on the relationship between the HCCA and preventable mortality rates. Using multivariate regression analyses, the team measured the extent to which either the ARC Economic Distress Index or the U.S. Department of Agriculture Persistent Poverty County status was associated with the HCCA or its components and the premature mortality rates (YPLL_75). At the national level, the HCCA Index exhibits an independent relationship to preventable mortality rates, that is, the HCCA Index varies along with premature mortality no matter how other variables change. This is important because, in all three geographies, all U.S., Appalachian state and Appalachian Region counties, the socioeconomic status of counties, as reflected in the ARC Economic Distress Index, also has a substantial relationship to preventable mortality rates but there appears to be an independent effect related to costs of care and access to care at the national level. In Appalachian counties this pattern of association was not significant and suggests that something other than economic distress, healthcare cost and access are influencing health outcomes in the Appalachian states. The HCCA components, for insurance (HIC) and cost access (HCC), explained almost half the variance in preventable mortality (46.2 percent), which is very significant. When equations included a variable to test the influence of a county's location in the Appalachian Region on preventable mortality, rates of preventable mortality in Appalachian counties

compared to other counties in Appalachian states were higher than would be predicted on the basis of their scores on ARC_EDI and HCCA alone, suggesting that there may be another factor beyond the combined impact of socioeconomic status and health system characteristics access, cost and coverage, that accounts for variations in preventable mortality in Appalachia.

OTHER HEALTHCARE USE MEASURES

The study also reviewed other measures of healthcare use and expenditures in the Appalachian Region as reported by the CMS and the Veterans Health Administration (VHA). Most of the Appalachian Region had high Medicare expenditures per capita in 2009. This may be affected by a combination of the region's particularly high per capita enrollment in Medicare Disability programs and its lower health status. Parts of Central and Southern Appalachia rank in the highest national quintile of per capita enrollment in Medicare Disability in 2007, and Disability enrollees are heavy healthcare users. In central and southern Appalachia, as much as 15.6 percent of the population received Medicare Disability payments. Information from 2007 VHA use files showed military veterans in the Appalachian Region, particularly the central sub-region and western Pennsylvania were among the highest users of VHA services in the U.S.

The research team also reviewed the scientific literature on relationships between personal healthcare expenditures and bankruptcy, finding that healthcare costs are associated with bankruptcy, though the extent is not clear. Several studies noted that social policy design flaws in many government safety net health insurance programs not only discourage individual economic pursuits; they also leave many people at risk of bankruptcy from expensive, uncovered medical care costs if they are not treated in clinics and hospitals with safety net programs.

HEALTH REFORM POLICY ISSUES

Health reform will change health insurance coverage and the structure of the healthcare delivery system. Among the issues under study is the CMS Medicare Hospital Geographic Wage Index, the HCC component of the HCCA. This index establishes a baseline rate for 60 percent of Medicare payments and, by reference, for other payers as well. Presently the average county in the Appalachian Region receives lower payments than the U.S. average. Moreover, in general, Appalachian counties have not benefited as much from the work-arounds that have helped other rural communities to side-step low rates. A "Frontier" adjustment, for example, brings communities in several states in the west to the lower of their own or the national average index. ARC may wish to consider advocacy to give rural Appalachian counties parity with Frontier counties when policy makers consider adjustments to the index.

Federal health reform will increase insurance coverage. A review of the scientific and policy literature indicates that the Affordable Care Act's coverage initiatives will have a direct impact on state Medicaid budgets. Most reports indicate that Appalachian states' total Medicaid costs will increase, although the amounts are a function of a state's current coverage policies. Individual Appalachian states may see costs increase 1.4 to 15.4 percent¹ to cover six to 41 percent more people². This will occur when health reform is fully implemented in 2014. In that year, each state Medicaid program must cover all persons with incomes under 133 percent of the national poverty level. Because HCCA results show low correlation between health insurance coverage and preventable mortality rates, more coverage alone may not result in health status improvements. The study's demonstrated relationships between payment and resource availability suggest that without payment changes many people with new coverage may have trouble getting service.

¹ Table 26 of this report.

² Table 22 of this report, Kaiser Commission on Medicaid and the Uninsured, on line, 2010.

Health reform initiatives will clearly require more healthcare resources in Appalachia. Two programs championed by ARC, the Rural Health Clinics Act and the J-1 visa waiver program for foreign medical graduates can improve resource availability. For different reasons, both merit renewed attention in the health reform environment. The former addresses payment for primary healthcare providers and the latter addresses supply of healthcare providers to underserved areas.

ARC encouragement of broadband communications to rural areas will also help with the technology needed to support contemporary health care delivery, thus expand resource access. Finally, encouragement of expanded roles for entry workers in health care labor force will be similarly beneficial.

