Advancing Wellbeing in Northern Arizona: A Regional Health Equity Assessment

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This report was prepared by the Northern Arizona University

Center for Health Equity Research

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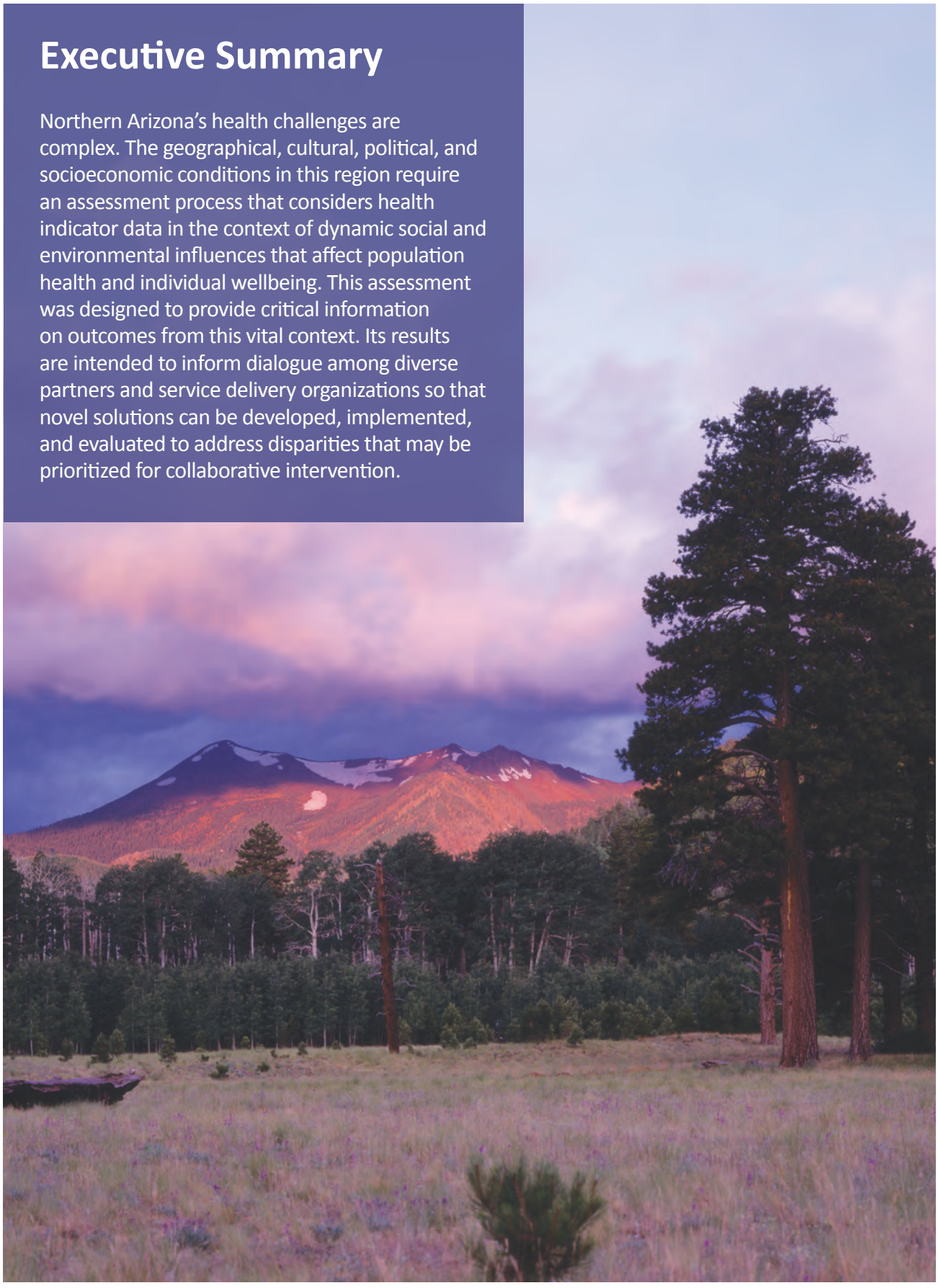
TABLE OF CONTENTS

List of Figures

List of Tables

Executive Summary

Northern Arizona's health challenges are complex. The geographical, cultural, political, and socioeconomic conditions in this region require an assessment process that considers health indicator data in the context of dynamic social and environmental influences that affect population health and individual wellbeing. This assessment was designed to provide critical information on outcomes from this vital context. Its results are intended to inform dialogue among diverse partners and service delivery organizations so that novel solutions can be developed, implemented, and evaluated to address disparities that may be prioritized for collaborative intervention.



Why Health Equity?

Wellbeing and good health are not equitably distributed. As defined by the National Academies of Sciences, Engineering, and Medicine, health equity is:

> **"the state in which everyone has the chance to attain their full health potential and no one is disadvantaged from achieving this potential because of social position or any other defined circumstance".**[1]

Targeted solutions designed to address health equity needs and challenges in northern Arizona can improve health status indicators, reduce costs in medical care, and promote vibrant community development with benefits across the social and economic spectrum.

Scope of Study

The NARBHA Institute, in partnership with the Northern Arizona Healthcare Foundation, commissioned the NAU Center for Health Equity Research (CHER) to conduct a regional health equity needs assessment to inform the goal of advancing wellbeing in northern Arizona. This report summarizes findings from CHER's comprehensive study of health disparities across the six-county region of northern Arizona encompassed by Apache, Coconino, Gila, Mohave, Navajo, and Yavapai Counties. This extensive area, which covers 66,223 square miles, is ethnically diverse and largely rural, with a mix of tribal, public and privately owned lands. Twelve of the 22 federally recognized American Indian tribes in Arizona live in this region.

Methods

The comprehensive nature of the analysis is unique; the report authors are not aware of any previous studies occurring in the region with a similar breadth and scope. The project team collected and analyzed diverse quantitative and qualitative data in an iterative process, which allowed team members to regularly discuss ongoing findings and identify areas for further exploration.

Qualitative data collection occurred through:

- Detailed review and synthesis of 57 existing reports from the region;
- Engagement in 18 stakeholder meetings, 13 conferences and community forums, 62 interviews with community leaders and service providers, and seven focus groups with 49 participants.

The quantitative team completed:

- Primary data analysis of the Arizona Department of Health Services Hospital Discharge, Centers for Disease Control and Prevention (CDC WONDER), and the Behavioral Risk Factor Surveillance System (BRFSS) datasets;
- Secondary data analysis of county-level information in diverse sectors (e.g. health, employment, poverty, food security, education, crime, youth behavior and neighborhood environment).

Framework for Analysis

Social factors determine health outcomes more often than medical care. The assessment was guided by the *Social Determinants of Health (SDOH)*[2] framework to allow for exploration of the complex intersections of social, cultural, economic, and systems level influences on health and wellbeing. Information was gathered in 5 categories: access to healthcare, economic stability, education, neighborhood and built environment, and social and cultural contexts. Such a holistic approach is fundamental to ongoing efforts to identify system-level changes that offer the potential to reduce health inequity in the region.[1]

Result Highlights

Among the many results identified in the assessment, noteworthy findings include:

• Higher Fatality Rates

When comparing Arizona and United States age-adjusted causes of death, the six-county region has significantly higher fatality rates from heart disease, cancer, chronic lower respiratory disease, accidents, suicide, chronic liver disease and assault/homicide. These leading causes of death varied by county and community, with the top three causes of death overall for the region being diseases of the heart, cancer and unintentional injuries.

• Increased Rates of Injury and Suicide

Among the leading causes of death, accidents and suicide were of particular note for northern Arizona given their comparatively high rates. Suicide rates were highest among non-Hispanic whites, while fatalities from unintentional injuries were highest among American Indian populations. Suicide and self-inflicted injury rates were also highest among people ages 13-28 across the region.

• Burden of Chronic Disease

Chronic health conditions, especially diabetes, heart disease, obesity, respiratory conditions and dental health were highlighted qualitatively as important health priorities. Across the region, the leading causes of death largely aligned with the health priorities identified by participants in the qualitative analysis, including diseases of the heart, diabetes and respiratory conditions.

• Impact of Substance Use and Poor Behavioral Health

Study participants identified substance use and behavioral health conditions as critical priorities because of the influence these issues have on accidents, suicide, chronic illnesses and violent crime, as well as their negative effects on educational attainment, economic self-sufficiency and social engagement.

• Population-Specific Disparity Patterns

Participants emphasized the key role that population level analysis will play in ongoing improvement efforts. Specific populations identified for additional "deeper dive" analysis and potential targeted interventions included American Indians (including elders), Hispanics, Veterans, aging adults, children, rural populations, low-income populations, members of the LGBTQ community and individuals with disabilities.

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• Opportunity for Interdisciplinary Partnerships

While appreciative of the existing services that bring diverse individual and community benefits, many participants stressed the need for more cross-sector, inter-agency collaboration in data collection and analysis, strategic planning and resource sharing, and program implementation.

SDOH Findings

Participants identified a range of social, environmental and system issues affecting health equity and wellbeing in the northern Arizona region. This information is summarized within the SDOH five-dimensional framework as follows.

ACCESS TO HEALTHCARE

Access to healthcare was the most discussed barrier to achieving good health.

- There is a shortage of providers and services across primary care, behavioral health and dental care. Specialty provider visits, especially for children, require residents to travel long distances, often traveling outside the region.
- Although many people report having some type of health insurance coverage, residents regularly experience difficulties accessing care because of an insufficient number of providers, the cost of services or a lack of system navigation competency.
- Recruitment and retention of rural-based providers has proven challenging and there are long wait times reported for many facilities.
- There is limited capacity for receiving behavioral health services, partially because of a lack of providers, but also, due to eligibility requirements and inadequate service options.
- There is a common perception that people most likely to receive needed behavioral health services are those who are AHCCCS-eligible, have a serious mental illness or are in crisis. Resident behavioral health needs that are less severe are often unmet.
- Because they frequently interface with community members with mental health problems, law enforcement officials need more training to recognize mental health conditions and navigate the behavioral health system.
- Participants highlighted inadequate home health care for older adults and people with disabilities, and a shortage of palliative care for people with serious conditions.
- Access to dental services for preventive care is reported as limited across the region. Poor dental coverage with many insurance plans also creates major barriers.

ECONOMIC STABILITY

A significant percentage of the population in the northern Arizona region live in poverty.

- All six counties have a higher percentage of children living in poverty than national rates and five out of six counties experience overall higher poverty rates compared with the national average.
- Lack of employment opportunities, in particular among American Indian communities, contributes to high poverty rates.
- High cost of living and unavailability/unaffordability of housing options impact residents' ability to procure healthy foods, health care services and other basic resources.
- Limited local access to healthy food options also contributes to high food insecurity. Expanded access to nutritious foods in schools is vital.
- County-specific associations were identified between lower household income and increased mentally unhealthy days, lower self-rated health status, increased functional limitations and higher cardiovascular risk factors.

EDUCATION

Educational attainment significantly correlates with reports of health status.

- Associations were identified between lower education levels and higher mentally unhealthy days, increased cardiovascular morbidity and higher self-reported functional limitations.
- Variation across the region is seen in high school graduation rates, with Navajo, Gila, and Apache counties having the lowest rates.
- American Indian youth have the lowest high school graduation rates in the region, followed by Hispanic students.
- There is a need for improved information-sharing and understanding on the benefits of preventive health care, strategies for managing health (especially for those with chronic physical or behavioral health conditions), and health system navigation.

SOCIAL & CULTURAL CONTEXT

Social and cultural factors have both positive and negative influences on health equity in the region.

Strengths

- There are many close-knit communities in the region whose residents support one another despite social and environmental challenges.
- Local and regional organizations serving the area have an understanding of the SDOH and often use this framework for holistic approaches to support health and well-being.
- American Indian populations especially demonstrate resiliency and strong communities supported by cultural revitalization efforts.

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Challenges

- Limited social activities and productive engagement opportunities are felt to result in higher rates of substance use and other risky behaviors in youth.
- The stigma associated with seeking mental health services is felt to be palpable.
- Limited transportation, loss of mobility, and insufficient community and social supports result in social isolation and poor access to resources like food and medication for aging adults and individuals with disabilities.
- Some members of the American Indian communities identified historical trauma and loss of culture as contributing to health disparities.
- There is some distrust reported with health systems, especially among the Hispanic population.
- Representatives from both the Hispanic and American Indian communities identified incongruences between traditional health beliefs and western medicine practices.

NEIGHBORHOOD & BUILT ENVIRONMENT

Important environmental factors were identified, including:

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- Transportation options are often limited, and, if available, are frequently not affordable.
- Access to parks, sidewalks, and other recreational infrastructure is varied, with residents of Apache, Mohave and Navajo counties having less access as compared to the state average.
- Although most counties in northern Arizona rated better than the state average in the quantitative measurements of violent crime, residents of specific neighborhoods in the region reported high rates of crime and violence, partly attributed to substance use.

Assessment Limitations

Gaps in data available to inform this assessment included:

- Hospital discharge data for IHS and Tribal 638 facilities. These facilities are not required to report such information to the Arizona Department of Health Services.
- Data on outpatient healthcare and mental health-related encounters. Such data sources are not easily available for integrated analysis.
- Data sources specific to the health status of members of the LGBTQ community.
- Linked data sets, to help identify patterns of individual utilization/needs over time and further population-specific needs for priority populations otherwise identified by the assessment.

The intent of this assessment was to gather and summarize quantitative and qualitative data related to health equity across a wide, six-county geography. Consequently, information regarding innovative, best practice programs that are underway across the region was not systematically gathered. In addition, the assessment was not designed to specify the priority in which interventions might be collaboratively developed and implemented to address issues identified in the assessment. Such prioritization should occur as part of future activities within and among organizations serving this region.

Next Steps

Review of this report's findings in diverse community and organizational settings may serve to:

1. Validate its major themes and findings;
2. Formulate plans to address gaps in data and refine topics for further inquiry;
3. Build collaborative dialogue that will facilitate expanded regional information sharing and interdisciplinary program planning.

Further programmatic planning will benefit from the following considerations:

- **Improvements in health equity and wellbeing depend on inter-sector and intra-region collaboration.** This collaboration can be facilitated by building capacity to more easily communicate, collect and share data and information, and align goals. Fifty-seven existing health reports and community needs assessments were reviewed as part of this regional report. Opportunities exist to combine resources for future assessments. The NAU Center for Health Equity Research would be pleased to participate in planning related to such efforts.
- **Solutions for the multi-factorial challenges identified in this report necessitate interdisciplinary approaches to service delivery; many have either not been previously attempted or have only been demonstrated locally in select communities.** New sources of data – and the ability to establish links among data sets – will be fundamental to future population health collaborations and their evaluations. Because this comprehensive health equity needs assessment included the formal acquisition of data from regional, statewide and national data bases, detailed analysis is now possible of population health conditions that are unique to the region, along with comparative studies of issues that are common across the region, state and nation.
- There was widespread community uncertainty about service availability in different parts of northern Arizona. **Stakeholders should work to create and maintain a comprehensive and up-to-date list of available resources across the region.** Resource information should be convenient and readily available, as well as be culturally, linguistically, intellectually, and age appropriate.

We hope that this report will establish a solid foundation for continued collaborative efforts to advance wellbeing in northern Arizona.

[1] Communities in Action: Pathways to Health Equity. Report by the *National Academies of Sciences, Engineering, and Medicine*, January 2017.

[2] CDC. Healthy People 2020. http://www.cdc.gov/nchs/healthy_people/hp2020.htm. Accessed 9/29/16.

INTRODUCTION

The Advancing Wellbeing in Northern Arizona project was generously funded by the NARBHA Institute and the Northern Arizona Healthcare (NAH) Foundation. Our intention as an interdisciplinary research team was to present information that is culturally relevant and comprehensive, and that can be innovatively used to develop and promote community-engaged strategic actions to reduce health disparities across northern Arizona. The geographic, cultural, political, and economic conditions in northern Arizona require an assessment process that does not simply take a generic approach to develop generic solutions. The goal of the regional health needs assessment project was to provide critical information on the context surrounding the health needs and assets of the region. This will foster the creation of locally targeted activities with community and consortium partners that complement the factors identified through existing data sources. By identifying local context and conditions that might not be readily visible in existing data sets (issues of space, time, and culture), this project was designed to avoid "one size fits all" solutions. This report will contribute to the strategic planning efforts of community organizations, agencies, and health care facilities as they seek to develop targeted, culturally relevant, and locally appropriate interventions to advance community health equity throughout the region. The project has three main goals:

Goal 1: Synthesize existing data and conduct deeper data-dives to understand regional patterns and anomalies in health outcomes and access to resources for healthy lifestyles.

Goal 2: Identify local and institutional strengths, needs, barriers, and resources for addressing health disparities in northern Arizona.

Goal 3: Engage local stakeholders in an interactive and iterative dissemination process. Help identify communities and organizations as potential partners that can build cross-sector collaborations to improve health outcomes.

NORTHERN ARIZONA REGIONAL OVERVIEW

The northern Arizona region comprises six counties: Apache, Coconino, Gila, Mohave, Navajo, and Yavapai (Figure 1). This region covers 66,223 square miles of land in Arizona and is home to 12 federally recognized American Indian tribes.[2] This region is largely rural and very culturally, economically, and geographically diverse. This diversity makes it important to consider health issues as well as community assets and challenges in a locally specific context. Counties and communities vary greatly in demographics such as ethnicity and age and also in degrees of access to all types of services, opportunities, and utilities necessary for healthy people and communities. Reporting data at the county level obscures many important elements of the social and physical environments that impact health differently for different populations. For example, reporting data at the county level can skew averages toward wealthier urban populations and obscure conditions and realities in rural and underserved populations. This is a necessary and important consideration when developing strategic plans to improve health and increase health equity across the region. Although it is incredibly diverse, the region also shares some important features that contribute to common health issues and challenges, making regional trends an important topic for analysis and collaborative strategies vital to facilitating improvements in the health of the region.

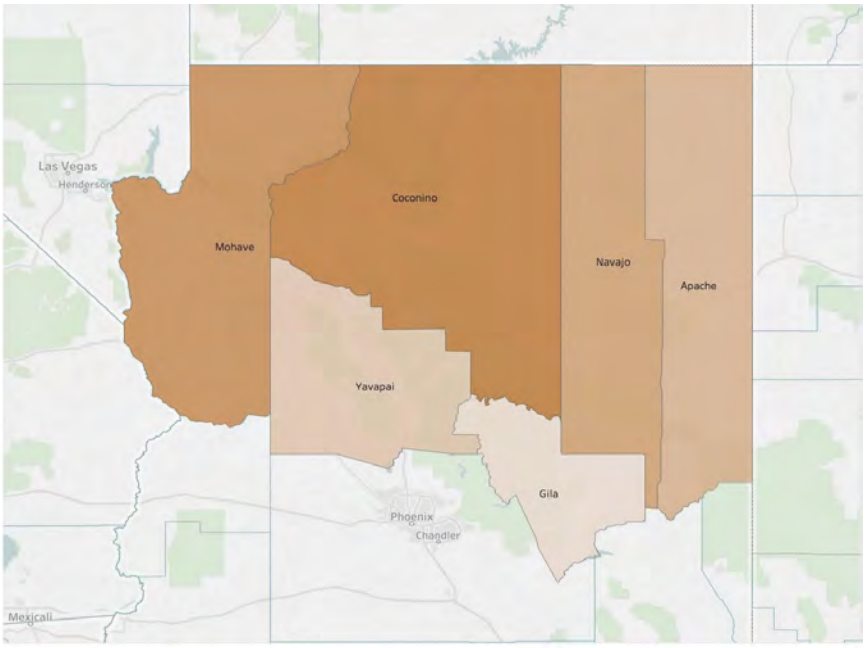

Figure 1. Map of the northern Arizona region.

Geographic Overview

Most of the northern Arizona region sits atop the Colorado Plateau and is home to a variety of climates and natural features including sparsely vegetated plateaus and mesas, deep canyons, barren deserts, and dense pine forests. The highest elevations are in Coconino County at 12,633 feet, and the lowest are in Mohave County at 1,112 feet.[3] Northern Arizona is home to some of the most beautiful sites in the country including the Painted Desert, Antelope Canyon, Montezuma Castle National Monument, Monument Valley, Roosevelt Lake, the Grand Canyon, and many other national forests, monuments, rivers, and lakes. Although Coconino County is the largest county in the region geographically, Yavapai and Mohave have much larger populations; Yavapai is the most populous county in the region but it covers only 12% of the land geographically.

Most of the land in northern Arizona (52%) is publicly owned and is maintained by either the U.S. Forest Service or the Bureau of Land Management. The second largest sector (27%) is owned by American Indian tribal governments. Only 15% of the total land in the region is privately owned. Although 68% of the land in Apache County is tribally owned, tribal lands make up less than 1% of Yavapai County.[4-9] See Figures 2 and 3.

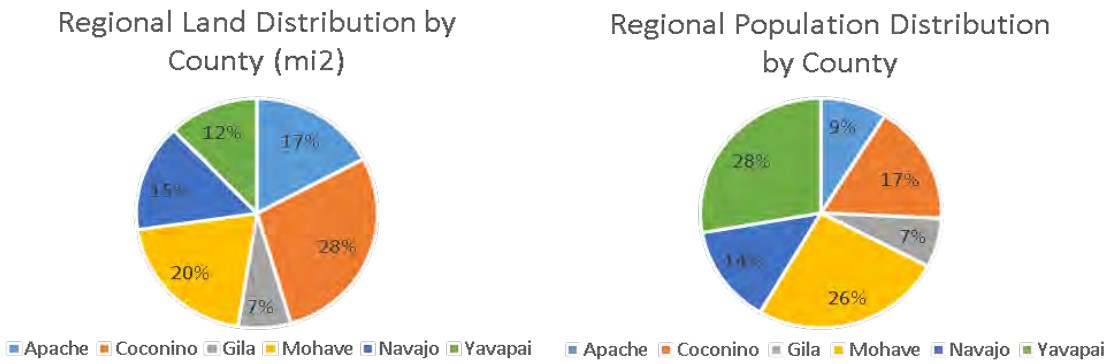

Figure 2. Regional land distribution by county.[2]

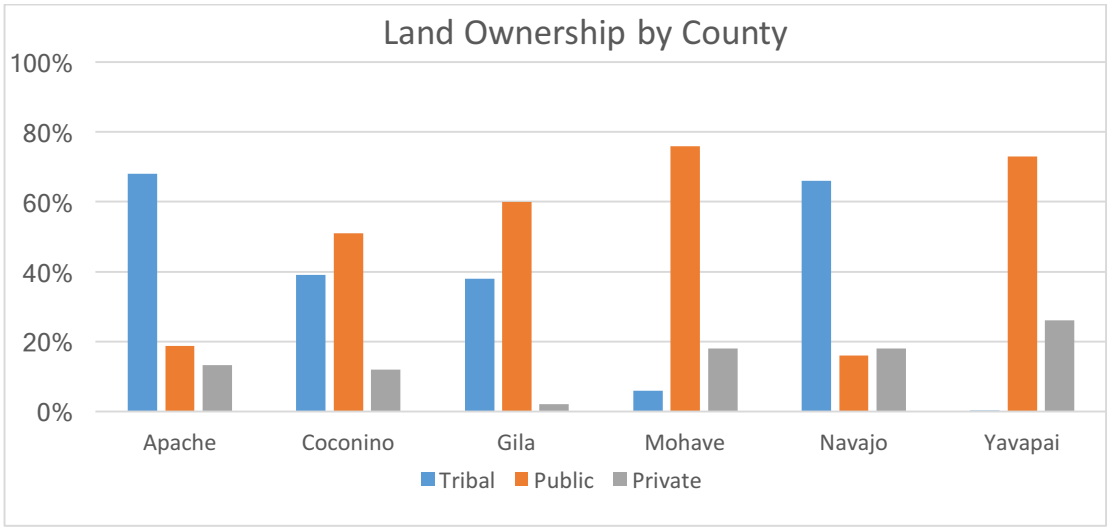

Figure 3. Regional land ownership by county.[3-8]

Demographic Overview

Figures 4–8 present the population demographics of each county in the region. A comparison of the population of each county reveals great variability in the number and concentration of residents, the relative ages of residents, the ethnic/racial composition of each county, and the percentage of residents who identify as veterans.

Apache and Navajo counties have a much younger population than most other counties, with roughly 30% of their respective populations younger than 18. Yavapai and Gila counties have relatively larger aging adult populations.[2] These differences can have large effects on the distribution of important health outcomes and challenges that communities face in getting appropriate and relevant health resources and services.

Yavapai and Mohave counties are the least ethnically diverse. Gila and Coconino counties have relatively larger Hispanic populations, whereas Apache County is more than 70% American Indian.[2] As discussed later in the report, these populations can face unique challenges as well as social, economic, and political contexts that affect health outcomes.

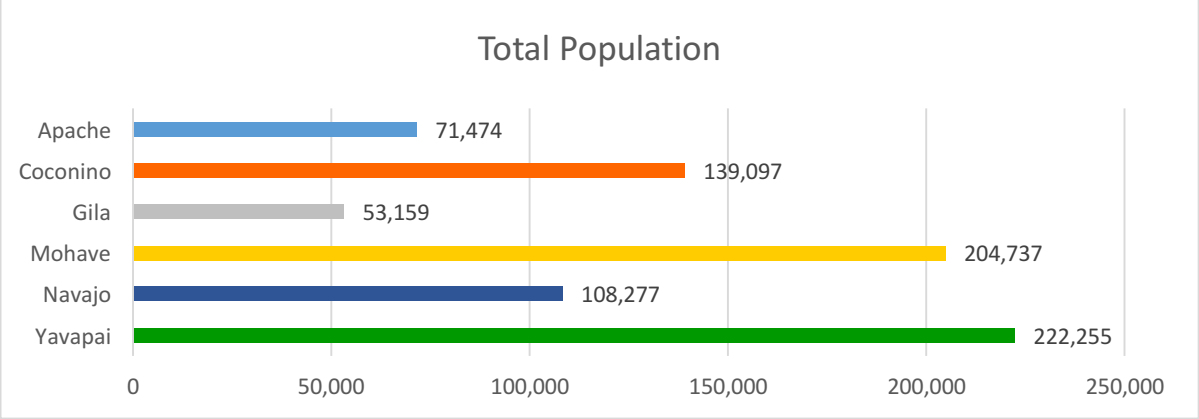

Figure 4. County population totals.[2]

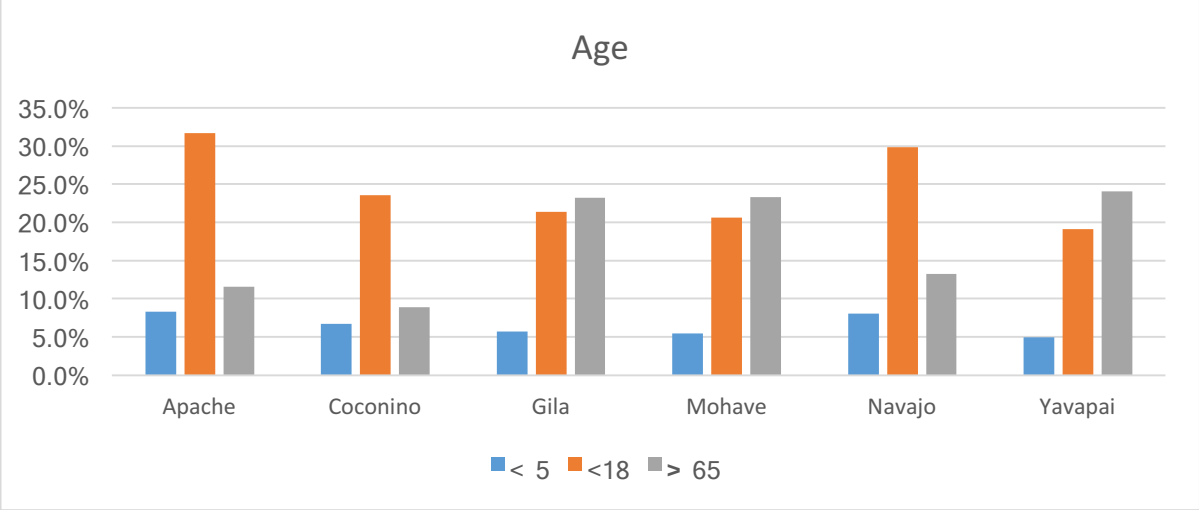

Figure 5. Age distribution by county.[2]

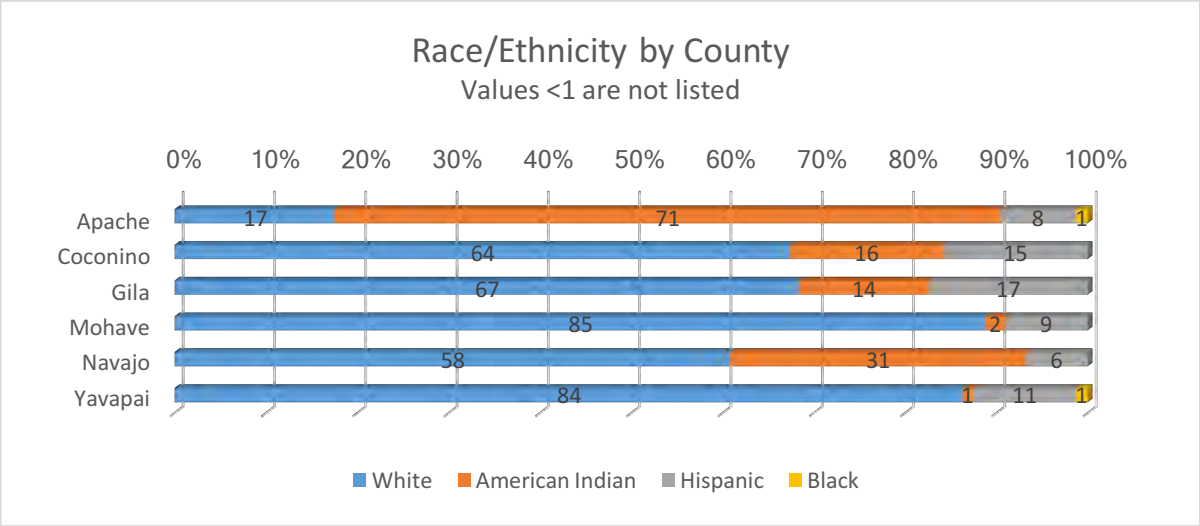

Figure 6. Racial/ethnic population characteristics by county.[10]

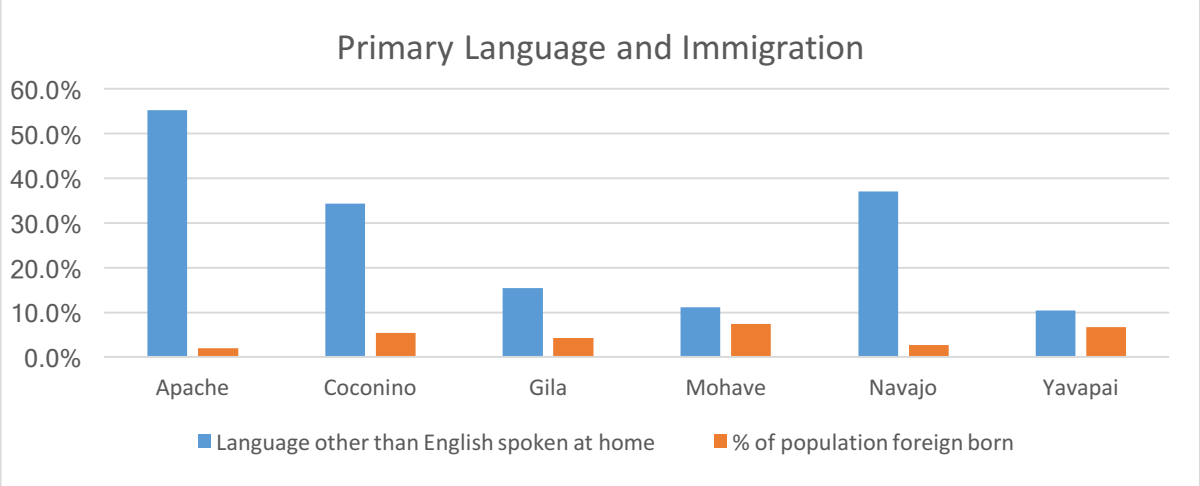

Figure 7. Regional primary language and immigration by county.[2]

Twelve of 22 federally recognized American Indian tribes live in northern Arizona. Many people of American Indian descent live on reservations, but many also live in border towns, urban centers, and rural areas outside of reservations. The history, economy, culture, and language of each tribe is unique, as is the geography and physical environment of each reservation. The level and quality of social, economic, and health care resources and infrastructure available to tribal members also varies between tribes. Despite their uniqueness, there are also many commonalities in regards to health issues, assets, and barriers that tribal communities share regardless of tribal affiliation. These themes are discussed further later in this report.

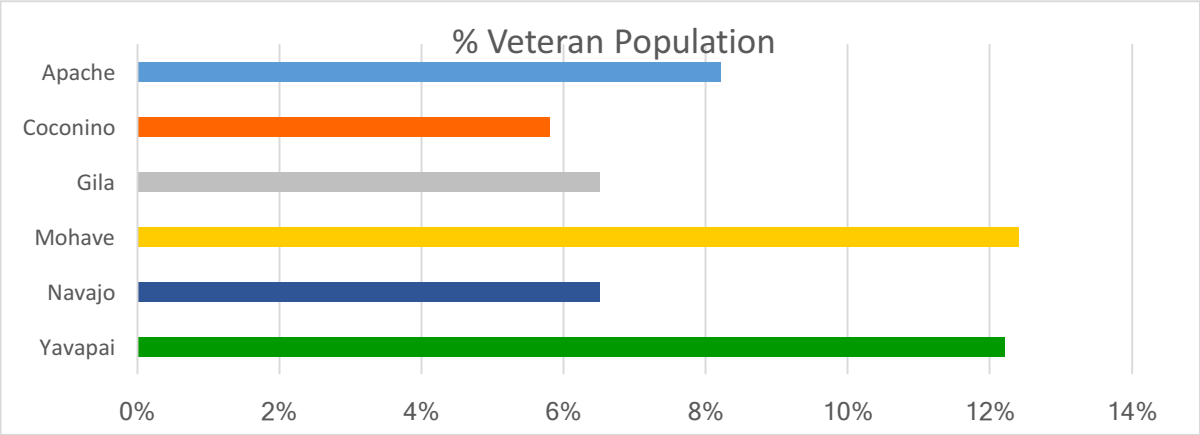

Figure 8. Regional veteran population by county.[2]

The relative sizes of each tribe based on percentage of population and percentage land ownership relative to the regional totals are shown in Figures 9 and 10. Only the largest tribes in the region, those comprising more than 1% of the total tribal population in the region, are shown in Figure 9. The seven smaller tribes in the region comprise a combined total of 3% of the regional tribal population. These smaller tribes are shown in Figure 10 according to their proportion of the remaining 3% of the total tribal population. The Navajo Nation, which covers parts of Arizona, Utah, and New Mexico, has more than 200,000 members.[11] According to the 2010 Census, more than 100,000 members of the Navajo Nation are living in the Arizona portion of the reservation, making it the largest tribe in the region in terms of population and reservation size, which totals over 18 million acres. The smallest tribe in the region is the Tonto Apache, who number 120 and occupy a reservation of just 85 acres.[12]

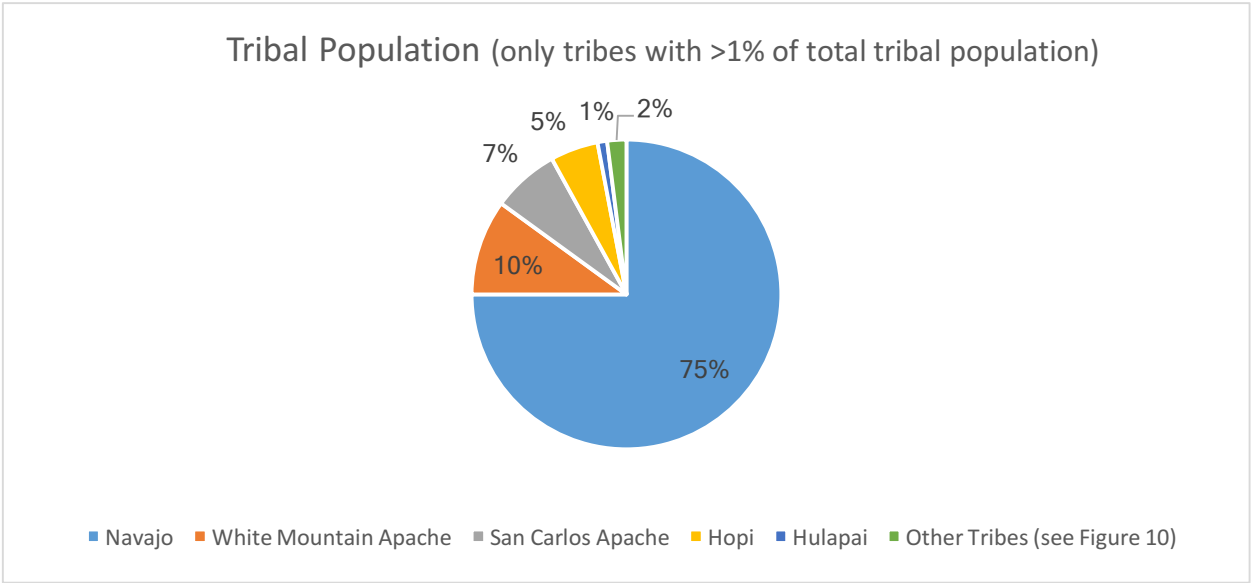

Figure 9. Regional tribal population of largest tribes.

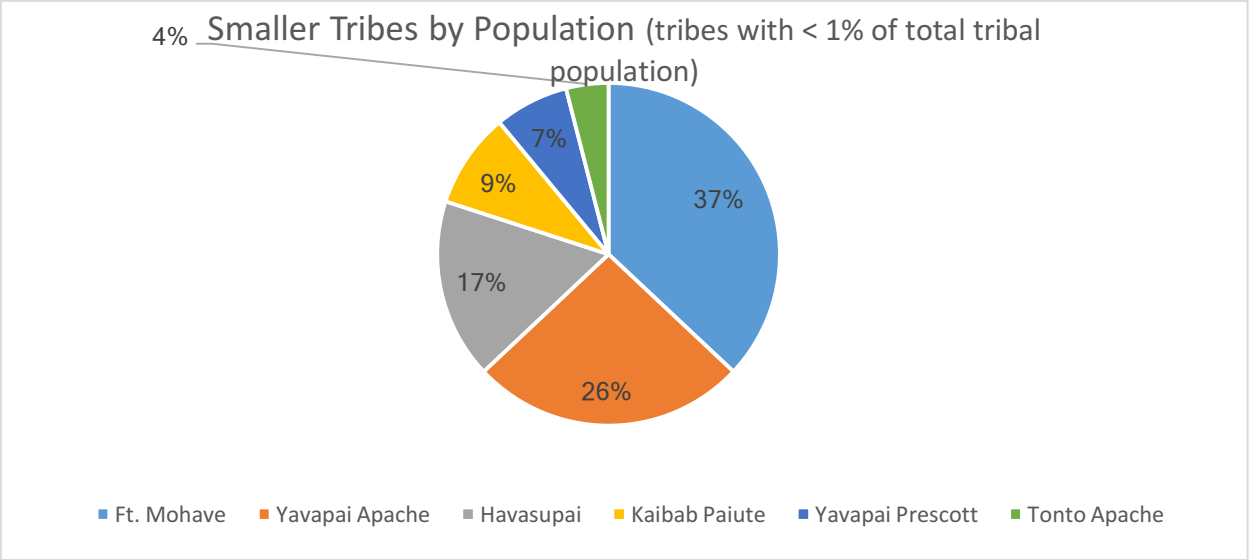

Figure 10. Regional tribal population of smallest tribes. San Juan Southern Paiute tribal population is incorporated into total for Navajo Nation.

Rural populations experience significant health disparities when compared to more urban populations. Risk factors for these disparities include social and geographic isolation, higher rates of risk behaviors, lower incomes and job opportunities, and fewer opportunities for constructive entertainment and engagement. All of these things contribute to higher rates of chronic illness and lower rates of overall good health in rural communities.[13] Although there are some major urban centers in the region, much of the area consists of small rural areas. Sixty-three percent of the population in the region lives in urban areas (population greater than 50,000) or urban clusters (population greater than 2,500) and 37% live in rural areas (population less than 2,500).[2] See Figure 11.

Significant numbers of residents in Coconino, Mohave, and Yavapai counties live in highly developed urban areas, whereas Apache, Gila, and Navajo counties have no population centers with more than 50,000 people. Apache and Navajo counties have the highest populations living in rural areas whereas most of the people in Gila County live in an urban cluster.[2] See Figure 12.

As shown, therefore, northern Arizona is primarily rural, with a mix of land ownership between private, public, and tribal groups. Strategic planning to address these diverse environmental and structural issues is challenging. The proportion of the population living in urban versus rural areas has important implications for levels of access to health services and other resources that are important for strong health outcomes.

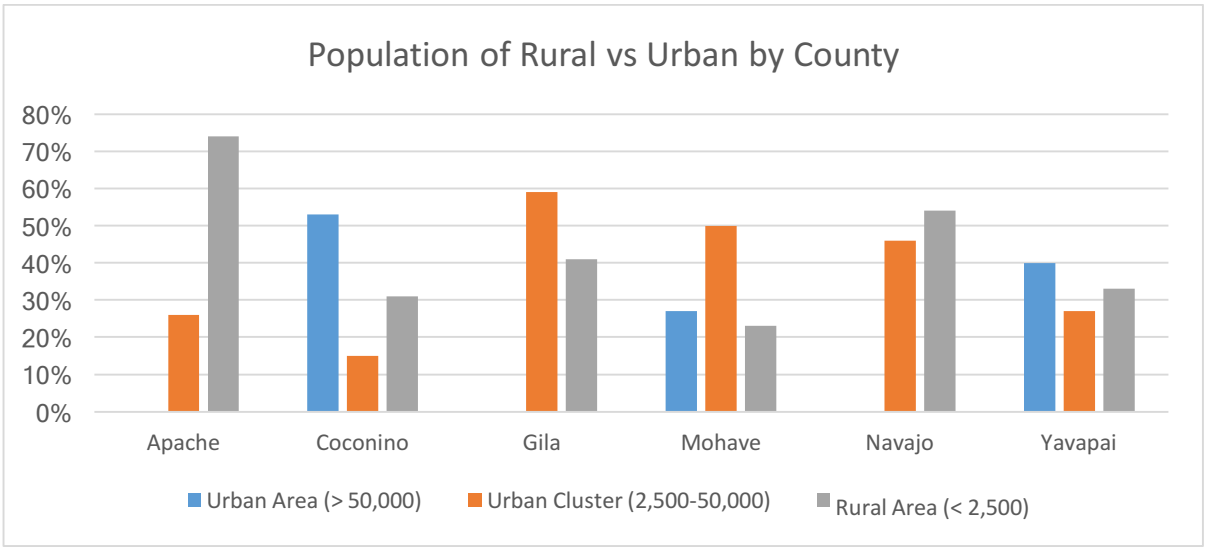

Figure 11. Regional population characteristics by county.

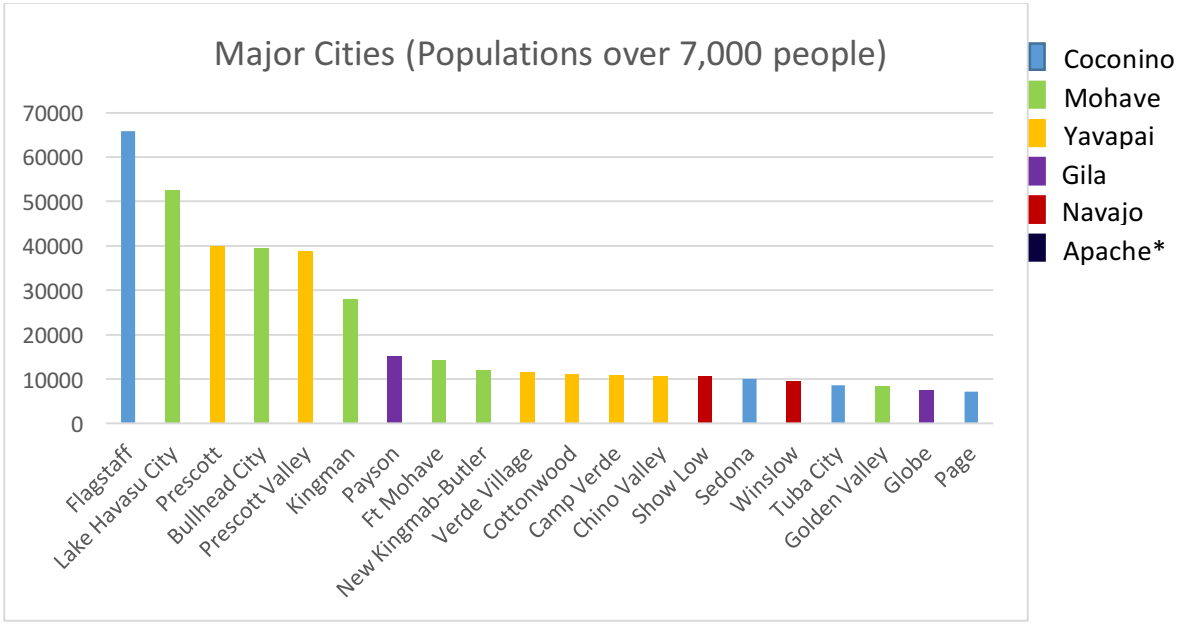

Figure 12. Regional population centers by county. *No towns in Apache County have populations higher than 7,000 people. The largest towns in the county are Eager with 4,885 people and Chinle (part of the Navajo Nation) with 4518 people (Census 2010).

THEORETICAL FRAMEWORK AND RESEARCH DESIGN

Due to the comprehensive nature of the needs assessment and the expansive size of the region, we elected to use the Social Determinants of Health Model (SDOH) as an overarching theoretical framework for this needs assessment. The SDOH serves as a guide for exploring the complex intersections between social, cultural, economic, political, and systems level influences on mental and physical health among diverse populations throughout the region.[1]

SOCIAL DETERMINANTS OF HEALTH MODEL

The World Health Organization defines the SDOH as encompassing "the conditions in which people are born, grow, live, work, and age … circumstances shaped by the distribution of money, power, and resources at global, national, and local levels."[1] It is important to explore the social and physical environments in which people live as we strive to see health in terms of holistic wellbeing instead of merely as the absence of disease or illness. Issues such as access to health care, neighborhood safety, economic stability, and many other conditional influences affect individual and population health. It is also important to understand the context in which people make decisions that affect their health. Accordingly, the SDOH is now widely recognized as a critical model that attempts to explain and mitigate health disparities and inequities worldwide.

Figure 13 depicts a working model of the SDOH, illustrating correlations between multiple social factors that affect health outcomes and individual and community wellbeing.[1] The SDOH model does not ignore the immediate causes of poor health such as individual decisions and genetics, but it expands the picture to consider the upstream factors that create the conditions for poor health and inequitable access to resources. This framework helped us to identify critical information that could help elucidate both immediate and underlying community needs and assets. By highlighting the unique aspects of geography, demography, and the economic and social context of the region, this report will help to guide regional partners in creating locally adaptive and relevant strategies that can make a lasting and positive impact on the health of the region.

MIXED-METHODS RESEARCH DESIGN

The needs assessment team consisted of researchers and affiliates who brought a diverse set of skills including qualitative and quantitative research, biostatistics, community-based participatory research, data informatics and imaging, GIS (Geographic Information Systems) mapping, and program evaluation. The team used a mixed-methods research design to gather, analyze, and integrate both qualitative and quantitative data to understand health issues, contexts, priorities, and assets and to help build a more complete picture of health and wellbeing across the region. By collecting and analyzing both qualitative and quantitative data, the team was able to triangulate findings and help compensate for the weaknesses of each type of data. There are areas where qualitative data helped to explain the significance or seeming inconsistency in the numbers, and there are also instances where the statistical data helped to give credence to the anecdotal evidence. Utilizing a mixed-methods approach allowed for a more in-depth picture of health and wellness priorities and assets throughout the northern Arizona region.

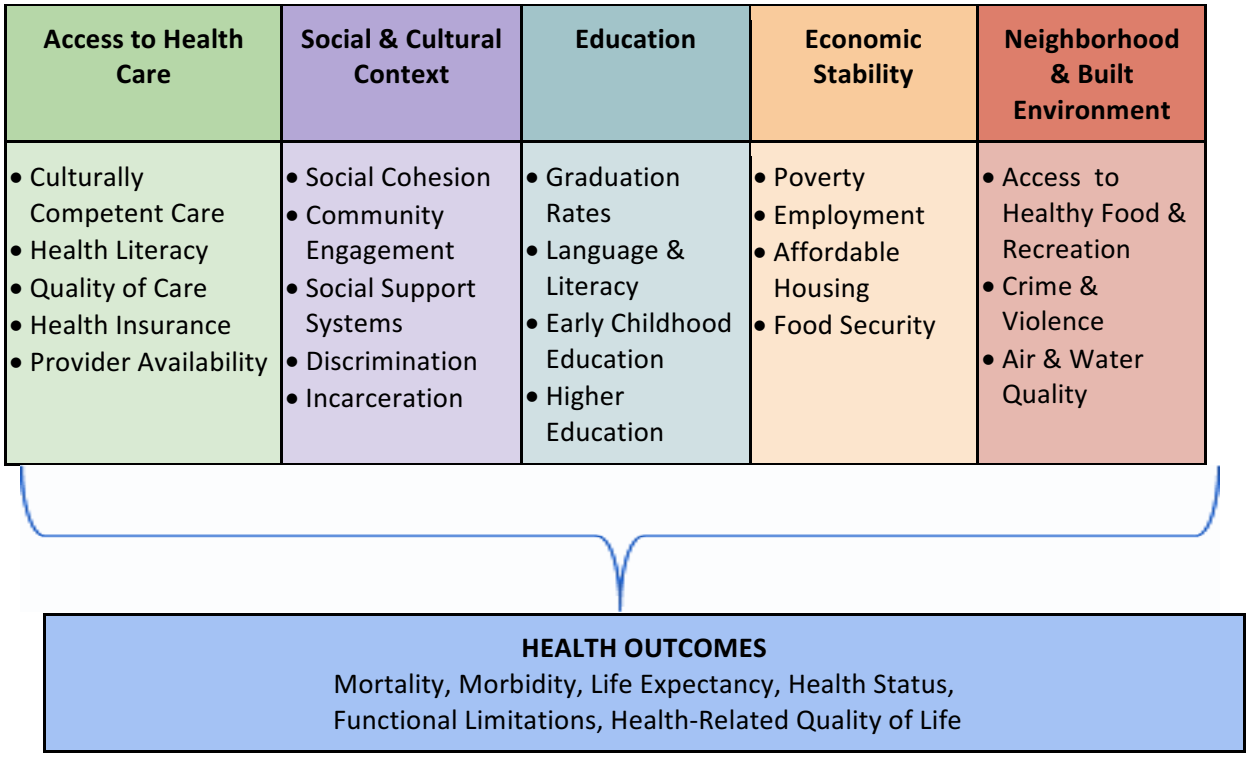

Figure 13. The Social Determinants of Health Model (SDOH).

To collect qualitative data, the team conducted focus groups and interviews with community members, leaders, and health care providers. The team also attended various community forums and regional health conferences, and held meetings with a variety of local stakeholders and community organizations. The focus of these data collection methods was to draw on the firsthand experience of those living and working in the region to document their perceptions and priorities regarding health in their communities, and to add important social and cultural contexts to health issues that are not measurable using strictly quantitative data.

To collect relevant quantitative data, the team focused on primary data sources that included geographic resolution at the zip code or county level. The main data sets analyzed were from the Behavioral Risk Factor Surveillance System (BRFSS) and the Arizona Department of Health Services Hospital Discharge Data. The BRFSS data include important indicators that address topics such as access to health care, self-reported health status, preventative and health management behaviors, and additional social determinants of health such as income and education.[10] The hospital discharge data include all hospital admissions and emergency department visits, and show both primary and secondary diagnoses of all patients who sought care at every hospital across the region. These data can be aggregated to show prevalence of more than 250 health conditions according to any number of categories including insurance type, gender, age, ethnicity, and zip code of residence. The report also includes a number of secondary data sources, aggregated at the county level.

Throughout the process, the team continuously conducted an informal gap analysis through constant comparison of emerging trends and themes, existing data, and community and stakeholder priorities. Quantitative and qualitative researchers frequently came together to discuss the research process, available data, and preliminary findings. This process helped to identify strategic areas for deeper data-dives and to inform the data collecting and analysis practices from both teams.

Qualitative Methods

The first phase of this project involved conducting **visioning focus groups** with project funders and key stakeholders within the region. Questions posed to participants were open ended and all members were given a chance to participate. During these visioning groups, participants discussed a variety of topics including emerging and persistent health priorities, available data sources, additional stakeholders to incorporate into the process, and desired deliverables of the project. The research team used these groups as a first step to outline the overall goals and scope of the project. All visioning focus groups were audio recorded and transcribed verbatim. The transcriptions were then coded using NVivo Qualitative Analysis Software.[15] Analysis of the data followed a standard ethnographic approach of identifying consensus-level themes and trends.[16]

We began each visioning group using a standard ethnographic approach known as **freelisting** to design knowledge-based and opinion-based questions about health.[17] A freelisting-style question allows for a mixed-methods (both qualitative and quantitative) approach to data collection. The participant is asked to list everything they can about a particular topic—e.g., *list all of the health disparities or health issues that exist in northern Arizona that we could address in this assessment*. We used this technique to build a consensus model of health priorities of key stakeholders. The freelisting data were analyzed using a cognitive anthropology program called Anthropac.[17] The program allows the composite freelistings from all respondents to be displayed in a table that lists all items mentioned by all participants and identifies the rank ordering, saliency, and frequency of each item. We categorized each response into broader topic areas to highlight areas of general consensus.

As part of this needs assessment process, the research team collected, analyzed, cross-checked, and **synthesized** existing regional and institutional reports and data, such as county health needs assessments, health improvement plans, and reports on specific health issues in the region. These investigations were focused on the needs and assets identified in existing local, regional, and statewide assessments. Because of the prevalence of additional data sources for specific and up-to-date quantitative indicators and measures, we chose to focus on broader themes, key priorities, and the qualitative methods used by various counties and agencies to gain an understanding of the social context of health needs and assets within the region, as well as areas of underlying methodological biases and potential gaps in addressing health disparities in the region. Although needs assessments and strategic plans completed within the past 3 years were prioritized, we also collected assessments and plans conducted as far back as 2004. Older assessments were treated as longitudinal assessment data, rather than current health data within the communities of interest.

The team collected and synthesized 57 documents, which included a needs assessment for each county in northern Arizona (Apache, Coconino, Gila, Mohave, Navajo, Yavapai), needs assessments for regional

medical centers within each county, assessments of tribal populations, and needs and assets assessments for organizations such as the Susan Komen Foundation, WIC, Veterans Affairs, and other organizations whenever available. Needs assessments that focused on specific illnesses, housing, disability, and other specific topics of interest with a statewide focus were included to provide in-depth information on programs within the region of interest. See Table 1.

Table 1: Documents Collected for Needs and Assets Assessment Synthesis

Region	Document Type	Population or Agency	Year (s)
AZ Statewide	Annual Report	Substance Abuse	2014
AZ Statewide	Annual Report	General Population	2011
AZ Statewide-Tribes	Annual Report	American Indian	2008
AZ Statewide-Tribes	Annual Report	American Indian	2014
County-Apache	Annual Report	General County Population	2013, 14
Tribe-Navajo	Annual Report	HIV/AIDS, Navajo Nation	2015
Tribe-Navajo	Annual Report	Tuba City Regional HC Corp.	2014
Tribe-Navajo	Health Survey	Navajo Nation	2013
AZ Statewide	Health System Review	Behavioral Health	2011
AZ Statewide	Health System Review	Developmental Disabilities	2016
AZ Statewide	Needs Assessment	HIV/AIDS	2014
AZ Statewide	Needs Assessment	WIC	2013
AZ Statewide	Needs Assessment	Oral Health	2004
County-Coconino	Needs Assessment	Flagstaff Medical Center	2012, 15
County-Coconino	Needs Assessment	Page Medical Center	2013
County-Coconino	Needs Assessment	General County Population	2013, 16
County-Gila	Needs Assessment	General County Population	2012, 15
County-Mohave	Needs Assessment	General County Population	2012,13
County-Mohave	Needs Assessment	Kingman Regional Medical Center	2016
County-Navajo	Needs Assessment	Little Colorado Medical Center	2014
County-Navajo	Needs Assessment	Summit Regional Medical Center	2015
County-Navajo	Needs Assessment	General County Population	2012
County-Yavapai	Needs Assessment	General County Population	2012
County-Yavapai	Needs Assessment	Yavapai Regional Medical Center	2013
Northern Arizona	Needs Assessment	Mental Health	2015
Northern AZ-Verde Valley	Needs Assessment	Verde Valley Medical Center	2012
Tribe-Navajo	Needs Assessment	Asthma	2015
Tribe-Navajo	Needs Assessment	Tsehootsooi (Ft. Defiance) Medical Center	2013
US Border States	Needs Assessment	CHW Training Needs	2011
US Nationwide	Needs Assessment	Disabilities, American Indian	2011
US-Western States	Needs Assessment	Veterans	2014
Tribe-Hualapai	Needs Assessment/Assets Report	Hualapai Tribe	2014
AZ Statewide-Tribes	Report-AI Behavioral Health	Behavioral Health, American Indian	2012
AZ Statewide-Tribes	Report-AI Health Conference	American Indian	2012
AZ Statewide-Tribes	Report-AI Health Status	American Indian	2014
AZ Statewide-Tribes	Report-AI Trauma	American Indian Trauma	2011

Table 1 (continued)

AZ Statewide	Report-Breast Cancer Community Profile	Breast Cancer	2015
AZ Statewide	Report-Early Childhood Opportunities	Early Childhood	2015
AZ Statewide	Report-Oral Health	Oral Health	2016
AZ Statewide-Tribes	Report-Oral Health Summit	Oral Health, American Indian	2011
AZ Statewide	Report-Race/Ethnicity Comparative	Racial/Ethnic Differences in Health Status	2013
AZ Statewide	Report-Racial/Ethnic Health Status	Racial/Ethnic Differences in Health Status	2013
AZ Statewide	Report-SMI Service Capacity Assessment	Serious Mental Illness	2014
AZ Statewide-Tribes	Report-Tribes Consultation	American Indian	2015
AZ Statewide	Strategic Plan	Housing	2013-14
County-Apache	Strategic Plan	General County Population	2013
County-Coconino	Strategic Plan	General County Population	2014
County-Gila	Strategic Plan	General County Population	2012
County-Mohave	Strategic Plan	Mohave Regional Medical Center	2013
County-Navajo	Strategic Plan	General County Population	2013
Prescott–Quad Cities	Strategic Plan	General Population	2014

The initial synthesis of existing health needs assessments and strategic plans was completed using Excel to catalogue priorities and methods by region. In-depth syntheses using NVivo Qualitative Analysis Software involved the development of codes to categorize topics identified in the initial stages of coding.[15] NVivo coding was used to aggregate specific health topics, existing programs, evaluation status, and barriers to health as identified by the various counties. Further, several of the assessments reported on community surveys, key informant interviews, and focus groups. These reports provided initial community perspectives and informed our development of surveys and interview guides to use in this assessment.

Meetings with **stakeholder organizations** helped us to start to build relationships with organizations and agencies working on health issues throughout the region to get their perspective and insights into health issues as well as where to go for additional information. We met with a number of groups working on community health issues throughout the region who represent diverse populations such as the Intertribal Council of Arizona, First Things First, Health Choice Integrated Care, and county and tribal health departments and agencies. Because health departments are responsible for the community health needs assessments (CHNA), we used these meetings to discuss their most recent CHNAs. We did not ask participants to reiterate what was published in their needs assessments, but instead to expand on what was included and discuss issues that may not have been reflected in the needs assessment but are still prevalent in the community.

The team attended various **conferences** across the region to collect and share information. The main goals in attending these meetings and conferences was to introduce the goals and objectives of the project, solicit input on perceptions of health priorities, learn about key issues that are currently being addressed, and discuss potential collaboration and data sharing opportunities.

The research team conducted **interviews** with local stakeholders, health care providers, and community leaders. These semi-structured, one-on-one interviews were designed to explore a variety of community perspectives on the major health concerns and disparities as well as relevant community assets and strengths throughout northern Arizona. See Appendix A for the full interview question guide. The main topics we explored in these interviews are outlined as follows:

- Persistent and emerging health issues.
- Prevalent disparities and the populations most adversely affected by these disparities.
- Social/structural determinants of health (SDOH) that contribute to the disparities.
- Organization and agency level challenges needed to address health issues.
- Strengths of the health care system in northern Arizona that can be built upon to increase capacity and deliver quality health care services.
- Programs or organizations that employ innovative strategies to serve the needs of the community and have been successful in overcoming common challenges across the region.

We started by identifying three key groups of stakeholders (described below) who would offer complementary perspectives and insights into community health issues. To build a nominated expert sampling frame, we asked everyone we spoke with to name other people who they felt would offer a unique and relevant perspective on regional health issues. We divided the participants into three groups, outlined below, for coding purposes.

- Visioneers: People involved in health care or community life who can reach across county lines and offer a perspective of the entire region. This group includes researchers, consultants and tribal liaisons, and regional directors of programs and services.
- Community Leaders: Leaders of faith-based organizations, political officers, law enforcement officers, directors of community programs and services, and educators.
- Community Providers: Doctors, nurses, care coordinators, community health representatives, health educators, social workers, counselors, and other direct health service providers.

To ensure that we captured a thorough and varied sample of county and tribal level expertise, we developed a target sample schema, distributing the targets evenly across sectors of expertise, tribe, and county. See Tables 2 and 3.

Interviewers audio recorded each interview and took detailed notes. The research team then reviewed the audio recordings and transcribed exemplary and compelling quotes to be used in the final report. The interview notes were coded using NVivo Qualitative Analysis Software as described above. Researchers followed a standard ethnographic approach of identifying consensus-level themes and cultural perceptions, as well as variability around those themes.[16,18]

The team also collected supporting primary data through the implementation of **community member focus groups**. We used the focus groups as an opportunity to further explore priority health issues and document the stories and experiences of community members who are dealing with these issues firsthand. We also documented participants' perceptions of community sources of resilience and the experiences of people who are benefitting from successful strategies to help eliminate health barriers and disparities.

Table 2: Community Interview Sampling Schema

Home County of Participant							
Sector of Expertise	Apache	Coconino	Gila	Mohave	Navajo	Yavapai	Tribal
Behavioral Health Services	✔	✔	✔	✔	✔	✔	✔
Medical Provider	✔	✔	✔	✔	✔	✔	✔
Housing/ Shelter Services	✔	✔			✔		
Food Security and Hunger	✔				✔	✔	
Youth Programs			✔	✔			✔
Education		✔	✔			✔	
Senior Services	✔				✔		✔
Jail & Probation Services		✔				✔	
Fire Dept. and First Responders	✔	✔			✔		

We conducted seven focus groups that represented geographically diverse areas across the region including Page, Winslow, Kingman, Payson, and Springerville. We also used our preliminary data-dive to locate some specific area residents who face unique challenges regarding health and wellness including older adults, low-income residents, border town residents, veterans, and residents of very remote or rural locations. See Appendix B for the full focus group question guide.

Photovoice is a participatory qualitative research method in which participants go out into their community and take photographs to explore community issues and identify community needs and assets. We are implementing this data collection technique to include the voices of young people across the region in a creative way that will allow community members to share their stories and experiences through a powerful visual medium.[19] The team conducted a training and information session with two youth groups and then sent them out into their communities to take photographs. After the photographs were developed, the participants engaged in a group discussion with researchers to talk about the pictures they took, the significance of the images, what the pictures represent to the photographer and to the rest of the group, and what context the pictures can provide to the overall health of their communities. This method also facilitates the development of a critical dialogue between researchers and community members where participants can explore community issues as they construct meaning through their own personal experiences.[20] Oftentimes, the photos serve as a springboard to enter into a meaningful discussion of many topics and issues surrounding health and wellness. This method also allows participants to advocate for themselves and their communities using their own language and experiences.[21] Through Photovoice, we asked young people to explore themes related to (1) health concerns or problems prevalent in their community; (2) things that made it more difficult to be healthy in the community; and (3) things that made it easier for people in the community to be healthy.

Table 3: Summary of Qualitative Methods

Method of Data Collection	Examples of Participants	Number completed
Synthesis of existing needs assessments	• County Assessments • Tribal Assessments • Regional Assessments • Medical Center Assessments • Private Foundation Assessments	57
Meetings with stakeholder organizations	• NARBHA Institute • NAH Foundation and NAH • North Country Healthcare • Intertribal Council of Arizona • County and Tribal Health Departments • First Things First • HCIC	18
Conferences and community forums	• Indigenous Community Forums • Indian Disability Summit • Navajo Nation COPE Symposium: Community Outreach and Patient Empowerment • AZ Rural Health Conference: U of A Center for Rural Health • HCIC Tribal Summit • Hopi Mental Health Conference • CHR Conference	13
Interviews with community leaders and providers	• Behavioral Health Care Providers • Medical Providers and CHRs • Housing and Shelter Services • Civic Organizations • Political Representatives • Food Assistance Services • Youth Programs and Education • Senior Services • Fire Department and EMT • Jail and Probation Services	62
Community focus groups	• Flagstaff – North Country HealthCare clients • Winslow – North Country HealthCare clients • Page – General Community • Lake Havasu – Head Start • Springerville – Senior Center • Bullhead City – American Legion	49
Photovoice	• Springerville Boys and Girls Club • Havasupai Youth Group	16

Quantitative Methods

Concordant with the overall project, the quantitative team also used the SDOH to provide a theoretical framework for the quantitative analyses. A simple aggregation of variables into theoretical constructs was not possible because multiple data sources used for these analyses provide estimates at differing levels of discrimination. For example, some may provide state-level estimates, some county-level estimates, and others zip code or census block-level discrimination. Although this might be construed as a limiting factor, we believe that this is rather a strength of the design. For certain data sets, the team used a top-down approach by fitting variables into a SDOH framework, *a priori* (e.g., Behavioral Risk Factor Surveillance System), whereas analyses with different data sets (e.g., American Community Survey) employ a bottom-up approach by combining variables into respective components, statistically, that aggregate themselves into categories that would fit into the SDOH model. We also used data representing rates of disease, illness, prevention behaviors, and rates of reasons for hospital utilization as a way to show disparities and priorities in health outcomes. A unique benefit of this top-down and bottom-up design is that all variables are captured and their respective weight to the SDOH model can be examined.

Negotiation of Data Use Agreements

As part of this needs assessment process, the quantitative team worked to secure critical database sharing agreements with the majority of our stakeholder groups, in order to conduct deep data-dives on all of the key public health, epidemiological, and health care metrics that have been identified in both the qualitative and the quantitative elements of the needs assessment. Some publically available data sets on key health needs are valuable for assessing overall health priorities and disparities, but the team discovered that state- and even county-level data do not provide the granularity needed to address some of the unique health disparities found in northern Arizona, because some of those needs and affected populations are overshadowed by the aggregate data from the broader region and state.

The team successfully negotiated a full public health data use agreement with the Arizona Department of Health Services (ADHS) and Northern Arizona University, and is now an accredited repository for all of the ADHS data sets, including birth, death, hospitalization and discharge, infectious disease, and immunization records for the entire state. The data use agreement includes the opportunity to work with third-party groups (such as hospitals, community clinics, etc.) to conduct analyses of all state health data. These data include both PHI (Personal Health Information) and PII (Personally Identifiable Information) which over time will allow us to, with appropriate IRB and HIPAA oversight, significantly refine our broader analysis of the public data sets and to identify the variability of needs across our geographical region, as well as identify the common needs that cut across the region. Access to these data will be extremely useful in many future health research endeavors at the university.

The quantitative team identified several data sources that helped to create a more robust picture of health disparities and areas of greatest health need in northern Arizona. The data sources that we used in our analysis are summarized below.

Data Sources

The **Behavioral Risk Factor Surveillance System** (BRFSS) is an annual phone survey conducted nationally through state health departments with technological and methodological assistance from the CDC. This survey is designed to assess health-related risk behaviors, chronic health conditions, and use of preventive services. It includes all 50 states and is large enough to provide state-specific estimates for key health risks and health resources. A key strength of the BRFSS is that it uses probability sampling and thus is representative of the non-institutionalized (i.e., not in a group home, in the military, or incarcerated) adult population of Arizona. Interviews are conducted using both landline and cellular telephones. For landlines, respondents are randomly selected from all adults living in the household. Cellular telephone respondents are treated as single households. Approximately 20% of completed interviews were cell phone respondents. This sampling approach provides a less biased assessment of several health indicators relative to other data sources such as those from health care institutions or health care contacts (e.g., primary care records). Persons under 18 are excluded from the survey and data on health conditions and chronic disease diagnoses are self-reported.[10]

We used publicly available codebooks to select key health assessments corresponding to Healthy People 2020 health indicators and other national health benchmarks.[1,10] We have restricted BRFSS data from 2013–2015, including county identifiers. We used these data to illustrate county-specific patterns for the key BRFSS variables within Arizona. The BRFSS data fit nicely into the SDOH framework because several of the leading health indicators for Healthy People 2020 are assessed in the BRFSS. These include insurance coverage, having a usual source of care, having unmet care needs, breast cancer and colorectal cancer screening, hypertension screening, obesity, health-related quality of life, smoking, and binge drinking.

We chose four key determinants available in the BRFSS data set to provide further analysis to highlight patterns and correlations between social determinants of health and priority health outcomes. These domains represent a broad set of health indicators and address stakeholder interest in comorbidity, i.e., the presence of multiple risk factors within individuals. These correlations are discussed in the Regional Health Overview, Priority Health Outcomes, Patterns and Disparities in Populations, and Social Determinants of Health sections of this report.

The **Arizona Department of Health Services (ADHS) Hospital Discharge** database comprises a primary data source that includes records for all inpatient and emergency department (ED) visits from all Arizona licensed hospitals. These data were instrumental in conducting regional comparisons of why people from different regions go to the ED and inpatient departments. This data set includes patient information such as residence zip code, age, ethnicity, and insurance payer. Not all data were analyzed in this first project phase, but future evaluations will include analysis regarding any disparities in diagnoses according to zip code, age, ethnicity and insurance payer. These data will also allow us to analyze ED utilization patterns to understand whether non-emergency ED discharges are more closely correlated with communities that either do not have access to care or usual transportation or are low-income or are less educated. We will use Primary Care Areas (PCAs) and zip code tracts as the major level of resolution for this data moving forward. A PCA is defined as a geographic area in which most residents seek primary health services from the same health facility.[22] This will allow a finer level of analysis than the general county and tribal level.

The **Centers for Disease Control and Prevention Wide-ranging Online Data for Epidemiologic Research** (CDC WONDER) is a publicly available web application that manages 20 data sources including U.S. births, deaths, cancer diagnoses, Tuberculosis, cases, vaccinations, environmental exposures, and population estimates. Understanding the leading causes of death within a geographically defined population can lend insight into health problems that are more specific to that population. To better understand causes of mortality that are unique to the six counties of northern Arizona, together and individually, we accessed the 15 Leading Causes of Death database that is part of CDC WONDER. The data are aggregated from the 57 different Vital Statistics jurisdictions in the United States over 5 years (2011–2015).[23]

Additional Data Sources

A number of additional sources provided data at the county level. Although we were unable to conduct secondary analysis on this information at a granular level, these data were very helpful for comparing indicators across counties in the northern Arizona region and comparing the regional averages with statewide trends and U.S. trends. Many of these databases are compiled from other federally funded primary sources, including the U.S. Census Bureau, the Center for Disease Control and Prevention's (CDC) Behavioral Risk Factor Surveillance System (BRFSS), the American Community Survey (ACS), the National Cancer Institute (NCI), and several others.

Arizonahealthmatters.org is an excellent database for researchers to identify issues impacting Arizonans. The embedded community dashboard includes 164 indicators, which are available by state and county level. This database is updated within 3 months of a new data release from data sources.[24]

The **Community Health Rankings** database is created and maintained by the Robert Wood Johnson Foundation. This database includes 58 health indicators from a variety of sources, and the indicators correspond to a variety of focus areas including health outcomes, quality of life, health behaviors, clinical care, social and economic factors, and physical environment. The data are only available at the county level but are important for describing some key health issues in the region. The data were last updated in 2017.[25]

The **Center for Disease Control Community Health Status Indicators** (CDC CHSI) database includes 43 indicators that represent categories such as mortality, health care access and quality, health behaviors, social factors, and physical environment. The data were last updated in 2015.[26]

The **Kids Count Data Center**, created and maintained by the Annie E. Casey Foundation, contains a variety of indicators related to child and family wellbeing. Depending on the indicator, data are available at the national, state, and county level. Certain indicators are available at the zip code level in some places. Although we only used data that were available with at least county-level resolution, some important indicators used from this database included children receiving SNAP and TANF benefits, children ages 3–4 enrolled in school, adolescent suicides, and juvenile arrest rates. [27]

We used **U.S. Census** data at the county level to gather descriptive statistics on county-level population distribution across the region, county age distribution, poverty, unemployment, rural vs. urban

populations, and veteran population. The census was last updated in 2010, although 2015 estimates are available for some indicators.[2]

The **American Community Survey** (ACS) is conducted every 5 years by the U.S. Census Bureau. Surveys are mailed to 295,000 addresses each month. It is important to note that people are not selected, but rather addresses are selected to ensure geographic coverage. If forms are not returned, second forms are mailed, followed by telephone calls and personal visits to a subsample of non-responders and group residences. The resulting data from this ongoing survey are distributed to federal, state, and local agencies to assist in the decision-making process for allocation of nearly $400 billion in funding per year. The indicators included in this survey include population, housing, and social and economic characteristics of communities that are comparable across the country. This data set allows us to compare previous and current data and to establish a benchmark with which to compare future data and to highlight trends.[28]

The **Arizona Youth Survey** (AYS) was administered by the Arizona Criminal Justice Council to a statewide sample of eighth, tenth, and twelfth grade students in 2016. The survey uses the Risk and Protective Factor model to assess the prevalence and frequency of youth behaviors. The questions cover topics such as substance use, gang involvement, attitudes towards family and community, safety, and prosocial behaviors.[29]

The **Arizona Department of Education** collaborates with local school districts, the Arizona State Legislature, and the U.S. Department of Education to gather data on many indicators related to student and school performance.

The **Arizona Department of Health Services** (ADHS) publishes statistical profiles on each primary care area in the state of Arizona. Statistical profiles of PCAs include information on demographics, health resources, and health status indicators. These profiles are updated annually.[22]

Mapping and Informatics

The above-mentioned approaches provide statistical rigor and comprehensive analytics. Mapping through Geographic Information System (GIS) analysis provides additional visualization of the location of health care facilities, distribution mapping of PCAs, and distribution mapping of food deserts, etc.

RESULTS

The results of our mixed-method inquiry are presented first via an overview of the health of the region, which includes leading causes of mortality, hospital inpatient and ED visits, priority health outcomes, and patterns of disparities among populations. The bulk of the qualitative findings are summarized and discussed using the SDOH framework and incorporating quantitative data. Issues regarding access to health care are followed by discussion of economic stability, education, and the neighborhood and built environment. The discussion of social determinants of health includes social and cultural contexts that impact health, and community strengths identified in the needs and assets assessment. Organizational barriers related to addressing health issues are also presented, along with a list of priority services and supports identified through the needs assessment.

REGIONAL HEALTH OVERVIEW

One approach to understanding population health involves the assessment of health-related quality of life (HRQOL), which refers to mental and physical wellbeing as well as an individual's general health perceptions. These domains are regularly assessed in population health surveys because they mirror known racial and ethnic disparities and predict important outcomes such as health care utilization and mortality.[30] The BRFSS includes HRQOL measures and therefore provides an overall picture of the health status and resources of northern Arizona. The most global indicator of HRQOL—self-rated health—is assessed by asking respondents to rate their health as poor, fair, good, very good or excellent. This single item provides an integrative summary of health status and is particularly noteworthy because it predicts mortality independent of age, sex, smoking, existing disease, etc. and is more strongly related to mortality than a large number of clinical biological measures. Figure 14 shows responses aggregated at the county level for participants who rated their health as good, very good, or excellent.

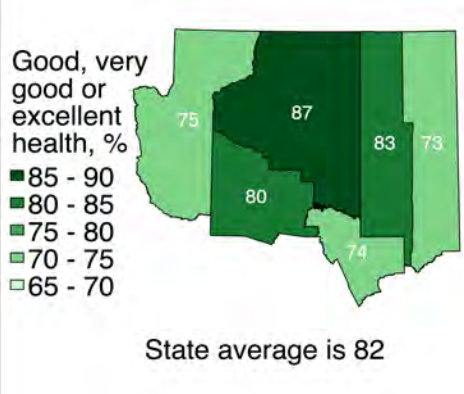

Figure 14. BRFSS self-rated health status.

Arizona residents report good health status overall, with Apache (73%), Gila (74%), and Mohave (75%) counties having notably lower numbers of adults reporting good, very good, or excellent health status. These are large absolute differences relative to the state in general whereas Coconino County residents report the best health status (87%) of any county in Arizona.

The extent to which people feel physically or mentally unhealthy is related to overall health (Figures 15 and 16). Respondents were asked, "how many days in the last 30 was your physical health not good?" The percentage of adults who reported 14 or more days of poor physical health (a standard definition of poor health) in northern Arizona was generally above the state average. There was a high burden of physically unhealthy days in Mohave County where, along with Apache county, a higher burden of the number of mentally unhealthy days was also observed (days when people were sad, blue, or depressed).

Difficulty with activities of daily living (dressing, bathing, running errands, etc.) is strongly associated with overall wellbeing (Figure 17). These difficulties represent another substantial health burden in northern Arizona residents. Although Coconino County has the lowest percentage of adults reporting any activity limitations, elsewhere in northern Arizona the burden of difficulties is high, with a third or more of adults in Yavapai, Gila, and Apache counties reporting some difficulty and 36% of Mohave County adults reporting some difficulty with these activities. This appears to indicate one of the largest health disadvantages in the state and is a pressing health need.

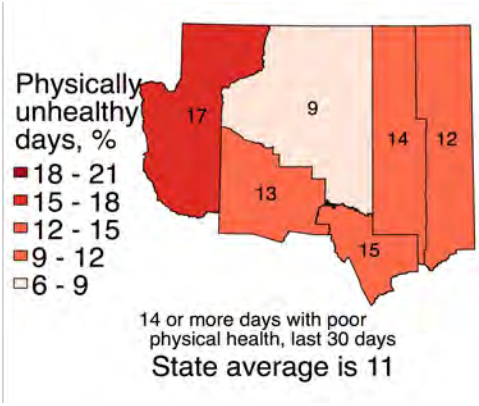

Figure 15. BRFSS physically unhealthy days.

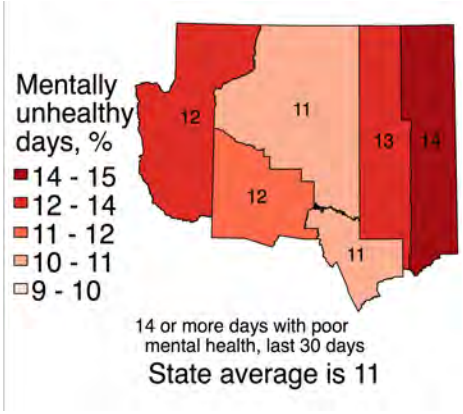

Figure 16. BRFSS mentally unhealthy days.

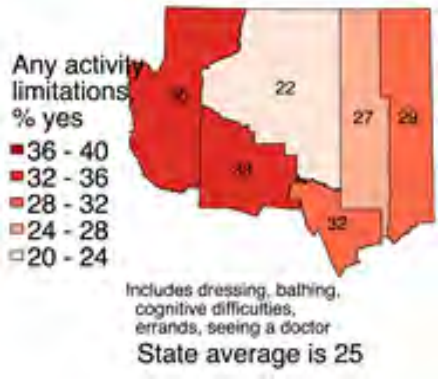

Figure 17. BRFSS activity limitations.

LEADING CAUSES OF MORTALITY

Regional Trends

Understanding the leading causes of death within a geographically defined population can lend insight into health problems that are more specific to that population. To better understand causes of mortality that are unique to the six counties of northern Arizona, together and individually, we accessed the 15 Leading Causes of Death database that is part of CDC WONDER. The data are aggregated from the 57 different Vital Statistics jurisdictions in the United States over 5 years (2011–2015).[23] Table 4 presents the leading causes of death for the northern Arizona region.

Table 4: Leading Causes of Mortality across Northern Arizona Region: 2011–2015 (All Ages)[23]

15 Leading Causes of Mortality	Deaths	Crude Rate	Age Adjusted Rate
Diseases of heart	9681	245.3	172.4
Malignant neoplasms	9420	238.7	160.4
Accidents (unintentional injuries)	3216	81.5	79.2
Chronic lower respiratory diseases	3047	77.2	52
Cerebrovascular diseases	1812	45.9	32.3
Diabetes mellitus	1276	32.3	23.3
Alzheimer's disease	1208	30.6	22
Intentional self-harm (suicide)	1207	30.6	30.3
Chronic liver disease and cirrhosis	1167	29.6	25.5
Influenza and pneumonia	841	21.3	15.5
Nephritis, nephrotic syndrome and nephrosis	602	15.3	10.6
Parkinson's disease	475	12	8.3
Essential hypertension and hypertensive renal disease	427	10.8	7.5
Septicemia	394	10	7.2
Assault (homicide)	272	6.9	8

*Rates are per 100,000 individuals.

When comparing the entire United States population, 14 of 15 leading causes of death are the same. In the entire United States population, Pneumonitis due to solids and liquids (including inhalation of food, vomit, oils, essences, and other solids and liquids) is the 15th leading cause of death, whereas the Arizona list (including three of the six northern Arizona counties: Apache, Coconino, and Navajo) includes assault (homicide). Figure 18 shows only the causes of mortality (age-adjusted rate per 100,000) that were higher in northern Arizona than in the state and the nation. See Appendix C for a complete list of leading causes of mortality at the national, state, and county level. Figure 18 shows the causes of mortality that rate higher in northern Arizona than the national and state rates.[23]

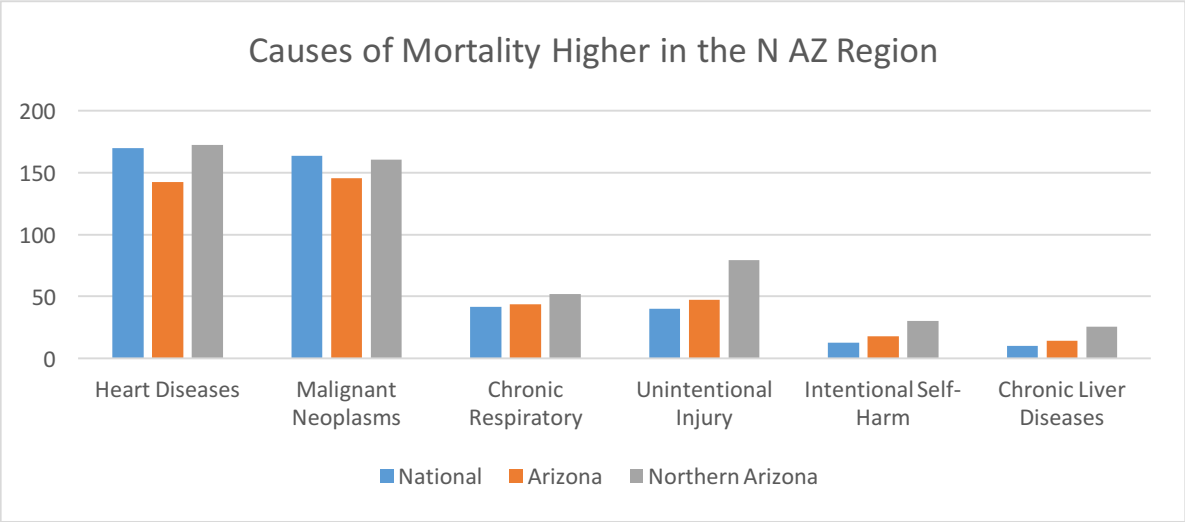

Figure 18. Mortality causes higher in northern Arizona: Age-adjusted rate per 100,000, 2011–2015.[23]

County Trends

The 15 leading causes of death are the same among Arizona and the six counties of northern Arizona, but are ordered differently. Figures 19 and 20 show the leading causes of mortality by county. It is important to note the age demographics of the county, which can affect what types of diseases are affecting community members. Gila, Mohave, and Yavapai counties have the highest rates of people over the age of 65 whereas in Navajo and Apache counties, about 30% of the population is under the age of 18.[23]

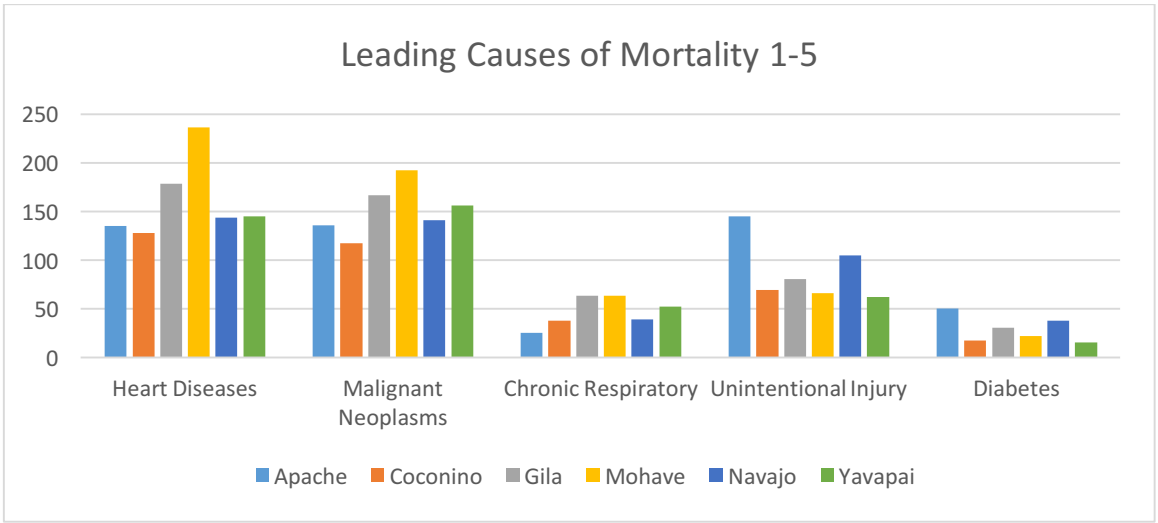

Figure 19. Leading causes of mortality by county.[23]

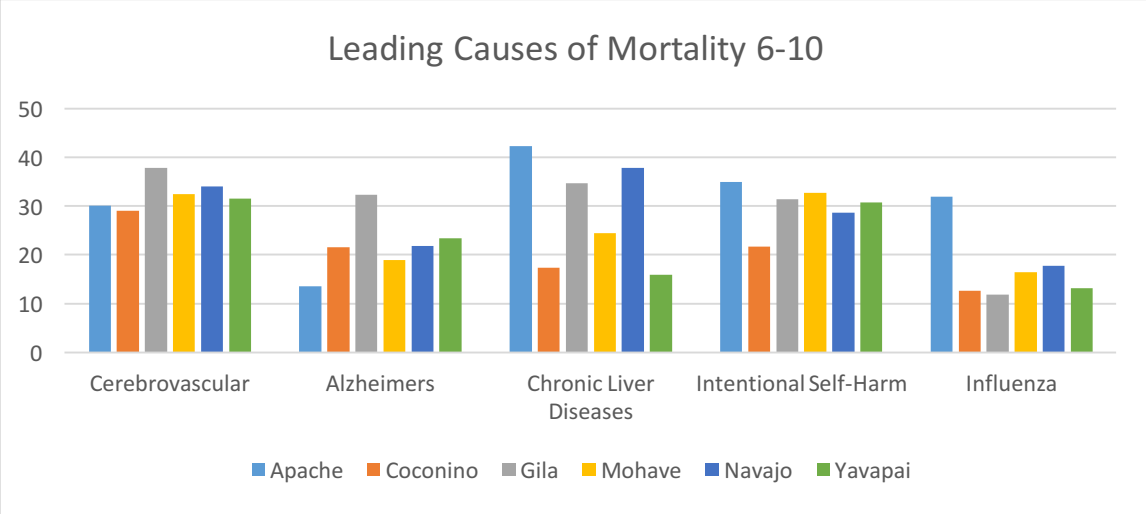

Figure 20. Remaining leading causes of mortality by county.[23]

CAUSES OF HOSPITAL ADMISSION AND EMERGENCY VISITS

In an effort to understand health differences among the populations living in northern Arizona, when stratified by geographic differences, we analyzed the 2010 and 2014 hospital discharge databases provided by the Arizona Department of Health Services. The data sets contained more than 100 variables for every inpatient and emergency department visit made by residents of the six counties of northern Arizona, excluding visits made to Indian Health Service facilities. To better understand the clinical manifestations that are most greatly impacting the residents of northern Arizona, we used a systematic approach, driven by the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM), which is a standardized list of six-character alphanumeric codes to describe diagnoses.[31] We are using this coding system rather than the more recent ICD-10-CM system because the majority of the data sets that we have collected fall into the same timeframe as the ICD-9-CM system (until October of 2015). The ICD-9 codes are used by hospitals to categorize procedures and diagnoses for billing purposes.

There are some limitations with this data set. Because diagnostic codes are not collected for research purposes, ICD-9 diagnostic codes may not capture a diagnosis accurately. ICD codes may reflect provider diagnostic practices or preferences. Providers do not always choose the codes that make it to the final billing submission. Moreover, conditions must be diagnosed in order to be classified, and some diseases, such as hypertension, depression, and diabetes, are often under-diagnosed. Diagnosis information may not be comprehensive; for example, there is limited clinical information such as physiological measurements, test results, and data about how long someone has had a disease or condition and its severity. This data set is not "linked," meaning there is no way to account for one patient making multiple hospital visits for the same condition. Each time that person visited the hospital would count as a separate data entry. However, because the use of ICD codes is increasingly commonplace, studies on code accuracy are available for a wide variety of disease and discipline specific journals.

Regional Trends

To understand the larger picture of types of conditions that most commonly affect northern Arizona residents, we divided the codes into the clinical categories shown in Table 5. For a complete list of ICD-9 codes included in each category, see the left-hand column in Table 5.

To better understand the clinical manifestations that result in the greatest number of inpatient and emergency department visits, we parsed the data for the top 10 principal ICD-9 codes associated with visits. Table 6 shows the top 10 principal diagnostic codes for inpatient admissions and emergency department visits made by residents of the northern Arizona region in 2010 to any hospital in Arizona (excluding Indian Health Service facilities) according to the clinical categories of the principal diagnoses codes. These are specific diagnoses that refer to specific conditions, not general categories as in Table 5. Table 6 also includes the total medical expenditures related to each condition.

Table 5: List of ICD-9 Code Categories

ICD-9 Codes	Disease Category
001-139	Infectious and Parasitic Diseases
140-239	Neoplasms
240-279	Endocrine, Nutritional and Metabolic Diseases, and Immunity Disorders
280-289	Diseases of the Blood and Blood-Forming Organs
290-319	Mental Disorders
320-389	Diseases of the Nervous System and Sense Organs
390-459	Diseases of the Circulatory System
460-519	Diseases of the Respiratory System
520-579	Diseases of the Digestive System
580-629	Diseases of the Genitourinary System
630-679	Complications of Pregnancy, Childbirth, and the Puerperium
680-709	Diseases of the Skin and Subcutaneous Tissue
710-739	Diseases of the Musculoskeletal System and Connective Tissue
740-759	Congenital Anomalies
760-779	Certain Conditions Originating in the Perinatal Period
780-799	Symptoms, Signs, and Ill-Defined Conditions
800-999	Injury and Poisoning
V01-V91	Supplementary Classification of Factors Influencing Health Status and Contact with Health Services

Table 6: Top 10 Most Common Clinical Manifestations for Northern Arizona Residents, 2010

Inpatient Visits				Emergency Department Visits			
Clinical Category	Visits	Charges	ICD-9 Codes	Clinical Category	Visits	Charges	ICD-9 Codes
Urinary tract infection site not specified	5613	$24,746,092	599.0	Pneumonia, organism unspecified	763	$22,792,109	486.
Acute upper respiratory infections of unspecified site	5049	$4,330,791	465.9	Chronic bronchitis	486	$16,603,823	491.21
Live born Infants	4761	$22,148,162	V30.00	Unspecified septicemia	465	$37,544,836	038.9
Other chest pain	4612	$45,954,799	786.59	Acute pancreatitis	411	$13,825,668	577.0
Headache	4377	$13,553,019	784.0	Cardiac dysrhythmias	366	$9,911,539	427.31
Unspecified otitis media	4357	$2,949,013	382.9	Other chest pain	348	$9,394,414	786.59
Abdominal pain unspecified site	4313	$20,900,815	789.00	Acute kidney failure, unspecified	322	$13,114,720	584.9
Pneumonia, organism unspecified	4023	$51,599,838	486	Urinary tract infection site not specified	310	$8,527,051	599.0
Acute pharyngitis	3933	$3,378,818	462	Subendocardial infarction initial episode of care	307	$24,982,557	410.71
Unspecified chest pain	3691	$21,534,183	786.50	Cerebral artery occlusion unspecified with cerebral infarction	283	$11,758,332	434.91

County Trends

The discharge data from all hospitals from 2010 and 2014 show very similar patterns in reason for inpatient admission across the region. For a full list of the top 15 diagnoses for inpatient admissions and ED visits by county, please see Appendix D. The ICD-9 categories with the highest percentages were injury and poisoning at 20–22%, ill-defined conditions at 12–18%, and respiratory conditions at 10–15%. Digestive conditions were in the 6–8% range and musculoskeletal conditions were in the 6–9% range. In Apache County, 15% of admissions were classified as respiratory conditions and the rate for all other counties was 10%. In Coconino County, mental disorders were the highest at 6% and in 2014 the percentage rose to 8%. All other counties ranged from 2% to 4%. In Yavapai County, musculoskeletal disorders were the highest at 9% and all other counties ranged from 4% to 7%. The most common reasons for ED visits were also very similar across the counties. Over the same time period, injury and poisoning as well as respiratory conditions were the top two reasons for the ED visit. In most counties,

musculoskeletal conditions or digestive conditions took the number three spot, but in Coconino County the third highest rate was mental disorders.

Primary Care Area Trends

Because there is a high degree of demographic variability in communities within the county boundaries, we used primary care areas (PCAs) as a more granular geographically defined category. Again, a PCA is defined as a geographic area in which most residents seek primary health services from the same health facility.[22] Figure 21 shows the 26 PCAs in northern Arizona.

Figure 22 shows ED and inpatient visits per 10,000 residents living in a primary care area in 2014, calculated from the hospital discharge data. The values representing the height of each bar were determined by dividing the total number of visits per primary care area by the number of residents living in that primary care area, and then multiplying by 10,000 to get a crude rate. Because this is a rate of visits, instances where the rate per 10,000 people exceeds 10,000 indicates the prevalence of individuals visiting the hospital multiple times. Sometimes one individual could have dozens of visits to the hospital in a given year. Again, this does not include visits to IHS or all Tribally-governed facilities.

Figure 21. Map of primary care areas in Arizona.[32]

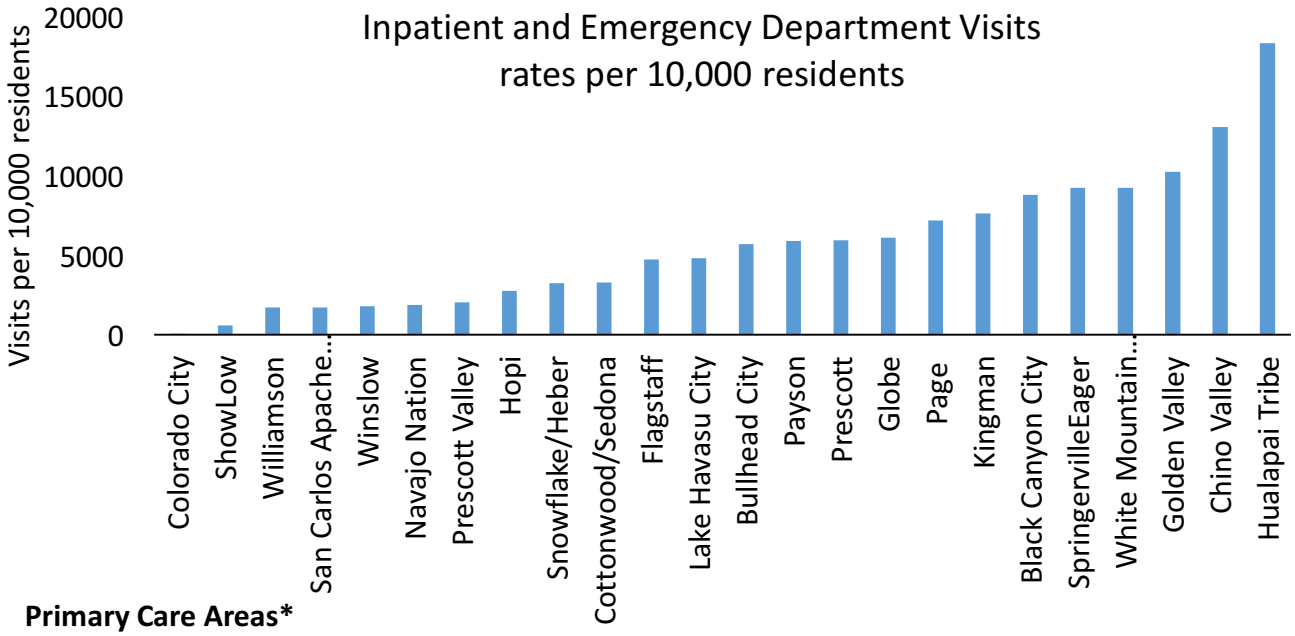

Figure 22. Hospital visits per 10,000 residents living in a primary care area in 2014. Does not include Grand Canyon Village PCA.

PRIORITY HEALTH OUTCOMES OF COMMUNITY MEMBERS

Priority health outcomes include what illnesses and conditions are of highest concern, discussed here from both a quantitative and qualitative perspective. In some cases, similar priorities are identified through both the qualitative and quantitative data. There are also some instances where priorities were identified by community members but were not the most prevalent heath issues according to county data. There could be a number of reasons for these differences, which are discussed.

Substance Abuse and Behavioral Health Issues

According to the qualitative data, substance abuse is perceived by many community members as one of the leading health priorities across the region. Participants frequently noted that substance abuse problems are often a cause of, as well as an outcome of, many broader health and social problems such as low educational attainment, poverty, unemployment, depression, and other mental and physical health issues. Not only does alcohol and substance abuse lead to chronic illnesses such as kidney disease, liver disease, and heart disease, but it is also a factor in many fatal injuries. As noted previously in this report, unintentional injury (accidents) was ranked in the top three leading causes of death for the region broadly, and was the number one leading cause of death in Apache County.

Alcohol abuse was the most prevalent concern but abuse of prescription drugs, methamphetamines, and heroin was also a major concern in many communities. Participants said that either alcohol or substance abuse was a factor in almost 100% of sexual assaults and suicide attempts at the time of the

act. Substance abuse was also seen as a key factor in domestic violence and child neglect, both of which are discussed further later in this report. Participants' perceptions of the causes and effects of high rates of substance abuse and its social impacts are discussed in various sections throughout this report.

Two behavioral **leading health indicators** in the BRFSS data set are tobacco use and alcohol use, particularly binge drinking (Figures 23 and 24). About 15% of Arizona adults report binge drinking (consuming five or more alcoholic drinks in one sitting for men and four or more for women). This is slightly lower than the 2015 U.S. median of 16.3%, with Coconino County the highest at 19%. Statewide, 16% of adults are current cigarette smokers with substantially higher rates in Mohave (23%), Gila (23%), and Yavapai (19%) counties. The national average for cigarette smoking was 17.5% in 2015. These are areas of particular concern because tobacco use is the largest preventable health risk behavior.

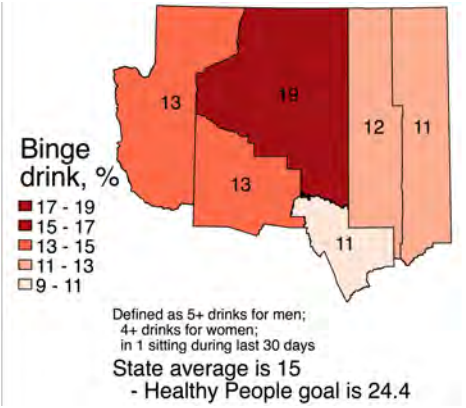

Figure 23. BRFSS binge drinking by county.

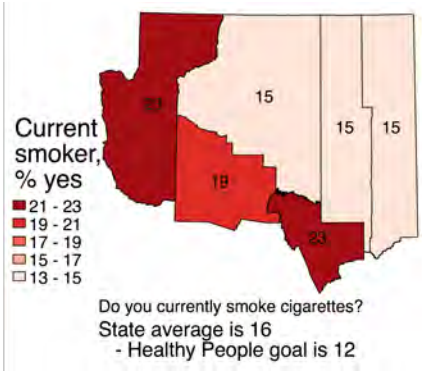

Figure 24. BRFSS smoking by county.

Figure 25 summarizes data from the Arizona Department of Public Safety crime reports. The graph shows substance abuse related to adult arrest rates per 1,000 people. These figures were created by averaging the total adult (over 18) arrests in 2013–2015. Most counties were at or below the state average for DUI arrests and marijuana possession, with the exception of Coconino County. Only Apache and Coconino counties were below the state average for arrest for possession of other dangerous narcotics, whereas Mohave County was more than 5 times higher than the state average. Mohave and Navajo counties were almost 1.5 times higher than the state average for liquor law violations, and Coconino County was more than 3 times higher.[33]

According to data from the Arizona Youth Survey, the most commonly used substances among twelfth graders are alcohol, cigarettes, and marijuana. In five of the six counties, the percentage of students using cigarettes at least once by twelfth grade was above the state average. The percentages ranged from 41.6% in Gila and Navajo counties to 35.9% in Yavapai County. The state average for this indicator is 38.3%.[29] Figure 26 shows the percentage of twelfth graders who have used either alcohol or marijuana in the 30 days prior to taking the survey. These data are from 2016. Coconino County reported the highest rates of alcohol and marijuana use, whereas Apache County reported the lowest. The other four counties were fairly consistent with the state average.[29]

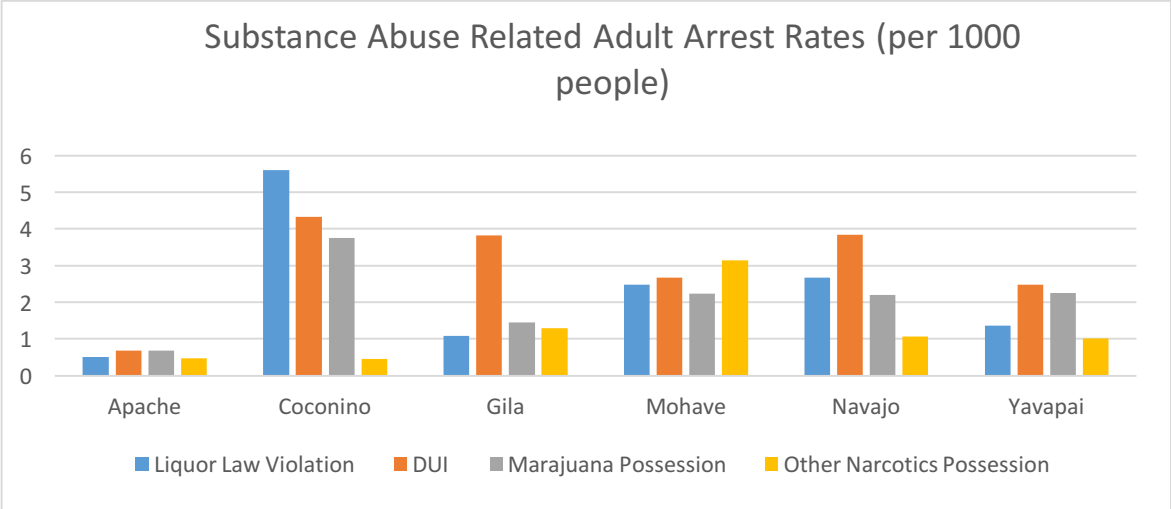

Figure 25. Regional substance abuse related arrest rates by county.[33] Calculated using data in Arizona crime reports from 2015 and 2015 Census population estimates.

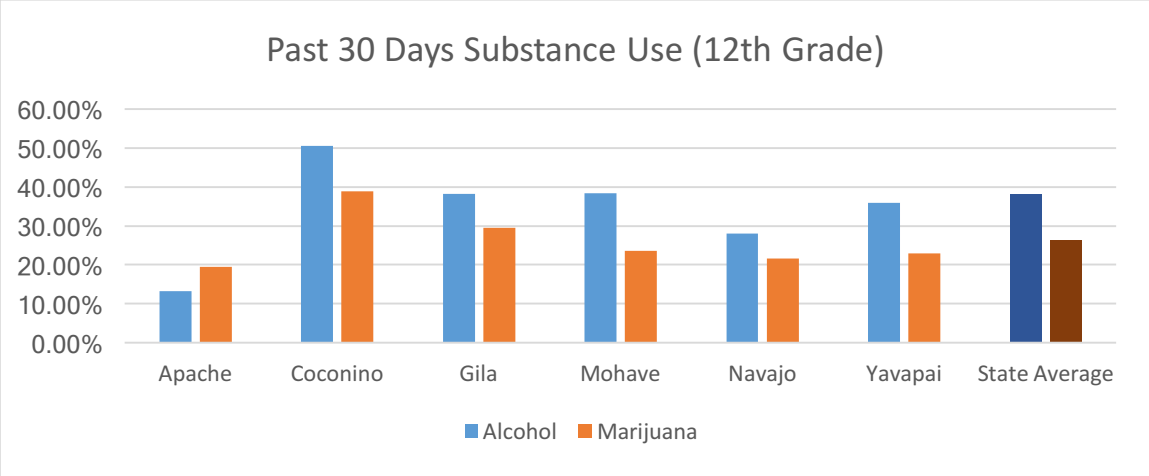

Figure 26. Alcohol and marijuana use by twelfth graders.[29]

The other most commonly used substances included prescription opioids, over the counter drugs, prescription tranquilizers, and prescription stimulants. Inhalants, hallucinogens, ecstasy, methamphetamines, and heroin were also reported but at rates much lower than other more common substances.[29] For these substances, Coconino and Gila counties were significantly higher than the state averages, and Apache County was again lower. The other three counties were fairly consistent with state averages.[29] See Figures 27 and 28.

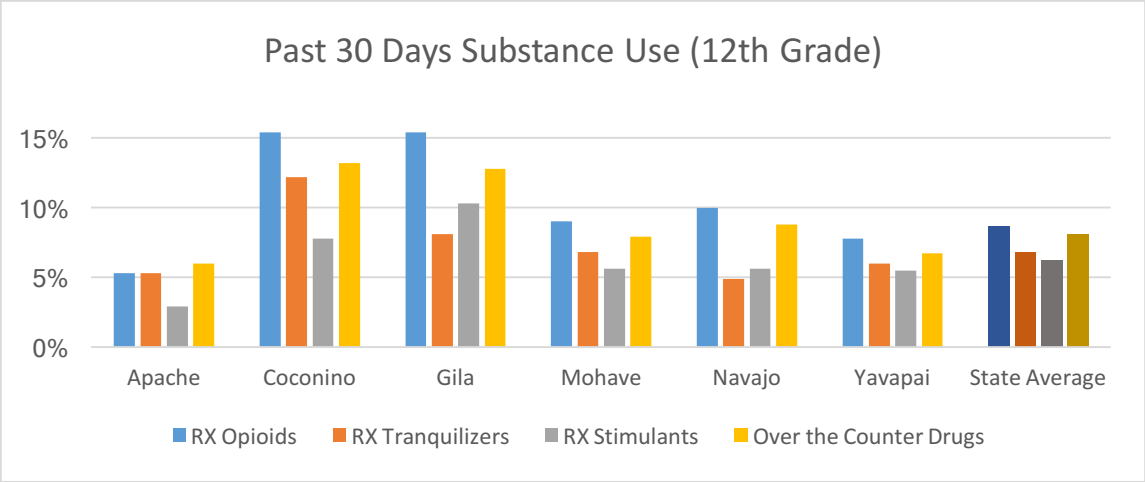

Figure 27. Other types of substance use by twelfth graders, prescription drugs.[29]

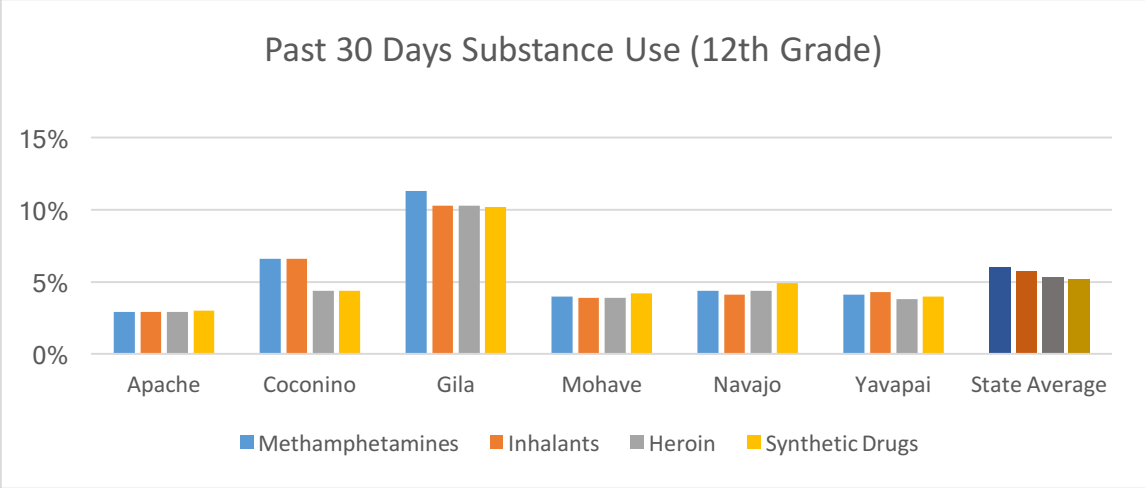

Figure 28. Other types of substance use by twelfth graders, non-prescription drugs.[29]

Despite the qualitative data pointing to substance abuse as a major concern for northern Arizona, the self-reported quantitative data largely point to substance use rates either at or below the state average among the general population. The only groups with elevated rates of substance use were young people in Coconino and Gila counties. These discrepancies could be due to the fact that the quantitative data set relies on self-report and it is possible that people could under-report their personal substance use. Also, the outcomes of substance abuse are palpable within families and communities; this is likely why this was a main topic of the health priority discussion among participants in the qualitative part of the study.

Participants felt that substance abuse is often an underlying factor in other priority behavioral health issues including unintentional injury, depression, suicide, domestic violence, and sexual assault. Many

participants discussed suicide as a priority community health issue, especially among young people (Figure 29). According to the CDC WONDER data, suicide was ranked as the eighth leading cause of death for the region as compared to the tenth leading cause of death in the United States. All six counties had higher age-adjusted rates of suicide compared to the U.S. rate. Northern Arizona also shows higher rates of unintentional injuries (accidents) resulting in fatalities (Figure 30). Participants identified this as related to substance use. Rates are particularly high in Apache and Navajo counties.[23]

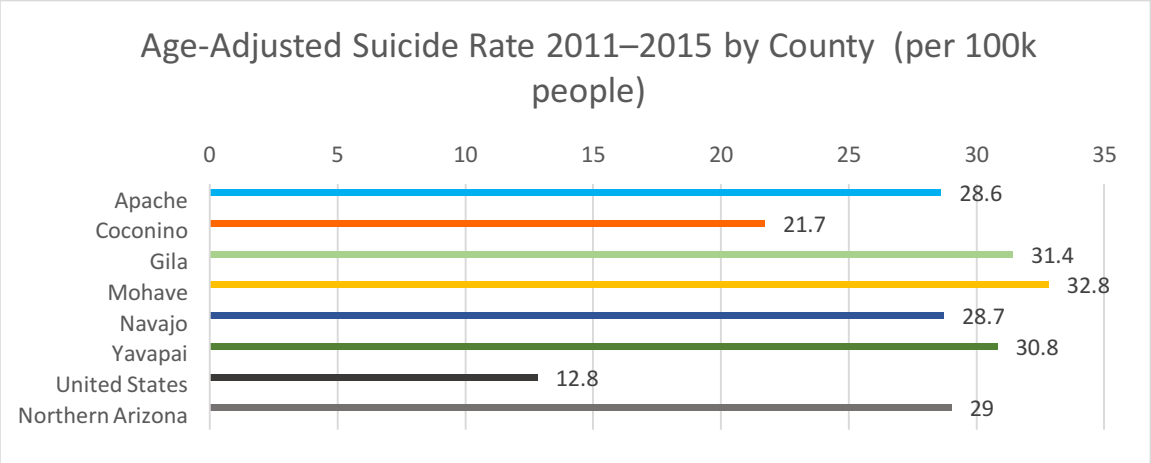

Figure 29. Suicide rates by county.[23]

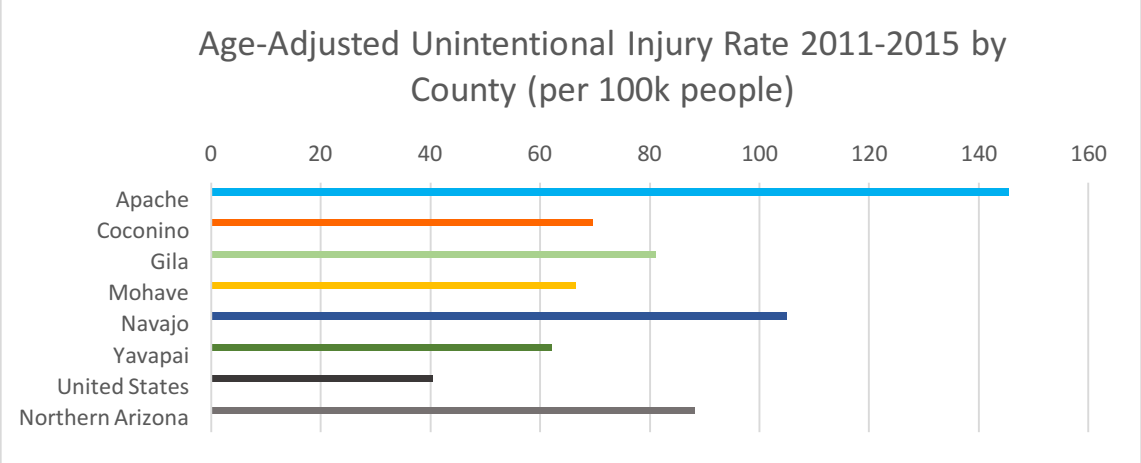

Figure 30. Unintentional injury rates by county.[23]

Figure 31 describes the distribution of age at the time of suicide, suicide attempt, or self-inflicted injury among northern Arizonans in 2014. Time of suicide, suicide attempt, or self-inflicted injury is identified from ICD-9 diagnostic codes from the Arizona Department of Health Services Hospital Discharge Data. These codes do not distinguish between patient encounters that resulted in death or any degree of recovery. For additional histograms showing age distributions by county, see Appendix E.

Suicide rates ranged from 1.0 to 2.3 suicides per 1,000 residents. The rate was highest in Navajo County and lowest in Apache County (see Appendix E). Most suicides for all counties were attempted by residents younger than 38 years of age. The age of suicide attempters was highest in Mohave and Yavapai counties; 31–34% of all suicide attempts in these counties were carried out by residents older than 48 years of age. Ages were youngest in Navajo and Coconino counties, where 16–17% of all suicide attempts were carried out by residents younger than 18 years of age. In Coconino County almost 40% of all suicide attempts were carried out by residents younger than 23.

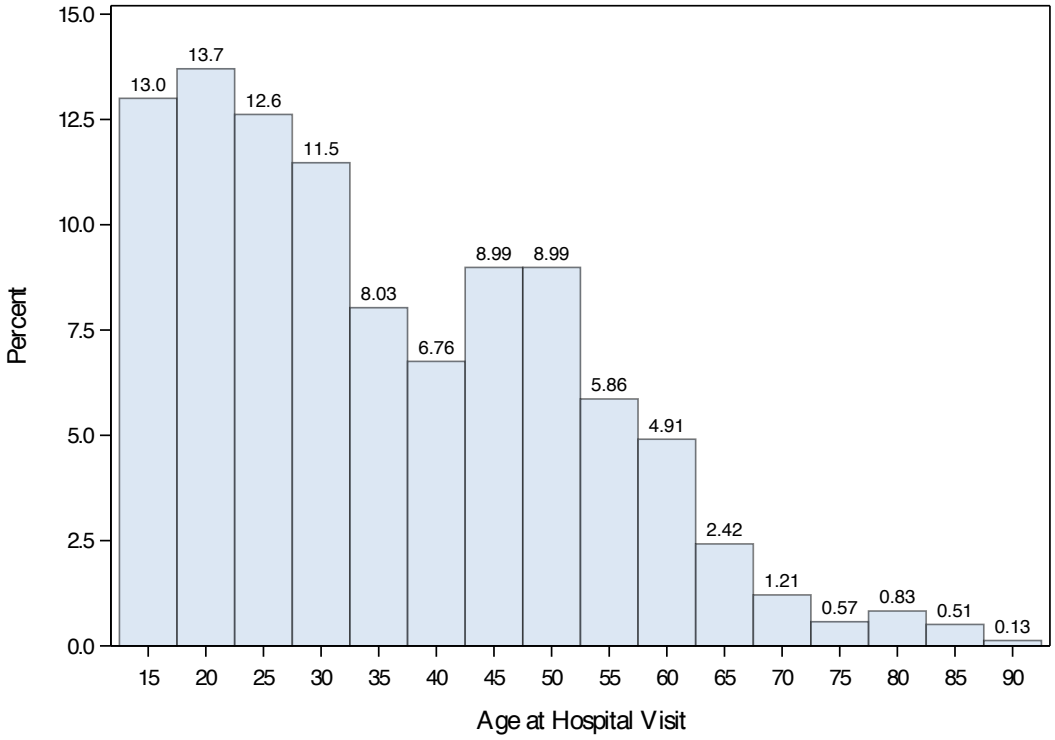

Figure 31. Age at time of hospitalization for suicide, suicide attempt, or self-inflicted injury in northern Arizona (2014).

Population-Specific Information

Veterans were seen as more susceptible to mental and emotional health issues. Many members of the veteran community spoke about high rates of mental illness. Respondents reported that PTSD was a major problem that often goes unrecognized and untreated. This leads to increases in self-medication through substance abuse and higher rates of suicide.

Alcohol and substance abuse was the number one priority health issue among American Indian community members (identified by AI community members themselves as well as other stakeholder groups). Many discussed the devastating impacts that parental substance abuse has on the family unit and also noted a rise of young people under the influence of drugs and alcohol. Many discussed the relationship between substance abuse and high rates of domestic violence, sexual assault, neglect, and emotional abuse that affects children and elders. Alcohol, prescription drug abuse, methamphetamine, and heroin were the substances of highest concern. High rates of depression and problems coping with anger were also a common concern, especially among young people.

> *I think domestic violence and sexual assault are closely related to substance abuse. About 40% of the women that come to the shelter are Native. Of that 40%, about 25% are fleeing domestic violence on the reservation. Of the women that I work with, somewhere between 50–90% have experienced some form of sexual assault.* (Interview Participant)

They also commonly noted the tendency of alcohol and substance abuse to co-occur with other mental health issues, as well as physical health issues for both the drug user and his or her family.

> *Young parents now are struggling with that because some of 'em are not able to finish school. Maybe because they have issues at home with their, you know, like alcoholism, drugs, child abuse, sexual abuse. I mean, a whole range. And that kind of cycles into, you know, people using drugs and alcohol and all those kind of stuff. And then the parents, we kind of disappear on them. So the kids are basically raising themselves. And so now, I think we're seeing the effects of that.* (Focus Group Participant)

Participants explained that things like poverty, unemployment, geographic isolation, inadequate access to behavioral health care, and other social determinants of health create a cycle of perceptions of helplessness and hopelessness that are perpetuated by and then contribute to violence, depression, suicide, and substance abuse. Participants' perceptions of the causes and effects of high rates of substance abuse are discussed in various sections throughout this report.

Chronic Health Conditions of Concern

Concerns regarding chronic conditions were consistent across the region, with diabetes, heart disease, obesity, and respiratory conditions at the top of the list of concerns from the qualitative data. The BRFSS data also confirm high rates of diabetes and other cardiovascular conditions in the region. The percentage of people who have had a heart attack is generally small in Arizona although somewhat higher percentages are found in northern Arizona. Stroke prevalence is also low, ranging from 2% in Apache County to 5% in Mohave and Gila counties. In contrast, cardiovascular risk factors, such as high blood pressure and diabetes, are much higher in Mohave, Yavapai, Gila, Navajo, and Apache counties

(Figures 32–35).

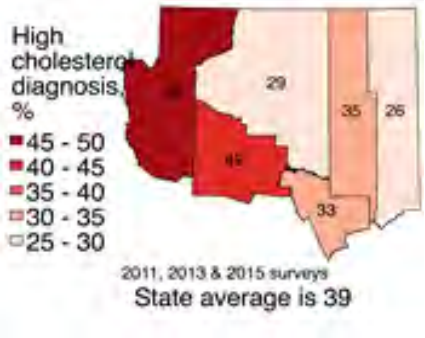

Figure 32. BRFSS high cholesterol by county.

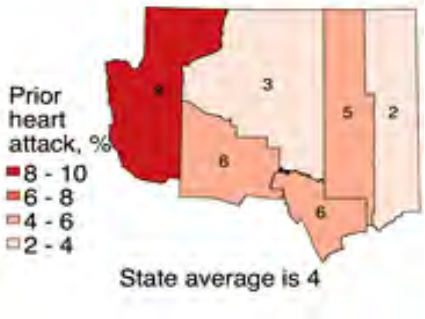

Figure 33. BRFSS prior heart attack by county.

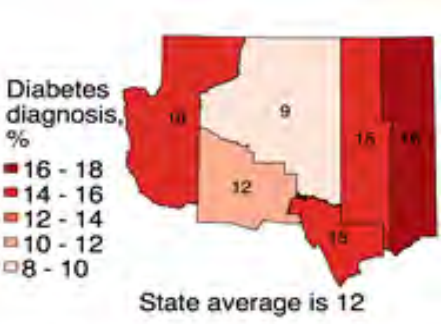

Figure 34. BRFSS diabetes by county.

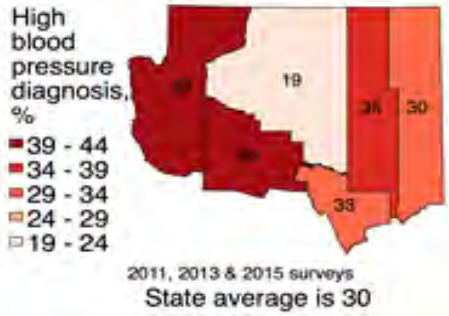

Figure 35. BRFSS high blood pressure by county.

The high absolute prevalence of diagnosed hypertension in northern Arizona suggests a strong need for secondary prevention, in part because diagnosed high blood pressure is likely to underestimate the true prevalence of hypertension and because of the strong association of blood pressure with heart disease and stroke.

Diagnosed high cholesterol, another potent cardiovascular risk factor, varies substantially across counties, with 26% reporting high cholesterol in Apache County and 46% in Mohave. These estimates are expected to be lower than the true prevalence because diagnosis requires both screening and correct recall of screening results. Overall, there is a high burden of cardiovascular disease risk concentrated in Mohave County. We need additional examination of the extent to which these risk factors are successfully controlled.

Analysis of the existing county and hospital health needs assessments revealed very similar health outcome priorities. Rates of STDs and STIs were included in many CHNA priorities and were also mentioned by interview or focus group participants. Alzheimer's disease, cancer, and stroke were also identified as areas of concern in many of the county CHNAs as well as through the qualitative data collected during this assessment. Death rates from cancer are perceived to be particularly high due to the prevalence of late diagnosis and late treatment and the reality that for many people, cancer specialists are not available locally and are unaffordable. Community members also felt that in some

areas, exposure to a particularly high level of environmental contaminants was linked to rising rates of cancer as well as respiratory ailments such as asthma, COPD, pneumonia, and Alzheimer's disease. These could be especially prevalent because in many rural areas, the average age of the population is increasing. Most participants also discussed dental problems as being a priority health issue for both children and adults. Preventative care is very minimal and simple dental problems often go untreated, leading to more serious health conditions.

Population-Specific Information

Stakeholders also discussed priority health status concerns among specific populations including veterans and the American Indian communities. The average age of veterans in many communities is around 60. Veterans of the Vietnam War may have been exposed to toxic substances, which could create chronic health problems (cancer especially) and many are concerned that they are not getting the care they need to treat or manage these conditions.

Concerns among the American Indian (AI) communities were very similar to the concerns of the general population across northern Arizona. Diabetes and heart disease, along with associated conditions and complications, were at the top of the list. Many people suffer from heart and kidney conditions that stem from unmanaged or advanced stages of diabetes. There was also a concern about the high level of amputations that could be avoided with proper management of diabetes. Many AI participants were also concerned with rising rates of cancer.

PATTERNS AND DISPARITIES IN POPULATIONS

We asked participants to identify particular populations that are disproportionately affected by illness. Participants discussed specific and unique challenges for rural communities, American Indian and Hispanic populations, young people, individuals with disabilities, veterans, and older adult populations across the region. Table 7 summarizes the specific populations and their unique health challenges, as identified by participants.

Health Patterns and Disparities in Rural vs. Urban areas

Many residents of the northern Arizona region live in very rural and remote areas and often lack basic utilities such as running water, electricity, and phone/Internet service. There are few services in remote rural areas and transportation is a common barrier to seeking services and resources. Participants felt that more support services are needed for seniors who are homebound or have little access to transportation.

> *We live in one of the … the poorest counties in the nation. We have people who live out, off grid. They don't have running water. They don't have toilets, anything like that. And these are the people that I see on a regular basis.* (Focus Group Participant)

> *People don't have laptops and Internet to apply for assistance services – AHCCCS and Food stamps. All DES offices are closed – closest one is in Show Low – that can be 100 miles round trip – can't buy fuel if they can't buy food.* (Interview Participant)

Table 7: Populations Uniquely Affected by Health Challenges

Population	Unique Health Challenges
Homeless and Transient	Lack of affordable housing means less money to spend on other resources. High levels of stress due to instability which contribute to other health problems. Lack of wrap-around shelter services that help people get back on their feet.
Aging Adults	Lack of community support services for the homebound. Lack of social support services to help with social isolation and depression. Lack of advocates to help seniors navigate the health care/social service application system successfully.
People with Severe Mental Illness	Lack of supported group housing. Lack of behavioral health treatment services. Lack of access to timely screening services. High rates of substance abuse, homelessness, and social insecurity. Lack of prioritization of treatment over incarceration.
Rural Population	Lack of opportunities for education and employment and high rates of poverty. Lack of proximal providers and specialty services. Lack of transportation. Lack of Internet connectivity. Lack of access to utilities, infrastructure, and nutritious foods.
American Indian	Lack of opportunities for education and employment. High rates of transiency leads to fragmented care. Historical trauma as basis for many disparities. Lack of cohesiveness between IHS, 638, and off-reservation health care systems. Lack of incorporation of American Indian concepts of health and wellness into Western medical system.
Hispanic	Fear and discrimination discourages use of available services. Language barriers make it more difficult to navigate health care system.
Veterans	Inconsistencies and barriers with the VA health care system. High rates of PTSD and other mental health issues with little access to behavioral health care.
Youth	Lack of access to community engagement opportunities. Limited resources for recreation. Lack of education and awareness about health prevention topics.
Individuals with Disabilities	Lack of proximal providers and services. Lack of transportation. Social isolation.

Problems stemming from lack of specialists, difficulty with provider retention, and distance to primary care facilities are much worse in the most rural communities. Providers are drawn to more urban areas where pay is higher and there is more to do socially. Small rural populations cannot support specialty services. The lack of providers in rural areas is exacerbated by lack of public transportation, lack of employment opportunities, and lower access to basic utilities and infrastructure.

> *The problem with living in a small town is that you don't always have what you need right here close. So the people that I work with, I'm finding they have to travel a long ways to get help with DES or whatever. Our DES office was closed for a while so in order to get food stamps, they had to travel to Show Low to get their fingerprints done. Which a lot of our clients cannot travel. It's just hard not to be able to have all the services that you need close by.* (Focus Group Participant)

As noted earlier in this report, most of the land area in northern Arizona region consists of very rural areas (Figure 36). Apache County has the highest proportion of rural residents at 74% (defined as those living in communities of fewer than 2,500 people), followed by Navajo County at 54%. All counties contain at least one urban cluster (at least 2,500 people), but half of the counties contain no urban areas at all (more than 50,000 people). The health needs and concerns of the most rural areas in the region can be much different from urban communities with more access to health and social services, transportation, and more opportunities for productive and engaging social outlets. That being said, even though many of these services and opportunities are available in urban areas, affordability, transportation, and other social barriers still exist that inhibit people from accessing them.[2]

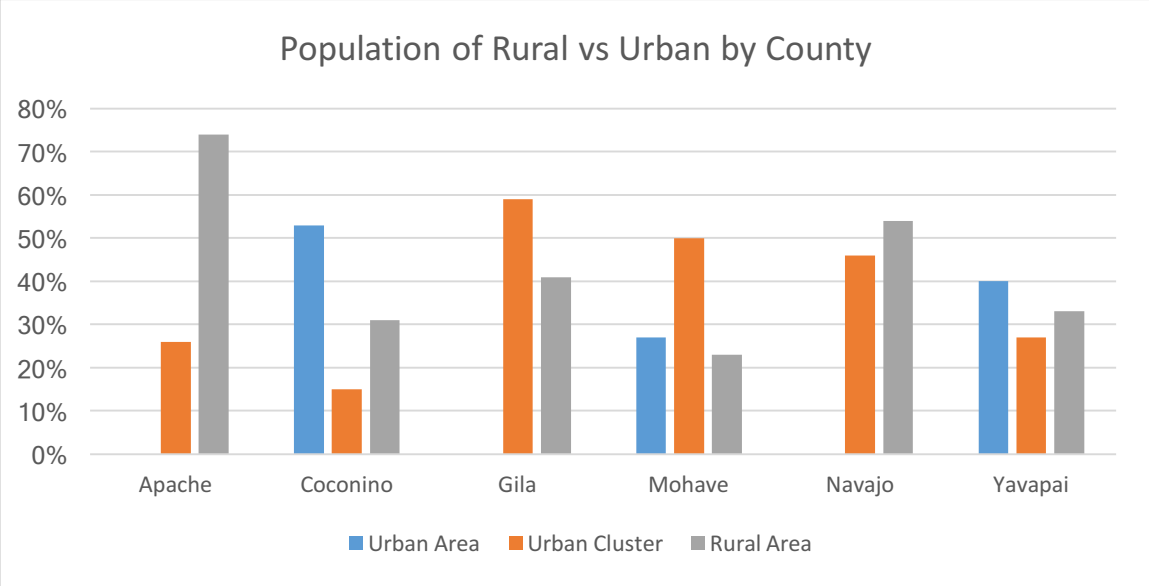

Figure 36. Regional population distribution by county.[2]

We used the ADHS discharge data to observe patterns in hospital discharges among rural and urban populations. As discussed above, hospital discharge information is problematic for a number of reasons. Briefly, because diagnostic codes are not collected for research purposes, ICD-9 diagnostic codes may not capture a diagnosis accurately. Providers do not always choose the codes that make it to the final billing submission. Moreover, conditions must be diagnosed in order to be classified, and some diseases—such as hypertension, depression, and diabetes—are often underdiagnosed. This data set is not "linked," meaning there is no way to account for one patient making multiple hospital visits for the same condition. Each time that person visited the hospital would count as a separate data entry. We described the top 20 ICD-9 diagnosis codes for inpatient admissions and emergency department visits for each zip code included in the urban/rural classification. We were able to identify patterns of ICD-9 discharge codes in rural and urban areas (described below).

The definitions used here to determine rural vs urban areas and the degree of rural remoteness is more complex than those used in the U.S. Census (shown in Figure 11). For the following analysis, we used two different classifications to determine the level of geographic remoteness for each aggregation level. For the first, we used zip code level discharge data. The U.S. Census Bureau uses the term "Frontier and Remote" (FAR) to describe areas that have some combination of low populations and high geographic remoteness. To capture variation in differing degrees of remoteness and access to goods and services, the Census uses four levels of designation to delineate these differences.[34] Each zip code is classified as Urban (not colored) or Rural. If the zip code is rural, it is further classified as Level 1, 2, 3 or 4.

Level 1 FAR describes an area with a relatively high population and relatively easy access to high-level goods and services such as advanced medical procedures or regional airport hubs. Level 4 FAR more closely describes an area with a much smaller population with more difficult access to goods and services such as grocery stores, gas stations, and basic health care services. Each level is defined in relation to the time it takes to drive to the outer edges of the nearest urban area. Figure 37 shows a map of zip code areas in northern Arizona according to their rural code designations. Areas in white are not designated as rural. The lightest blue indicates Level 1 and the darkest blue, Level 4. It should be noted that most of the Level 3 and 4 FAR regions correspond with tribal reservation lands. To further explore the relationship between degrees of FAR and health outcomes in northern Arizona, we would need to include tribal health data.

Rural Level 1 – Areas with up to 50,000 people that are 60 minutes or more from an urban area of 50,000 or more people.

Rural Level 2 – Areas with up to 25,000 people that are 45 minutes or more from an urban area of 25,000–49,999 people and 60 minutes or more from an urban area of 50,000 or more people.

Rural Level 3 – Areas with up to 10,000 people that are 30 minutes or more from an urban area of 10,000–24,999 people, 45 minutes or more from an urban area of 25,000–49,999 people, and 60 minutes or more from an urban area of 50,000 or more people.

Rural Level 4 – Areas that are 15 minutes or more from an urban area of 2,500–9,999 people, 30 minutes or more from an urban area of 10,000–24,999 people, 45 minutes or more from an urban area of 25,000–49,999 people, and 60 minutes or more from an urban area of 50,000 or more people.[34]

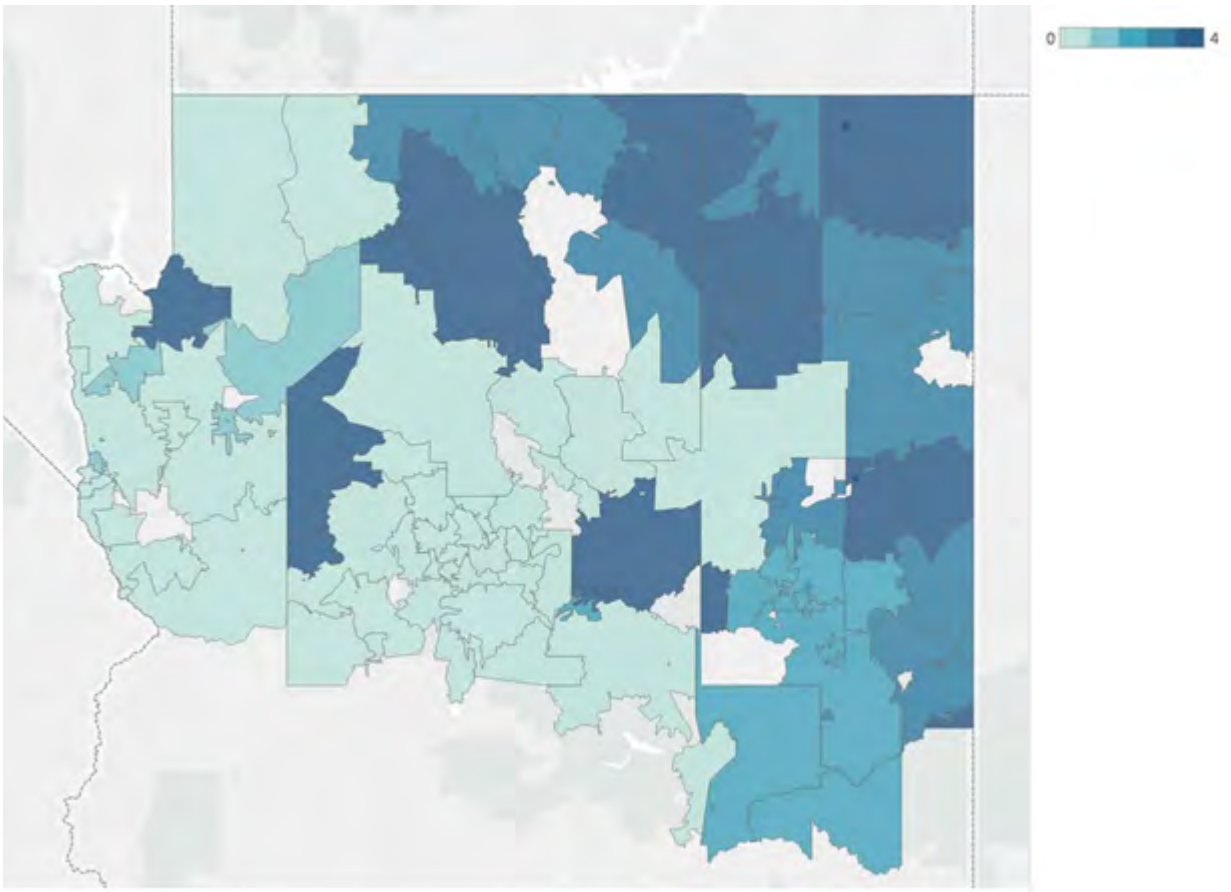

Figure 37. Map of foreign and remote levels by zip code.

In general, the top ICD-9 diagnostic codes for inpatient admission across all five classifications were very similar. Respiratory conditions and ill-defined signs and symptoms accounted for a large percent of the top 20 in all five urban/rural classifications. Common respiratory conditions included upper respiratory infections, pharyngitis, pneumonia, respiratory failure, asthma, and bronchitis. Ill-defined signs and symptoms commonly included headache, chest pain, abdominal pain, syncope, and vomiting. Genitourinary conditions were also common and mostly consisted of urinary tract infections.

In the Rural Level 4 category, alcohol abuse was the number two code in 2010 and the number one code in 2014, accounting for 3% of all inpatient admissions in those years. Injuries were fairly consistent across the geographic categories. Percentages in Figures 38–41 represent percent of total admissions in the top 15 diagnoses. Abbreviations for the figures are as follows:

- *Ill-Def*: Ill-defined signs and symptoms
- *Resp*: Respiratory conditions
- *Genit*: Genitourinary conditions
- *Injury*: Conditions related to injury and poisoning
- *Mental:* Mental conditions
- *Circ*: Circulatory system conditions
- *Digest*: Digestive system conditions
- *Endo*: Endocrine and metabolic system disorders

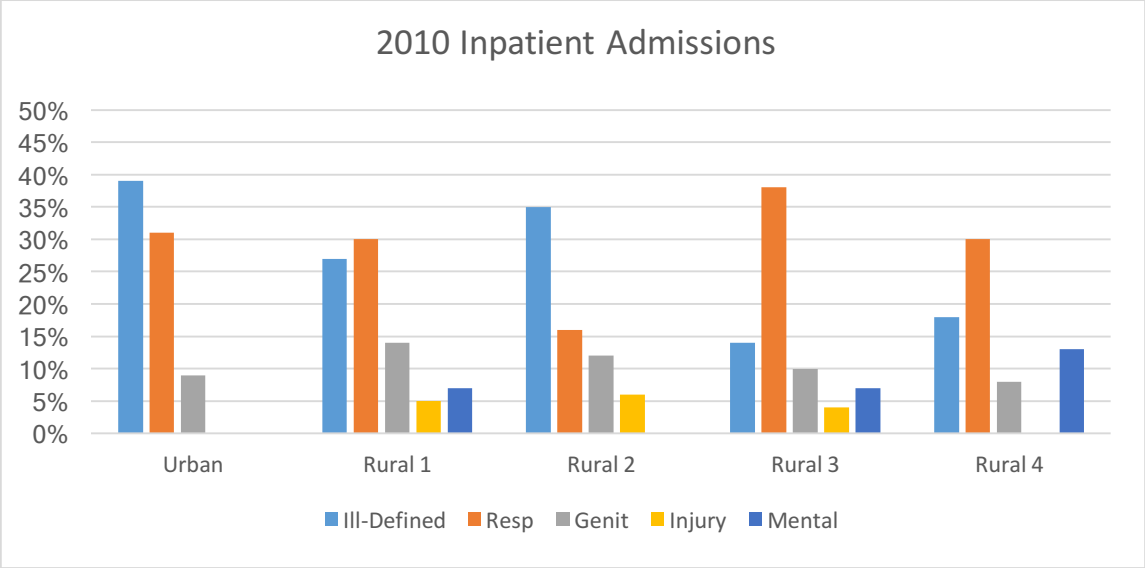

Figure 38. Top disease categories for inpatient admissions: urban/rural, 2010.

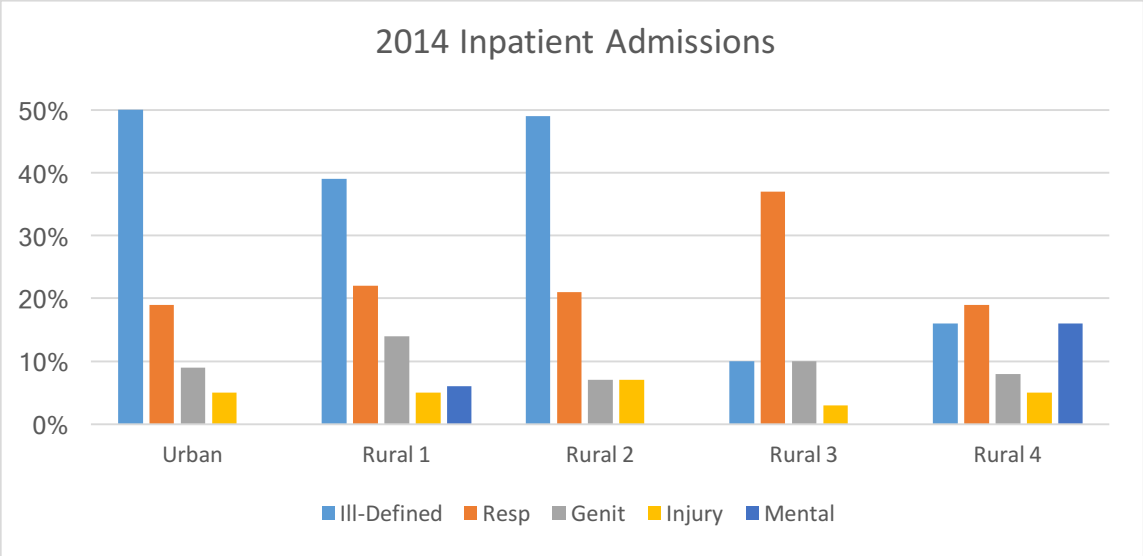

Figure 39. Top disease categories for inpatient admissions: urban/rural, 2014.

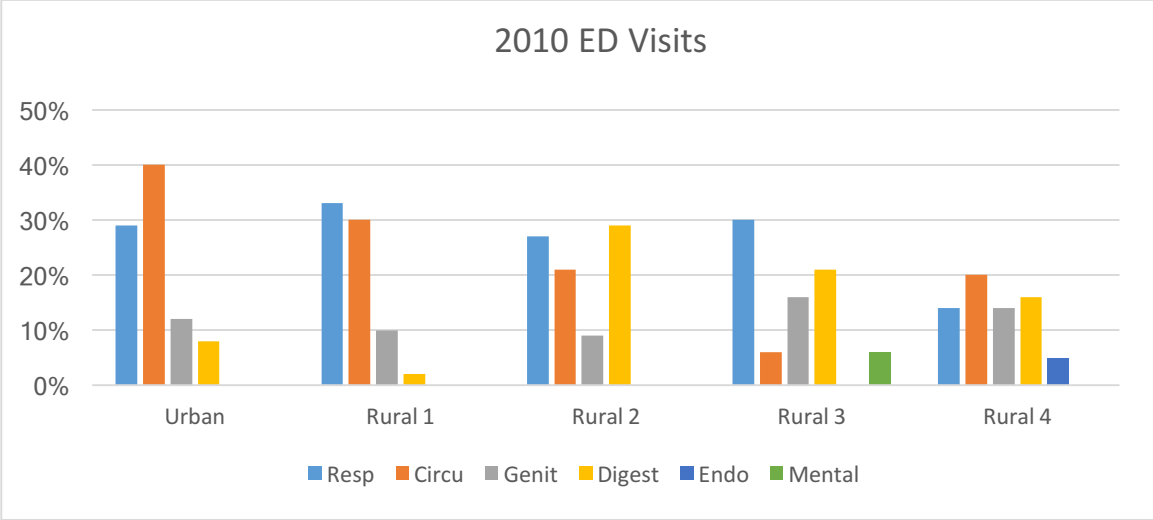

Figure 40. Top disease categories for ED visits: urban/rural, 2010.

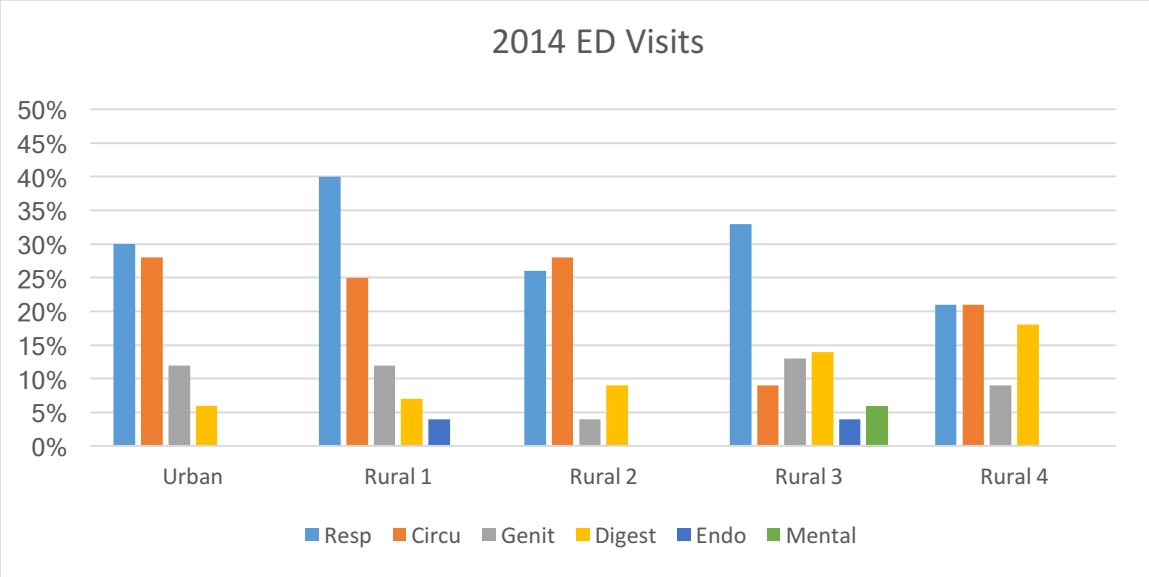

Figure 41. Top disease categories for ED visits: urban/rural, 2014.

There were also many similarities across rural classifications for Emergency Department (ED) visits. For all levels of geographic remoteness, circulatory conditions and respiratory conditions made up the majority of the top 15 diagnoses. The respiratory conditions were similar to those of the inpatient diagnoses. Common circulatory conditions included atrial fibrillation, subendocardial infarction, artery occlusion, heart failure, and pulmonary embolism. Digestive conditions were also common in the top 15 ED diagnoses. This category most commonly included pancreatitis but also gastroenteritis and colitis. Digestive disorders occur in Rural Level 2 areas more frequently than in Urban and Rural 1 areas. They were more frequent in 2010 than in 2014. Alcohol withdrawal appears in the top 15 diagnoses in 2010 and 2014 only in Rural 3 areas. Also in Rural 3 areas, Type 1 diabetes appears in the top 15 diagnoses in 2014 but not in 2010. Type II diabetes appears in Rural 4 areas in 2010 and Rural 1 and 3 areas in 2014. In Figures 40 and 41, endocrine disorders correspond to diabetes, and mental disorders to alcohol abuse. For a complete list of the top 15 diagnoses per category, see Appendix F.

For the second characterization of rural and urban, we looked at PCA-level discharge data (see Figure 21 for a map of PCAs). We grouped the zip codes by their corresponding PCAs. ADHS categorizes each PCA as one of four potential descriptors: Urban, Rural, Frontier, or Indian. Urban PCAs are those that occur in counties with more than 400,000 people and contain Census tracts of more than 50,000 people. No PCAs in northern Arizona were designated as Urban. Rural PCAs are those that occur in counties of fewer than 400,000 people (if they do not qualify as Frontier or Indian).[22] Sixteen of 26 PCAs in northern Arizona are classified as Rural. Frontier PCAs are Rural but also have fewer than six people per square mile. Five of 26 PCAs in the region qualified as Frontier. Indian PCAs are defined as those within federally recognized tribal reservation borders. Five of the 26 PCAs are classified as Indian.

The most common diagnosis codes linked to inpatient admissions were very similar across the region. Most diagnoses were related to childbirth, abdominal pain, respiratory conditions, and injuries. Most common ED codes in Rural and Frontier PCAs were septicemia, respiratory conditions including acute respiratory failure and chronic bronchitis, pneumonia, and heart-related conditions. The top diagnoses for Indian PCAs included septicemia and pneumonia but diabetes-related conditions were also high. In general, the most common diagnosis codes in PCAs designated “Indian” were much more likely to include codes related to chronic alcohol abuse and intoxication. These commonly included alcohol abuse, alcohol withdrawal, and acute alcoholic intoxication, and less commonly included alcohol-induced dementia and toxic effects of ethyl alcohol.

Health Patterns and Disparities by Race/Ethnicity

It is well documented in the literature that ethnic minorities often receive a lower quality of care and that they often suffer from greater morbidity and mortality than non-minorities.[35-38] The reasons for this are incredibly complex and beyond the scope of this report. Health disparities that affect any ethnic population are always compounded by a host of social, economic, political, and cultural factors that intersect in a myriad of dynamic interactions. The following section explores racial/ethnic disparities identified in the BRFSS, CDC Wonder, and ADHS Hospital Discharge databases. Additional layers of population-specific context were gathered through our qualitative methods. It is important to note that one of the major limitations of this analysis is that it does not include any data from any Indian Health Service facilities.

Racial/Ethnic Patterns in Selected BRFSS Health Indicators for Northern Arizona

Despite the 5 years of combined BRFSS data, the sample sizes within county by race and ethnicity are too small to estimate health characteristics for all groups within all counties (Table 8). However, several within-county comparisons for functional limitations, mentally unhealthy days, and self-rated health met minimum statistical standards for reporting and are described here. Questions regarding high blood pressure and high cholesterol were only assessed in odd survey years. Thus, when examined with small frequencies of racial and ethnic participants, the county-level numbers for comorbid cardiovascular risk were too small to explore by race/ethnicity.

There are clear disparities by race/ethnicity in self-rated health (Figure 42), but the level of disparity in perceived health status varies across county. For example, Hispanics in Apache County have the best health status in the county whereas Hispanics in Yavapai County have the lowest health status in the county and among the lowest in northern Arizona. Twenty percent more American Indian respondents living in Navajo county have high self-rated health compared to those living in Apache County. Also notable is that county-level variation is as large as variation across race and ethnicity. Thus, education and geography appear to be stronger determinants of self-rated health status than race/ethnicity.

Figure 43 shows more consistent patterns for functional limitations. Non-Hispanic Whites were more likely to report some limitation relative to other social groups. Coconino County was the exception where whites and American Indians were comparable. Again, these differences are striking but are less dramatic than the prevalence of functional limitations among those with less than a high school education. Fewer data points are available to compare mentally unhealthy days across county and race/ethnicity. Generally minority groups reported more mentally unhealthy days relative to non-Hispanic Whites (Figure 44).

Table 8: Number of Survey Participants by Race/Ethnicity and County, 2011–2015 Arizona Behavioral Risk Factor Surveillance System

	Apache (*n* = 802)	Coconino (*n* = 1,464)	Gila (*n* = 985)	Mohave (*n* = 2,217)	Navajo (*n* = 951)	Yavapai (*n* = 2,345)
Non-Hispanic White	333	1,164	773	1,937	697	2,121
Non-Hispanic Black	5	16	2	11	4	6
Asian Non-Hispanic	6	17	3	9	4	7
American Indian	384	115	92	44	171	18
Hispanic	51	113	94	145	53	130
Other	23	39	21	71	23	63

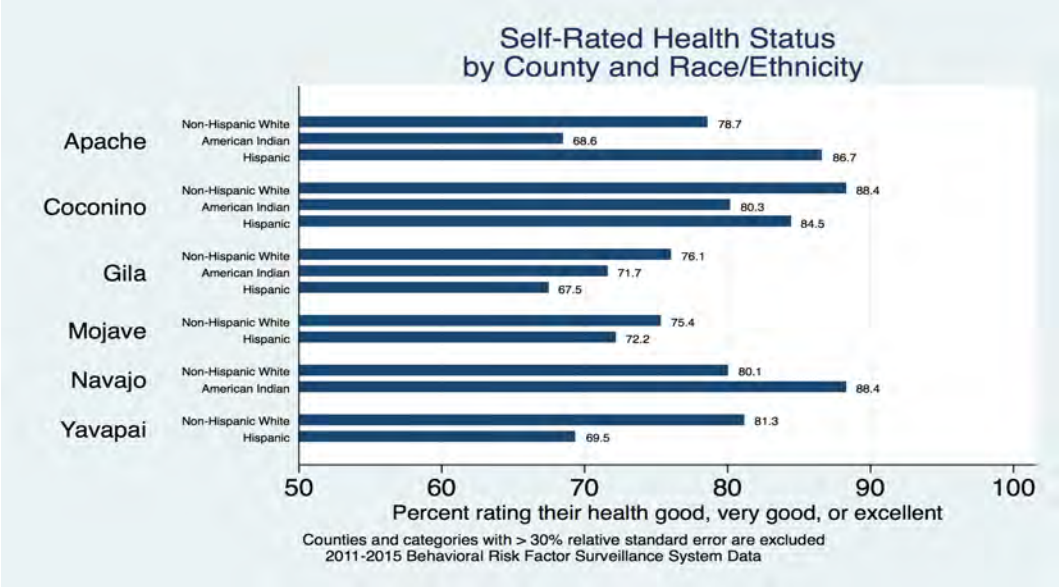

Figure 42. BRFSS self-rated health status by ethnicity and county.

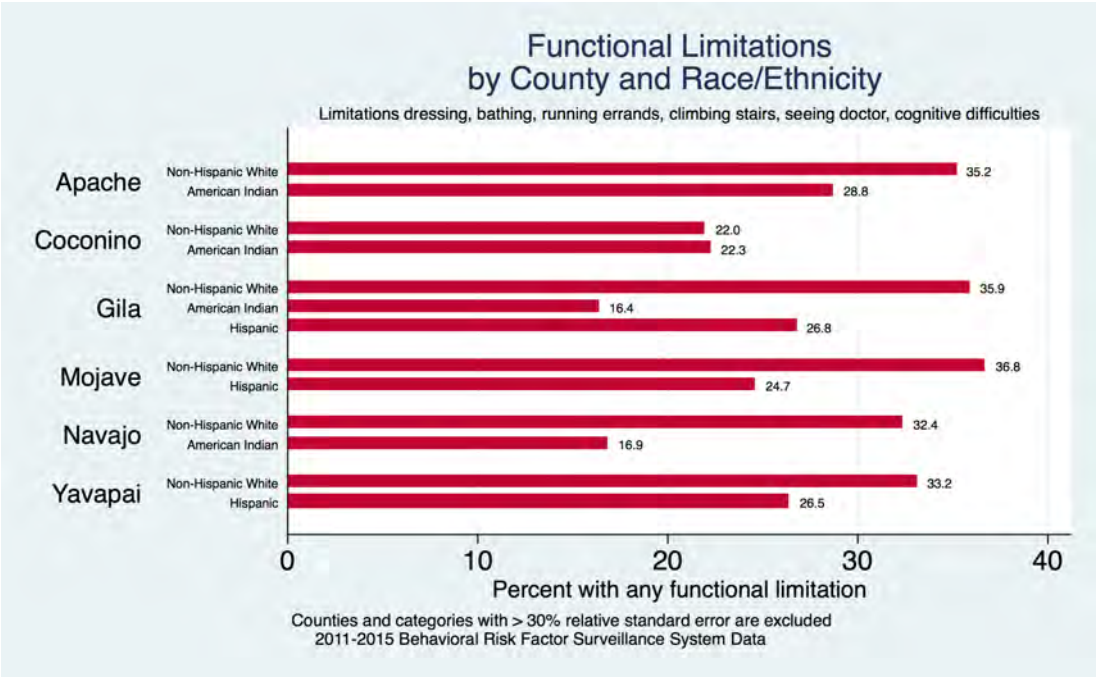

Figure 43. BRFSS functional limitations by ethnicity and county.

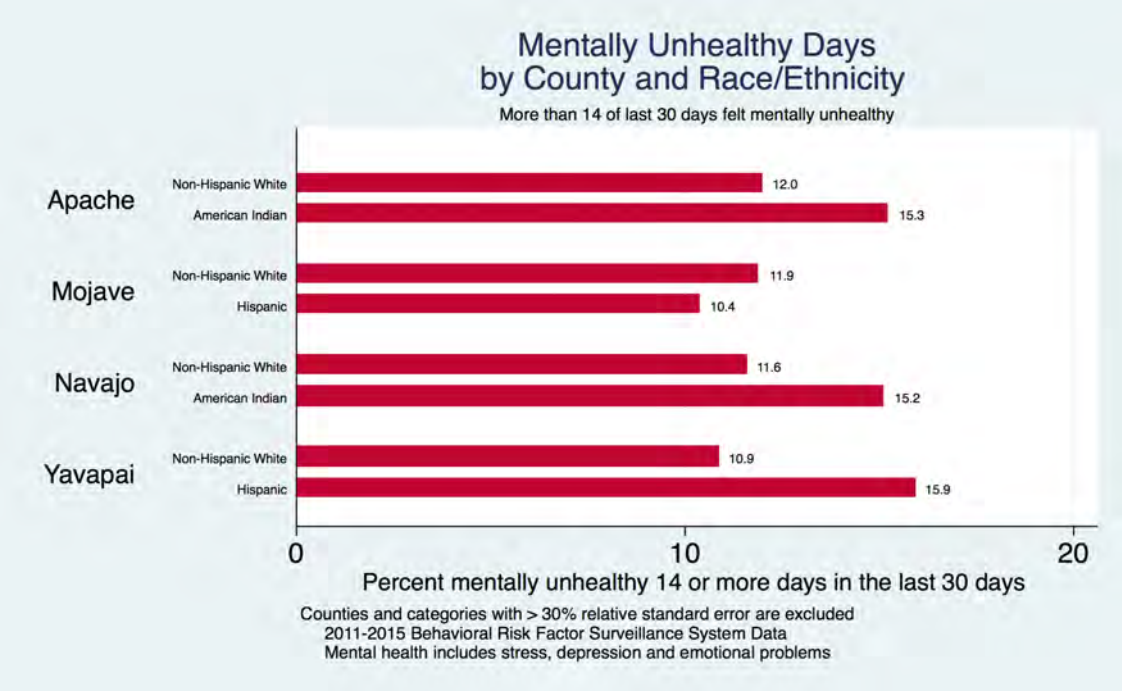

Figure 44. BRFSS mental health by ethnicity and county.

Leading Causes of Mortality: Stratification by Race and Ethnicity by County

In the six counties of northern Arizona, non-Hispanic Whites, Hispanic and Latinos, and American Indians comprise nearly 95% of the total population. With this in mind, we sought to better understand differences in age-adjusted mortality rates among these racial/ethnic populations in each of these counties.[23] See Appendix G for a complete list of leading causes of mortality in each county by ethnicity.

A focused look within each county reveals substantial differences when county populations are stratified by race and ethnicity. In the following tables, the age-adjusted rates are for each leading cause of mortality by ethnicity. Cells are left blank when the data for that population are unreliable due to low rates or small populations. **Green rates are significantly better than the county average; for all populations, red rates are significantly worse.**[23]

Apache County

The 2015 American Community Survey estimated that there were 71,474 residents of Apache County, where 18.8% of the population is non-Hispanic White, 73.5% is American Indian, and 6.5% is Hispanic or Latino.[28] In Apache County, cancer and diseases of the heart are disproportionately high in the Hispanic population and low in the American Indian population. Accidental injuries are disproportionately high in the American Indian populations and extremely low in the non-Hispanic White population (Table 9).

Table 9: Leading Causes of Mortality, Apache County, Age-Adjusted Rate per 100,000

Leading Causes of Death	All Populations	American Indian	Hispanic	Non-Hispanic White
Malignant neoplasms	135.9	124.7	185.3	154.8
Diseases of heart	134.9	115.4	181	180.7
Accidents (unintentional injuries)	145.3	178.2	Unreliable	50.8
Chronic lower respiratory diseases	25.2	4.3	----	64.3
Cerebrovascular diseases	30.1	31.6	----	25.8
Intentional self-harm (suicide)	35	34.2	----	42.5
Chronic liver disease and cirrhosis	42.3	51.7	----	Unreliable
Diabetes mellitus	50.6	62.6	----	25.4
Alzheimer's disease	13.5	Unreliable	----	28.3
Influenza and pneumonia	32	41.7	----	Unreliable
Assault (homicide)	16.6	19.3	----	----

Coconino County

The 2015 American Community Survey estimated that there were 136,701 residents of Navajo County, where 54.7% of the population is non-Hispanic White, 28.3% is American Indian, and 13.8% is Hispanic or Latino. Twenty-two percent of the population lives below the poverty level.[28] There are relatively few data points for Coconino County for the Hispanic population. The American Indian population has a disproportionately high rate of accidental injury and chronic diseases of the liver, diabetes, and influenza/pneumonia, and a relatively low cancer rate. The non-Hispanic White population has higher than average cancer rates and lower than average liver disease and diabetes (Table 10).

Gila County

The 2015 American Community Survey estimated that there were 53,159 residents of Gila County, where 63% of the population is non-Hispanic White, 16.8% is American Indian, and 18.7% is Hispanic or Latino. Just over 21% of the population lives below the poverty level.[28] In Gila County, the mortality rates that were available for Hispanics were relatively low. The American Indian population has relatively low rates of cancer and heart disease but almost twice the rate of accidental injury, over three times the rate of diabetes, and over four times the rate of chronic diseases of the liver (Table 11).

Table 10: Leading Causes of Mortality, Coconino County, Age-Adjusted Rate per 100,000

Leading Causes of Death	All Populations	American Indian	Hispanic	Non-Hispanic White
Malignant neoplasms	117.4	81.9	120.3	130.5
Diseases of heart	128.1	115.4	121	132.3
Accidents (unintentional injuries)	69.5	134.9	60.2	44.1
Chronic lower respiratory diseases	38	Unreliable	----	50
Cerebrovascular diseases	29.1	39.9	----	25.8
Intentional self-harm (suicide)	21.7	22.6	----	23
Chronic liver disease and cirrhosis	17.4	40.7	----	7.2
Diabetes mellitus	17.3	35.5	----	11.3
Alzheimer's disease	21.6	----	----	26.8
Influenza and pneumonia	12.6	32.1	----	6.7
Parkinson's disease	9.9	Unreliable	----	8.4
Assault (homicide)	6.4	16.2	----	----

Table 11: Leading Causes of Mortality, Gila County, Age-Adjusted Rate per 100,000

Leading Causes of Death	All Populations	American Indian	Hispanic	Non-Hispanic White
Malignant neoplasms	166.5	154	143.2	167.1
Diseases of heart	178.5	171	150.1	182.2
Accidents (unintentional injuries)	80.9	154	52	71.9
Chronic lower respiratory diseases	63.5	Unreliable	Unreliable	70.8
Cerebrovascular diseases	37.9	Unreliable	Unreliable	36.2
Intentional self-harm (suicide)	31.4	Unreliable	Unreliable	31.6
Chronic liver disease and cirrhosis	34.7	114.2	Unreliable	22.4
Diabetes mellitus	30.8	137.9	40.3	17.9
Alzheimer's disease	32.4	----	61.6	28.7
Influenza and pneumonia	11.9	----	----	11.9
Parkinson's disease	7.5	----	----	7.8
Assault (homicide)	6.4	----	----	----

Mohave County

The 2015 American Community Survey estimated that there were 204,737 residents of Mohave County, where 77.5% of the population is non-Hispanic White, 3% is American Indian, and 16.2% is Hispanic or Latino. Just over 17% of the population lives below the poverty level.[28] In Mohave County, both Hispanic and American Indian populations have lower than average rates of cancer and heart disease. Again the American Indian population had about twice the average of accidental injury and three times the rates of chronic disease of the liver. The Hispanic population had almost half the rate of chronic lower respiratory diseases (Table 12).

Navajo County

The 2015 American Community Survey estimated that there were 107,656 residents of Navajo County, where 42% of the population is non-Hispanic White, 44% is American Indian, and 11% is Hispanic or Latino. Nearly 31% of the population is below the poverty level. In Navajo County, American Indian and Hispanic populations had relatively low rates of cancer and diseases of the heart whereas the non-Hispanic White populations had relatively higher rates of those conditions. Again, American Indian populations have disproportionately higher rates of diabetes, liver disease, accidental injury, and pneumonia/influenza (Table 13).

Table 12: Leading Causes of Mortality, Mohave County, Age-Adjusted Rate per 100,000

Leading Causes of Death	All Populations	American Indian	Hispanic	Non-Hispanic White
Malignant neoplasms	192.2	146.7	119.7	199.3
Diseases of heart	236.6	191.1	129.3	245.8
Accidents (unintentional injuries)	66.3	119.2	39.8	68.1
Chronic lower respiratory diseases	63.6	----	28.6	66.6
Cerebrovascular diseases	32.5	----	38.7	31.9
Intentional self-harm (suicide)	32.8	Unreliable	Unreliable	36.3
Chronic liver disease and cirrhosis	24.5	92.9	24.2	22.4
Diabetes mellitus	22.5	Unreliable	23.9	21.9
Alzheimer's disease	19	----	----	19.4
Influenza and pneumonia	16.4	----	Unreliable	17.1
Parkinson's disease	6	----	----	5.9

Table 13: Leading Causes of Mortality, Navajo County, Age-Adjusted Rate per 100,000

Leading Causes of Death	All Populations	American Indian	Hispanic	Non-Hispanic White
Malignant neoplasms	140.9	112.9	122.2	171.8
Diseases of heart	143.5	133.1	115.4	177.3
Accidents (unintentional injuries)	104.9	157	57.4	68.4
Chronic lower respiratory diseases	39.1	----	Unreliable	53.3
Cerebrovascular diseases	34.1	31.7	Unreliable	43.6
Intentional self-harm (suicide)	28.7	27.5	----	27
Chronic liver disease and cirrhosis	37.9	66.3	Unreliable	21.1
Diabetes mellitus	37.9	66.7	56.5	21.3
Alzheimer's disease	21.9	18.5	----	29.4
Influenza and pneumonia	17.7	35.8	----	16.8
Parkinson's disease	8.9	12.7	----	----
Assault (homicide)	11.8	18.5	----	----

Yavapai County

The 2015 American Community Survey estimated that there were 222,255 residents of Yavapai County, where 80.6% of the population is non-Hispanic White, 2.2% is American Indian, and 14.4% is Hispanic or Latino. Yavapai County has the fewest number of people living in poverty, with 15.1% of the population living below the poverty level.[28] Many indicators are missing for the American Indian population in Yavapai County, but from the data we do have, it is clear that the population suffers relatively low rates of cancer and heart diseases compared to other populations in the county. The Hispanic population also had relatively low rates of cancer and heart disease as well as accidents and chronic respiratory diseases. The non-Hispanic White population had slightly higher rates of cancer but was on par with other indicators (Table 14).

In general, American Indian populations in our region experienced much higher rates of accidental injury, chronic diseases of the liver, and diabetes and much lower rates of cancer and heart diseases.[23] The Hispanic population tended to have relatively low rates of cancer, heart disease, and accidental injury. There was little consistency between counties in terms of what conditions disproportionately affected this population. The non-Hispanic White population consistently had higher rates of cancer and heart disease and in most counties, higher rates of chronic respiratory diseases. They also generally suffered lower rates of accidental injury, diabetes, and chronic liver diseases.

Figure 45 shows the age-adjusted mortality rates for the top three leading causes of death by ethnicity. Age-adjusted county rates were averaged for each ethnic population. Heart disease and cancer were much more likely to affect the Hispanic/Latino populations and the Non-Hispanic White populations than accidents, while accidents were much more likely to affect the American Indian populations.

Table 14: Leading Causes of Mortality, Yavapai County, Age-Adjusted Rate per 100,000

Leading Causes of Death	All Populations	American Indian	Hispanic	Non-Hispanic White
Malignant neoplasms	156.3	91.9	107	161.6
Diseases of heart	144.7	113.9	118.9	147.5
Accidents (unintentional injuries)	62	Unreliable	47.4	66.2
Chronic lower respiratory diseases	52.2	----	21.5	53.8
Cerebrovascular diseases	31.5	----	36.1	31.1
Intentional self-harm (suicide)	30.8	----	Unreliable	34.8
Chronic liver disease and cirrhosis	15.9	Unreliable	18.2	15.3
Diabetes mellitus	15.3	Unreliable	23.2	14.5
Alzheimer's disease	23.4	----	Unreliable	24
Influenza and pneumonia	13.1	----	Unreliable	13.3
Parkinson's disease	10.4	----	----	10.4

The non-Hispanic White population overall had higher rates of suicide than the American Indian or Hispanic/Latino populations. Data for Hispanic/Latino were statistically too small to trust so those were coded as unreliable. The numbers for the American Indian populations in Gila, Mohave, and Navajo counties were also very small and therefore unreliable.

American Indian populations have dramatically higher rates of unintentional injury and chronic diseases of the liver. American Indians overall also experienced the highest rates of fatalities due to unintentional injuries. In Yavapai County the numbers were too low to calculate reliable estimates. Rates for Hispanic/Latino were also unreliable for Apache County. See Figure 46.

Another health outcome category that disproportionately affects American Indian populations is chronic diseases of the liver. Figure 47 compares age-adjusted rates in the American Indian population to rates in the total population by county.

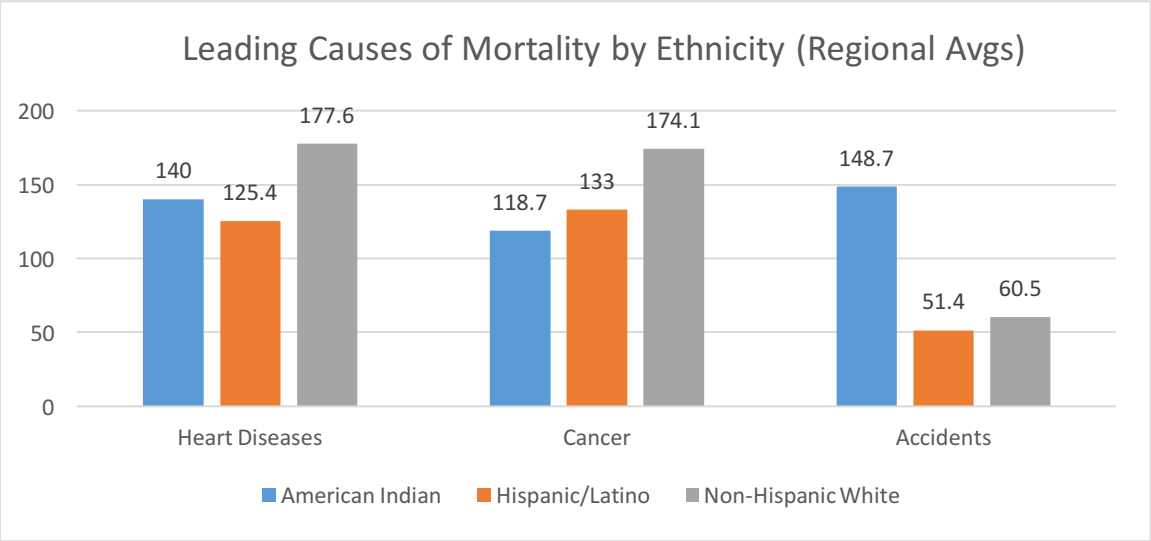

Figure 45. Leadings causes of mortality by ethnicity.

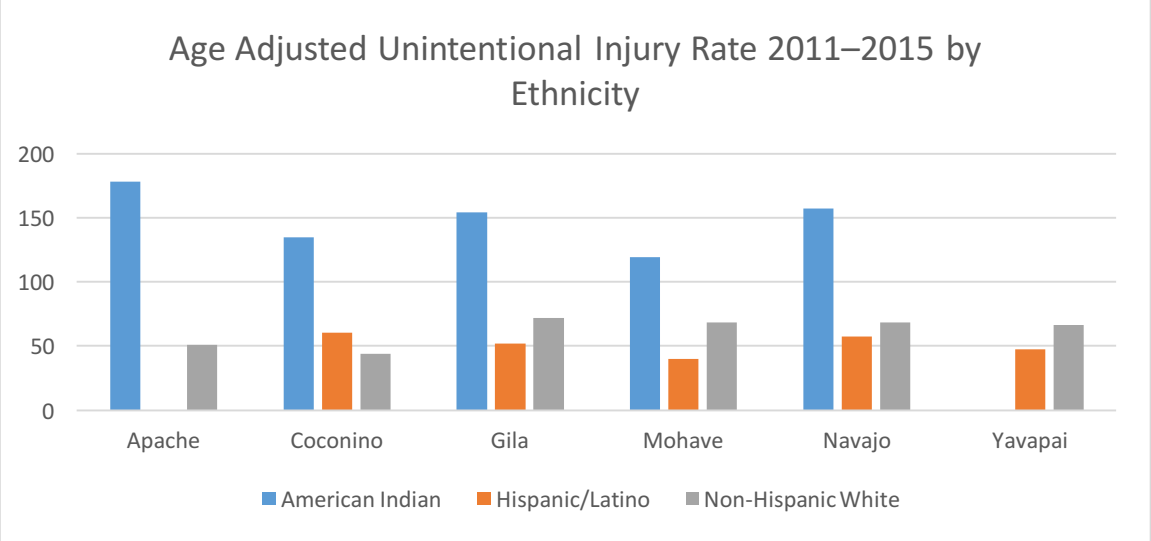

Figure 46. Age-adjusted unintentional injury rate by county and ethnicity 2011–2015.

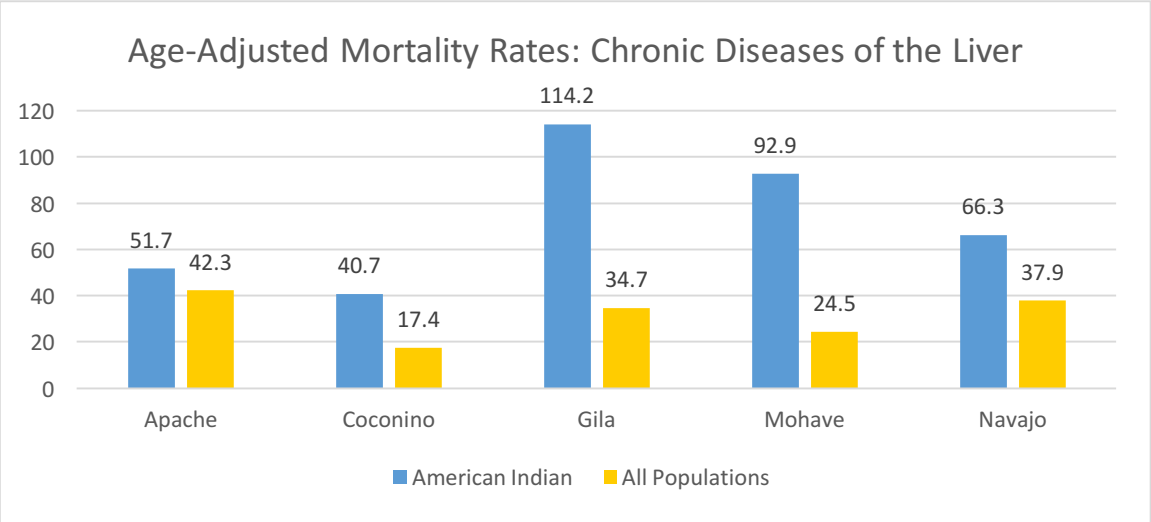

Figure 47. Chronic liver diseases in the American Indian population.

Hospital Utilization for Certain Conditions by Ethnicity

All inpatient and emergency department hospitalizations for residents living in the six counties of northern Arizona in 2014 were incorporated into this analysis. All visits for each clinical category were stratified into the observed number of visits for individuals self-reported to be American Indian, Hispanic or Latino, or non-Hispanic White. All clinical categories, except diseases of the skin and subcutaneous tissue, had significantly different population proportions than what would be expected based on the population that visits the hospital (as opposed to the proportion of the general population). For the clinical categories of injury, poisoning, and endocrine, nutritional, and metabolic disorders, the combination of groups indicated that the racial ethnic groups were different from what was expected; no individual group was responsible for the differences; that is, the combination of all groups needed to be taken into account.

Figure 48 illustrates hospital utilization rates by ethnicity for certain categories of health conditions. In instances where the bar extends above the X-axis, that population had higher than expected utilization rates for that type of condition relative to population size. In instances where the bar extends below the X-axis, that population had lower than expected utilization rates for that type of condition relative to population size. This type of analysis can help illuminate which ethnic populations are disproportionately seeking care for certain types of conditions.

For most health condition categories, the non-Hispanic white and American Indian populations utilize hospital services more than expected taking into account the proportion of the population those groups comprise. For American Indian populations, these data do not account for visits to Indian Health Service or other Tribally-governed facilities. Excluding skin conditions and complications due to pregnancy and delivery, Hispanics utilize hospital services at a much lower rate than expected considering the proportion of the population Hispanics comprise.

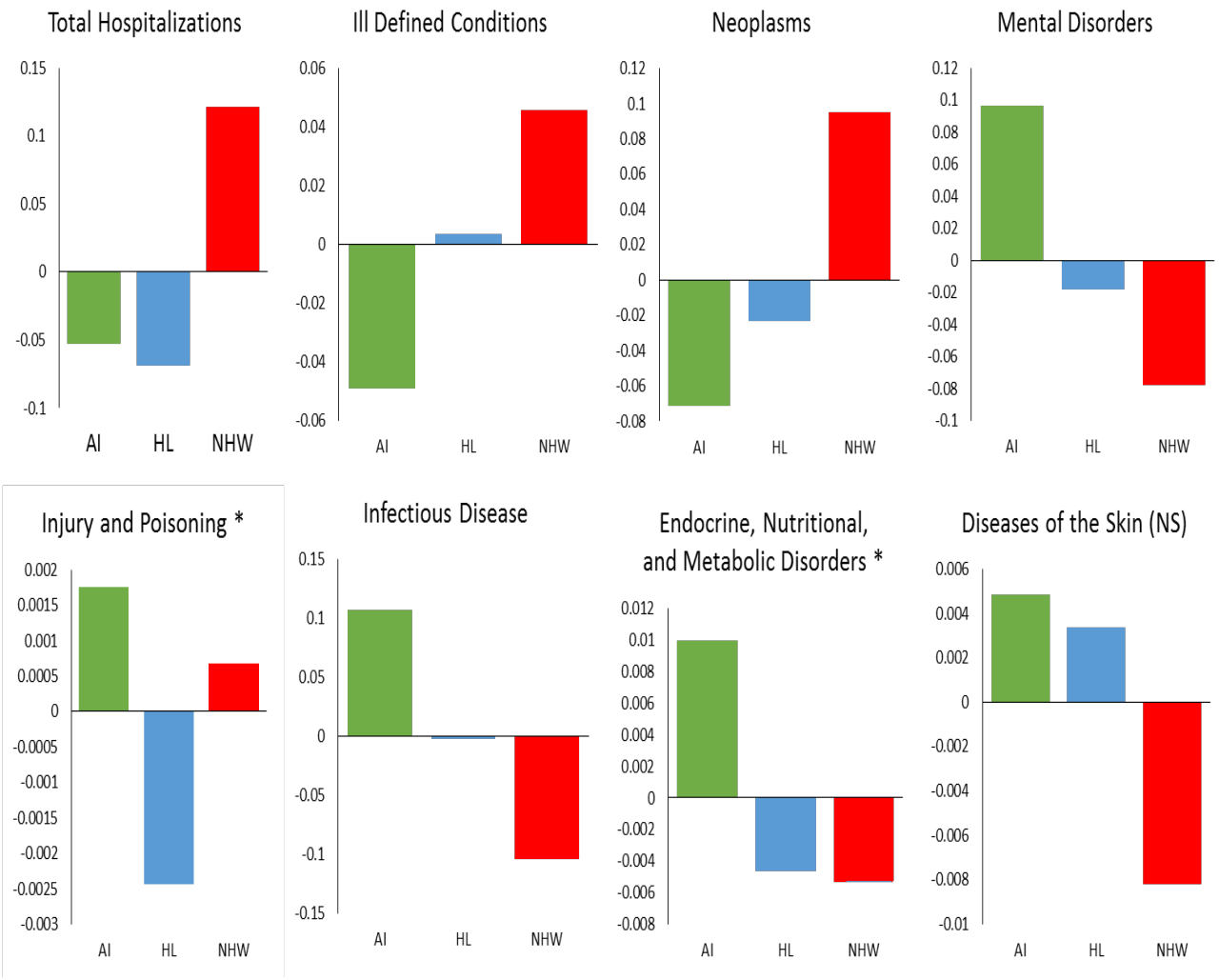

Figure 48. Clinical disease categories stratified by race/ethnicity, 2014.

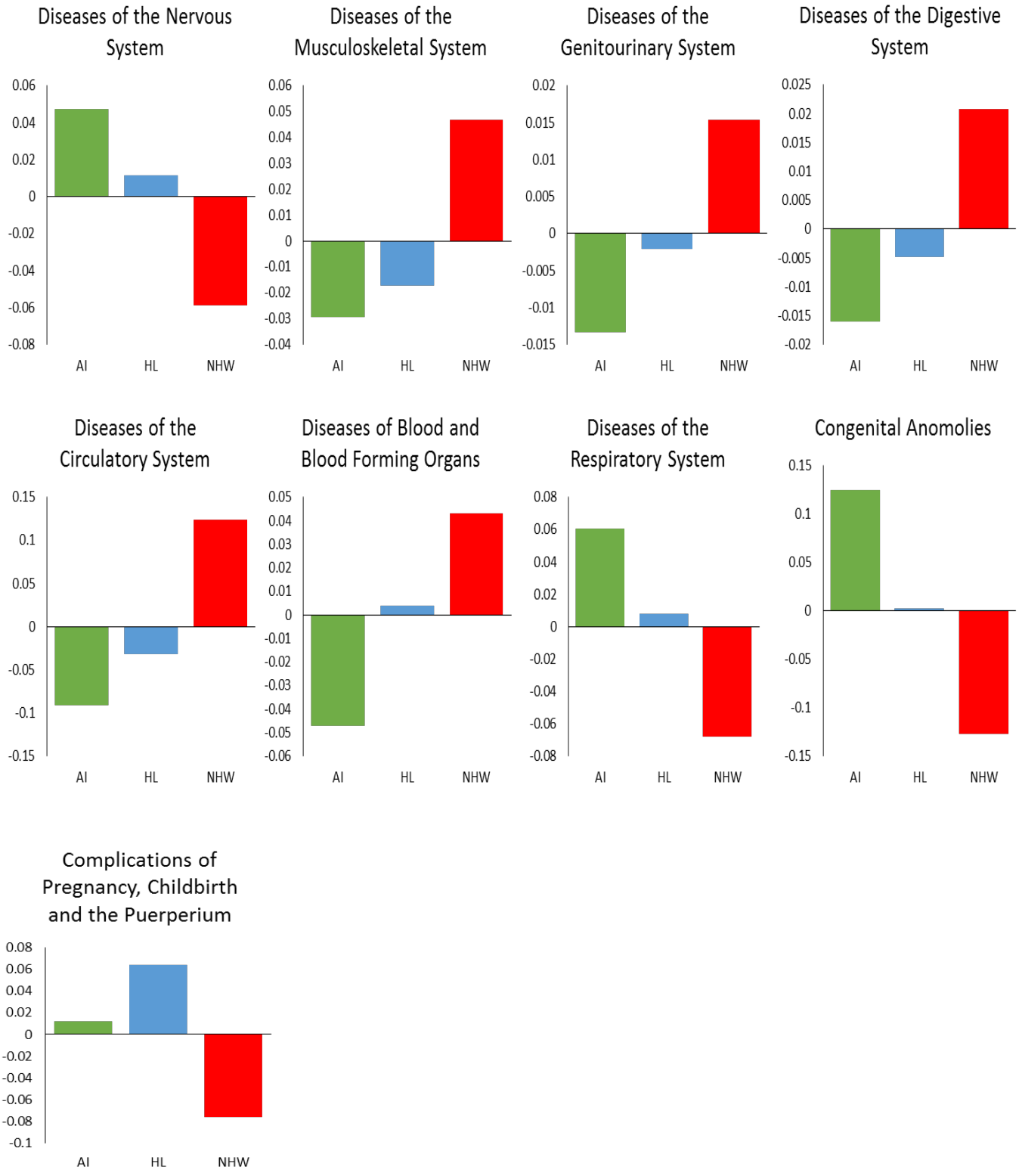

Figure 48 (continued).

Figure 49 summarizes hospital utilization by ethnicity for each primary care area in the region. The values determining the height of each bar were calculated by dividing the total number of visits per primary care area per racial/ethnic groups by the number of residents of that racial/ethnic group living in the primary care area, and then multiplying by 10,000 to get a crude rate. If the number of visits is greater than 10,000, the number of visits made by a racial/ethnic group exceeded the number of residents in a primary care area that comprise that racial/ethnic group. This is due to the fact that single individuals can visit the hospital any number of times in a given year. For example, if the population of non-Hispanic White individuals in a primary care area was 10,000, but those individuals made 20,000 of the inpatient or emergency room visits, then the crude rate would be 20,000 visits per 10,000 non-Hispanic White residents**.** Data from Grand Canyon Village were not available.

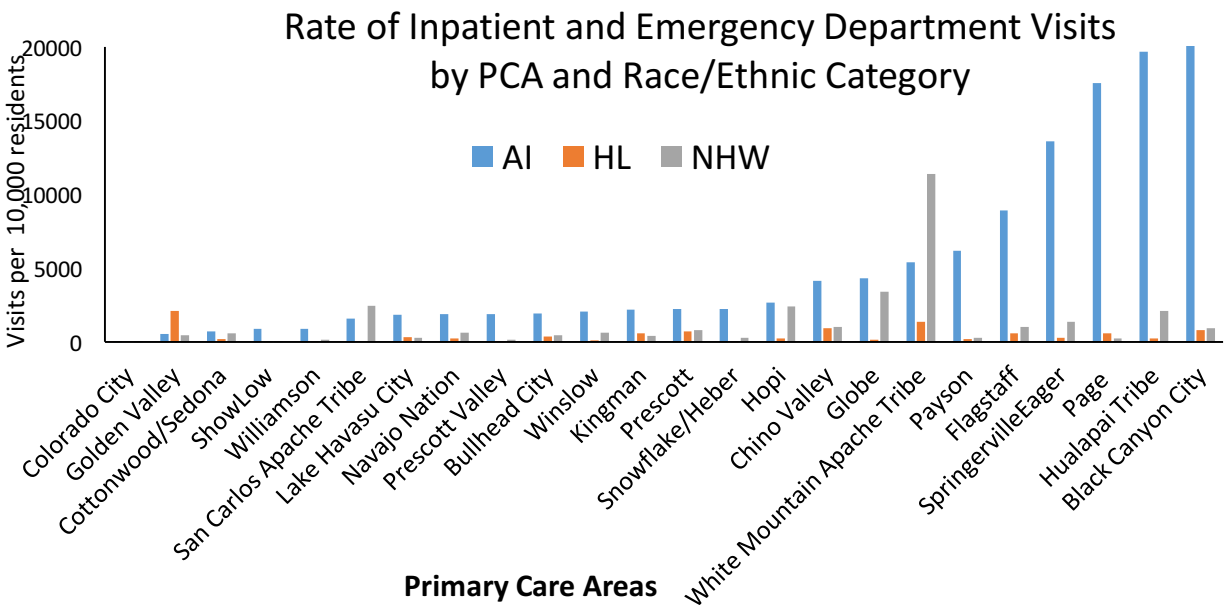

Figure 49. Hospital utilization by PCA and ethnicity, 2014.

Health Patterns in Children Age 0–24

Few health data on children are consistent at the county level in Arizona. To understand what conditions are affecting children ages 0–24, we consulted the Arizona Department of Health Services' Hospital Discharge data by age group. Of note, up to 25 ICD-9 codes can be specified in a claim and the primary diagnostic code was used for the purpose of this research.

The following analysis is based on data showing the 15 most common primary diagnosis codes for inpatient and emergency department visits by county. The diagnoses are categorized further by age group (less than 1 year old, 1–4 years old, 5–9 years old, 10–14 years old, and 15–24 years old). Each diagnosis code is classified as 1 of 18 general disease categories. We used those categories to code the top 15 diagnoses and ascertain the percentage of each disease category within the top 15 diagnoses.

Figures 50 and 51 depict the regional summaries for 2010 and 2014. Disease categories occurring among the top 15 diagnoses are summarized by age group. **Percentages represent percent of total admissions**. Some of the specific diseases that correspond with each category listed below vary between age groups and counties. For a complete list of the top 15 diagnoses and their corresponding disease categories by county and region, see Appendix H.

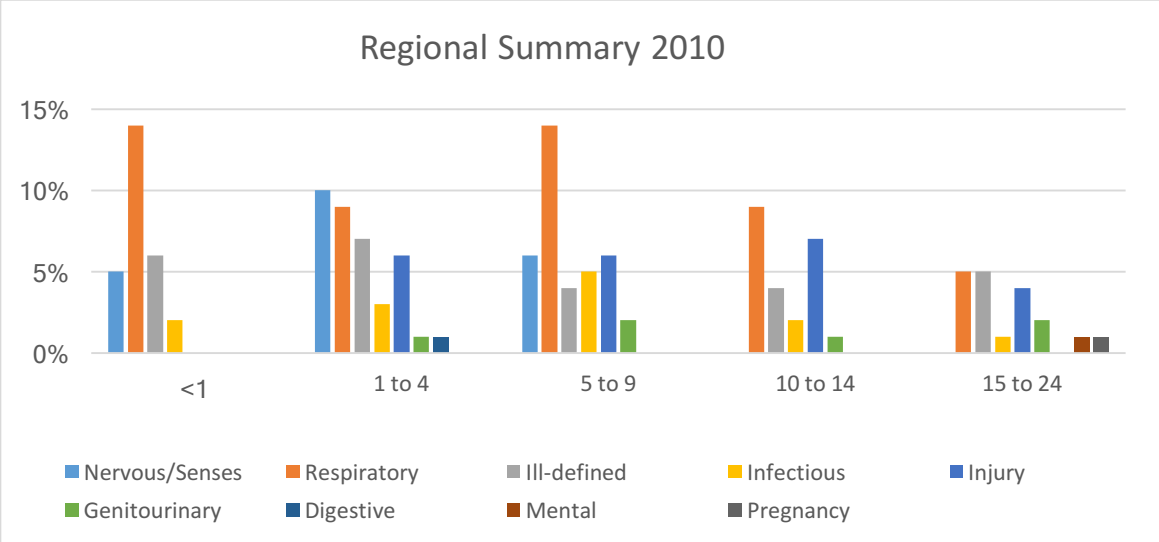

Figure 50. Regional summary of disease categories for top 15 diagnoses, 2010.

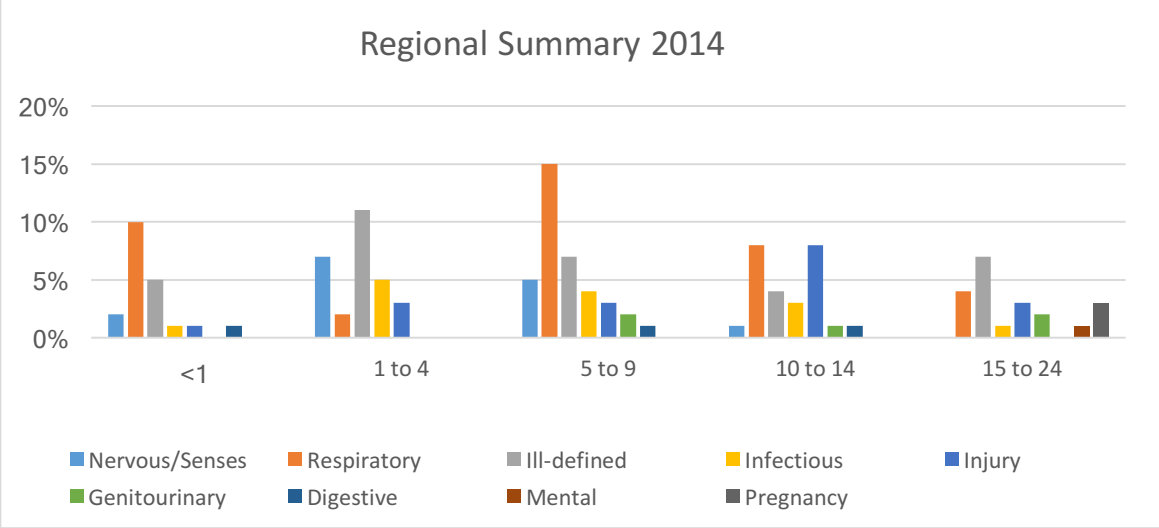

Figure 51. Regional summary of disease categories for top 15 diagnoses, 2014.

Less than 1 Year

For children less than 1 year old, the most common discharge diagnosis was birth. This category most commonly included single live birth babies born through cesarean and non-cesarean delivery as well as twin births born by cesarean section. There was relative consistency across the counties in terms of cesarean vs. vaginal deliveries. Cesarean deliveries comprised between 20% and 30% of all live births across the region.

The second most common discharge diagnosis category was diseases of the respiratory system. This category commonly included acute upper respiratory infections, acute bronchitis, and pneumonia. Less common diagnoses in this category were sinus infections and croup.

Admissions for diseases of the nervous system and sense organs were also relatively high. Specific diagnoses in this category most commonly included ear infections (90–100%) but in some counties also included conjunctivitis (pink eye). Ear Infections ranked fourth on average in the top 15 diagnoses across the counties. On average, this category comprised about 6% of total admissions for this age group in 2010 but dropped to 3% in 2014 (Figures 52 and 53).

Symptoms, signs, and ill-defined conditions typically made up 4–5% of all admissions for this age group. Specific diagnoses in this category commonly included fever, vomiting, vomiting with nausea, cough, and less commonly, diarrhea.

From 2010 to 2014, the proportion of respiratory disease diagnoses decreased substantially from 25% to less than 10% in Apache County. Smaller decreases occurred in Coconino, Gila, Mohave, and Yavapai counties.

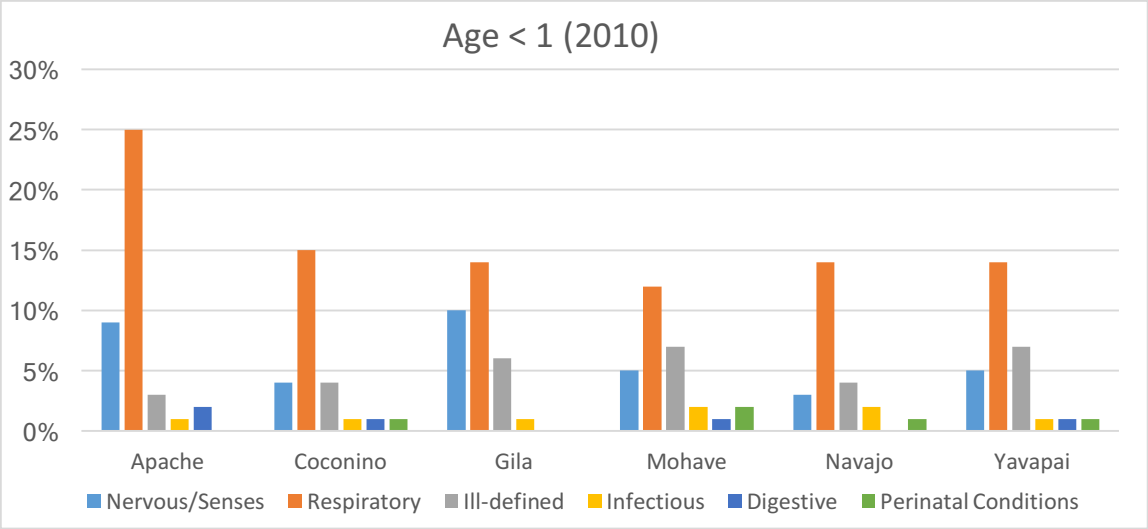

Figure 52. Top disease categories for children less than 1 year old by county in 2010 (excluding birth). The perinatal conditions disease category included jaundice and other unspecified conditions.

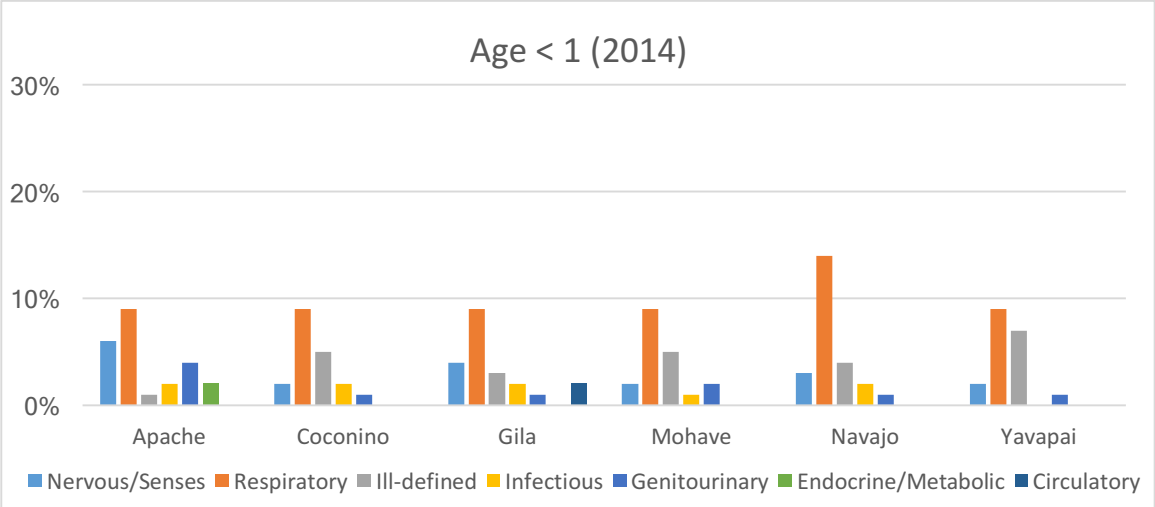

Figure 53. Top disease categories for children less than 1 year old by county in 2014 (excluding birth). The endocrine/metabolic condition that appeared in the top 15 diagnoses for Apache County was dehydration. The circulatory conditions that appeared in Gila County were heart failure (*n* = 21) and subendocardial infarction (*n* = 16).

1–4 Years

For the 1–4 age group, the most common disease category for hospital admission or ED visit was diseases of the respiratory system. The diagnoses that comprised the majority of this category were upper respiratory infections followed by pneumonia, croup, pharyngitis, bronchitis, and pneumonia. Pneumonia was the second highest diagnoses in Navajo County but between the other five counties, averaged at about ninth.

On average, ear infections ranked second in the top 15 diagnoses across the region. Ill-defined symptoms and conditions were also common for this age group and this group included fever, nausea, and vomiting. Nausea and vomiting were in the top 15 for all six counties and on average, ranked in the middle of the list. Injuries made up about 8–11% of all admissions regionally. All specific diagnoses in this category involved some type of injury to the head, face, or neck. Injury rates were the highest in Coconino County, comprising 15–17% of top 15 diagnoses. Injuries in Apache County for this age group averaged 2% of top 15 diagnoses. Streptococcal virus was the most common infectious disease for this age group.

From 2010 to 2014, noticeable decreases in the proportion of respiratory disease diagnoses occurred in Apache and Coconino counties. Similarly, nervous/sense diseases also decreased in Coconino and Mohave counties (Figures 54 and 55).

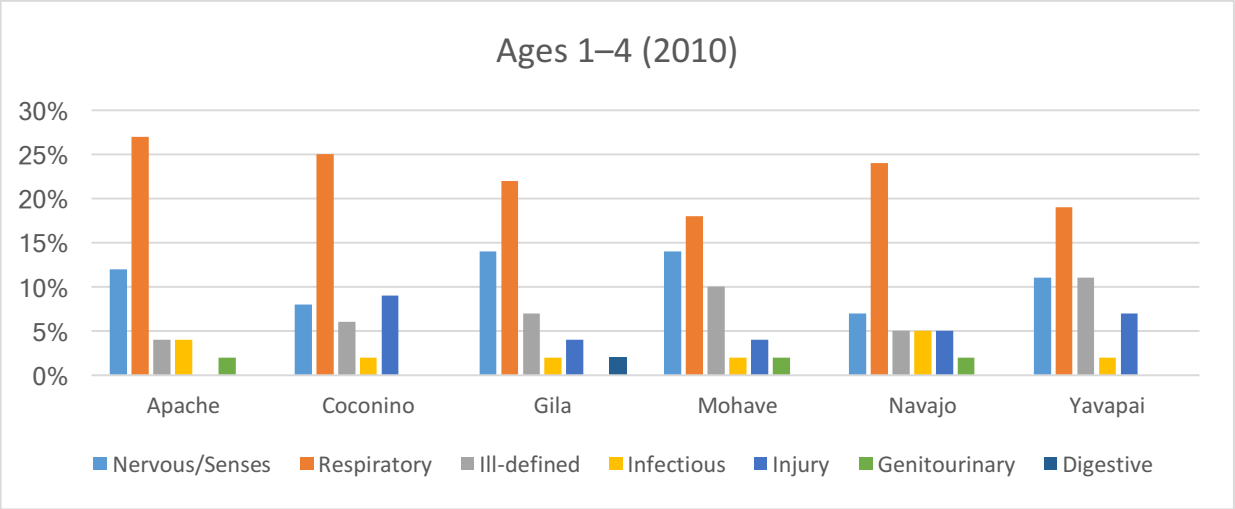

Figure 54. Top disease categories for children ages 1–4 years by county, 2010.

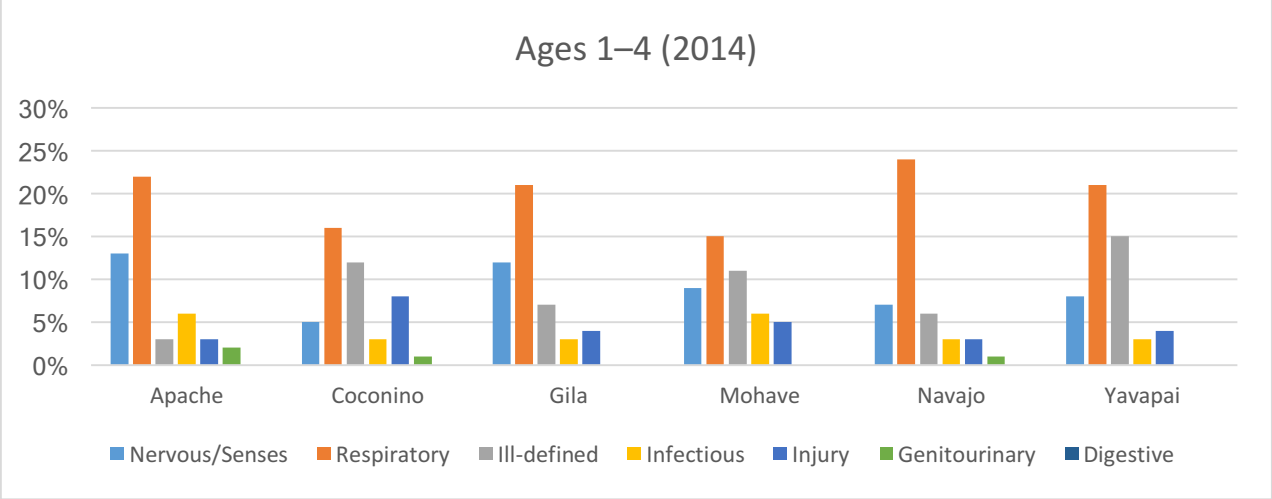

Figure 55. Top disease categories for children ages 1–4 years by county, 2014.

5–9 Years

For children ages 5–9, diagnoses classified as respiratory conditions were the highest (35–44% of the top 15 diagnoses) followed by injuries (11% in 2010 and 19% in 2014) and ill-defined symptoms and conditions (17% in 2010 and 7% in 2014). In 2010, although the respiratory conditions made up 35% of the top 15 diagnoses, the rate in Apache County was 47%. The types of diagnosis that comprised these categories were very similar to those found in the 1–4 year age group. Asthma began to appear in this age group as a major respiratory diagnosis but was generally toward the bottom of the top 15. The exception to this was that asthma was the fifth top diagnosis in Apache County in 2010 and asthma with acute exacerbation was the third highest diagnosis in Navajo County in 2014. Abdominal pain appears as a diagnosis in the ill-defined conditions category along with nausea, vomiting, and fever, common in the younger age groups. Diseases of the nervous system and sense organs were still common among this

age group. Ear infections remained the top diagnosis for this category but conjunctivitis (pink eye) is also in the top 15 for most counties for this age group (Figures 56 and 57).

Dissimilar from younger age groups, respiratory diseases increased among children 5–9 years old from Gila, Mohave, and Navajo counties. Infectious diseases also increased from 2010 to 2014 among this age group from Apache, Gila, Mohave, and Navajo counties.

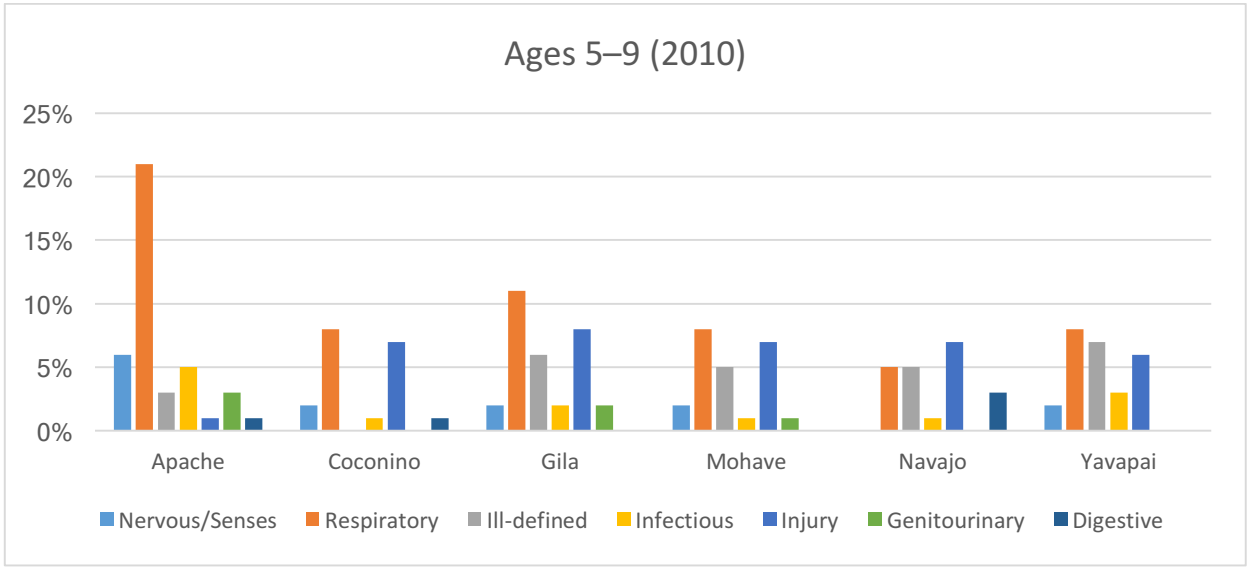

Figure 56. Top disease categories for children ages 5–9 years by county, 2010.

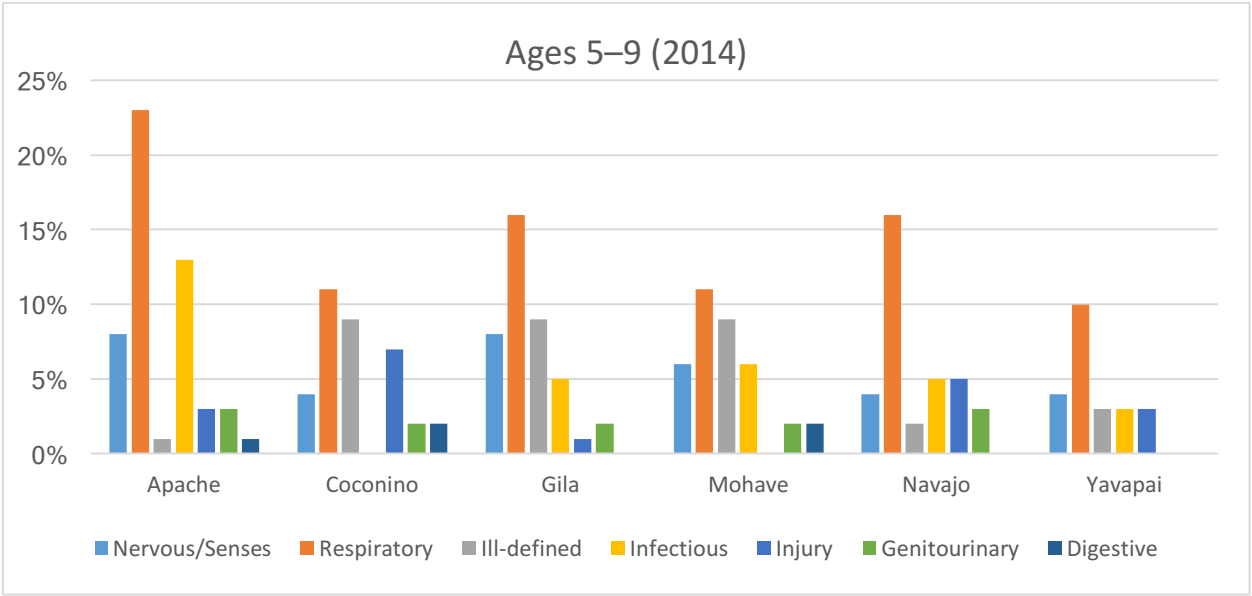

Figure 57. Top disease categories for children ages 5–9 years by county, 2014.

10–14 Years

Ear infections and conjunctivitis were lower for this age group but respiratory conditions (31–34%) and injury/poisoning (28–30%) were slightly higher than for other age groups. The types of respiratory conditions were consistent with the other age groups. Asthma was still in the top 15 but is consistently near the bottom of the list in all counties. Proportions of urinary tract infections are slightly higher in this age group than in the younger age groups and rank either fifth or sixth in each county. In Gila County in 2014, Type 1 diabetes appears in the top 15 diagnoses but with only 10 diagnosed cases. Of note is that respiratory diseases decreased substantially from 2010 to 2014 among children 10–14 years old from Apache, Gila, Mohave, and Yavapai counties (Figures 58 and 59).

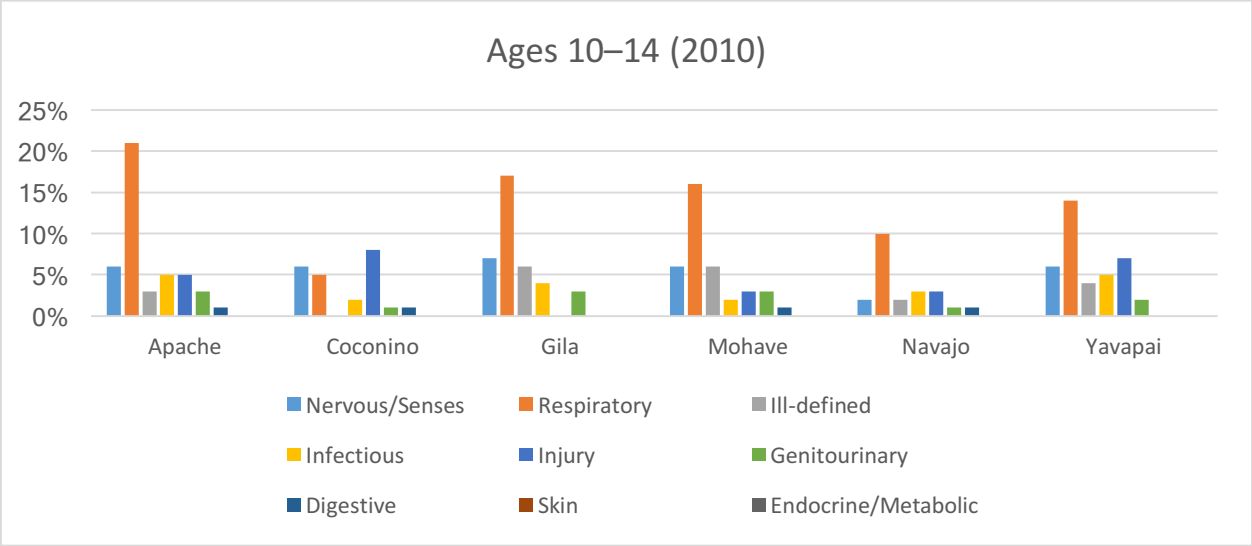

Figure 58. Top disease categories for children ages 10–14 years by county, 2010. The genitourinary category included urinary tract infection diagnoses only. The digestive category included colitis and gastroenteritis.

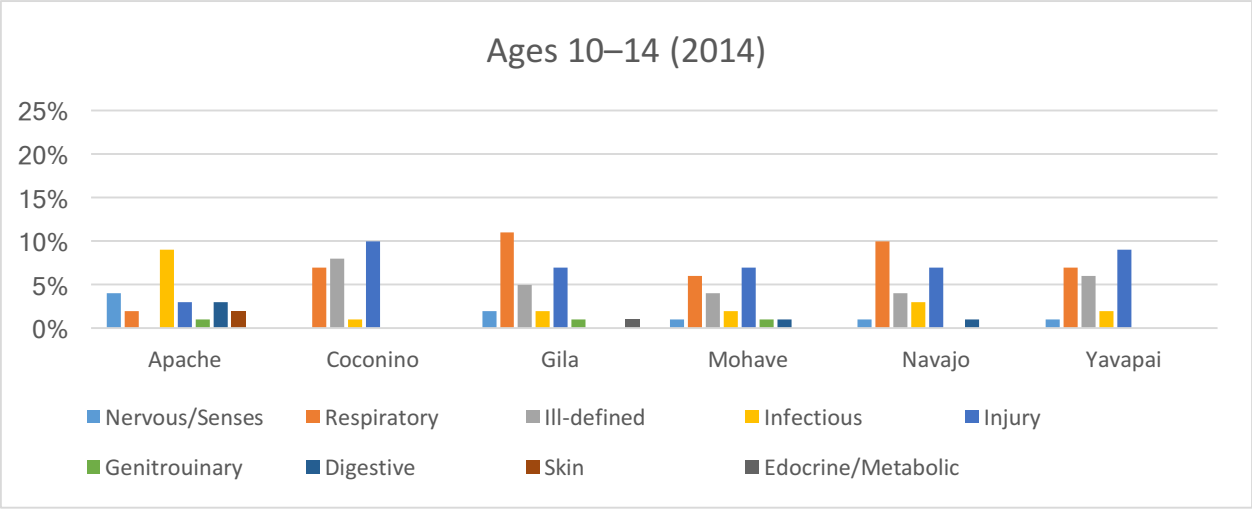

Figure 59. Top disease categories for children ages 10–14 years by county, 2014.

15–24 Years

Respiratory conditions, injuries, and ill-defined conditions were all still common in this age group. Urinary tract infections move to the top five diagnoses for most counties and asthma moves out of the top 15 for most counties. For this age group, complications or conditions associated with pregnancy and/or childbirth begin to commonly occur in the top 15. Across the regional top 15 diagnoses, pregnancy-related conditions accounted for 8% in 2010 and 14% in 2014. In Mohave County this rate was 21–22% and in Navajo County it was 20% in 2014 (up from 9% in 2010). In 2014 this category was the second highest reason for hospital admission in Mohave and Coconino counties (Figures 60 and 61).

Mental conditions appear for the first time in this age group. In 2010, alcohol abuse was the number one diagnosis for this age group in Coconino and Navajo counties. In 2014, the rates of alcohol abuse were relatively lower compared to other diagnoses but appeared in more counties. In Yavapai County, the mental category included anxiety and depressive disorders but not alcohol abuse. Anxiety disorder appears in Mohave and Coconino counties and depressive disorders appear in Navajo and Yavapai counties. Mental disorders were not in the top 15 diagnoses in Gila County for either 2010 or 2014.

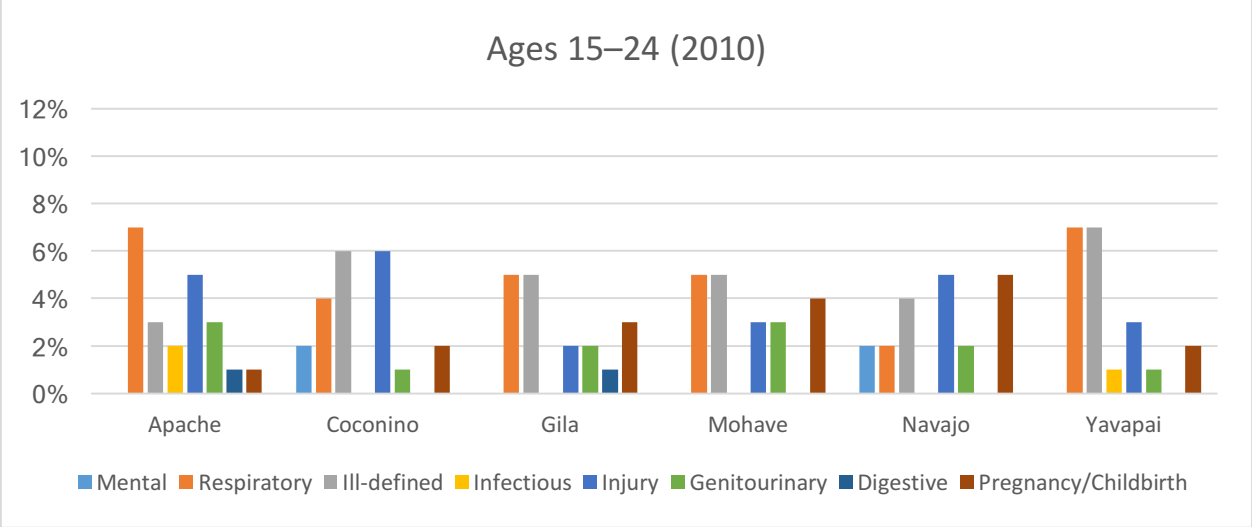

Figure 60. Top disease categories for children ages 15–24 years by county, 2010.

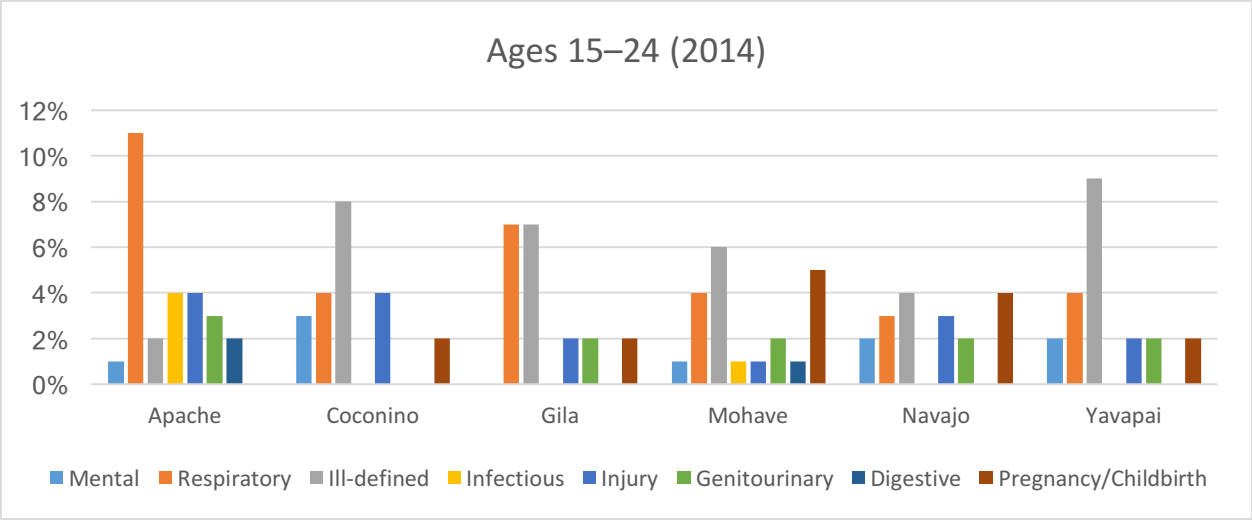

Figure 61. Top disease categories for children ages 15–24 years by county, 2014.

SOCIAL DETERMINANTS OF HEALTH

As described previously concerning this report's theoretical framework, the Social Determinants of Health (SDOH) model is an important framework for exploring the complex intersections between social, cultural, economic, political, and systems-level influences on mental and physical health among diverse populations throughout the region. The key social determinants explored in this section are outlined in Figure 62. Many of these factors relate to the health disparities between populations discussed in the previous section.[14]

Access to Health Care	Social & Cultural Context	Education	Economic Stability	Neighborhood & Built Environment
• Culturally Competent Care • Health Literacy • Quality of Care • Health Insurance • Provider Availability	• Social Cohesion • Community Engagement • Social Support Systems • Discrimination • Incarceration	• Graduation Rates • Language & Literacy • Early Childhood Education • Higher Education	• Poverty • Employment • Affordable Housing • Food Security	• Access to Healthy Food & Recreation • Crime & Violence • Air & Water Quality

HEALTH OUTCOMES
Mortality, Morbidity, Life expectancy, Health status,
Functional limitations, Health-related quality of life

Figure 62. Diagram depicting the Social Determinants of Health (SDOH) model.

SDOH Factor 1: Access to Health Care

Healthy People 2020 has several objectives related to health care access that broadly focus on increasing the number of people with health coverage and a regular source of care, while reducing the number of people unable to obtain needed prescriptions, dental care, and health care.[1] This assessment identified access to care as a major concern requiring urgent attention in northern Arizona.

Access to quality, affordable health care was the most commonly discussed priority health issue identified by all methods of qualitative data collection. The issue of access to care is complex, and several social determinants of health can serve as underlying barriers or facilitators to people being able to access the care and resources they need. Some of these barriers were direct, and are loosely defined here as the immediate barriers that prevent people from receiving care. These mainly stem from a lack of knowledge of services, lack of available services, lack of affordable and reliable transportation, inconvenient office hours, and general challenges to obtaining insurance and barriers in patterns of coverage. Indirect barriers refer to underlying social determinants, such as social, cultural, economic, and environmental barriers that inhibit people's ability to access quality care and the resources necessary to live a healthy life.

Shortage of Proximal Providers and Services

There is a perception of a shortage of health care providers in most of northern Arizona. One cause is the inability of local health care facilities to recruit and retain providers, especially in rural areas. Providers are often community outsiders and they do not stay long enough to get to know the community where they work. If a patient finds a provider they like and begins to develop a positive trusting relationship, when the provider leaves they have to start over with someone new.
Some participants feel that the lack of continuity of providers contributes to a lower quality in care. The shortage also causes very long wait times to get appointments, and in some cases, specialty services are not available locally at all.

> *Patients say, "I had such a good relationship with my last counselor and now I have a new one – that's why she came to the ER – new person isn't seeing the whole picture." We need to keep staff for them to be useful.* (Interview Participant)

> *We only have [one provider] – that puts a lot of pressure on them to address a lot of need. Their staff has recently turned over – getting a lot of new behavioral health people who are not from this area – they're not in tune to what is happening in this area yet – need a few years to adjust – probably won't last here that long.* (Interview Participant)

Many veterans were frustrated by the fact that they have to make appointments for prevention and management very far in advance because often the wait times are more than a month. It is very hard to find providers for emergency or urgent situations. Providers who are available to veterans using the VA health care system are among the lowest ratios of any population.

> *We have 8,000 veterans … about 4,700 are registered with the VA here and we were doing that with one doctor and the doctor didn't speak English – he used a translator.* (Focus Group Participant)

Veteran participants also talked about the red tape and regulations that make it hard for them to obtain convenient quality services. Most of these barriers were related to insurance and being restricted to where they can obtain covered services. Differences in quality and availability within various veteran service centers means that often the highest quality services are not available at the closest VA location. There are veterans traveling 2 hours to receive certain services.

> *I'm a veteran and I got really sick 2 years ago. I went to the VA and they said no you have to go to the emergency room. So I couldn't afford to go to the emergency room so I went up here to the health facility. And they said we can't see you because you have VA. I offered to pay them cash and they wouldn't take it. I had to go all the way up [another] VA facility – I was lucky because I had a car but think about the people that can't.* (Interview Participant)

Lack of Behavioral Health Providers

The Arizona Department of Health Services has designated all of northern Arizona as a Mental Health Professional Shortage Area (MHPSA). Table 15 shows the ratio of mental health providers (i.e., psychiatrists, psychologists, licensed clinical social workers, marriage/family therapists, counselors, nurses specialized in mental health services, and mental health providers treating substance use) to population by county. According to County Health Rankings, the state average for the ratio of mental health providers to population is 839:1. Only Yavapai County and Coconino County averages are better than the state average. The highest ratios are in Gila and Navajo counties.

Lack of access to mental health services was one of the most common issues discussed in the interviews and focus groups. Participants discussed an extreme inadequacy in the numbers of mental and behavioral health providers, especially in rural areas. The perception is that many other health and social issues are compounded because of the lack of appropriate and timely mental health care. Participants were particularly concerned about the shortage of inpatient treatment centers and outpatient support services for substance abuse issues.

Table 15: Population to Mental Health Provider Ratio, 2017[39]

County	Mental Health Care Provider to Population Ratio
Apache	1153:1
Coconino	543:1
Gila	1772:1
Mohave	1484:1
Navajo	1504:1
Yavapai	637:1
Arizona Overall	850:1

They come out from our place and they don't have any kind of supports around and they're right back on the street. They're right back in the … in the throes of addiction. And then most likely, the law enforcement will pick 'em up. They could end up in jail. And then it's just a cycle. (Focus Group Participant)

There are no facilities for people who want to get help. You know, they … they can start it. And they say, well, I'm sorry, you have to do outpatient. You know, some people just can't do it outpatient. They go to their group, and then they come home, and are surrounded by their environment. So it's really hard for individuals here. There is very little for the entire northern Arizona … for people who want to better themselves. (Focus Group Participant)

Participants also felt that many people would benefit from having access to outpatient counseling services that could help people manage their mental health issues and prevent people from going into crisis. Many of the behavioral health services that are available, are reserved for AHCCCs patients, those who are severely mentally ill, or people in crisis.

Behavioral health is a huge area of need – Change Point is the only provider and most services offered are available to AHCCCs only. (Interview Participant)

If you're under 18, there are NO behavioral health services that work with private insurance or cash pay. (Interview Participant)

Because mental health is a less visible health concern, many people do not see less severe mental health issues as being something that can actually be actively prevented or treated. There is little awareness and promotion of the important potential of counseling services for addressing common issues such as relationship problems, depression, hopelessness, anger, and stress. Participants discussed the connection between people not having access to the resources to help manage these issues and the fact that eventually many turn to substance abuse, suicide, or other self-destructive behaviors.

The stresses that people go through … there are lots of single parent families – them trying to go to school and deal with putting food on the table and a roof over their heads – sometimes is just too much – too much pressure – it leads to depression and anxiety – they turn to substance abuse because of the stresses. (Interview Participant)

All too often, law enforcement serves as a potential liaison to needed health and mental health care services. Many community members that interact with law enforcement on a regular basis suffer from severe mental illness, chronic homelessness, or chronic substance abuse issues. Participants discussed barriers that exist in the intersection between the criminal justice system and the behavioral health care system that make it very difficult for law enforcement to help community members get the appropriate mental health resources they need and avoid unnecessary incarceration.

Mental health … is not addressed at any level within the police department. If there's somebody who is arrested and their issue is mental health, they may be doing criminal acts because of issues that they're dealing with – they just arrest and release – there is no treatment or observation or referral. Those issues are never addressed. (Interview Participant)

*We are using the jails as de facto mental health centers which they should not be. We should not have people in jail who are there because of mental health reasons. (*Interview Participant)

Some law enforcement agencies in the region do see a need for reforming the way that officers interact with community members who are suffering from these issues, but they face organizational challenges in successfully implementing better long-term strategies for getting these individuals the help and resources they need to avoid future altercations and potential incarcerations. More opportunities are needed for law enforcement officers to have Crisis Intervention Training (CIT). Often, even when officers are trained in CIT, when police respond to a call and recognize that the person needs behavioral health services, they do not have the mental health resources available to make sure the person gets the appropriate help.

We might only have five officers working the streets in the entire city and we find somebody that needs mental health care and we end up spending hours and hours with these people because we can't get an agency to come screen them or come help us deal with them. (Interview Participant)

Nobody will come to the scene and we don't have a drop off … there is no quick fix available to take someone who needs help to the people that can help them. (Interview Participant)

Participants discussed organizational and regulatory issues that make this process more difficult. Staffing issues at behavioral health facilities create long response times. Individuals who are not existing patients at a behavioral health facility must be willing to seek services voluntarily. If they are resistant, there is little the officers can do besides arrest them. Individuals also have to have a medical screening before they can be accepted into an inpatient facility. Often, officers spend hours waiting in the ER with individuals to get the necessary screening.

People also reported that veterans experience lack of mental health services. PTSD and other combat-related mental and emotional issues are very prevalent in the veteran community but there is a lack of awareness about these issues. Often symptoms go unrecognized and veterans and their families are not connected to the resources they need.

We have combat veterans coming home who have watched their brothers in arms die right in front of them or be wounded right in front of them. Right now the medical sciences have advanced rapidly as far as physical abilities, such as prosthetic legs and arms, they're doing great but they haven't really progressed much in the area of mental health. (Interview Participant)

Lack of Primary Care Providers

Participants reported that because there are too few primary care providers, they are overloaded and as a result are providing lower quality care. It is difficult for community members to get appointments in a timely manner and when they do, they feel that the doctors do not have enough time to listen to the patients and give them the attention and information they need. Many providers are not even taking new patients.

> *I got irritated with the doctor over there because when I had my son 9 years ago, he was really good. And now, 'cause he's overloaded with all these patients, it's like his work is slacking.* (Focus Group Participant)

> *When you do go try to find a doctor, they're not taking new patients – if you have kids, your peds will take your newborn, but if you don't … like I lost my [general practitioner] and it was almost impossible to find a new one – they want to know what is pre-existing. "How much work are you going to be?" That's what you feel like.* (Interview Participant)

> *We seem to have an awful lot of doctors that unless you know you're gonna be sick a month in advance, and can get an appointment, it's just tough luck … you might as well forget it. You're – you're gonna die before you get in to see one of them.* (Focus Group Participant)

In the northern region of Arizona, only 23% of Primary Care Areas (PCAs) had better primary care provider to population ratios than the state as a whole (Table 16).[40] In more urban areas such as Flagstaff, Show Low, and Prescott, the ratios were lowest. Ratios were highest in the most rural and remote areas. Most tribal PCAs do not have a general hospital. According to 2016 data from the ADHS Division of Licensing Services, more than half of PCAs have no skilled nursing facilities or home health agencies.

Adequacy of transportation is determined by the transportation score, which is part of the Primary Care Index. Transportation scores are based on poverty and access to a personal vehicle and not on access to public transportation, infrastructure, and distance to services.[22] PCAs with the worst transportation scores include the San Carlos Apache Tribe, White Mountain Apache Tribe, and Navajo Nation, and the best scores came from Flagstaff, Williamson, and Page.[41]

According to the quantitative (BRFSS) data, only Yavapai County is above the state average for residents who self-reported that they have a usual source of care. In Coconino and Apache counties the averages are in the mid-50s, the lowest in the region. The percentages of people who visited their doctor for a routine check-up in the past year are closer to the state average. For both indicators, Yavapai and Gila counties are the highest (Figures 63 and 64).

Table 16: Primary Care Area Resource Profile[41]

Primary Care Area	Population	Pop-PCP Ratio *	General Hospital**	Hospital Beds per 1,000 ppl	Skilled Nursing Facilities	Home Health Agencies	Trans Score ***
Arizona State	6,835,518	296:1	Yes**	2.0	146	225	109
Springerville/Eager	18,000	857:1	Yes	1.4	0	0	109
Page	9,700	461:1	Yes	2.6	0	0	99
Grand Canyon Village	10,500	1,169:1	No	0	0	0	101
Flagstaff	93,900	193:1	Yes	2.8	2	3	81
Payson	27,700	504:1	Yes	1.6	2	1	118
Globe	19,500	454:1	Yes	1.3	2	2	117
San Carlos Apache Tribe	10,400	10,350:1	Yes	0	0	0	191
Colorado City	11,000	2,200:1	No	0	0	0	117
Kingman	61,400	285:1	Yes	3.8	3	3	121
Hualapai Tribe	1,300	1,300:0	No	0	0	0	164
Golden Valley	10,900	1,100:1	Yes	0	0	0	121
Bullhead City	64,000	400:1	Yes	3.6	2	4	115
Lake Havasu City	57,000	372:1	Yes	2.7	3	2	104
Navajo Nation	100,000	1600:1	Yes	0.3	1	4	153
Hopi Tribe	12,000	290:1	No	0	0	0	140
Winslow	18,400	382:1	Yes	1.4	1	0	130
Snowflake/Heber	18,000	1,000:1	Yes	0	0	0	106
Show Low	30,300	227:1	Yes	2.9	2	1	102
White Mountain Apache Tribe	13,000	823:1	No	0	0	0	171
Cottonwood/Sedona	63,700	327:1	Yes	1.7	0	3	104
Chino Valley	24,000	1,600:1	Yes	0	0	0	101
Williamson	12,900	800:1	Yes	0	0	0	82
Prescott Valley	59,600	784:1	Yes	1.2	1	3	103
Prescott	50,100	134:1	Yes	2.7	4	3	114
Black Canyon City	13,000	874:1	No	0	0	0	113

*Number of active providers, and ratio to population of Family Practice, General Practice, Gynecology, Internal Medicine, Obstetrics and Gynecology, Obstetrics, Pediatrics (MDs) physicians, all active Osteopathic Physicians (DOs), Nurse Practitioners (NPs) and Physician Assistants (PAs) working in Primary Care (includes federal doctors). NPs and PAs are counted as 0.8 of an MD full-time equivalent. **A general hospital is defined by the Arizona Department of Health Services as a short-stay, acute care, non-federal general hospital. For a "yes" designation in this category, the hospital must be within a driving time of 35 minutes or less. There are 67 general hospitals in the state. ***The transportation score is determined by six indicators including % of population with annual income less than 100% of poverty line, % population over 65 and under 14, % of population with disability, % of population without a motor vehicle, and the motor vehicle to population ratio. The higher the score, the less adequate or greater the need for transportation.

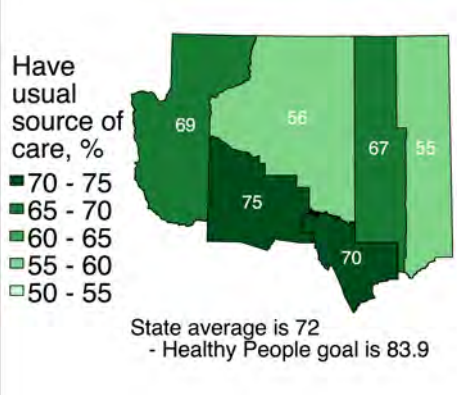

Figure 63. BRFSS usual source of care.

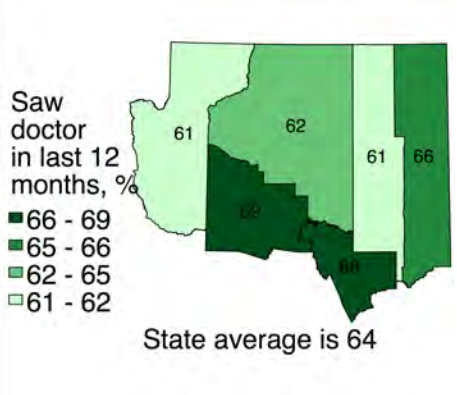

Figure 64. BRFSS recent doctor visit.

Primary Care Access in the American Indian Community

Many American Indian community members also spoke about a lack of "customer service" in the health care delivery system. Participants spoke about a lack of empathy and compassion among some providers who serve American Indian communities. Many patients travel hours to seek services and when they are greeted with negativity, it can affect their entire health care experience and their willingness to come back for care. Many participants said that people feel disrespected by doctors and feel that their expectations of the health care system are rarely met. Often, people feel like the doctors are in such a rush that they do not take time to really communicate with patients in a productive way. Long wait times for appointments at Indian Health Services (IHS) or Tribally-governed facilities are also a huge barrier for people seeking services. Patients often wait for hours to be seen. Clinics are currently shifting from a walk-in system to a stricter appointment system. Patients who are used to the walk-in system and have little access to transportation become frustrated when they show up and are turned away or told to reschedule. There is also frustration with the lack of treatment capacity at many IHS or Tribally-governed clinics. Many people reported waiting days or weeks to get an appointment at IHS or Tribally-governed clinics only to be referred to another facility, which is often farther away.

> *The clinic is trying to drop walk-ins. People got used to being seen whenever they went to the clinic and now they are trying to make it so that you have to have an appointment. If you're 10 minutes late you can't be seen. People aren't willing to put up with that. People can have a real problem and they just won't say because they don't feel like they will be listened to*. (Interview Participant)

Lack of Specialty Services

The most commonly discussed specialty area that participants felt was lacking was home health care services for older adults, people with disabilities, or homebound individuals. Often, elders do not want to lose their independence or move far from their homes into assisted living facilities. The limited number of home health services, especially in rural areas and on the reservations, can be a huge barrier for individuals to get the care they need. When older adults do not have someone regularly checking in on them and helping to monitor their condition and noticing changes, their health can deteriorate very rapidly. Often older adults rely on friends and family members but that system can be inconsistent and those people are often not medically trained.

We have very limited home health in our area. There is only one nurse and he comes out [here], and he won't go to our outlying areas … So there's very limited resources. It's a nurse and so he can do, you know, he can do nursing things. But there is not therapy here for our area. (Focus Group Participant)

American Indian community members discussed the need for more palliative care resources for elders. Often seniors have to be placed in facilities that are very far from their traditional lands and their families. Participants at the Indigenous Community Forum discussed the physical and emotional impact of being forced to leave their homes to live in remote facilities because many elders are so strongly connected to the land where they grew up. Some would rather not get the care they need than leave their homeland.

Participants, especially in rural areas, are frustrated with the general lack of services that their local health facilities provide. This could mean that many people have to travel very long distances to see certain types of specialists if they could even get in to see someone at all. Sometimes the specialists are booked weeks or months in the future. The most commonly discussed needs were surgical services, lab and imaging services, and OB/GYN services. Other specialty providers that participants felt were in very short supply were oncology, rheumatology, cardiology, speech therapy, autism specialists, and pediatric behavioral health specialists.

We have very limited surgeries at our hospitals so they would have to go out of town. They even have to go to Show Low to have babies. (Focus Group Participant)

And then when you finally do get in to see somebody, they can't help you. I was waiting for an ultrasound and they gave it to me and found the ovarian cysts and twice they've told me. "Okay, we can't get you in until November," and it was like September. (Focus Group Participant)

Lack of Dental Providers

Many participants were frustrated over the lack of affordable dental care in the region. Many insurance plans do not cover dental services and only North Country HealthCare offers sliding scale services which can also be cost prohibitive.

In terms of dental, unless a person has credit or can pay in full, there are no dental providers –Dental for people who don't have insurance – that's non-existent. It's unfortunate because then people end up in the ER and the problem is so much worse and presents as a critical pain problem or another health problem – the highest cost of care. (Interview Participant)

We do have AHCCCS and all these different plans, but once you reach a certain age, you know, you don't get any dental care … 'cause I've seen quite a few patients that are unable to eat because of their teeth, and yet they can't get dental coverage. (Focus Group Participant)

According to BRFSS data, preventive oral health care, another **leading health indicator**, varied from 49% to 65% across counties, with only half of residents in Yavapai and Mohave counties having seen a dentist in the last 12 months (Figure 65). Table 17 shows the population to dentist ratio for each Primary Care Area in the northern Arizona region.[22]

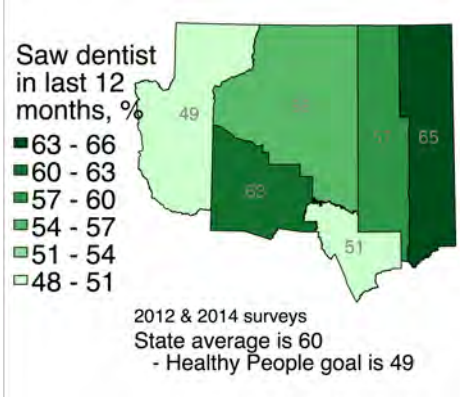

Figure 65. BRFSS recent dentist visit.

Table 17: Population to Dentist Ratio

Primary Care Area	Population to Dentist Ratio
Springerville/Eager	4500:1
Page	2425:1
Grand Canyon Village	0
Flagstaff	1189:1
Payson	2518:1
Globe	9750:1
San Carlos Apache Tribe	0
Colorado City	0
Kingman	2117:1
Hualapai Tribe	0
Golden Valley	0
Bullhead City	2667:1
Lake Havasu City	2375:1
Navajo Nation	10000:1
Hopi Tribe	12000:1
Winslow	3067:1
Snowflake/Heber	2250:1
Show Low	1443:1
White Mountain Apache Tribe	0
Cottonwood/Sedona	1481:1
Chino Valley	4000:1
Williamson	7300:1
Prescott Valley	2384:1
Prescott	795:1
Black Canyon City	0
Arizona	1853:1

Distance to Providers and Services

Because of the shortage of local primary care and specialty providers, community members are often forced to drive long distances to seek care. This can be a major problem considering the lack of public transportation options and the lack of affordable and dependable transportation resources, especially in rural areas. Traveling long distances for medical care also comes with additional indirect costs such as the need to take more time off from work (for many residents this time is unpaid) or more time required for paid childcare, which many people cannot afford.

> *Limited resources – traveling hours away is not an option for people – unless it is unavoidable, people will opt not to go – can't miss work, don't have a place to stay if it's far away.* (Interview Participant)

> *Transportation is a big part of it … if you don't live in the city limits and you need that kind of support, it is literally impossible. I had a friend who broke her arm and couldn't drive and to come into town and go to her doctor's appointment and run some errands, cost her $70 in cab fees; she only lives 7 miles out of town.* (Interview Participant)

Insurance Coverage and Cost Barriers

Having health insurance is a **leading health indicator**. According to BRFSS data for 2011–2015, more than 80% of participants reported having health insurance with modest between-county variability (Figure 66). Estimated rates of the medically insured population from other sources are 4–5% lower than the BRFSS data. In Apache County, the 2015 Census estimate of insured people is slightly lower than the BRFSS data (Figure 67).[2]

It is worth noting that before 2008, 2 years before the Affordable Care Act went into effect, the average rate of insured adults in the northern Arizona region was about 15% lower than recent estimates.[2] However, analysis of BRFSS data shows that despite widespread insurance coverage, 14–16% of northern Arizona adults reported that they could not afford to see a doctor when they needed one. This is comparable to the Arizona average (Figure 68). The rate of insurance coverage for most American Indians living on reservations in the region is significantly lower than the general population (Figure 69). However, even without insurance, American Indians are eligible to receive care at IHS, Tribally-governed, or Urban Indian health facilities.

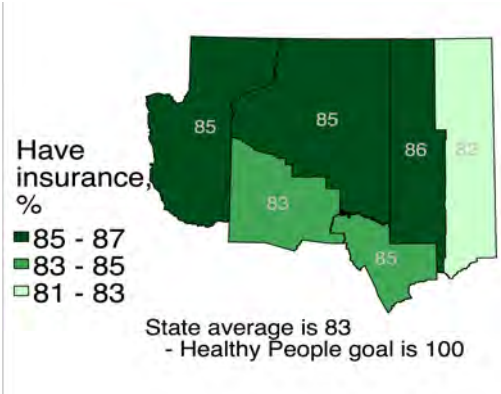

Figure 66. BRFSS insurance coverage.

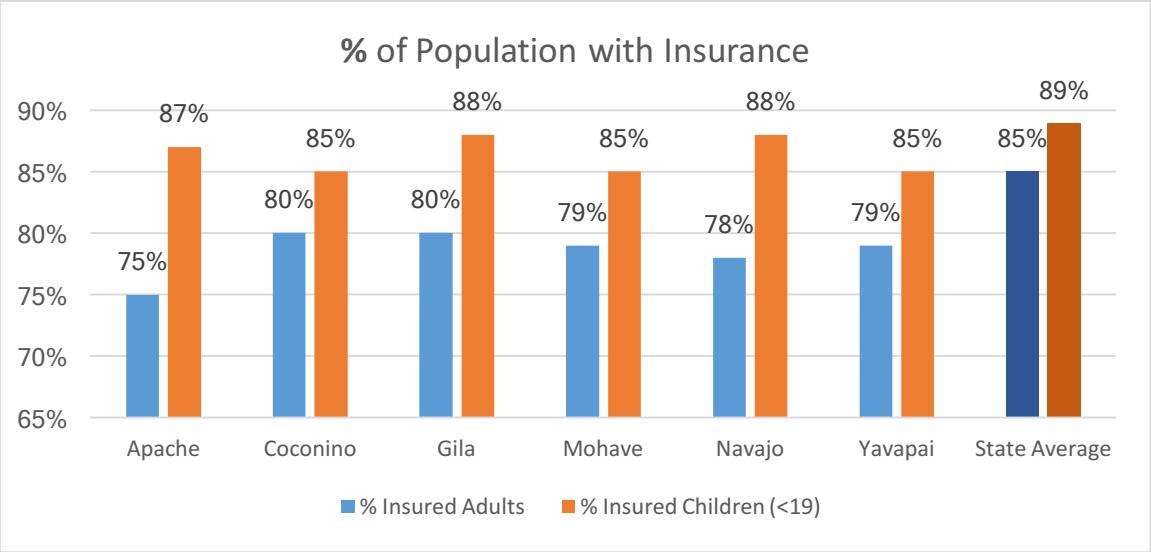

Figure 67. Rates of insured population by county.[2]

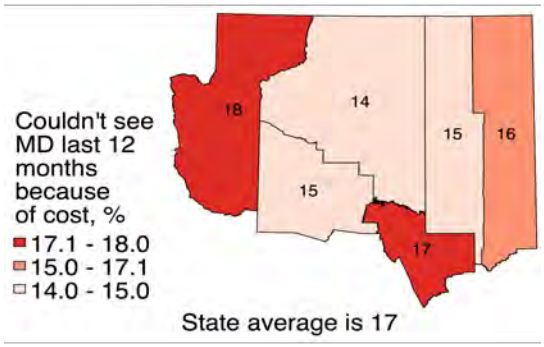

Figure 68. BRFSS couldn't see a doctor because of cost.

Participants discussed a variety of issues with health insurance coverage that create major barriers to accessing affordable convenient health care. Many people still do not have insurance because they do not understand the eligibility requirements and application process.

> *Insurance is a big barrier – there is a lack of understanding how to do that. Also there are quite a few people who did sign up for insurance and the premiums have increased prohibitively – there is a lot of concern about that. Increased drastically. And then not knowing what other options there are – getting assistance, other options for insurance.* (Interview Participant)

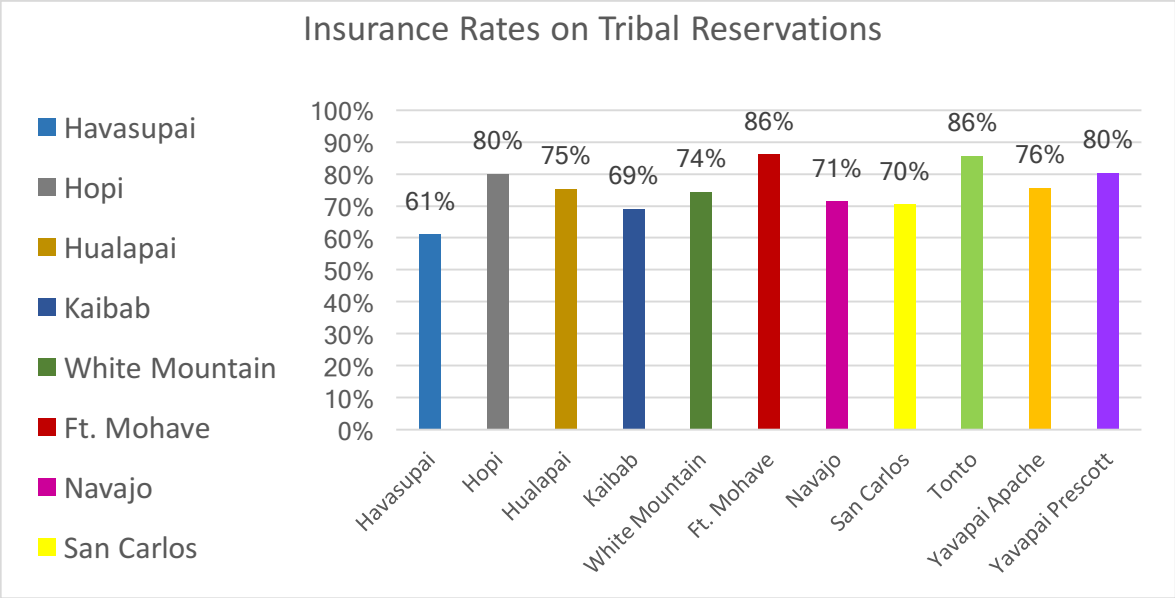

Figure 69. Rates of insured population on tribal reservations.[42]

Cost is an issue even for those who have insurance due to high cost of copays, transportation, child care, and medications. Many participants also discussed the recent and dramatic rise in rates for insurance premiums. This created a sizable gap between the level of income required to qualify for AHCCCS and the ability of many working families and individuals to pay for private insurance through the health marketplace, making purchasing insurance unattainable for many people. Even with insurance, medical services can be cost prohibitive. Often, people can only afford plans with high deductibles so even though they have insurance, their out-of-pocket cost can be extremely high. This results in many people making the decision not to seek medical services unless it is an emergency.

> *[It's hard for the] middle income people on Obama Care – it's a middle gap in insurance. Those high-deductible insurance plans is all people can afford but nothing is covered.* (Interview Participant)

> *I mean, and these bills are huge. And my insurance only pays like so much. What do you do? You try not to go. If there's like a remedy you can do it yourself at home, you do it. Unless it gets really bad, then you go.* (Focus Group Participant)

People who do have insurance often struggle to find providers within the geographic area that are covered by their insurance because many services are not available within the care network. There are also so few providers in the care network that people do not feel like they have choices. Some of the health care facilities that are available, especially in shortage areas, prioritize AHCCCS patients due to regulations and there are few affordable local services that have space for privately insured or cash-paying patients. Some services that people need simply aren't covered by their insurance, especially dental and vision services.

Even with insurance some procedures and services are astronomical – sometimes won't pay because you're out of the area – but there are no services in the area. (Focus Group Participant)

People's insurance won't cover like x-rays and that stuff in the hospital. It has to be done like in a lab. There's no lab in Page. So people have to go to Flagstaff to get x-rays done because their insurance won't cover it if they go to the hospital. (Focus Group Participant)

Similarly, roughly 10% of adults reported being unable to fill a prescription due to cost, a pattern that was consistent statewide (Figure 70). This is particularly concerning given the high percentage of adults likely to have pharmaceutically managed chronic disease—for example, high blood pressure treated with antihypertensive medication.

Many participants noted that it is often very hard to get insurance companies to pay for certain medications, especially for those required to manage chronic conditions such as high blood pressure and diabetes. Even when insurance pays for part of a prescription, the out-of-pocket cost can vary wildly and sometimes is not affordable. For many people who are struggling to make ends meet, paying for medications can mean not being able to afford food or other basic necessities.

I have to take medication every single day. And I had to pay. One time I had to pay for it and I'm like, oh my gosh. Are you kidding me? I couldn't pay for it. I went a week without that medication … It was really stressing not having a medication that you absolutely need every day. (Focus Group Participant)

So you have people coming to a senior center, getting free lunches because they can't afford to eat, who have to pay 250 dollars for insulin to stay alive. And that's crazy. That is ridiculous. (Focus Group Participant)

Many participants discussed frustration with not being able to seek services because they could not afford to take the time off work. In many cases, the only services available on weekends or after working hours are in emergency rooms. In some cases, community members are choosing between taking care of themselves and their families and losing their jobs.

Time off from employment and also the ability to get to a doctor after work hours. Either you can't take time off or if you can, then it's not paid time off. (Interview Participant)

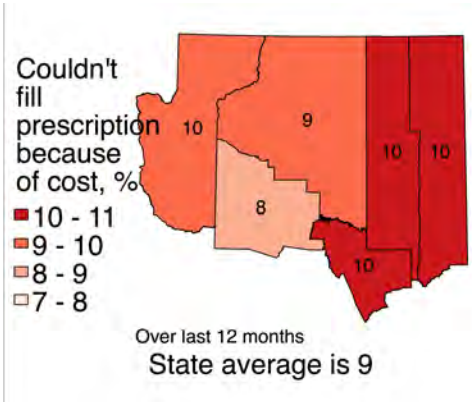

Figure 70. BRFSS couldn't fill prescription due to cost.

And most of us are, you know, most of the families work minimum wage. They don't have access to insurance with their employment. They don't have sick leave, annual leave. We have absolutely no daycare in town … She had, what, six kids. She worked the motels. And kids will get sick. And every time she took time off to get … to take care of her child that was sick, she got fired. She takes time off, she gets fired again. And four times, and then she couldn't find a job in town because she had a history of being fired. (Focus Group Participant)

Clearly access to care is a complicated issue faced by many across northern Arizona. Barriers are systemic, including a lack of primary care, behavioral health, and specialty providers, resulting in people traveling long distances to receive care. For some, even when they do access care, their perception is that the quality of care is poor. Additionally, despite the data showing high coverage rates of insurance, residents reported that not all services were covered by their payer or there were not enough providers included in their payer's provider network or the deductibles were too high. Difficulty with access to needed services impacts other areas of the residents' lives, including ability to afford food and to maintain employment.

SDOH Factor 2: Economic Stability

Living in an impoverished state has been linked with poor health outcomes.[43] Healthy People includes objectives focused on reducing the proportion of people living in poverty, having difficulty affording housing, and experiencing food insecurity. Our analysis also identified these factors related to health.

Poverty /Unemployment

Poverty and unemployment are obvious obstacles to accessing health care services. They also contribute to other barriers discussed below such as lack of access to childcare, higher education, and adequate housing. Participants discussed the connections between poverty, unemployment, and mental health concerns such as depression and substance abuse. Some parents are working multiple jobs and have little time to spend with their families and friends. Many people have high amounts of stress because they feel like they cannot get ahead financially.

The families are barely hanging on, making ends meet, working two jobs, you have kids and you're trying to do all that and when your spouse comes home you expect them to pick up the slack and they need help too. That causes family issues which increases substance abuse, domestic violence, and those issues. (Interview Participant)

When parents are stretched financially, health care, especially preventive health care, quickly moves down the list of priorities. Some participants who are parents talked about not having the time or money to care for their own health because the children come first.

So health becomes like a last issue too. Who's worried about your weight? Who's worried about taking your child to the clinic? You know? We don't take our children to the clinic until they're very sick. Or for immunizations. 'Cause we don't have the transportation. We don't have the money. (Focus Group Participant)

And honestly like, we're women, so our children come first. And then whatever that's bothering you … you just put yourself last. You just do because you gotta make sure these guys are okay. You forget about it and put it off and say I'll be okay … You know, and then it just like leads to more serious

stuff. (Focus Group Participant)

The lack of job opportunities contributes to a sense of hopelessness and helplessness. Several participants also discussed the sense of self-worth that is tied to employment. The emotional toll of being unemployed or unable to provide for your family is a major factor that affects wellbeing. This can lead to or exacerbate problems with depression, alcohol abuse, and family violence.

It's so hard for people to find jobs up here. I just have … I have some roommates. I have one roommate and she can't find a job. It's hard and her boyfriend doesn't have the income. And I'm supporting everybody on Walmart. (Focus Group Participant)

People tie self-worth and self-esteem to work – when they are out of work they get depressed which feeds the cycle … it is a combination of hopelessness and helplessness. (Interview Participant)

I think the extreme poverty is a huge contributing factor because it works on not just financial, but on their self-esteem and their self-worth. We all do get satisfaction from work and being able to be self-reliant. And when you don't have that, it's very difficult I think on people's mental health as well. (Focus Group Participant)

Figure 71 illustrates the level of poverty experienced by residents in all six counties. National estimates of poverty from Healthy People 2020 indicate that 14% of the population broadly live in poverty and 20% of children are living in poverty. All counties in northern Arizona except Yavapai were above these poverty thresholds, for the general population and for children.[28]

According to the U.S. Bureau of Labor Statistics, unemployment rates in the United States have hovered around 5% since 2016. Yavapai County was close to the national unemployment rate, but other counties in northern Arizona have unemployment rates above 5% (Figure 72).[24]

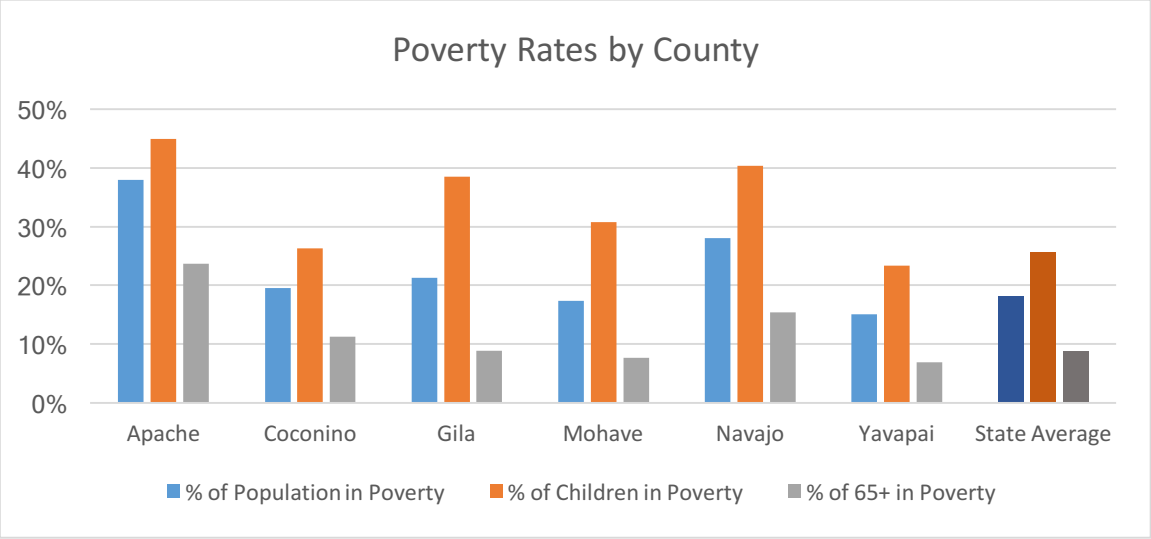

Figure 71. Regional poverty rates by county.[28]

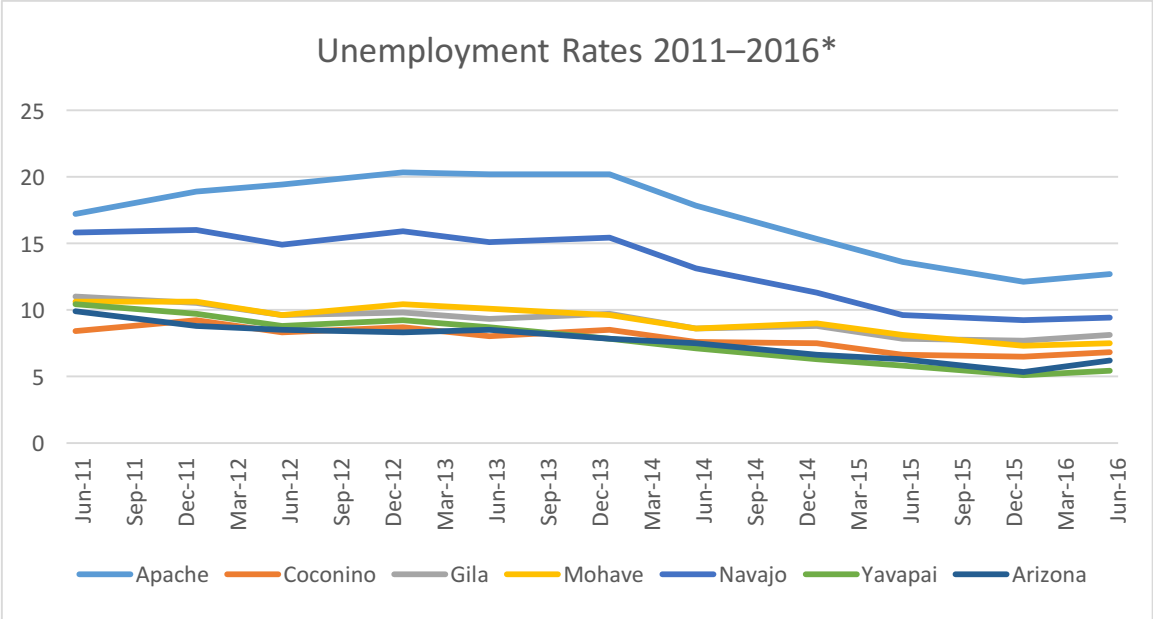

Figure 72. Trends in unemployment by county.[24] Rates averaged from January and June each year.

Poverty and Unemployment in the American Indian Community

In most tribal communities living on reservations, rates of poverty and unemployment are dramatically higher than in the rest of the population. On average, the tribal poverty rates are 11% higher than the county levels and the unemployment rates are twice as high on reservations.[2,42] Among the tribal reservations in northern Arizona, the White Mountain Apache had the highest unemployment rate and San Carlos had the highest poverty rate (Figure 73).[42]

The presence of exacerbating structural factors including high rates of poverty and unemployment and lack of opportunities for education and job training were common for those living on and off the reservation but for those living on the reservations, these factors were perceived as more severe. These factors not only create barriers to accessing care, but they also create conditions that make people more susceptible to mental and behavioral health issues such as depression, suicide, domestic violence, and substance abuse. Some participants discussed discrimination and racism as a social factor that exacerbates many of these challenges.

> *Our average family cannot even afford to live here in town. They have to live with somebody else to be able to make it. And it's really hard because, you know, all that adds stress to the family unit. Separates families. And you know, the dads, you know, I don't think we always think about what the dads are pressured, you know, to be the provider. And if they can't provide for their families, their self-esteem and their hopes of being a good parent go down the hill and then they turn to drugs and alcohol.* (Focus Group Participant)

High unemployment and poverty rates across the region, and in particular among tribal communities, are influencing the mental health and physical health of residents. Compounding these issues is also the high cost of living and housing in the region.

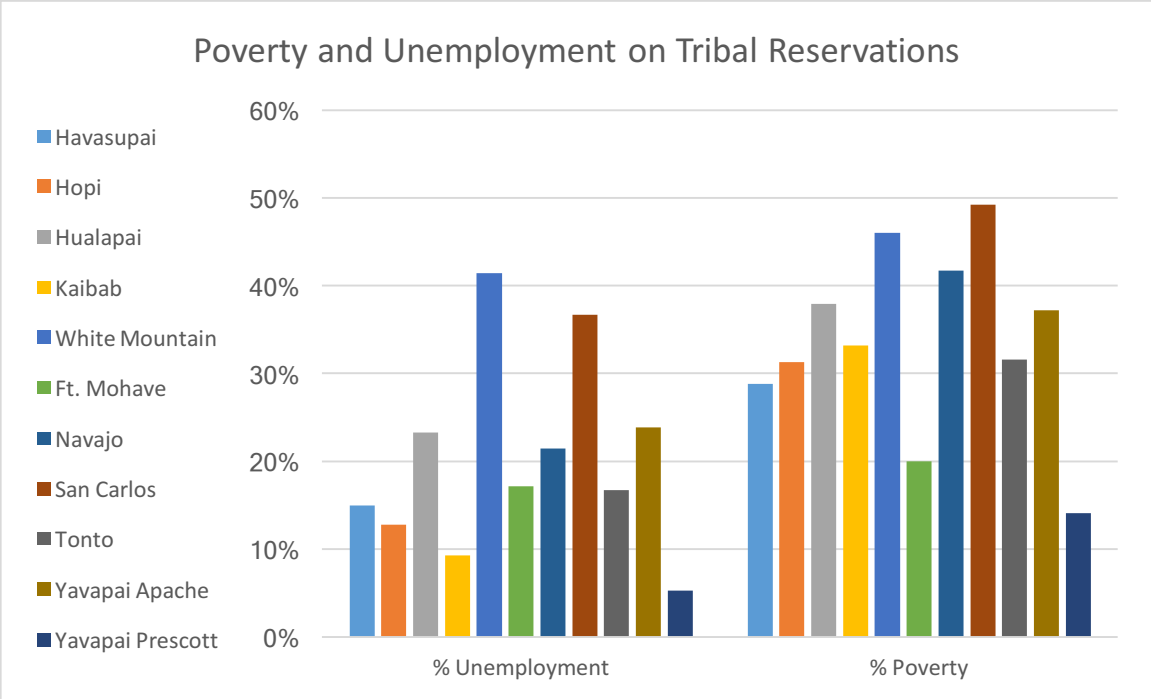

Figure 73. Tribal poverty and unemployment rates.[42]

High Cost of Living and Housing

High housing costs can influence home ownership levels (Figure 74). When families are spending a larger than normal percentage of their income on rent, lower-income families are often not able to procure health food, health care services, and other basic resources that facilitate health and wellbeing.[44]

Participants also discussed the high cost of living in many areas as a factor that exacerbates economic insecurity. The lack of affordable housing and affordable childcare were the most commonly discussed elements of this topic. Paying a large percent of income for housing creates more financial strain on the household which can exacerbate other barriers to health care and barriers to emotional and physical wellbeing. Members of the American Indian community also discussed problems with housing on the reservations. In many communities housing is overcrowded and the structures are dilapidated.

> *Yeah, affordable housing. And the one place I was living in had cockroaches and they wouldn't take care of it. Made my younger son get cockroaches in his ears and infections in his ears. So I just lived out of hotels for a while.* (Focus Group Participant)

Participants felt that homelessness is common and also is underrepresented in statistics. Many people live in their cars or in hotels, or stay for short stints with friends and relatives. These people are not counted in the homelessness statistics and the extent of the problem is largely hidden. Not having stable housing also creates a barrier to employment and applying for insurance or other social services.

> *So many young families are considered homeless because they don't have a regular place to stay or live – they go from couch to couch or are living in their cars or in motels. If you don't have that stability then sometimes you don't qualify for these benefits. It's another vicious cycle.* (Interview Participant)

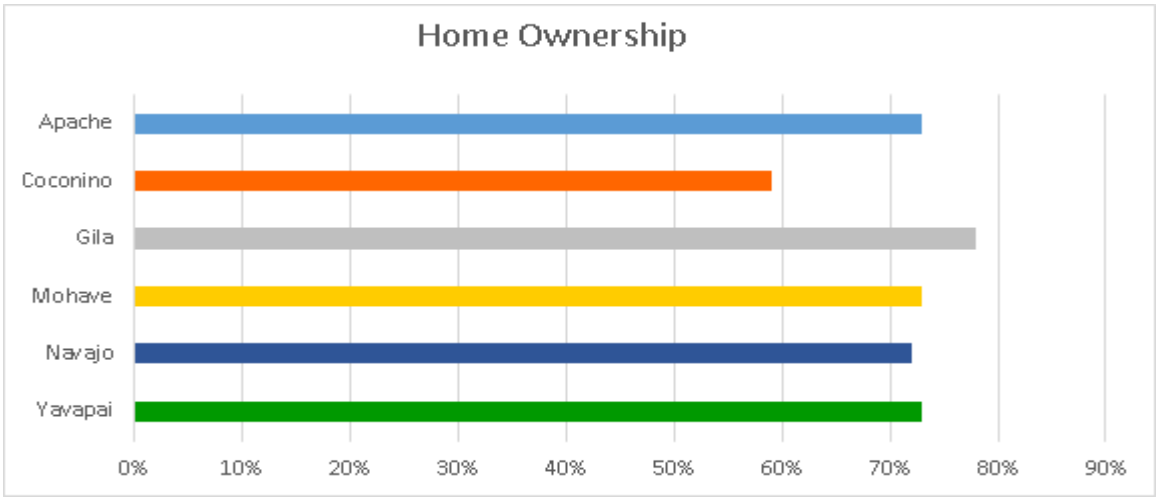

Figure 74. Regional home ownership by county.[10]

Participants also felt that the cost of childcare is unaffordable to families. The inability to afford childcare has a huge effect on earning capacity, stress, and job performance/security.

> *And then childcare is a huge issue. The cost of childcare. People will go days without seeking medical attention because they can't take off of work and very few doctors are open on weekends or they can't arrange for childcare and so they just go without addressing it.* (Interview Participant)

> *We have absolutely no daycare in town. Another reason why some parents can't go to work, because they have no one to watch their children.* (Focus Group Participant)

Besides Apache, the remaining counties are above the U.S. median for the percentage of the population with high housing costs. However, residents of Apache County reported the highest proportion of households experiencing housing stress, indicating poor quality housing conditions (Figure 75).[25,26]

Income Patterns in Selected BRFSS Health Indicators for Northern Arizona

We examined disparities for four key health indicators as a function of reported household income (Figures 76–79). To ensure adequate stability of income estimates, the eight income categories were collapsed into four categories. Lower income levels are associated with a greater burden of poor mental health, with the exception of Navajo County, which shows a curvilinear association with income level.

Better self-rated health status showed a positive association with income level. For each county, higher income was associated with a higher percentage of people who rated their health as good, very good, or excellent. Functional limitations were strongly related to household income, with the two lowest income categories (representing incomes less than $25,000 per year) having the greatest prevalence of functional limitations. And comorbid cardiovascular risk factors followed the expected inverse association with income levels for Mohave, Navajo, and Yavapai counties but less so for the other three.

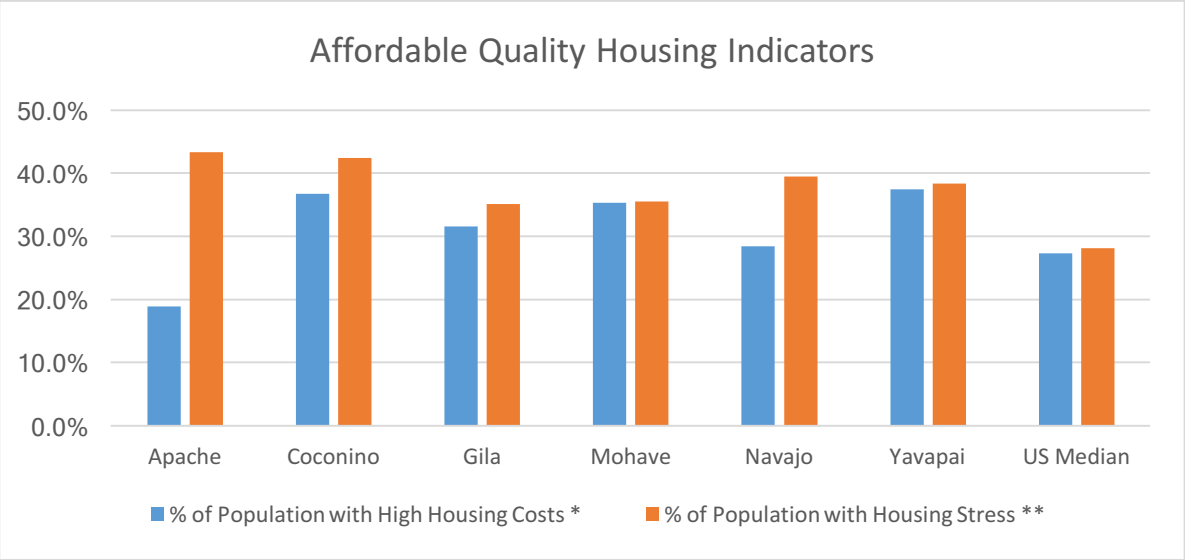

Figure 75. Regional affordable quality housing measures by county.[25,26] *Renters or owners living in units with a mortgage spending 30% or more of household income on rent, American Community Survey 2008–2012 averages.[28] **A house is defined as stressed if one of the following criteria is met: (1) housing unit lacks complete plumbing; (2) housing unit lacks complete kitchen; (3) household is overcrowded (more than 1 person per room; or (4) household is cost burdened (housing costs > 30% of monthly household income).[26]

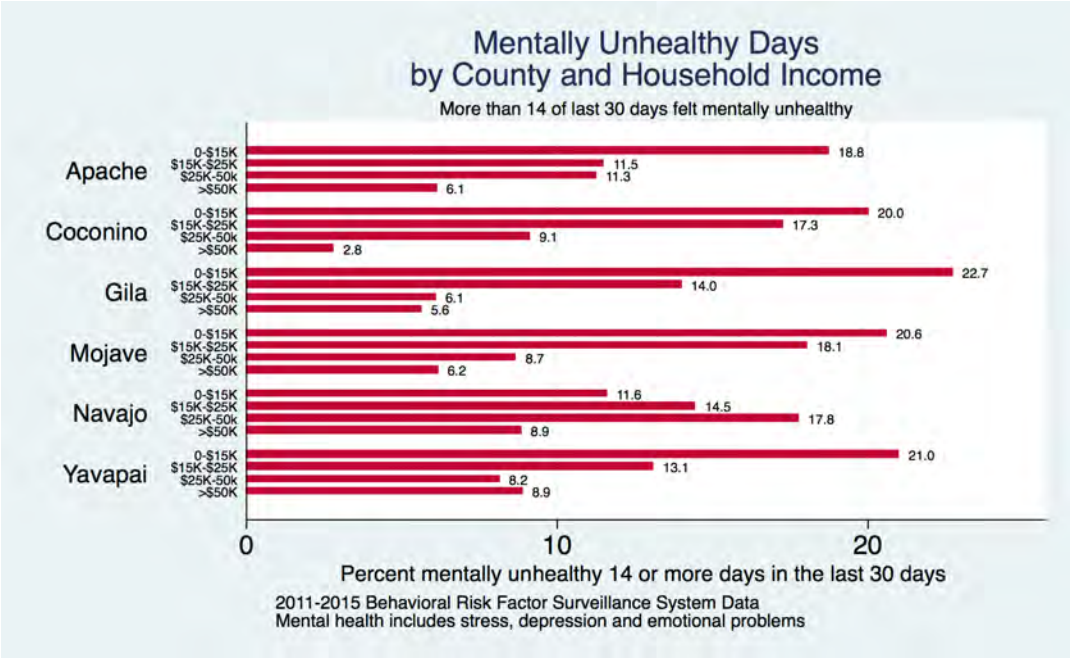

Figure 76. BRFSS mental health and income.

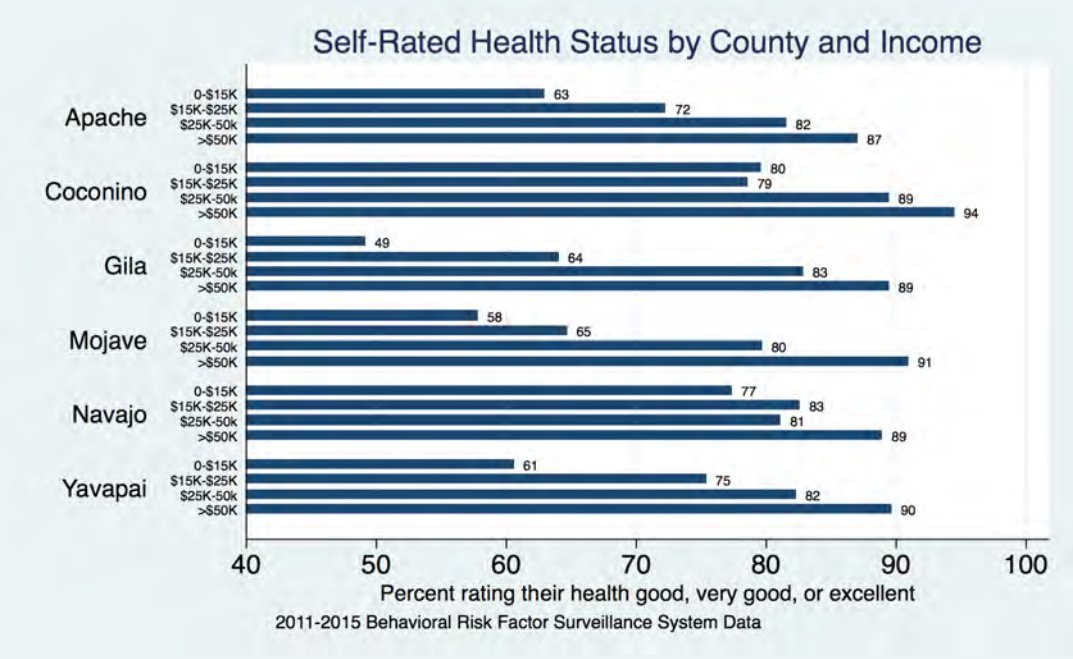

Figure 77. BRFSS self-rated health and income.

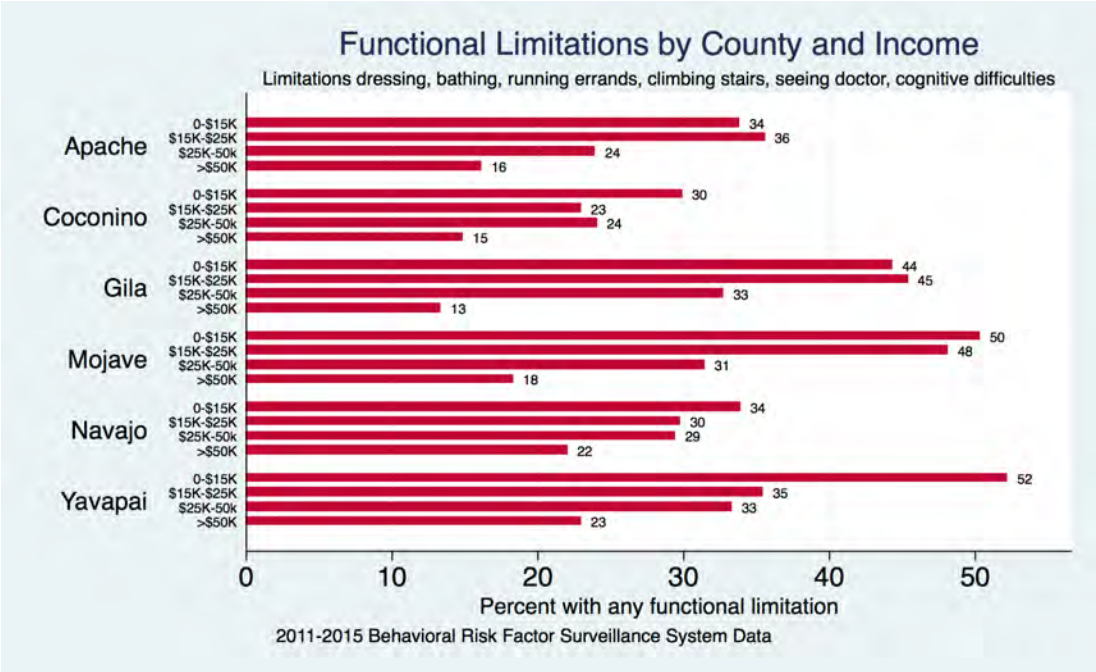

Figure 78. BRFSS functional limitation and income.

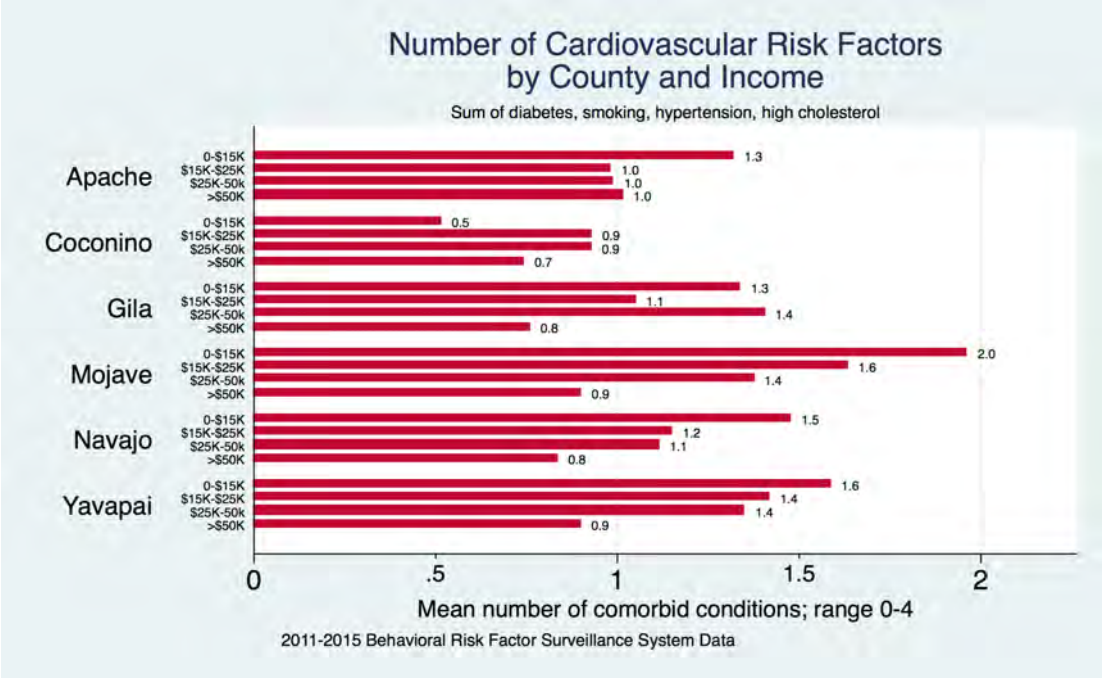

Figure 79. BRFSS cardiovascular risk and income.

Results of the BRFSS data analysis identified an association between income level and self-rated health, mental health, functional limitations, and cardiovascular risk factors across the region. This highlights the importance of designing programs and services to address health and wellness to be inclusive of the social determinants of health.

Access to Healthier Food

Diabetes, heart disease, and obesity are health outcomes related to poor nutrition and lack of exercise. This is due to both a lack of awareness and food insecurity. Many people do not have the money or time to buy and cook healthier foods or participate in recreational activities. Diabetes is often not properly managed and leads to very serious and debilitating complications.

Food insecurity is an economic and social indicator of the health of a community. The U.S. Department of Agriculture (USDA) defines food insecurity as limited or uncertain availability of nutritionally adequate foods or uncertain ability to acquire these foods in socially acceptable ways.[45] There is strong evidence that residing in a food desert is correlated with a high prevalence of overweight, obesity, and premature death.[46] Supermarkets traditionally provide healthier options than convenience stores or smaller grocery stores. Additionally, lack of access to fresh fruits and vegetables is a substantial barrier to consumption and is related to premature mortality.[47] The major determinants of food security are the physical availability of healthy foods and the economic and physical ability of a person to procure healthy foods, as well as food utilization practices which include eating habits, food preparation, and household distribution of foods.[48]

Food insecurity and poor or limited access to affordable nutritious foods and opportunities for physical recreation were commonly described as underlying factors of many chronic health problems in all communities, especially chronic conditions such as diabetes, heart disease, and obesity. Participants felt that limited access to healthy food is often compounded by a lack of knowledge about healthy food preparation, lack of time and capacity to prepare foods, and the higher cost of healthier foods. Participants commonly discussed high rates of food insecurity in their communities. Many families can barely afford to buy food at all, much less nutritious foods. People who do not have reliable transportation also have a harder time accessing healthy food, physical recreation, and other resources that support a healthy lifestyle.

> *Doritos and soda is not dinner. Even when they can get good food, many don't have a way to cook it.* (Interview Participant)

> *But even having food. Like some of those kids go home, and that's the only meal they get is at your school. They don't get food at dinnertime or on weekends.* (Focus Group Participant)

> *We all know that you shouldn't eat processed foods, but when you can get five boxes of boxed mac and cheese for a buck fifty, and that won't buy you a single chicken breast, for families that are really on a tight budget, you make the choices you have to make. We either don't have food for my kids tonight or it's processed mac and cheese because at least it's calories.* (Focus Group Participant)

Figure 80 summarizes the percentage of the adult and child population in each county who have experienced food insecurity at some point in the last year. The figure also shows the percentage of people in each county who have low access to food. This is defined by the percentage of people who are low income and who live more than 1 mile (urban residents) and more than 10 miles (rural residents) from a grocery store. All counties have higher rates than the state average for all three indicators. Navajo and Apache counties have the highest rates of food-insecure children. Almost 45% of residents in Apache County have low access to grocery stores, in part due to the extremely rural geography of the county.[24,25,49]

Figure 81 was created using the USDA Economic Research Service interactive mapper. The map shows areas based on Census tract where a significant percentage of the population is low income and/or has low access to a grocery store. The light blue indicates Census tracts with a poverty rate of 20% or higher, or tracts with a median family income less than 80% of the income for the state or metropolitan area. The pink indicates Census tracts in which at least 500 people or 33% of the population live farther than 1 mile (urban) or 10 miles (rural) from the nearest supermarket. The purple indicates tracts where all of the above conditions are met.[49]

Except for Flagstaff, much of northern Arizona's population lives far from a regular source of healthy foods, such as fruits and vegetables, which are two leading health indicators (Figures 82 and 83). Currently (2017) the national baseline is ~0.50 cup of fruit per 1,000 calories (for people 2 years and over) and the goal is to increase that to 1 cup per 1,000 calories. For vegetables, the current and targeted amounts are 0.76 and 1.16 cups per 1,000 calories, respectively. Arizona is on target for these goals, as are most northern Arizona counties. However, there are vulnerable sub-county regions without access to fruits and vegetables that merit attention.[1]

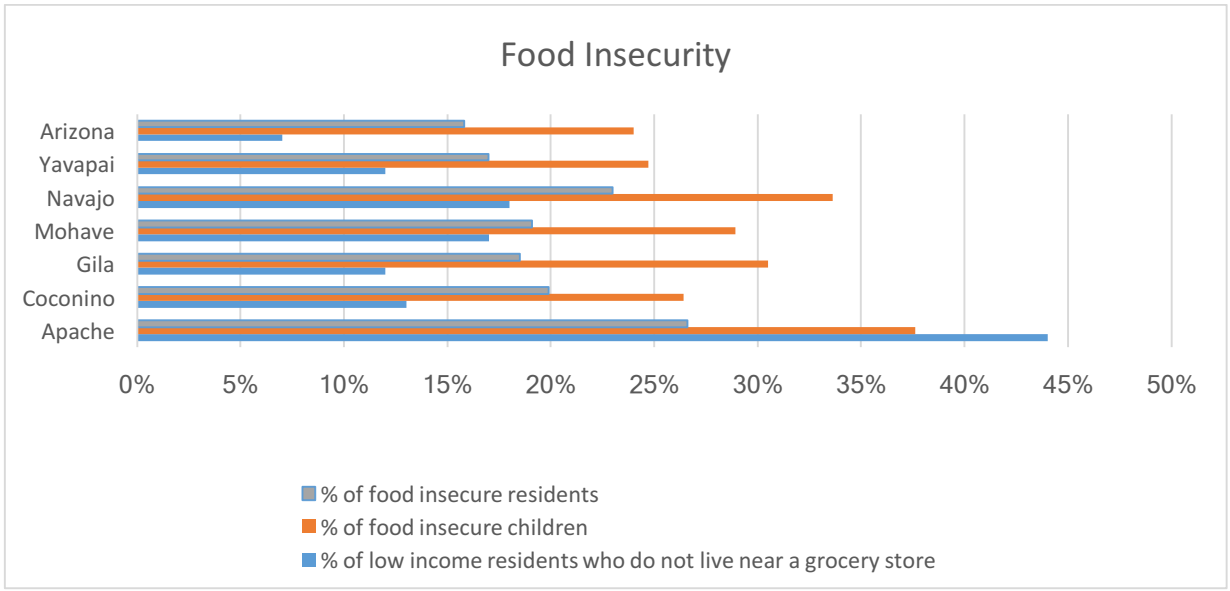

Figure 80. Regional rates of food insecurity by county.[24,25]

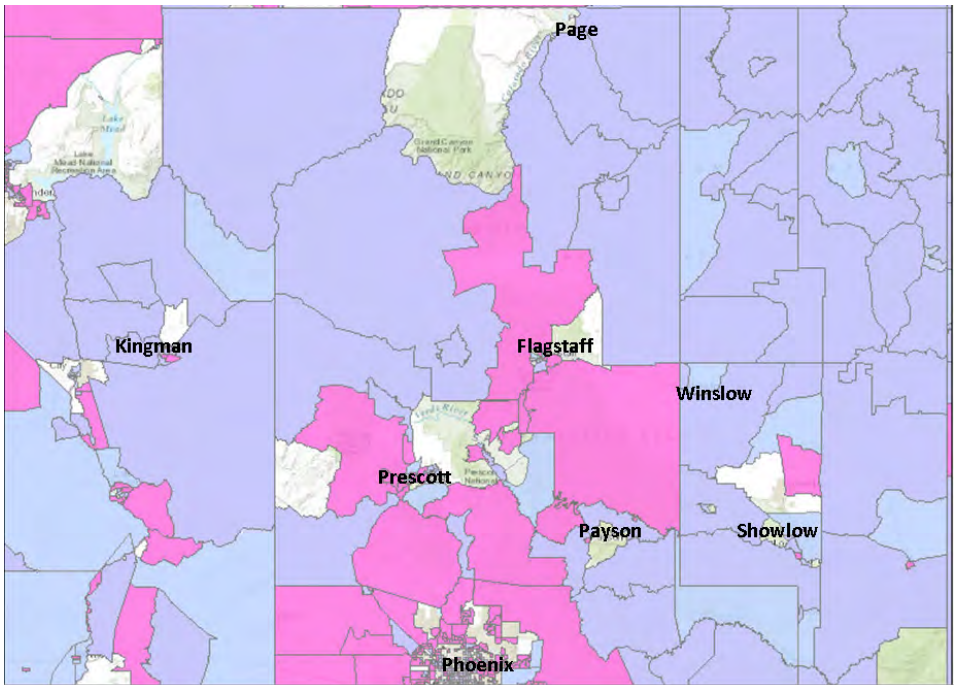

Figure 81. Map of regional food insecurity.[49]

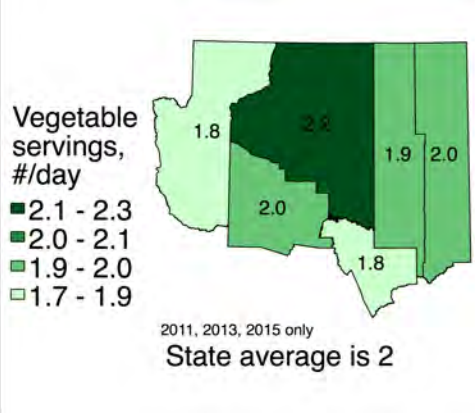

Figure 82. BRFSS daily vegetable intake.

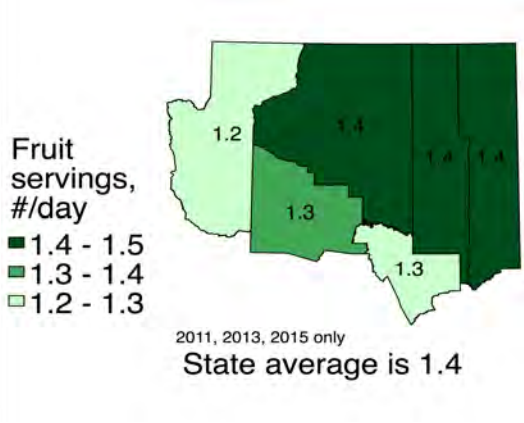

Figure 83. BRFSS daily fruit intake.

It is clear that much of northern Arizona lacks affordable housing, and ready access to healthy foods contributes to health disparities among residents. Additionally, unemployment and poverty contribute to stress and are associated with poor health outcomes. Improving educational attainment is one approach to addressing economic security.

SDOH Factor 3: Education

According to national data from the U.S. Census Bureau and the CDC BRFSS, people with more education are likely to live longer and experience better health outcomes. Better education confers health benefits at the individual, community, and societal level.[50] The linkages between educational attainment and health are complex. Researchers at the Robert Wood Johnson Foundation found three major interrelated pathways between educational attainment and health. First, educational attainment is linked to health knowledge, literacy, and behaviors. Second, education is linked to employment, working conditions, work-related resources, and income. And third, education is linked to social outcomes such as efficacy, social standing, and social supports.[51]

Participants discussed the lack of educational attainment and opportunities for job training and post-secondary education as factors that exacerbate all of the above-mentioned barriers. When there is less opportunity for people to get an education, develop skills and job training, and find good-paying jobs, it is very difficult to achieve economic stability and opportunity for improvement. Many people who do go to college do not take their skills back to their home communities because there are few jobs in their field and there is more opportunity in larger urban centers.

> *Job opportunities are low and there are no job training services – the jobs that are available, no one is qualified for.* (Interview Participant)

> *We're poor economically, no jobs, education levels are low, educational system is marginal, half of kids graduated and only a few go on to college.* (Interview Participant)

Education was also an area of concern for many American Indian participants. Many tribes are making efforts to improve educational attainment and quality, but it is a slow process. Many young people are dealing with complicated issues at home and do not have the support system and the parental pressure to make sure they stay in school. Some participants felt that many young people do not see the value in education.

> *Many parents dropped out of high school and don't try to get their GED. The kids see that and say, "Oh I don't have to go to school because my parents didn't" – the attitude is, "I don't need to do that because we can just go on assistance and live that way."* (Interview Participant)

Figure 84 shows rates of educational achievement by county according to the BRFSS data 2013–2015. Apache, Gila, and Mohave counties have the highest rates of residents with less than a high school diploma and Yavapai and Coconino counties have the highest populations of college graduates.

Figure 85 shows the annual dropout rates per county in northern Arizona. This indicator includes the percentage of 7–12 graders who dropped out each year. The graph depicts an average of the total percentage of dropouts for 2011–2014 in each county and also shows the county rates in 2015 alone.[52]

Figure 86 shows that American Indian students have the lowest 4-year graduation rates, followed by Hispanic students. American Indian students in Gila County are disproportionately lower than in other counties.[53]

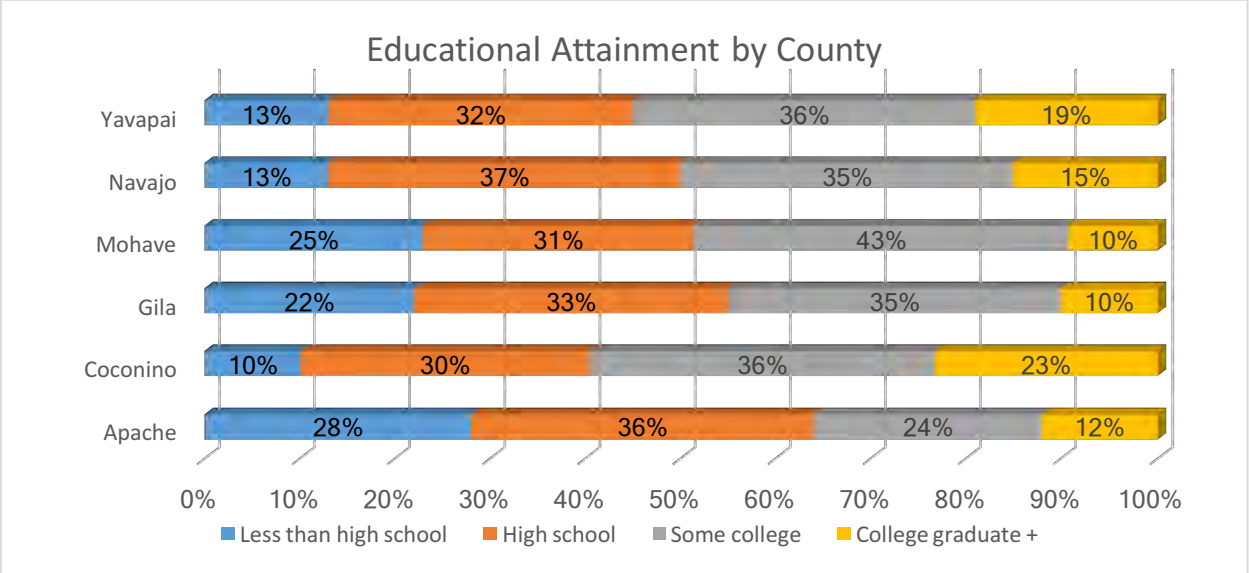

Figure 84. Regional educational attainment by county.

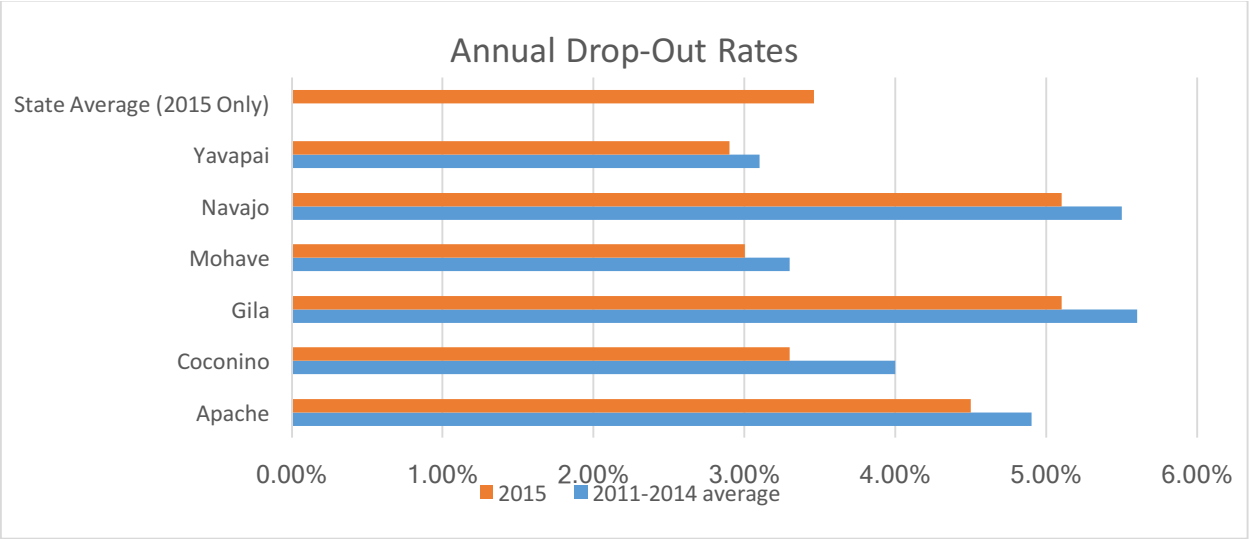

Figure 85. Regional annual drop-out rates by county (2011–2015).

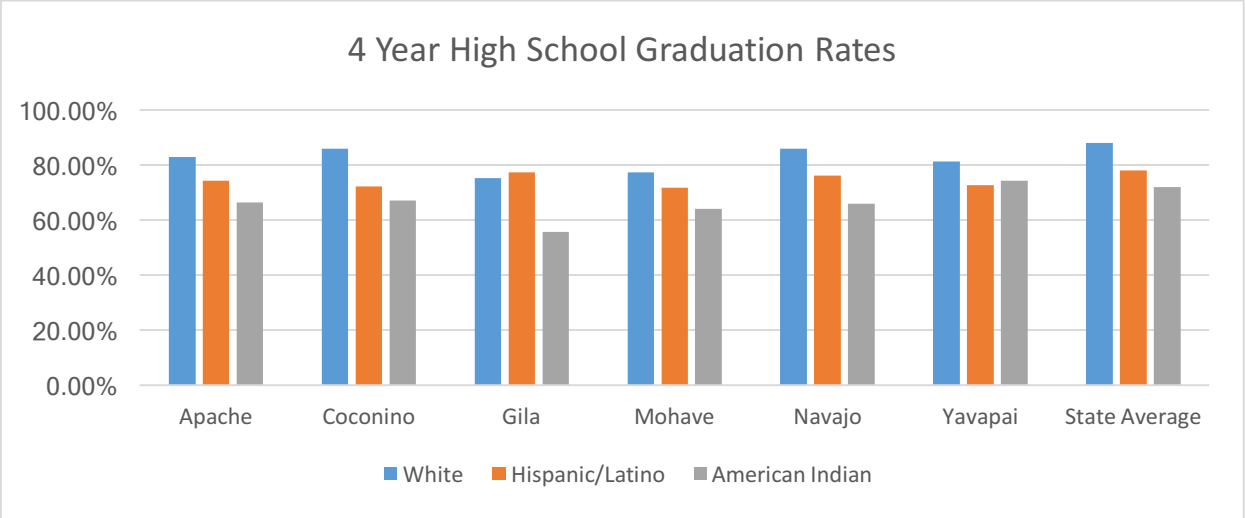

Figure 86. Regional "on time" high school graduation rates by county and ethnicity.[53]

Education Patterns in Selected BRFSS Health Indicators for Northern Arizona

Because educational achievement is an important social determinant of health, we examined four broad health domains by level of education. These include cardiovascular disease risk factors, self-rated health, functional limitations, and mental health. These domains were also chosen to address stakeholder interest in comorbidity—that is, the presence of multiple risk factors within individuals. We categorized respondents into four groups: less than a high school education, high school degree or equivalent, some college, and college graduates or higher. Education categories with fewer than 50 respondents do not provide sufficient stability for estimation and are thus omitted.

As shown in Figure 87, cardiovascular comorbidity was greater among persons with lower education, although this was less evident in Gila County. The absolute magnitude of these differences was large only for Mohave and Yavapai counties.

Persons with less than a high school education were more likely to rate their health as fair or poor, vs. good, very good, or excellent (Figure 88). This disadvantage decreased in a dose-response manner with educational attainment across most counties. This is consistent with national-level data from the BRFSS and other sources.

Persons reporting any functional limitation (Figure 89) were also more likely to have lower education. Education gradients were not observed in Navajo County, whereas in the rest of northern Arizona having less than a high school education was associated with a substantial burden. These data show that low education is strongly associated with functional limitations and that this subgroup has 8–20% higher prevalence of limitations relative to the county average. The form of this association was threshold rather than linear. That is, categories at or above a high school education were similar to one another rather than each higher education category evincing a more desirable health profile (e.g., as seen for self-rated health judgments).

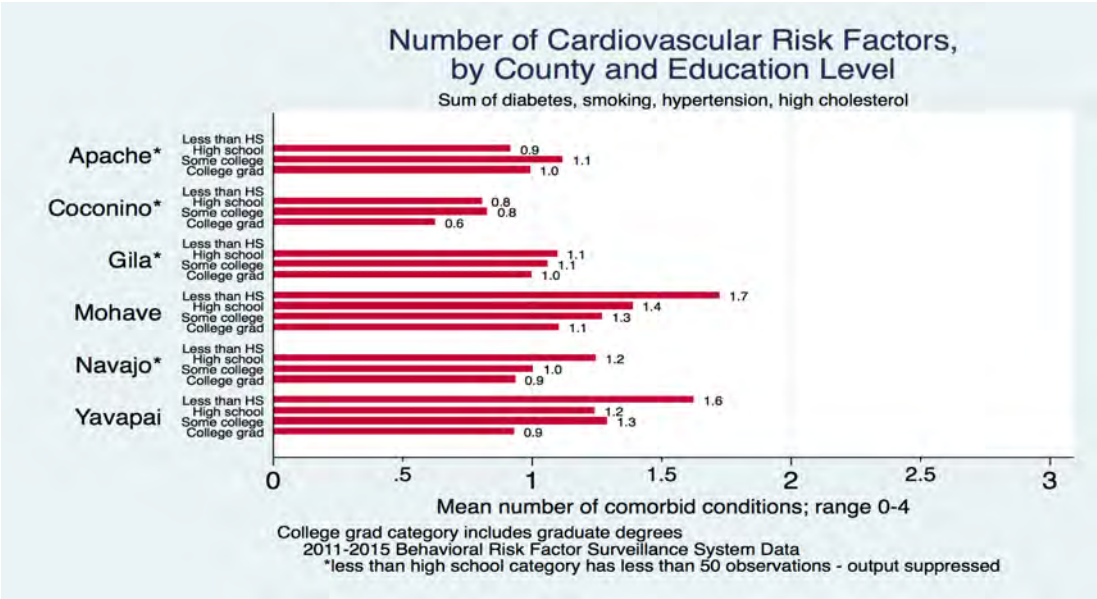

Figure 87. BRFSS cardiovascular risk and education.

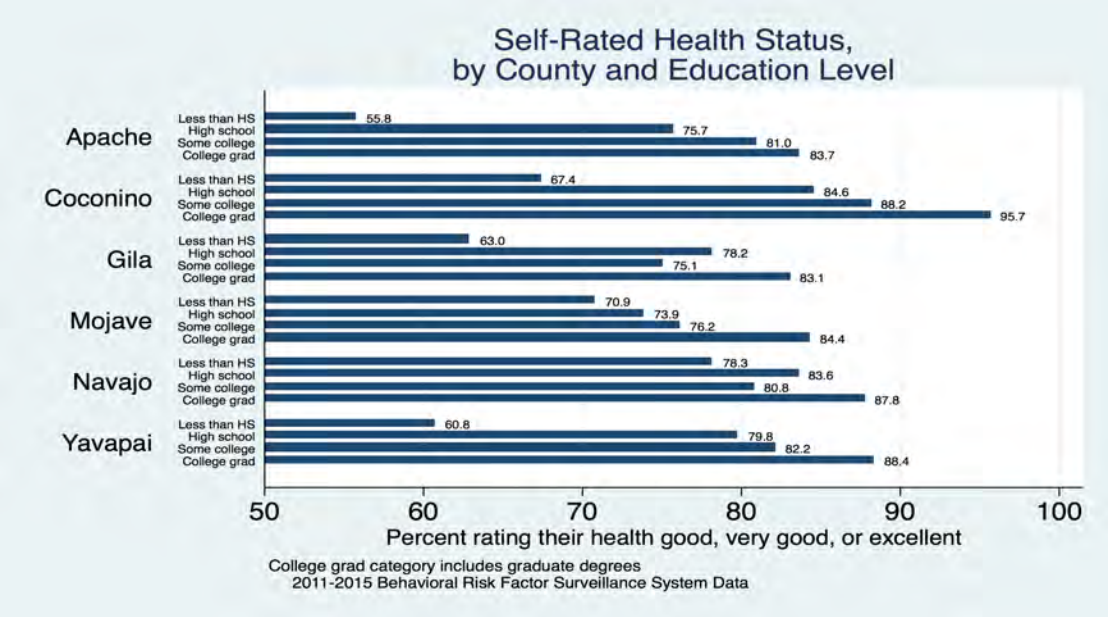

Figure 88. BRFSS self-rated health and education.

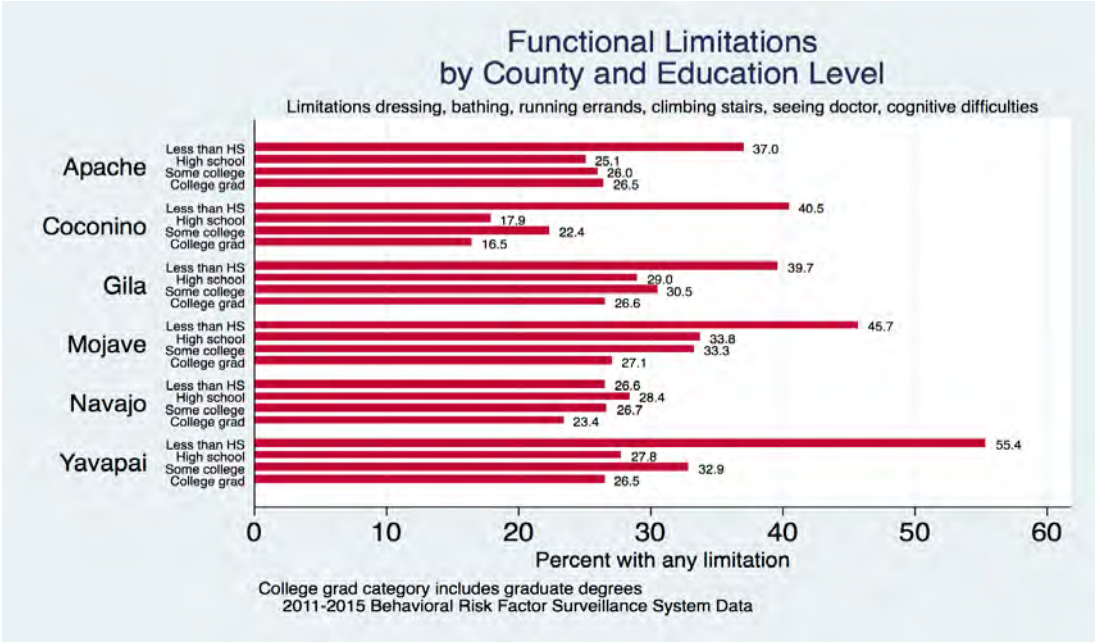

Figure 89. BRFSS functional limitation and education.

Patterns of education-related mental health difficulties varied across county (Figure 90). Most striking is the high percentage of Apache and Yavapai residents with less than a high school education reporting 14 or more mentally unhealthy days out of the last 30. These percentages are more than twice the average of their respective counties. Although the potential sources of these difficulties are heterogeneous (problems with stress, depression, and/or emotions), this illustrates an area of health need and a domain in which additional mental health screening is warranted. Analysis of the BRFSS data thus reveals an association between education and health and wellness outcomes.

Health Literacy and Awareness of Resources

Participants discussed the widespread lack of knowledge about the benefits of preventative care and regular check-ups with a primary care provider. Some participants discussed a lack of awareness of the importance of diet and exercise and a lack of knowledge about strategies for chronic disease management.

> *Most people don't see a doctor because they are scared to go or they just lack the basic health literacy and are unaware of what indicates a serious problem, the benefits of prevention, where to go for services, how insurance works – wait till things get really bad before they go in.* (Interview Participant)

> *For any type of chronic illnesses that people are diagnosed with, it's just kind of, here's your diagnosis. Here's your pill. Good luck. You know, there's no education. There's no follow-up care to teach you how to live with it, how to make it better without being, you know, necessarily medication dependent.* (Interview Participant)

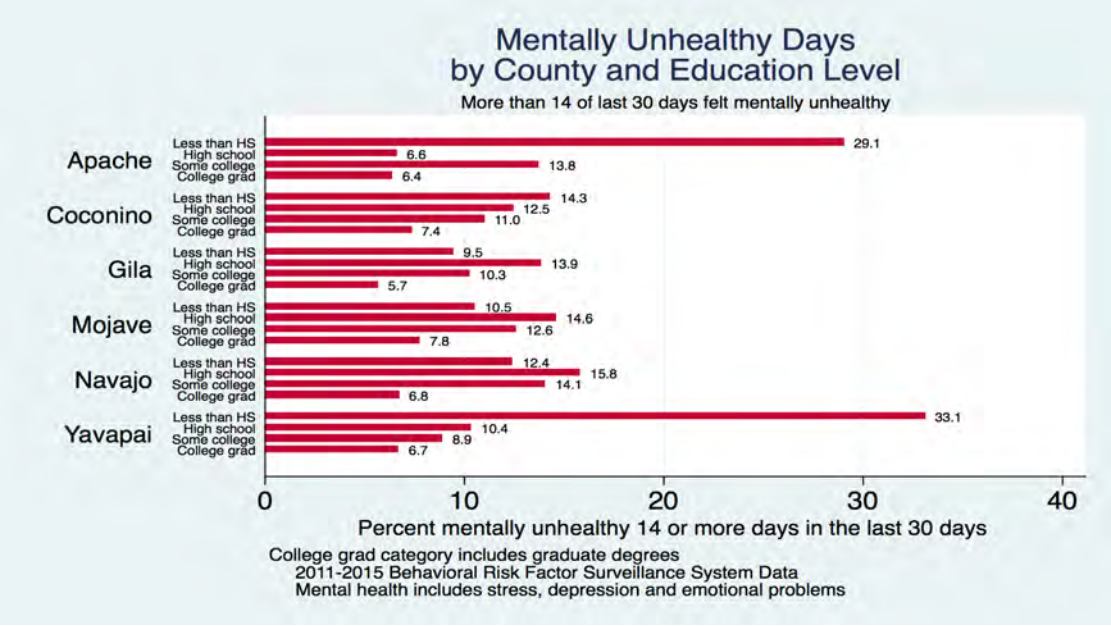

Figure 90. BRFSS mentally unhealthy days and education.

There is also a prevalent lack of awareness about where to go for certain services and the types of services that are available. Many participants expressed a desire for more information about what programs and services are available in their communities and where to go for more information about available services.

> *Even if they wanted to seek help, no one knows where to begin. Even people who have some knowledge of the system – just don't know where to start … there is no one intake place or non-profit organization that people really know about – it's just daunting. Who do you call to ask the question of where do I go get help.* (Interview Participant)

Participants discussed a major lack of awareness in how to apply for insurance and social services, what the eligibility requirements and income guidelines are, and how to navigate the system after the person is enrolled to receive benefits.

> *There is a lot of misinformation out there – especially in Indian Country. People don't understand that they also need to get coverage through Medicaid or the marketplace to get coverage … Opportunities are there to get people covered, but people need help to understand them.* (Interview Participant)

> *For some the elderly more, it's the pride issue – not knowing how because they've never had to or not having someone who can help them apply for services or direct them – don't know some of the organizations who can help them fill it out … Some people are too embarrassed to even ask.* (Interview Participant)

Health Literacy and Awareness in Specific Populations

Providers who work with a high percentage of Hispanic clients discussed specific challenges faced by the undocumented population. Many undocumented people do not have health insurance and do not know where to go for health resources that are designed to help the uninsured. There is often a general lack of knowledge about how to apply for insurance and other social services and how to navigate those systems after people are enrolled.

> *In bigger cities there are a lot of organizations that are Latino oriented and so people go there and say, "Help me." Or, "I have a health issue, I don't know where to go or what to do." There they get connected to other organizations and resources. We don't have that here.* (Interview Participant)

> *Sometimes insurance won't pay because you're out of the area – but there are no services in the area – in the Hispanic community, those are a lot of the things we don't know about – don't know about rules and regulations.* (Interview Participant)

As was prevalent in the general population of northern Arizona, many American Indian participants felt that people lack general health knowledge and a solid understanding of certain conditions, how they affect the body, and how they can be successfully managed. This makes it more difficult for people to employ prevention strategies, seek timely medical care, and successfully manage chronic conditions.

[In regards to diabetes] *Patients don't understand what it is. It's too complicated so it's not a personal priority at the time. They think, I'm alright, I feel okay, and I'll worry about it later. They don't understand the constant management that it takes.* (Interview Participant)

Part of it is a lack of knowledge and understanding of the disease – they know the procedures and terminology but don't fully understand the effects of it. We need to be more direct with people and give it to them in terms they understand. (Interview Participant)

Residents of northern Arizona will not successfully access available health resources without additional education regarding system navigation and availability of resources. Additionally, the ability to acquire adequate health knowledge would also help individuals manage their health conditions.

SDOH Factor 4: Neighborhood and Physical Environment

The physical context in which populations live also influences their health and wellness. This can include the natural environment, the built environment, crime and safety, or the availability of utilities and material goods.[1]

Access to Recreation Facilities

The BRFSS asks a series of questions about leisure-time physical activity as part of a "rotating core" of physical activity questions asked every other year. These cover different types of activities along with their duration and frequency. These features are matched with typical energy expenditures for the activities to determine whether respondents meet physical activity guidelines. Physical activity is presented as a binary outcome reflecting the percentage of respondents who meet recommended weekly activity levels. Recommended levels are 150 or more minutes per week of moderate activity or 75 or more minutes of vigorous activity.

Mohave County residents are slightly lower than the state average for being sufficiently active whereas the rest of northern Arizona is above the state average (Figure 91). Muscle strengthening is also an important activity with health benefits beyond aerobic activity. These include yoga, sit-ups or push-ups, and using weight machines, free weights, or elastic bands. Respondents reporting muscle strengthening activities at least twice per week were considered to meet the guidelines. Overall, northern Arizona was above the state average on muscle strengthening activities relative to the rest of the state. Mohave County, perhaps because of the older average age of residents, had fewer residents meeting physical activity guidelines. Healthy People 2020 Leading Health Indicators uses a composite of both guidelines. In northern Arizona counties, 22.3% of adults met both guidelines as ascertained with above-target percentages in Coconino, Gila, Navajo, and Apache counties.

The BRFSS study indicates that despite challenges with access to recreational facilities, northern Arizonans are able to maintain an adequate level of activity. Although these figures are promising relative to national targets, physical activity could be increased and overweight/obesity is pervasive in northern Arizona (Figure 92).

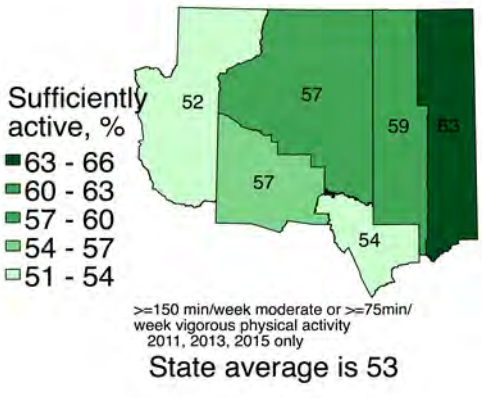

Figure 91. BRFSS sufficiently active

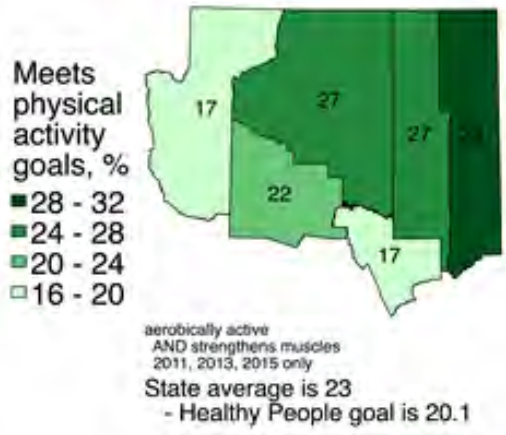

Figure 92. BRFSS meeting physical activity goals.

Participants discussed reduced opportunities for engaging in healthy activities due to limited parks, sidewalks, and other recreational facilities. Perceptions about neighborhood safety also affect residents' willingness to play or exercise outside. Lack of access to recreational facilities was not experienced by all residents across the region, as evidenced in Figure 93 which shows that residents of Yavapai and Coconino counties have similar access compared to the state average.[25]

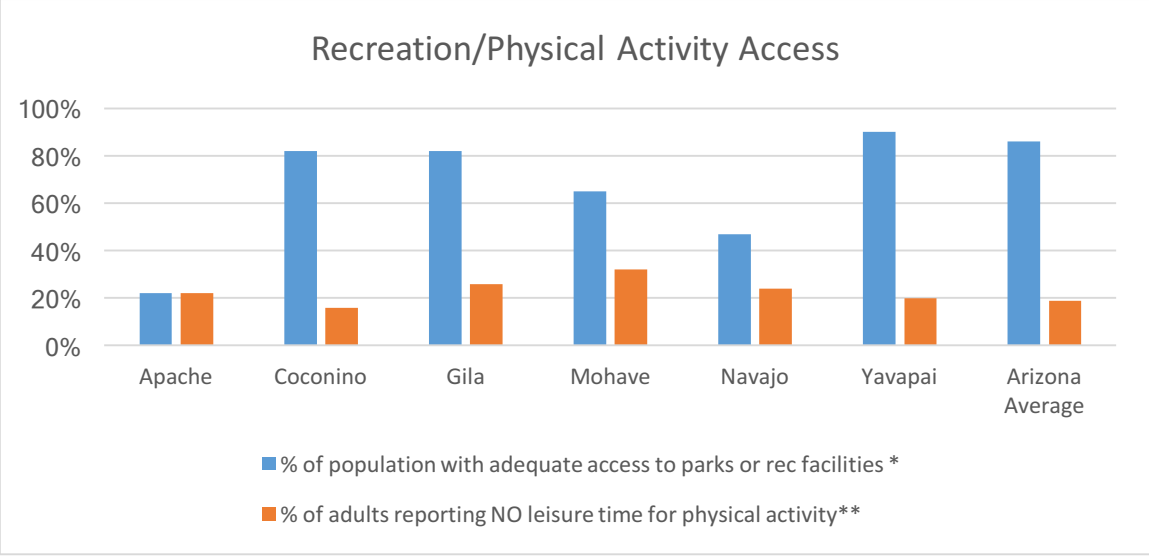

Figure 93. Regional access to physical activity and recreation opportunities by county (2017).[25] *Access to exercise opportunities measures the percentage of individuals in a county who live reasonably close to a location for physical activity. Locations for physical activity are defined as parks or recreational facilities. Adequate access for physical activity is defined by percent of people who reside in a Census block within half a mile from a park, in urban Census tracts within 1 mile of a recreation facility, and in rural Census tracts within 3 miles of a recreation facility. **Physical inactivity is the percentage of adults aged 20 and over reporting no leisure-time physical activity. Examples of physical activities provided include running, calisthenics, golf, gardening, or walking.

Crime and Violence

Crime and violence is often linked to geographic locale, and is therefore a neighborhood and built environment factor within the SDOH model. Figure 94 summarizes violent crime rates per 100,000 people by county. A violent crime is defined as a crime where there is a face-to-face confrontation. These include homicide, rape, robbery, and aggravated assault. The rates in all of the counties in the northern Arizona region fall below the state average. Apache and Mohave counties have the lowest rates of violent crime and Navajo and Gila counties have the highest.[25]

In northern Arizona, crime and violence are related to domestic violence and child abuse and neglect, which were perceived by community members to be priority health issues. Participants identified substance use as a key health priority for the region and also as a major contributor to crime and violence. The following data on domestic violence were taken from the Arizona Criminal Justice Commission Report from 2010 (Figure 95). Offenders are charged with aggravated domestic violence if the violation is their third domestic violence offense in the past 7 years. An incident is flagged as domestic violence if it meets at least one of the following criteria:

Aggravated harassment	Harassment	Criminal trespass
Interference with judicial proceedings	Dangerous crimes against children	Child or vulnerable adult abuse
Kidnapping and related offenses	Cruelty to animals	Stalking
Use of telephone to terrify, intimidate, threaten, harass, annoy, or offend	Preventing use of a telephone in an emergency	Surreptitious photographing, videotaping, or digitally recording
Assault and related offenses	Sexual assault	

Approximately half of arrests flagged for domestic violence across the state were for assault and assault-related offenses. More than 75% of those arrested for domestic violence were male. More than 80% of individuals arrested were white (note the only categories collected are White, Black, Asian, American Indian, and Unknown). From 2001 to 2010, the number of arrests for aggravated domestic violence more than doubled. Gila, Mohave, and Coconino counties had the highest domestic violence arrest rates and Apache County had the lowest.[54]

Figure 96 shows rates of "aggravated" domestic violence by county for 2005–2010. Over this time period, the only county which demonstrated a general upward trend in aggravated domestic violence was Apache.[54]

Child abuse and neglect was also a concern for many participants, who often discussed child abuse in relation to parental drug and alcohol abuse. Table 18 summarizes rates of cases of child abuse and neglect for 2011–2015. The highest rates were in Gila County but most counties were near or below the state average. [27]

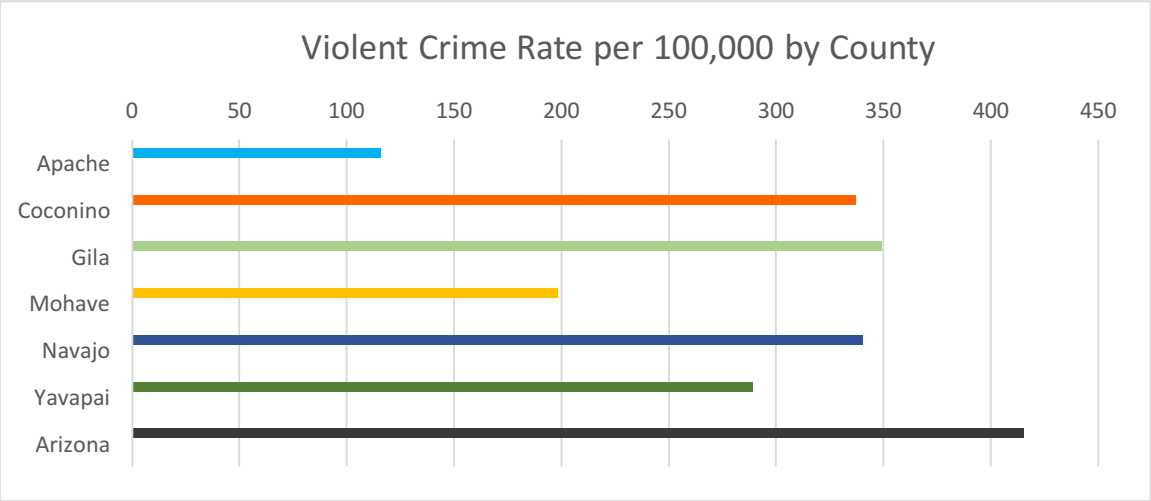

Figure 94. Violent crime rates by county (2017).[25]

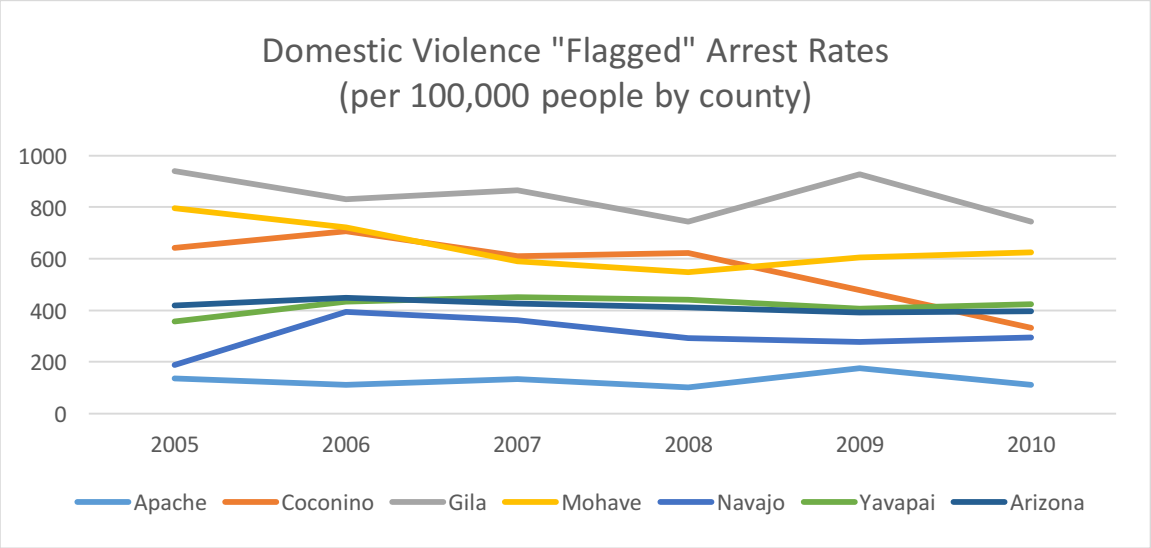

Figure 95. Regional domestic violence arrest rates by county (2013).[54]

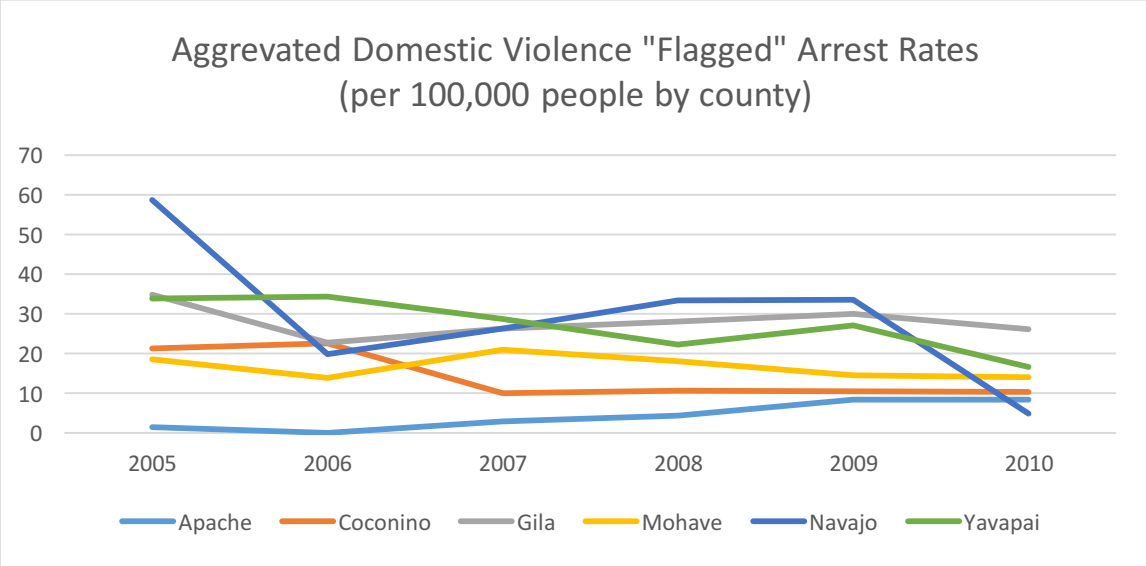

Figure 96. Regional aggravated domestic violence arrest rates by county (2013).[54]

Table 18: Regional Child Abuse and Neglect Reports by County

County	Child Abuse and Neglect Cases (Average 2011–2015)*	Rate per 1,000 people
Arizona	44,078	6.46
Apache	311	4.35
Coconino	776	5.67
Gila	418	7.83
Mohave	1,404	6.93
Navajo	718	6.65
Yavapai	1,245	5.77

*These data represent reports appropriate for investigation during the fiscal year by the Child Protective Services Central Registry for children ages 0–17. If more than one report is taken regarding the same incident for the same child/family, it is only counted once in the data shown here. If a report involves several children in the same household, it only counts as one report.

Environmental Toxins

Community members did talk about air and water quality issues, although they were not mentioned as frequently as some other issues. Air quality concerns were discussed in relation to respiratory conditions, especially asthma. All counties except Navajo reported at least one water quality violation in at least one community in the county.[25] Figure 97 shows air pollution particulate density by county and compares county rates to state and national averages. [25]

Many American Indian participants were also concerned with rising rates of cancer, and many attributed these rising rates to environmental contaminants in the soil and water on the reservations. People were also frustrated with the government response to environmental contamination.

> *That's another issue – there has been very slow government response to documented environmental contamination … they have been trying to draw attention to uranium contaminated water but it's not picking up – there is very little response to that.* (Interview Participant)

Members of the American Indian community also discussed the need for more data collection that focuses on linking environmental exposures to disease outcomes. They felt that health care providers are hesitant to suggest a cause of certain illnesses but they would like to have more data to illuminate the impact of environmental exposure on cancer incidence. The environmental exposure of highest concern was uranium.

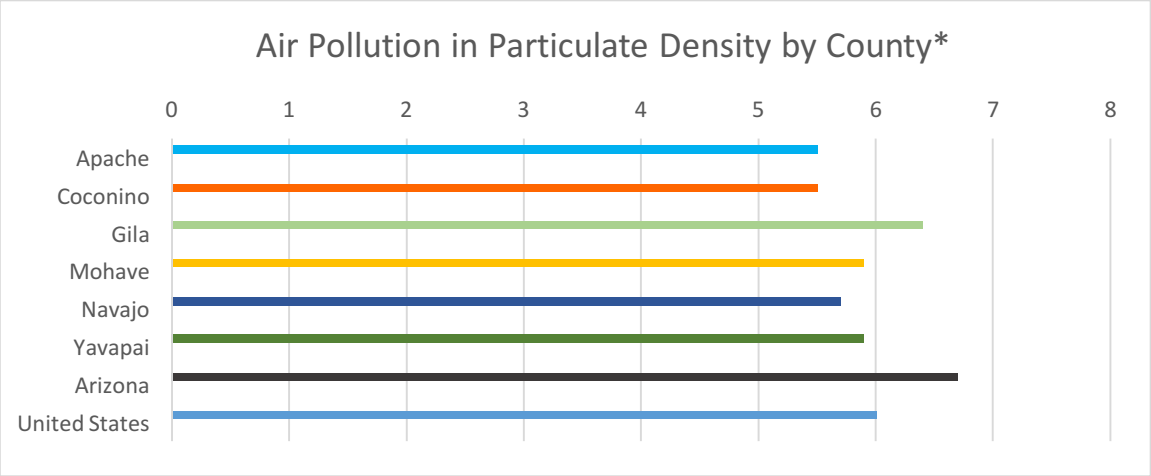

Figure 97. Air pollution by county (2017).[25] *Based on an average daily density of fine particulate matter in micrograms per cubic meter.

SDOH Factor 5: Social and Cultural Context

Social and cultural factors can have both positive and negative effects on health outcomes. Access to social support and adequate social networks contributes to positive physical and mental health outcomes.[55] Social engagement and cultural identity and resiliency can also act as protective factors for health and wellness. Conversely, lack of social opportunities and inadequate social networks can have negative influences on health and wellness.

Strength and Resilience

We asked participants to discuss sources of resiliency and strength in their communities. We asked them to describe positive efforts being made and assets or resources that can be built upon to increase the capacity of the community to support and encourage healthy lifestyles. Many participants talked about the benefits of living in a small, close-knit community. They generally felt that community members supported each other in times of need. They were grateful to be able to rely on close social networks for information, advice, and support when needed.

> *I love living in this town because it's small. People are like family here. We take care of each other.* (Focus Group Participant)

> *And we are a small community. I work at the store, so I see a lot of people. I know a lot of people, thank goodness. So I can have somebody like, "Hey, can you come look at my kid? I think he has an ear infection …. Do I really need to get to E-R?"* (Focus Group Participant)

Many people spoke about small changes in their communities that have been made possible by the willingness of local organizations and agencies to collaborate and share resources. Participants cited many examples of dedicated and passionate people who are trying to improve the community and help get people the resources they need. Many people in these positions are creative and know how to work with what they have, leverage what is available, and share what they can to make a difference.

> *People have heart. There is a core group of people who are very committed to working for change.* (Interview Participant)

> *There has been a lot of creative problem solving and interventions that have been effective even if the success is smaller than expected----even ones that have failed fast have learned important lessons to share.* (Interview Participant)

Many local and regional organizations are using a social determinants framework to look at health behaviors and prevention opportunities. They are trying to look at broader issues that affect people's access to care and access to resources that support a healthy lifestyle. People who work in public health feel that the Community Health Needs Assessment process is very helpful. Many people are starting to realize the potential benefits of integrated care and services and are starting to take steps in that direction.

> *Much of the provider pool has a global health mentality which goes a long way … the public health system is strong – that mentality and framework has a long history in the area*. (Interview Participant)

American Indian Community Strengths

American Indian participants specifically discussed the cultural resiliency and strengths of their communities. Many of the strengths participants listed were tied to cultural revitalization, learning traditional skills and crafts, learning about traditional foods, and bringing families together for ceremonies and celebrations. They felt that knowledge and use of their American Indian languages is a very powerful tool to restore connections between people and their traditional culture and restore the strength of family and community unity.

Community Health Representative programs were listed as valuable community resources that help many people get access to the education and assistance they need to manage their health. Various chapters of the Boys and Girls Clubs were also seen as a very positive program for American Indian youth. As one B&G Club employee said, "*This is their place where they want to be and they know, I can always go here and see them and they'll listen to me and be there for me*." First Things First and associated programming were also described by many as making a very positive impact for parents and families.

Tribal health departments, community organizations, and passionate and talented individuals are running many successful programs to educate and empower the community to take control of their health and make positive changes for themselves and their communities. There are also many successful programs aimed at youth engagement, leadership and skill development, cultural connections, building resiliency, and increasing protective factors in the community. Many tribes are also running successful community development programs and sustainable economic development projects that generate important economic resources to put into new programs and services. People see these programs as being successful because they are addressing the roots of the challenges faced by the communities in a culturally relevant and community-driven way.

Lack of Social Activities and Engagement Opportunities

Many people discussed the concern that there is very little for families and especially young people to do socially. They feel that the lack of constructive outlets for kids was a huge contributor to the high rates of young people experimenting with drugs and other risky behaviors. When they are not actively engaged, it is hard to build positive social connections and develop healthy habits. Many perceived this to be one of the root causes for substance abuse issues in their communities. When asked what services they would like that they do not have access to, more affordable (or free) social and physical activities for families was near the top of the list. Structured opportunities for social engagement among young people can influence their connections to one another and to their community and this can have long-lasting effects on health outcomes later in life.[56-58]

> *There's not really any real promotion for outside activities … and so kids get bored, so they start meddling into other things, more adult activity.* (Focus Group Participant)

> *Needs to be more free or inexpensive resources for kids – needs to be structured and have some time of learning attached to it – do have rec centers but needs to be organized activities – kids commit to going from this time to this time – something creative that involves learning.* (Focus Group Participant)

The lack of things for kids and families to do that are productive and creative – other than just running the streets. (Interview Participant)

Safety, Independence, and Social Support for Older Adults and Individuals with Disabilities

Some American Indian participants discussed safety concerns for elders with high rates of elder abuse which consisted of emotional abuse, neglect, and stealing money and medication from elders. Again, participants often discussed this in relation to drug or alcohol abuse within the family. Many older adults struggle with social isolation, personal loss, and depression as they navigate the major life changes that come with aging. People felt that often, older adults are more likely to struggle with these issues and less likely to ask for help. Next to alcohol and substance abuse, elder care was also a high priority concern for many American Indian participants. Many participants shared the perception that American Indian elders often are less communicative about emotional and physical health issues and can be more reluctant to reach out for help than the younger generations.

Participants were concerned that many elders who suffer from health problems lack a support system to help them maintain their homes, get to and from appointments, and get the food, medications, and resources they need. Aging adults and adults living with disabilities face additional transportation challenges. For many, lack of transportation, loss of mobility, and lack of community and social supports result in social isolation and a lack of access to resources like food and medication. For those living in very rural or remote areas and for those living on reservations, these issues can be a major contributor to poor health outcomes

So transportation is something that I am looking at here for my clients. They have to travel a long distance and they can't always make their appointments. And when they do find someone to take them over there, they're stuck all day there. (Focus Group Participant)

Another important issue that inhibits many older adults from seeking health services is a fear that drawing attention to their health conditions by asking for help could end up meaning that they will lose their independence. Many older adults do not want to lose their independence or make dramatic lifestyle changes and this often makes them less willing to ask for help. Many participants from the American Indian community shared the perception that American Indian elders are also less likely to follow-up with doctor's recommendations for lifestyle changes, which can make managing chronic disease very difficult.

Well, I'll tell ya, I'm 90, and I hate to ask my son-in-law to do something for me. He lives right next door. All I have to do is call him and he's right there. But I want to stay independent. And this is where we get into a problem, by saying, "No, I don't want you to do this for me. I'll do it." If I can't do it, it just stays there. (Focus Group Participant)

Even sometimes my dad won't call me because he says he doesn't want to bother me or be a burden. They feel a loss of independence so they're not reaching out because they don't want to lose that – once they can't drive then it gets really bad and sometimes they get really depressed. (Interview Participant)

Many older adults who live by themselves or do not have a social support system do not have anyone to check on them, get them information, and notice changes in their health condition, which makes connecting to timely care more difficult. Many older adults do not have anyone to advocate for them and help them negotiate their needs when dealing with insurance agencies and government assistance programs for which they may be eligible.

> *If you don't know the law, the government will, as I frankly state, they'll screw you. But it's necessary for people to be informed of what their legal rights are … or at least have someone who can kind of advocate for them. When I got a letter about my retirement, and they didn't say anything about Part B Medicare. And so when I found out I was supposed to pay a penalty for late enrollment … I had Part B taken away for a year because I didn't realize that.* (Focus Group Participant)

Some older adult participants discussed the issue of social media and how many older adults do not have access to computers, smart phones, or any kind of Internet-based resources or communication.

> *You know, a lot of information now is done through social media or over the computer, where some of our seniors don't utilize that. Even like to get a discount on your groceries at Safeway, you have to have an app on your phone or a computer to get this cheaper price on your groceries. That's something that our seniors don't utilize.* (Focus Group Participant)

Clearly, aging adults and adults with disabilities are two populations living largely isolated lives, which impacts their ability to access resources that could improve their health.

Stigma

Many participants discussed stigma as a barrier to seeking certain health services, especially mental and behavioral health services. In smaller communities, participants explained that the close-knit nature of the communities can sometimes be a barrier to seeking certain health services. People can get self-conscious and often worry about someone recognizing them if they are seeking care for a stigmatized service.

> *You know, you do run into that, where it's a small community and it can become a whole lot smaller when you're self-conscious about something that you're trying to seek help for. Because you will inevitably walk in and it'll be your best friend sittin' in the chair next to you.* (Focus Group Participant)

Many Hispanic participants also felt that stigma was a substantial barrier to seeking health services in the Hispanic community. Some discussed the stigma associated with asking for help. Many people do not want to seek help from people outside the Hispanic community. This is especially true for help with mental or emotional health or simply accessing social services.

> *One thing that I know from experience, maybe it's our culture, I don't know. We don't go to doctors too much until it's too late. My father he was a strong guy. He never went to doctors and I used to watch him and think, man he's good, he's strong. And the only time he ever went to the doctor … as soon as the doctor saw him, he said, "man he's really sick, I give him 3–4 weeks to live" and 5 days later he was gone.* (Interview Participant)

Mental health – seems like a taboo – you don't go to counseling, you don't seek anything. If you're sad you deal with it. If you're mourning, you deal with it. You don't go to support groups or look for counseling, you just try and do everything on your own. I don't know if it's pride or if people think that they should be able to take care of this at home … we keep it in the family, we don't need nobody to help our family. (Interview Participant)

Historical Trauma

Historical trauma among American Indian groups was also reported as contributing to existing health disparities. Historical trauma was cited as the underlying cause of many of the alcohol and drug abuse problems on the reservation and within urban American Indian communities. Community members stated that historical trauma has led to a disconnection between people and their culture, and in some cases, this is contributing to a deep sense of hopelessness. One man said that because older people were raised in boarding schools, "*they didn't learn the values of their parents and now they are adrift.*" Many participants also spoke about the loss of culture that comes from interaction and closeness between generations. Many attributed this loss of culture and family cohesion as a root cause of many social problems facing American Indian people.

Today's grandparents suffered cultural destruction and violence – loss of culture – trickles down into next generation as substance abuse – dual diagnosis is the norm. People, due to poverty and trauma and lack of education, turn to substance abuse to numb the pain. (Focus Group Participant)

A lot of the kids don't have that connection with their parents … their families are a single-parent home or they're placed with other family members or in foster care. The majority are dealing with alcoholism and drug abuse in their homes. The connection that a lot of parents have is that they want to be friends with the kids and don't want to play the adult role. They normalize bad behaviors. The kids just want that interaction with an adult that cares and shows them that they're there for them and they care for them. (Interview Participant)

Many people spoke about the destruction of the traditional family unit. Along with that goes the clan-based system of reciprocity and supportive relationships. They emphasized the importance of communicating traditions, values, and lifeways to the younger generations and making sure they feel strong in their cultural connection to their communities and families. Many participants see this breakdown as the basis for many other social and health problems.

It all comes down to the healing of the family structure and putting in resources to help families reconnect. One of the biggest problems I see is the deterioration of the family structure … not knowing how to communicate with each other across the different generations and get some understanding of what older people and younger people have experienced that makes them the way they are and see things the way that they do … be able to talk about the challenges they have experienced. (Interview Participant)

As young people move to cities for educational and employment opportunities, families are separated. This can widen the gap in communication, which is necessary for cultural transmission and resilience and can exacerbate the effects of historical trauma.

When I come face-to-face with my grandchild, they are like strangers. (Indigenous Community Forum Attendee)

Lack of Trust

Many participants representing the American Indian community discussed how a lack of trust of outsiders affects people's willingness to reach out for help or utilize services that are available to them. Often it takes a lot of time for communities to begin to build trust with a community agency or contact person. It takes a high level of trust for people to feel comfortable sharing details about their lives and what they might need help with.

A big part of that layer is the general mistrust of the federal government and their failures to uphold trust responsibilities to tribes. That creates a feeling of frustration and feeling like they don't matter – It's happened for so many generations that people feel this and they're just like, "why does my life here matter on the reservation if it's controlled in this manner." (Interview Participant)

People don't reach out because of a lack of trust … they don't want to let people into their lives, don't want to talk about their personal issues, don't want people to know what is going on. (Interview Participant)

Fear of harassment or discrimination is prevalent throughout the Hispanic community, for both documented and undocumented community members. This fear can limit mobility and utilization of available services.

Transportation is a big problem. Lots of Hispanics walk everywhere they go because they don't want to get stopped and get citations. (Interview Participant)

There is fear among immigrant families – since the election, there is going to be more fear and also more families will not be eligible. (Interview Participant)

People unable to access areas that other people access because they don't feel comfortable … it's a lack of trust up here. People don't reach out and seek preventative or early treatment services, they try to stay amongst themselves. They wait until it's really bad and then end up in the emergency room. (Interview Participant)

Hispanic participants also stressed the importance of establishing trust with this population because prevalent fear and distrust of outsiders prevents people from reaching out for help and making their needs known to community organizations and agencies. Having providers and outreach workers who speak Spanish and are willing to go the extra steps to actively reach out to the Hispanic community and work to establish trust is vital to making sure community members have the information and resources they need.

If I have a client that comes in for the Well Women's Program, when they sign them up I have to develop a trust with them because they're undocumented. Once I develop trust with them, they will give me information on what their other needs are for their families and their children. Then as other

things come up, they contact me for help. They will call for help for themselves, their husbands, their children, or another family member because of that trust. Unless there is trust, they won't tell you about any of their needs. (Interview Participant)

Many participants who spoke about health and social challenges in the Hispanic population felt that this population in particular was "forgotten" or "invisible." Some participants felt that the Hispanic population does not feel like they belong to the larger community and that can create discomfort and isolation. Without a strong social network, some Hispanic community members do not know where to go for help.

If you are Caucasian in this town, you get pretty much anything you want. If you are American Indian you can pretty well get what you want because you got IHS … but your forgotten group is the Hispanic community, whether they've been here one day or their whole entire life. (Interview Participant)

You're either a native born here (born in Flagstaff, generations before you) or you're American Indian. Hispanics don't belong to either group – they fall through the cracks – newcomers —– Everybody knows somebody and they get the resources but new families come in and don't know who to call and where to go. There are not many Hispanic organizations like you have in Phoenix – they have lots of health orgs for Hispanics – here we won't have that – at least to get more information. (Interview Participant)

Incongruences between Traditional Cultural Beliefs about Health and Healing and Western Medicine

Some American Indian participants cited a lack of incorporation of American Indian concepts of health and wellness into the Western medical system as a basis for health disparities in American Indian populations. For some American Indians, many elements of Western medical treatment don't align with their traditional beliefs. Some American Indian community members don't place value in the many tests and medications they are subjected to, often with very little explanation offered by the doctor. Many participants spoke about a preference for home remedies and other types of traditional medicine and they will exhaust those options before seeking formal mainstream Western medical care. Not feeling respected, heard, and understood can create unproductive doctor-patient relationships and can hinder people from reaching out to medical providers and/or following their advice.

Still have doctors who tell patients not to be utilizing their ceremonial ways because they don't work. Patients are afraid to go to the doctor because they don't want to be told what to believe and what not to believe. They feel like their doctor should take care of them without judging them and lecturing them. (Interview Participant)

Standard materials and strategies to educate people about health and disease are also often not culturally relevant to American Indian populations. This can contribute to gaps in understanding of disease process and management and also unproductive relationships between some American Indian patients and medical providers.

> *From a cultural perspective, we don't focus on the gory details or nature of the condition of all the bad things that can happen if you don't take care of yourself – you have to highlight the importance of living a full healthy life and embracing wanting to live into old age – that's how we view health. It doesn't go side by side with "this is what cancer looks like, this is what's going to happen to you if you don't do this.*" (Interview Participant)

Some participants also discussed a preference within the Hispanic community for home remedies and alternative medicine over going to the doctor or taking medication.

> *Within Hispanic culture – I know firsthand because of the way my mom was and now I see myself doing the same thing – you look for these other home remedies first before you actually take them to the doctor.* (Interview Participant)

Several social and cultural factors should be considered when addressing the health of a community. Some populations are particularly vulnerable (individuals with disabilities and aging adults) as they are often socially isolated and this influences their ability to maintain health and wellness and also stay connected to their community. In addition, American Indian and Hispanic populations may have a different cultural view of health; therefore, culturally relevant approaches to care are needed.

ORGANIZATIONAL BARRIERS

We asked participants to describe any challenges or barriers that they felt were present on an organizational level that made it more difficult for them to address the health issues that they were aware of in the community. Lack of resources was the most common organizational challenge in terms of both lack of funding and lack of manpower to gather data on community health needs, develop new programs, and evaluate existing programs to make them more efficient and effective. Another commonly discussed barrier was the lack of inter-agency communication and organizational collaboration through resource and information sharing.

Lack of Funding Resources

Participants identified two factors that they felt make it difficult to apply for state and federal funding for their counties and communities. The perception was that many communities in northern Arizona have a very large income inequality. In some cases, the wealthier households living in a town or community inflate the median household income to a point where the town no longer qualifies for certain types of funding to provide services for the lower income households.

Another common belief was that for some very rural communities, the populations are so small that when state funding is allocated by population, most funding goes to Maricopa and Pima counties and the rural counties split the remaining percentage of state funding. Although the populations are small, the needs of rural areas are often very different from urban areas. Participants felt that rural needs are not adequately considered in the state's development of new programs, policies, and funding allocation.

Lack of Evaluation and Data Collection Capacity

Participants representing many different agencies and organizations discussed the challenges they have in collecting relevant systematic data on the needs of the populations they serve and the impact of the programs they offer. Many participants discussed not having the time, knowledge, and systems in place to regularly collect this type of information. Others talked about challenges to being able to share the data that organizations and agencies are able to collect. Collecting these types of data would be very helpful in applying for funding, setting priorities for existing funds, developing strategic plans, and laying the framework for cross-sector collaboration. Evaluation data are important for demonstrating the utilization and impact of existing programs which are also an important part of the program development and strategic planning process.

Lack of Collaboration and Communication between Agencies

Often, community organizations and agencies are not aware of what services other agencies provide so they do not share that information with their clients. This creates a huge missed opportunity to connect people to resources that can help meet their needs.

> *Better communication helps agencies not duplicate services but instead refer people to the agency that specializes in that and really help people get the services they need.* (Interview Participant)

The lack of communication between providers makes it easier for patients to fall through the cracks. Because providers do not share information about patients, it is more difficult to identify all of the person's needs, as well as leverage the supports that they have in their lives to facilitate healthy behaviors and decisions.

> *HIPAA is a barrier because providers can't share information and that makes it a challenge for case managers to try and coordinate care and make sure patients are following up with what they are supposed to and make sure they can support those treatment plans with support and education.* (Interview Participant)

Many participants discussed the need for encouraging and facilitating collaboration between organizations. Many organizations and agencies are working on addressing similar issues but they are not working together. Participants felt that people are ready to collaborate but would like to see capacity building on an organizational level that encourages and simplifies cross-sector collaboration. This would help organizations share information and pool institutional strengths such as skills, knowledge, and resources.

> *Our community is ready to collaborate with each other but are struggling with exactly how to move it in a forward direction and get their strategic plans lined up*. (Interview Participant)

NEEDED SERVICES IDENTIFIED BY PARTICIPANTS

Throughout the qualitative data collection process, many participants discussed certain services, resources, and programs that they felt would greatly improve the health of their communities. The types of services varied widely but there were also many common themes. Their suggestions are grouped by theme and briefly summarized below.

Increase Providers and Expand Services

- Recruit and retain more providers for service in rural areas (this includes primary care, dental care, mental and behavioral health care and specialty care providers).
- Develop more programs that provide affordable care to the uninsured or underinsured. This includes programs that ensure that medications are affordable and available to everyone.
- Expand mental health services to increase both inpatient and outpatient substance abuse programs, programs focused on developing coping skills and points of resiliency as well as dealing with stress and depression, and developing and maintaining healthy personal relationships.
- Integrate mental health services into primary care to increase access and awareness of those services and decrease effects of stigma on seeking mental health services.
- Develop programs to allow law enforcement to interact with people who are suffering from severe mental illness, homelessness, and substance abuse issues in a more productive way.
- Develop mental health/education services and programs that are based on ideas outside of Western medicine traditions such as yoga, meditation, and other alternative health models.
- Develop and expand more mobile health care delivery systems.
- Expand emergency response services in rural/remote areas.
- Expand specialty services such as oncology, rheumatology, speech therapy specialists, autism specialists, dieticians, and pediatric behavioral health specialists.
- Support more school nurses and mental health counselors in schools.
- Develop more home-based care services and senior health care services.
- Help tribal community members to build partnerships between the tribes and local health care facilities to develop more palliative care and nursing home facilities on the reservations.
- Focus on local workforce development to increase students interested in pursuing careers in the health field.

Social Engagement and Development

- Develop programs and activities for youth and families that are organized, creative, fun, and affordable (or free).
- Build youth programs that are focused on developing resiliency and protective factors.
- Develop more support services for students.

Recreation and Nutrition

- Build capacity to encourage a wide variety of organized recreational activities for youth.
- Develop programs to increase nutrition literacy and healthy food preparation skills and knowledge.
- Increase access to more affordable, nutritious foods.

Education and Employment Development

- Increase job training services and development programs.
- Develop adult literacy programs.
- Develop money management and financial planning classes.

Access to Resources

- Develop programs to expand or support affordable housing opportunity.
- Develop "housing first" approaches to end homelessness.
- Invest in bringing high-speed Internet and better connectivity to rural areas to increase capacity to obtain and share information.
- Develop subsidized or more affordable childcare programs.
- Provide child care services at health care facilities for parents who come for appointments.

Transportation

- Develop, expand, and improve existing non-emergency medical transportation systems.

Health Education and Outreach

- Expand community-based health education classes for chronic disease management, healthy eating and exercise, and a wide variety of prevention topics.
- Develop marketing strategies to increase promotion of available community services and provide convenient, user friendly resources to connect people to services and help them navigate enrollment and/or application processes.
- Increase outreach for the uninsured and provide services that help them apply for insurance and navigate the system.
- Increase efforts focused on screening and early diagnosis for cancer and other detectable diseases.
- Increase efforts for outreach and education to children. Tailoring prevention and services toward children and families of children is an effective strategy because it allows providers and educators to interact with the parents face-to-face when they bring their children in.
- Increase efforts to raise awareness about signs and symptoms of PTSD and what to do if people recognize these symptoms in themselves or their loved ones.

REPORT STRENGTHS AND LIMITATIONS

This report, although comprehensive, cannot claim to represent the views of each unique community member across the very diverse northern Arizona region. As with any qualitative inquiry, there are limitations to making broad generalizations across populations of people represented by the willing participants in this project. However, we did talk to a variety of stakeholders including community members, leaders, providers, and tribal representatives to gain broad perspectives on the needs and assets to address health and wellness in northern Arizona. In future efforts, we would like to gather more data from additional populations highlighted in this report as experiencing disparities or in need of additional resources, including older adults, people with disabilities, young people, tribal groups, and the Hispanic community. We also need to spend more time considering the diversity between and within each county in the region. Additionally, more data on specific, community-based strategies or programs which are working well to address health disparities are needed.

Another strength of this needs assessment was utilizing a mixed-methods approach. We accessed a variety of data sets to understand the key issues faced by residents in the region and then incorporated our qualitative findings to help share the story behind the numbers. A major limitation of our quantitative inquiry was our lack of access to data from the Indian Health Service and the Veteran's Administration, both populations identified by participants as needing a specific focus in planned programs and services. In addition to lack of data, the data we had access to had further limitations. ADHS data is not collected for research purposes and BRFSS relies on information directly reported by the respondent. To date, this needs assessment process has engaged community members, providers, and leaders in a data gathering process, but has limited stakeholder engagement in the interpretation of the data. Next phases of the project will involve disseminating these preliminary results with stakeholders to further refine our understanding of needs, assets, and priorities across the region and inquire about further data interests and needs.

PRELIMINARY RECOMMENDATIONS AND NEXT STEPS

The initial key themes, priorities, and recommended action steps listed below should be seen primarily as conversation starters to use toward future funding, policy, and programmatic efforts.

Social Determinants of Health

Improving health and wellness in the region will involve policy and programmatic changes to enhance access to education, housing, recreation, employment, and access to healthy foods. It is important for these priorities to be set by communities themselves; they must be the leaders in strategizing ways to address the most important determinants.

Target Populations

Due to existing health disparities, programs targeting specific populations including American Indians, Latinos, aging adults (elder care), young people, veterans, rural communities, low-income individuals, and individuals with disabilities should be a top priority. It will be important for stakeholders to work closely with the populations they wish to target to further identify the assets and contexts of health. Many communities have leaders, key organizations, and social networks that will be important to utilize in the planning and implementation of new strategies. After a target population is identified, more work

will need to be done to gather information about these channels as well as specific assets and challenges facing each unique population.

Increase Quantity and Quality of Health Services and Resources

Given the large gaps in access to care, there is a need for programs with a focus on access to culturally relevant services and supports via provider development (rural provider capacity), alternative care approaches (integrated care, community health representatives, telehealth), and improved structural capacity (transportation, clinic locations).

Recruit and Retain Rural Health Care Providers

Provider recruitment and retention were cited as major barriers to meeting the needs of the population, and specialty providers were often mentioned as a particularly difficult group to recruit to rural areas. All six counties highlighted the lack of access to care for behavioral health services (including mental health and substance abuse services). Many participants discussed difficulty in recruiting and retaining mental health providers and the lack of insurance coverage for basic mental health needs such as counseling, drug and alcohol rehabilitation, and other outpatient support services.

Research regarding rural provider recruitment identifies key strategies for successful recruitment and retention of rural providers, including providing financial aid or student loan pay-off options for rural practitioners; including rural-based components in health provider curriculum (rural-based residency, rural-based practicum); recruiting individuals who were raised in rural areas; and providing professional growth and workforce develop opportunities to encourage rural residents to enter the health care field. Long-term approaches such as pipeline programs that expose rural elementary, middle, and high school students to health careers can be used to develop the health care workforce within a particular community.

Community Health Workers/Community Health Representatives (CHWs/CHRs)

Community Health Worker programs have been proven to help improve access to health care and health outcomes, especially in low-income, cultural minority, and rural populations. CHWs specialize in family health care coordination including connection to and enrollment into a variety of health care options. They are community insiders and understand the cultural and social assets and barriers that may affect health outcomes. This understanding and familiarity is extremely beneficial as they seek to build and maintain trusting relationships with community members, local social service agencies, and health care professionals. CHWs have a unique set of skills and they succeed in providing education, care, and capacity building for individuals and communities. They are able to serve as liaison/ intermediary between health/social services and the community to facilitate access to services and improve the quality and cultural competence of service delivery. Successful models are also being developed to implement community dental health workers and community behavioral health aides.

Community Paramedicine

Community paramedicine offers a number of health and social services that can improve access to care among individuals with disabilities, rural dwelling, aging adult populations, and others with limited access to reliable transportation. Expanding the role of paramedics to address gaps in the health care

system has been shown to promote community health while reducing unnecessary costs incurred by ER use. Community paramedics are trained to recognize and assess health and social factors that can influence patient health, provide patient advocacy, make referrals to health and social services, and assist patients with disease management, medication adherence, and health education within the privacy of their homes. One advantage of the model is the ability to directly reach out to patients through local networks and to provide regular follow-up, thus enhancing continuity of care. This model may help mitigate health disparities caused by shortages of health care providers, by utilizing an existing community resource.

Mobile Clinics

Mobile health units are a unique model of health care delivery, providing outreach to improve access to care and prevent disease. Mobile clinics are charged with providing health screenings (dental, mental health, and cancer), child immunizations and vaccinations, health education to enhance disease prevention, simple medical treatments, and disease monitoring procedures.

Telemedicine

Telemedicine employs a variety of technologies to exchange medical information to improve patient health/clinical care. Telemedicine technology is being utilized in a wide variety of ways to improve health care.

Primary care and specialist referral services may involve a primary care or allied health professional providing a consultation with a patient or a specialist assisting the primary care physician in rendering a diagnosis. This may involve the use of live interactive video or the digital transmission of diagnostic images, vital signs, and/or video clips along with patient data for later review.

Remote patient monitoring, including home telehealth, uses devices to remotely collect and send data to a home health agency or a remote diagnostic testing facility for interpretation. Such applications might include a specific vital sign such as blood glucose or heart ECG or a variety of indicators for homebound patients. Such services can be used to supplement the use of visiting nurses and can help patients track and manage their own health. Consumer medical and health information includes the use of the Internet and wireless devices for consumers to obtain specialized health information and online discussion groups to provide peer-to-peer support. Medical education provides continuing medical education credits for health professionals and special medical education seminars for targeted groups in remote locations. Emerging evidence shows that brief mental health counseling is effective via the Internet for both adults and adolescents.[59,60]

Increase Capacity through Training, Facilitating, and Supporting Multi-Sector Collaboration

Addressing health equity and wellbeing in this region is dependent upon building cross-sector, cross-county collaborations as well as the structure and capacity for stakeholders to engage in a sustainable collaborative strategic planning process. By building capacity to more easily communicate, collect, and share data and information, pool resources, and align goals, large strides can be made in achieving regional health equity and wellness goals.

Participants discussed the desire for more training in data collection and evaluation methods to assess health and social needs as well as the impact of local programs. It is important to collaborate on developing data collection standards and processes that will facilitate sharing of information between agencies, prevent duplication of efforts, and insure that the type of data being collected is comparable and relevant across time, measure, and agency.

Another important part of capacity building is training for employees in various sectors of the community to understand social determinants of health and how they impact health outcomes. This will help communities to identify key organizations in different sectors of the community that could bring diverse expertise and resources to the table to work together to create meaningful and sustainable changes. This would also make it easier for cross-sector collaboration in applying for funding opportunities.

Work Toward Integration of Health: Behavioral, Primary Care, and Oral Health Services into One Medical System and Setting

In order to increase awareness of mental and behavioral health issues and increase access to needed resources, wherever possible behavioral health services should be integrated into the primary care setting as well as other settings.

Health care providers and community leaders report a lack of continuity of care as a barrier to patient health and wellbeing. In general, mental health, physical health, and oral health services are provided by independent organizations instead of operating with one point of entry through which the patient enters a comprehensive health care system. Limited communication between providers and health care organizations prevents the sharing of skills, knowledge, and resources necessary to provide quality care that enhances the health and wellbeing of the whole person. In a truly integrated system, patients would have the opportunity to receive coordinated comprehensive health care rather than having separate visits for separate health issues coming from separate providers.

To accomplish this, there is a need for increased communication between providers and more focus on the provision of wraparound services. Many participants discussed the need for encouraging and facilitating collaboration between organizations. Participants felt that people are ready to collaborate but would like to see capacity building on an organizational level that encourages and simplifies cross-sector collaboration. This would help organizations share information and pool institutional strengths such as skills, knowledge, and resources. This includes simpler systems to facilitate sharing information through electronic medical records.

Even for those who qualify for social services assistance, there are barriers to accessing those benefits. Participants mentioned that people don't have computers to access online application forms, the offices are only open specific hours during the week and are often located in another town, and people have difficulty navigating the application process. A certain level of literacy and knowledge is required just to navigate the paperwork to apply for services. People need to be able to go to one place and have access to a variety of health services and also be connected or referred to additional community resources and

social services.

It is important to develop more training opportunities for employees in many key sectors who interact with the community regularly on how to identify physical health, mental health, and social health needs. Individuals should be trained on how to recognize needs and how to refer people to places and services who can help. Important key sectors include law enforcement, teachers and school administrators, EMT providers, and other social/public service sectors.

Increase Awareness of and Access to Existing Health Resources in the Community

Due to the widespread lack of awareness about where to go for certain services and the types of services that are available, stakeholders should work to create and maintain a comprehensive and up-to-date list of available resources and streamline an assessment and referral system that agencies can use to identify possible needs and connect community members with services that may be helpful. In terms of content and distribution mechanism, resource information should be convenient and readily available as well as culturally, linguistically, intellectually, and age appropriate.

As this assessment reveals, it is important to utilize both online and non-online information to reach all demographics of people in terms of age, income, ethnicity, and geographic location. All of these populations may utilize different forms of information.

Despite existing information circulating through communities, many participants discussed prevalence of confusion in navigating the social service referral and application process. We recommend increasing opportunities for people to speak with someone in person about their options and to get help with application and referral processes. One way to accomplish this may be through utilization of Community Health Workers. By having a strong community presence, CHWs can build trust and familiarity with community members, putting them in unique insider positions to help identify needs and assist the community in meeting those needs. If CHWs are trained to recognize social determinates of health, they could come together regularly to discuss the challenges and barriers to community members who need help and strategize locally relevant solutions to overcome those barriers.

NEXT STEPS

This project was a comprehensive process to identify health needs and resources in this geographically and ethnically diverse region. Data collection and analysis will continue beyond the publication of this report through dissemination and discussion with key stakeholders. The goal of these discussions is to validate the major themes and findings, identify gaps in data and priority topics for further inquiry, and start to build local and regional collaboration that will facilitate communication, information sharing, and strategic planning. We hope that these community meetings and discussions will help guide the next steps of this ongoing project.

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APPENDICES

A: Interview Guide for Community Member Interviews

B: Focus Group Question Guide for Community Member Focus Groups

C: CDC WONDER Leading Causes of Mortality by Nation, State, and County

D: Total Number of Hospital Admissions and Emergency Department Visits, 2010 and 2014, for each ICD-9 Code Category by County

E: Hospital Discharge Summary of Age Distributions at Time of Hospitalization Related to Suicide, Suicide Attempt, or Self-inflicted Injury by County (2014)

F: Top 15 Hospital Discharge Diagnoses for Inpatient Admission and ED Visits by Urban Area and Rural Areas 2010 and 2014

G: Leading Causes of Mortality by Ethnicity and County

H: Top 15 Discharge Diagnoses for Selected Age Groups by County, 2010 and 2014

Appendix A

Interview Guide for Community Member Interviews

1. How long have you worked for your organization? How long have you worked in the health field in this region?
2. What services [what issues] does your agency provide [focus on]?
   a. What services [what issues] do you wish your agency could provide [focus on]?
   b. What prevents this from happening?
3. In the last 5 years, what are the biggest persistent health issues in the populations you work with?
4. In the last 2–3 years, what are the biggest emerging health issues in the populations you work with?
5. Where do you see the biggest disparities in health?
   a. What populations are most affected?
   b. What are the biggest barriers that those populations face in regards to living a healthy life?
   c. What services do people need that they don't have access to?
   d. What are they underlying structural issues that contribute to these disparities?
6. What are the biggest barriers you face from an agency/organizational perspective that make it harder to address these health issues?
   a. What do you think should be done to address these barriers?
7. What are the strengths of the health system in northern Arizona that can be built upon to increase capacity to serve the health needs of the community?
8. If you could name one thing that you would like to see as an outcome of this needs/asset assessment that would help improve the health of the people of this region, what would it be?
9. Does your organization collect data on a regular basis that would be relevant to the assessment that we could get access to?
10. Who should be included as stakeholders in the needs assessment? (Organizations, community groups, names of individuals, if relevant). Who should we talk to? Who might have important data that would be useful to the assessment?

Appendix B

Focus Group Question Guide for Community Member Focus Groups

1. How would you describe the community where you live?
2. What things help support healthy lifestyles for you and your family or others in your community?
   a. What are some resources that help people stay healthy?
   b. Community strengths?
3. What are the biggest health concerns for you and your family or others in your community?
   a. What do you see as the primary cause of those issues?
4. What prevents people or makes it harder for people to stay healthy in this community?
   a. Are there barriers to accessing care?
   b. What prevents people from getting the services and resources they need?
5. Let's talk about some other things that might affect health indirectly. What would you say are the most important social concerns or problems in your community?
   a. Economic (money, jobs, food security, housing stability)
   b. Education (health education, awareness, job training, formal education)
   c. Community engagement/social connectedness
   d. Community environment (lack of access to healthy food, recreation, violence, environmental conditions)
6. How do these challenges impact health and wellness?
7. What would have the greatest impact on improving health and wellness/wellbeing in your community?
   a. What resources and services are not available (or hard to access) that would help people stay healthy?
8. Are there any issues that we didn't talk about today that you think should be part of our assessment in trying to understand health and wellbeing in this community?

Appendix C

CDC WONDER Leading Causes of Mortality by Nation, State, and County

Data from Centers for Disease Control and Prevention, National Center for Health Statistics. Multiple Cause of Death. 1999–2015 on CDC WONDER Online Database, released December, 2016. Compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Rates are per 100,000 individuals. Population size is the cumulative sum across all 5 years.

United States: 2011–2015; total cumulative population size of 1,581,910,672; All Ages

UCD - 15 Leading Causes of Death	UCD - 15 Leading Causes of Death Code	Deaths	Crude Rate	Age Adjusted Rate	Age Adjusted Rate Lower 95% CI	Age Adjusted Rate Upper 95% CI
Diseases of heart (I00-I09,I11,I13,I20-I51)	GR113-054	3055583	193.2	169.9	169.7	170
Malignant neoplasms (C00-C97)	GR113-019	2931825	185.3	163.6	163.4	163.7
Chronic lower respiratory diseases (J40-J47)	GR113-082	737779	46.6	41.6	41.5	41.7
Accidents (unintentional injuries) (V01-X59,Y85-Y86)	GR113-112	667286	42.2	40.3	40.2	40.4
Cerebrovascular diseases (I60-I69)	GR113-070	659882	41.7	37	36.9	37.1
Alzheimer's disease (G30)	GR113-052	457480	28.9	25.4	25.4	25.5
Diabetes mellitus (E10-E14)	GR113-046	379364	24	21.2	21.2	21.3
Influenza and pneumonia (J09-J18)	GR113-076	273730	17.3	15.3	15.2	15.3
Nephritis, nephrotic syndrome and nephrosis (N00-N07,N17-N19,N25-N27)	GR113-097	236430	14.9	13.3	13.2	13.3
Intentional self-harm (suicide) (*U03,X60-X84,Y87.0)	GR113-124	208286	13.2	12.8	12.7	12.8
Septicemia (A40-A41)	GR113-010	189459	12	10.6	10.6	10.7
Chronic liver disease and cirrhosis (K70,K73-K74)	GR113-093	183544	11.6	10.2	10.2	10.3
Essential hypertension and hypertensive renal disease (I10,I12,I15)	GR113-069	150159	9.5	8.3	8.3	8.3
Parkinson's disease (G20-G21)	GR113-051	126247	8	7.3	7.3	7.3
Pneumonitis due to solids and liquids (J69)	GR113-088	93266	5.9	5.2	5.2	5.2

Arizona: 2011–2015; total population size of 33,221,933; All Ages

UCD - 15 Leading Causes of Death	UCD - 15 Leading Causes of Death Code	Deaths	Crude Rate	Age Adjusted Rate	Age Adjusted Rate Lower 95% CI	Age Adjusted Rate Upper 95% CI
Malignant neoplasms (C00-C97)	GR113-019	56353	169.6	145.5	144.3	146.7
Diseases of heart (I00-I09,I11,I13,I20-I51)	GR113-054	54369	163.7	142.2	141	143.4
Chronic lower respiratory diseases (J40-J47)	GR113-082	16809	50.6	43.5	42.9	44.2
Accidents (unintentional injuries) (V01-X59,Y85-Y86)	GR113-112	16335	49.2	47.4	46.6	48.1
Alzheimer's disease (G30)	GR113-052	12319	37.1	32.6	32	33.2
Cerebrovascular diseases (I60-I69)	GR113-070	11231	33.8	29.6	29.1	30.2
Diabetes mellitus (E10-E14)	GR113-046	9279	27.9	24.1	23.6	24.6
Intentional self-harm (suicide) (*U03,X60-X84,Y87.0)	GR113-124	5999	18.1	17.8	17.3	18.3
Chronic liver disease and cirrhosis (K70,K73-K74)	GR113-093	5270	15.9	14.3	13.9	14.7
Essential hypertension and hypertensive renal disease (I10,I12,I15)	GR113-069	4166	12.5	10.9	10.5	11.2
Influenza and pneumonia (J09-J18)	GR113-076	3703	11.1	9.9	9.5	10.2
Parkinson's disease (G20-G21)	GR113-051	3069	9.2	8.1	7.8	8.4
Nephritis, nephrotic syndrome and nephrosis (N00-N07,N17-N19,N25-N27)	GR113-097	1966	5.9	5.2	4.9	5.4
Assault (homicide) (*U01-*U02,X85-Y09,Y87.1)	GR113-127	1871	5.6	5.8	5.5	6.1
Septicemia (A40-A41)	GR113-010	1850	5.6	4.9	4.6	5.1

All 6 Northern Arizona Counties: 2011–2015; total population size of 3,946,053; All Ages

UCD - 15 Leading Causes of Death	UCD - 15 Leading Causes of Death Code	Deaths	Crude Rate	Age Adjusted Rate	Age Adjusted Rate Lower 95% CI	Age Adjusted Rate Upper 95% CI
Diseases of heart (I00-I09,I11,I13,I20-I51)	GR113-054	9681	245.3	172.4	168.8	175.9
Malignant neoplasms (C00-C97)	GR113-019	9420	238.7	160.4	157.1	163.8
Accidents (unintentional injuries) (V01-X59,Y85-Y86)	GR113-112	3216	81.5	79.2	76.3	82.1
Chronic lower respiratory diseases (J40-J47)	GR113-082	3047	77.2	52	50.1	53.8
Cerebrovascular diseases (I60-I69)	GR113-070	1812	45.9	32.3	30.8	33.9
Diabetes mellitus (E10-E14)	GR113-046	1276	32.3	23.3	22	24.7
Alzheimer's disease (G30)	GR113-052	1208	30.6	22	20.7	23.2
Intentional self-harm (suicide) (*U03,X60-X84,Y87.0)	GR113-124	1207	30.6	30.3	28.5	32.1
Chronic liver disease and cirrhosis (K70,K73-K74)	GR113-093	1167	29.6	25.5	23.9	27.1
Influenza and pneumonia (J09-J18)	GR113-076	841	21.3	15.5	14.4	16.6
Nephritis, nephrotic syndrome and nephrosis (N00-N07,N17-N19,N25-N27)	GR113-097	602	15.3	10.6	9.7	11.5
Parkinson's disease (G20-G21)	GR113-051	475	12	8.3	7.6	9.1
Essential hypertension and hypertensive renal disease (I10,I12,I15)	GR113-069	427	10.8	7.5	6.8	8.3
Septicemia (A40-A41)	GR113-010	394	10	7.2	6.5	8
Assault (homicide) (*U01-*U02,X85-Y09,Y87.1)	GR113-127	272	6.9	8	7	9

Apache County: 2011–2015; total population size of 360,832; All Ages

UCD - 15 Leading Causes of Death	UCD - 15 Leading Causes of Death Code	Deaths	Crude Rate	Age Adjusted Rate	Age Adjusted Rate Lower 95% CI	Age Adjusted Rate Upper 95% CI
Accidents (unintentional injuries) (V01-X59,Y85-Y86)	GR113-112	485	134.4	145.3	132.1	158.6
Malignant neoplasms (C00-C97)	GR113-019	481	133.3	135.9	123.5	148.3
Diseases of heart (I00-I09,I11,I13,I20-I51)	GR113-054	455	126.1	134.9	122.3	147.5
Diabetes mellitus (E10-E14)	GR113-046	180	49.9	50.6	43	58.2
Chronic liver disease and cirrhosis (K70,K73-K74)	GR113-093	138	38.2	42.3	35.1	49.6
Intentional self-harm (suicide) (*U03,X60-X84,Y87.0)	GR113-124	119	33	35	28.6	41.5
Influenza and pneumonia (J09-J18)	GR113-076	105	29.1	32	25.8	38.3
Cerebrovascular diseases (I60-I69)	GR113-070	100	27.7	30.1	24.1	36.1
Chronic lower respiratory diseases (J40-J47)	GR113-082	89	24.7	25.2	20.1	31.1
Assault (homicide) (*U01-*U02,X85-Y09,Y87.1)	GR113-127	52	14.4	16.6	12.3	21.9
Septicemia (A40-A41)	GR113-010	49	13.6	14.3	10.5	19
Alzheimer's disease (G30)	GR113-052	41	11.4	13.5	9.7	18.3
Nephritis, nephrotic syndrome and nephrosis (N00-N07,N17-N19,N25-N27)	GR113-097	30	8.3	8.7	5.8	12.5
Congenital malformations, deformations and chromosomal abnormalities (Q00-Q99)	GR113-109	23	6.4	6.2	3.9	9.4
Parkinson's disease (G20-G21)	GR113-051	19	Unreliable	Unreliable	3.5	9.2

Coconino County: 2011–2015; total population size of 683,840; All Ages

UCD - 15 Leading Causes of Death	UCD - 15 Leading Causes of Death Code	Deaths	Crude Rate	Age Adjusted Rate	Age Adjusted Rate Lower 95% CI	Age Adjusted Rate Upper 95% CI
Malignant neoplasms (C00-C97)	GR113-019	690	100.9	117.4	108.2	126.5
Diseases of heart (I00-I09,I11,I13,I20-I51)	GR113-054	676	98.9	128.1	118.1	138
Accidents (unintentional injuries) (V01-X59,Y85-Y86)	GR113-112	437	63.9	69.5	62.7	76.3
Chronic lower respiratory diseases (J40-J47)	GR113-082	192	28.1	38	32.5	43.5
Cerebrovascular diseases (I60-I69)	GR113-070	148	21.6	29.1	24.2	33.9
Intentional self-harm (suicide) (*U03,X60-X84,Y87.0)	GR113-124	146	21.4	21.7	18	25.4
Chronic liver disease and cirrhosis (K70,K73-K74)	GR113-093	111	16.2	17.4	14	20.7
Diabetes mellitus (E10-E14)	GR113-046	103	15.1	17.3	13.8	20.8
Alzheimer's disease (G30)	GR113-052	97	14.2	21.6	17.5	26.3
Influenza and pneumonia (J09-J18)	GR113-076	62	9.1	12.6	9.6	16.3
Parkinson's disease (G20-G21)	GR113-051	45	6.6	9.9	7.2	13.3
Assault (homicide) (*U01-*U02,X85-Y09,Y87.1)	GR113-127	44	6.4	6.4	4.6	8.7
Nephritis, nephrotic syndrome and nephrosis (N00-N07,N17-N19,N25-N27)	GR113-097	40	5.8	7.6	5.4	10.4
Septicemia (A40-A41)	GR113-010	30	4.4	5.8	3.9	8.4

Gila County: 2011–2015; total population size of 265,619; All Ages

UCD - 15 Leading Causes of Death	UCD - 15 Leading Causes of Death Code	Deaths	Crude Rate	Age Adjusted Rate	Age Adjusted Rate Lower 95% CI	Age Adjusted Rate Upper 95% CI
Diseases of heart (I00-I09,I11,I13,I20-I51)	GR113-054	775	291.8	178.5	165.3	191.7
Malignant neoplasms (C00-C97)	GR113-019	766	288.4	166.5	153.9	179.1
Chronic lower respiratory diseases (J40-J47)	GR113-082	301	113.3	63.5	56.2	70.9
Accidents (unintentional injuries) (V01-X59,Y85-Y86)	GR113-112	226	85.1	80.9	69	92.7
Cerebrovascular diseases (I60-I69)	GR113-070	170	64	37.9	32	43.9
Alzheimer's disease (G30)	GR113-052	145	54.6	32.4	27.1	37.7
Diabetes mellitus (E10-E14)	GR113-046	134	50.4	30.8	25.1	36.6
Chronic liver disease and cirrhosis (K70,K73-K74)	GR113-093	114	42.9	34.7	27.4	42.1
Intentional self-harm (suicide) (*U03,X60-X84,Y87.0)	GR113-124	79	29.7	31.4	24.2	40
Nephritis, nephrotic syndrome and nephrosis (N00-N07,N17-N19,N25-N27)	GR113-097	71	26.7	15.3	11.9	19.4
Influenza and pneumonia (J09-J18)	GR113-076	45	16.9	11.9	8.3	16.5
Essential hypertension and hypertensive renal disease (I10,I12,I15)	GR113-069	42	15.8	9.7	6.8	13.4
Parkinson's disease (G20-G21)	GR113-051	36	13.6	7.5	5.3	10.4
Septicemia (A40-A41)	GR113-010	36	13.6	9.2	6.2	13.1
In situ neoplasms, benign neoplasms and neoplasms of uncertain or unknown behavior (D00-D48)	GR113-044	19	Unreliable	Unreliable	2.4	6.4

Mohave County: 2011–2015; total population size of 1,016,813; All Ages

UCD - 15 Leading Causes of Death	UCD - 15 Leading Causes of Death Code	Deaths	Crude Rate	Age Adjusted Rate	Age Adjusted Rate Lower 95% CI	Age Adjusted Rate Upper 95% CI
#Diseases of heart (I00-I09,I11,I13,I20-I51)	GR113-054	4042	397.5	236.6	229	244.2
#Malignant neoplasms (C00-C97)	GR113-019	3461	340.4	192.2	185.5	199
#Chronic lower respiratory diseases (J40-J47)	GR113-082	1164	114.5	63.6	59.8	67.3
#Accidents (unintentional injuries) (V01-X59,Y85-Y86)	GR113-112	733	72.1	66.3	61	71.7
#Cerebrovascular diseases (I60-I69)	GR113-070	552	54.3	32.5	29.7	35.3
#Intentional self-harm (suicide) (*U03,X60-X84,Y87.0)	GR113-124	361	35.5	32.8	29.1	36.6
#Diabetes mellitus (E10-E14)	GR113-046	359	35.3	22.5	19.9	25
#Chronic liver disease and cirrhosis (K70,K73-K74)	GR113-093	351	34.5	24.5	21.6	27.3
#Alzheimer's disease (G30)	GR113-052	317	31.2	19	16.9	21.1
#Influenza and pneumonia (J09-J18)	GR113-076	270	26.6	16.4	14.3	18.5
#Nephritis, nephrotic syndrome and nephrosis (N00-N07,N17-N19,N25-N27)	GR113-097	245	24.1	14.2	12.3	16
#Septicemia (A40-A41)	GR113-010	140	13.8	8.1	6.7	9.6
#Essential hypertension and hypertensive renal disease (I10,I12,I15)	GR113-069	123	12.1	7.2	5.9	8.5
#Parkinson's disease (G20-G21)	GR113-051	108	10.6	6	4.8	7.1
#In situ neoplasms, benign neoplasms and neoplasms of uncertain or unknown behavior (D00-D48)	GR113-044	89	8.8	5	4	6.2

Navajo County: 2011–2015; total population size of 538,192; All Ages

UCD - 15 Leading Causes of Death	UCD - 15 Leading Causes of Death Code	Deaths	Crude Rate	Age Adjusted Rate	Age Adjusted Rate Lower 95% CI	Age Adjusted Rate Upper 95% CI
Malignant neoplasms (C00-C97)	GR113-019	854	158.7	140.9	131.2	150.6
Diseases of heart (I00-I09,I11,I13,I20-I51)	GR113-054	809	150.3	143.5	133.4	153.6
Accidents (unintentional injuries) (V01-X59,Y85-Y86)	GR113-112	520	96.6	104.9	95.7	114.2
Chronic lower respiratory diseases (J40-J47)	GR113-082	228	42.4	39.1	33.9	44.3
Diabetes mellitus (E10-E14)	GR113-046	224	41.6	37.9	32.8	43
Chronic liver disease and cirrhosis (K70,K73-K74)	GR113-093	199	37	37.9	32.4	43.4
Cerebrovascular diseases (I60-I69)	GR113-070	192	35.7	34.1	29.2	39
Intentional self-harm (suicide) (*U03,X60-X84,Y87.0)	GR113-124	145	26.9	28.7	23.9	33.5
Alzheimer's disease (G30)	GR113-052	115	21.4	21.9	17.9	25.9
Influenza and pneumonia (J09-J18)	GR113-076	97	18	17.7	14.3	21.7
Essential hypertension and hypertensive renal disease (I10,I12,I15)	GR113-069	67	12.4	11.4	8.8	14.6
Nephritis, nephrotic syndrome and nephrosis (N00-N07,N17-N19,N25-N27)	GR113-097	65	12.1	11.9	9.1	15.2
Assault (homicide) (*U01-*U02,X85-Y09,Y87.1)	GR113-127	57	10.6	11.8	8.9	15.4
Septicemia (A40-A41)	GR113-010	52	9.7	8.8	6.5	11.6
Parkinson's disease (G20-G21)	GR113-051	47	8.7	8.9	6.5	11.8

Yavapai County: 2011–2015; total population size of 538,192; All Ages

UCD - 15 Leading Causes of Death	UCD - 15 Leading Causes of Death Code	Deaths	Crude Rate	Age Adjusted Rate	Age Adjusted Rate Lower 95% CI	Age Adjusted Rate Upper 95% CI
Malignant neoplasms (C00-C97)	GR113-019	3168	293.1	156.3	150.5	162.1
Diseases of heart (I00-I09,I11,I13,I20-I51)	GR113-054	2924	270.6	144.7	139.2	150.2
Chronic lower respiratory diseases (J40-J47)	GR113-082	1073	99.3	52.2	48.9	55.5
Accidents (unintentional injuries) (V01-X59,Y85-Y86)	GR113-112	815	75.4	62	57.1	66.9
Cerebrovascular diseases (I60-I69)	GR113-070	650	60.1	31.5	29	34
Alzheimer's disease (G30)	GR113-052	493	45.6	23.4	21.4	25.5
Intentional self-harm (suicide) (*U03,X60-X84,Y87.0)	GR113-124	357	33	30.8	27.2	34.4
Diabetes mellitus (E10-E14)	GR113-046	276	25.5	15.3	13.3	17.4
Influenza and pneumonia (J09-J18)	GR113-076	262	24.2	13.1	11.4	14.8
Chronic liver disease and cirrhosis (K70,K73-K74)	GR113-093	254	23.5	15.9	13.6	18.1
Parkinson's disease (G20-G21)	GR113-051	220	20.4	10.4	9	11.8
Essential hypertension and hypertensive renal disease (I10,I12,I15)	GR113-069	159	14.7	7.8	6.5	9.1
Nephritis, nephrotic syndrome and nephrosis (N00-N07,N17-N19,N25-N27)	GR113-097	151	14	7.4	6.2	8.7
In situ neoplasms, benign neoplasms and neoplasms of uncertain or unknown behavior (D00-D48)	GR113-044	93	8.6	4.7	3.7	5.8
Septicemia (A40-A41)	GR113-010	87	8	4.4	3.4	5.5

Appendix D

Total Number of Hospital Admissions and Emergency Department Visits 2010 and 2014 for each ICD-9 Code Category by County

2010 BREAKDOWN OF INPATIENT VISITS BY COUNTY AND CLINICAL DISEASE CATEGORY						
Disease Categories	APACHE	COCONINO	GILA	MOHAVE	NAVAJO	YAVAPAI
Total	19803	39143	25772	102331	35036	98907
Certain Conditions Originating In the Perinatal Period	61	93	27	191	127	186
Complications of Pregnancy, Childbirth, and the Puerperium	501	2175	859	3344	1739	2825
Congenital Anomalies	39	87	28	85	61	93
Diseases of the Blood and Blood-Forming Organs	60	63	98	396	136	362
Diseases of the Circulatory System	781	1167	2056	5476	1858	5057
Diseases of the Digestive System	1398	2341	1978	7446	2500	6133
Diseases of the Genitourinary System	1088	1839	1335	6330	1763	5154
Diseases of the Musculoskeletal System and Connective Tissue	1189	2269	1823	7232	1886	8493
Diseases of the Nervous System and Sense Organ	1314	2033	1432	6203	1578	5330
Diseases of the Respiratory System	3031	3926	2514	10531	3460	9854
Diseases of the Skin and Subcutaneous Tissue	775	1216	959	3923	1324	3958
Endocrine, Nutritional and Metabolic Diseases, and Immunity Disorders	535	852	522	1825	865	1497
Infectious	718	921	640	2170	1058	2201
Injury and Poisoning	4104	8785	5187	20088	7598	19675
Mental Disorders	642	2381	744	3084	1387	2971
Neoplasms	145	323	236	966	334	1094
Supplementary Classification of Factors Influencing Health Status and Contact With Health Services	961	2480	1247	4731	2330	4756
Symptoms, Signs, and Ill-Defined Conditions	2461	6192	4087	18310	5032	19268

2014 BREAKDOWN OF INPATIENT VISITS BY COUNTY AND CLINICAL DISEASE CATEGORY						
Disease Categories	APACHE	COCONINO	GILA	MOHAVE	NAVAJO	YAVAPAI
Total	21633	36835	26804	100282	39654	94351
Certain Conditions Originating In the Perinatal Period	17	85	38	125	84	151
Complications of Pregnancy, Childbirth, and the Puerperium	386	1925	858	3506	1865	3073
Congenital Anomalies	35	54	25	41	63	74
Diseases of the Blood and Blood-Forming Organs	57	88	118	369	133	273
Diseases of the Circulatory System	658	851	1800	3649	1632	4189
Diseases of the Digestive System	1615	1925	1757	6704	2762	5745
Diseases of the Genitourinary System	1278	1695	1540	5709	1792	4697
Diseases of the Musculoskeletal System and Connective Tissue	1478	2498	1947	8526	2549	7692
Diseases of the Nervous System and Sense Organs	1480	2213	1370	4935	2049	4103
Diseases of the Respiratory System	3490	3078	2724	8996	4019	8447
Diseases of the Skin and Subcutaneous Tissue	770	911	1128	3809	1326	3064
Endocrine, Nutritional and Metabolic Diseases, and Immunity Disorders	405	570	534	1628	687	1600
Infectious	1440	952	735	2487	1320	1603
Injury and Poisoning	4181	7423	5228	18634	7870	19015
Mental Disorders	849	3003	949	3622	2203	4638
Neoplasms	113	247	208	645	265	882
Supplementary Classification of Factors Influencing Health Status and Contact With Health Services	981	2276	1221	5298	2462	4309
Symptoms, Signs, and Ill-Defined Conditions	2400	7041	4624	21598	6571	20796

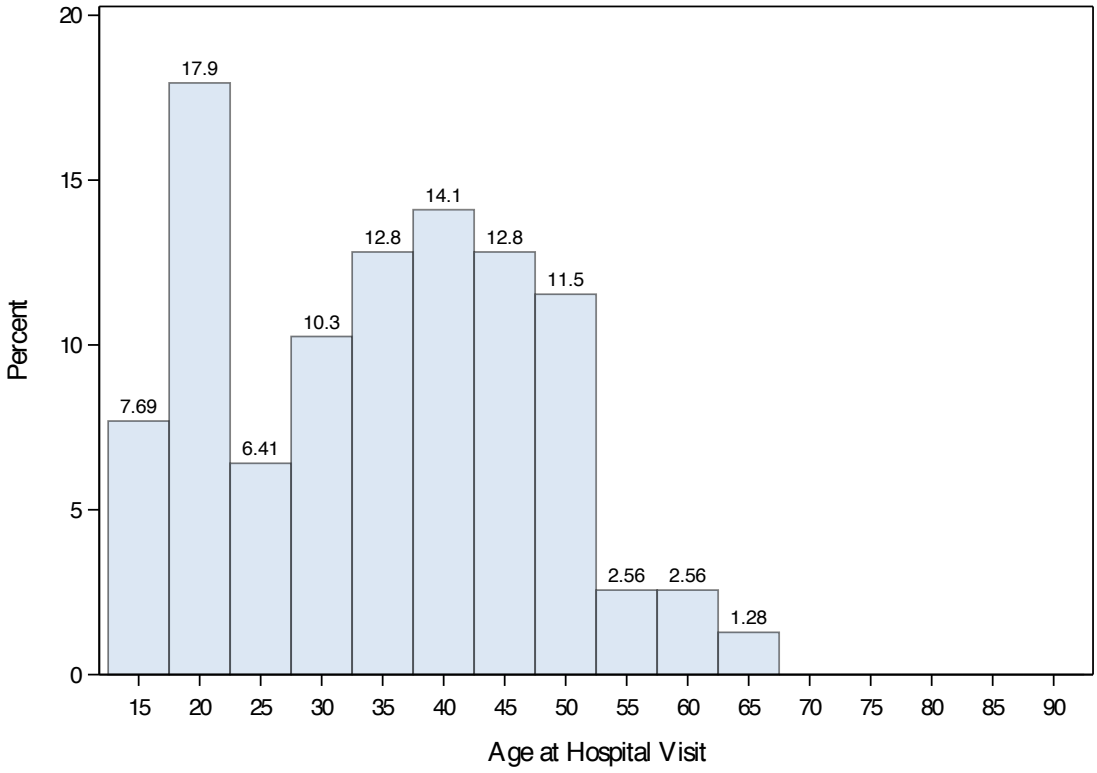
2010 BREAKDOWN OF EMERGENCY DEPARTMENT VISITS BY COUNTY AND CLINICAL DISEASE CATEGORY						
Disease Categories	APACHE	COCONINO	GILA	MOHAVE	NAVAJO	YAVAPAI
Total	645	2075	1698	7978	1648	5810
Certain Conditions Originating In the Perinatal Period	0	10	3	4	4	6
Complications of Pregnancy, Childbirth, and the Puerperium	5	33	21	96	75	283
Congenital Anomalies	1	3	2	5	1	5
Diseases of the Blood and Blood-Forming Organs	7	18	20	122	18	69
Diseases of the Circulatory System	63	293	305	1819	215	1047
Diseases of the Digestive System	98	357	340	1345	315	926
Diseases of the Genitourinary System	31	111	85	527	80	256
Diseases of the Musculoskeletal System and Connective Tissue	10	57	30	145	28	139
Diseases of the Nervous System and Sense Organs	20	53	33	177	26	137
Diseases of the Respiratory System	83	263	171	1174	212	707
Diseases of the Skin and Subcutaneous Tissue	37	87	44	211	55	166
Endocrine, Nutritional and Metabolic Diseases, and Immunity Disorders	44	132	89	353	57	343
Infectious	30	134	156	299	108	390
Injury and Poisoning	170	311	246	709	339	832
Mental Disorders	20	34	30	90	21	61
Neoplasms	7	25	27	194	20	120
Supplementary Classification of Factors Influencing Health Status and Contact With Health Services	1	1	3	11	2	2
Symptoms, Signs, and Ill-Defined Conditions	18	153	93	697	72	321

2014 BREAKDOWN OF EMERGENCY DEPARTMENT VISITS BY COUNTY AND CLINICAL DISEASE CATEGORY						
Disease Categories	APACHE	COCONINO	GILA	MOHAVE	NAVAJO	YAVAPAI
Total	1385	4101	2763	17264	3778	11727
Certain Conditions Originating In the Perinatal Period	2	9	6	7	10	20
Complications of Pregnancy, Childbirth, and the Puerperium	5	37	60	231	67	234
Congenital Anomalies	3	8	6	10	3	4
Diseases of the Blood and Blood-Forming Organs	17	40	30	295	42	153
Diseases of the Circulatory System	165	560	491	3784	578	2380
Diseases of the Digestive System	154	638	469	2553	555	1775
Diseases of the Genitourinary System	87	187	165	1162	173	519
Diseases of the Musculoskeletal System and Connective Tissue	26	93	70	254	71	219
Diseases of the Nervous System and Sense Organs	37	130	77	375	79	269
Diseases of the Respiratory System	228	514	313	2727	571	1680
Diseases of the Skin and Subcutaneous Tissue	52	136	72	442	135	264
Endocrine, Nutritional and Metabolic Diseases, and Immunity Disorders	89	204	131	951	177	640
Infectious	131	632	357	1238	386	1192
Injury and Poisoning	306	577	348	1537	690	1614
Mental Disorders	28	104	32	258	57	148
Neoplasms	15	60	41	405	53	262
Supplementary Classification of Factors Influencing Health Status and Contact With Health Services	3	4	3	14	4	8
Symptoms, Signs, and Ill-Defined Conditions	37	168	92	1021	127	346

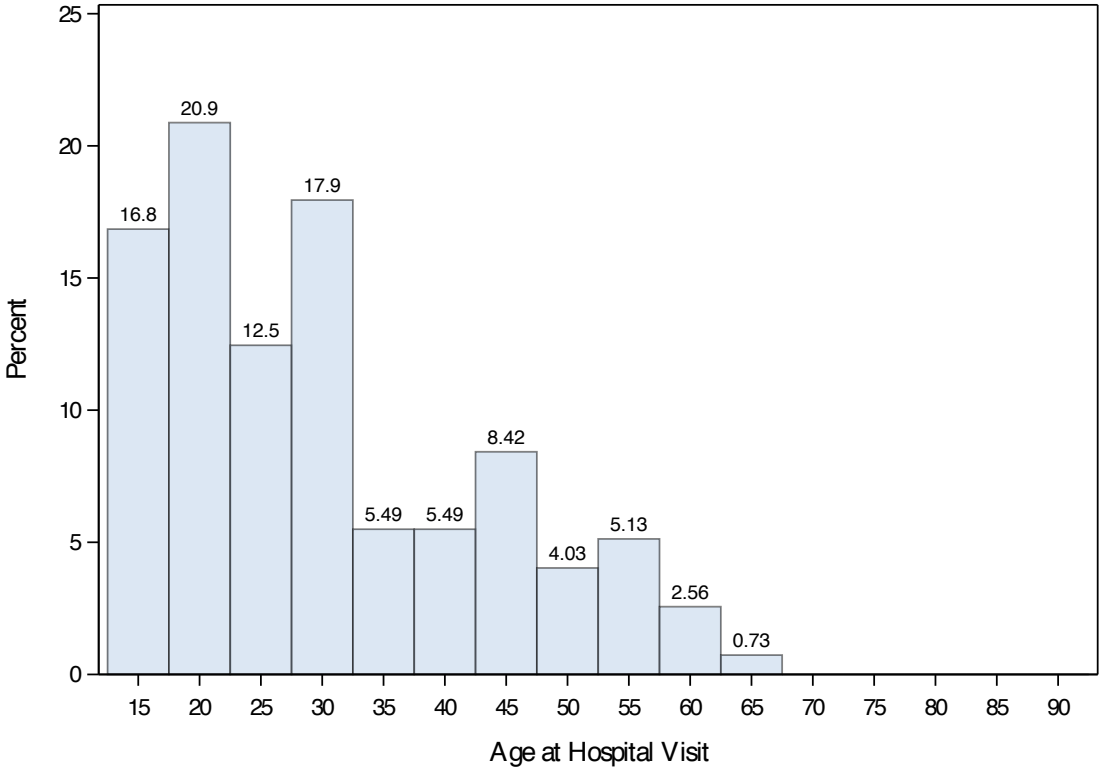
Appendix E

Hospital Discharge Summary of Age Distributions at Time of Hospitalization Related to Suicide, Suicide Attempt, or Self-inflicted Injury by County (2014)

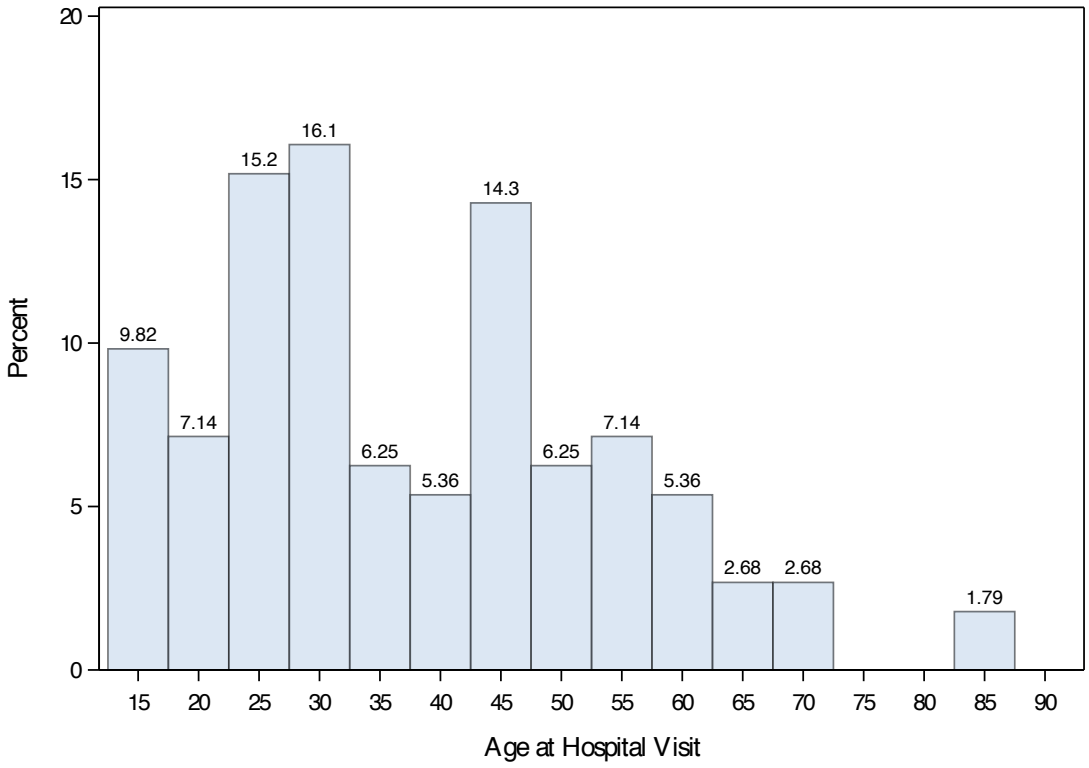
Distribution of age at time of suicide, suicide attempt, or self-inflicted injury in Apache County, 2014 (*n* = 78)



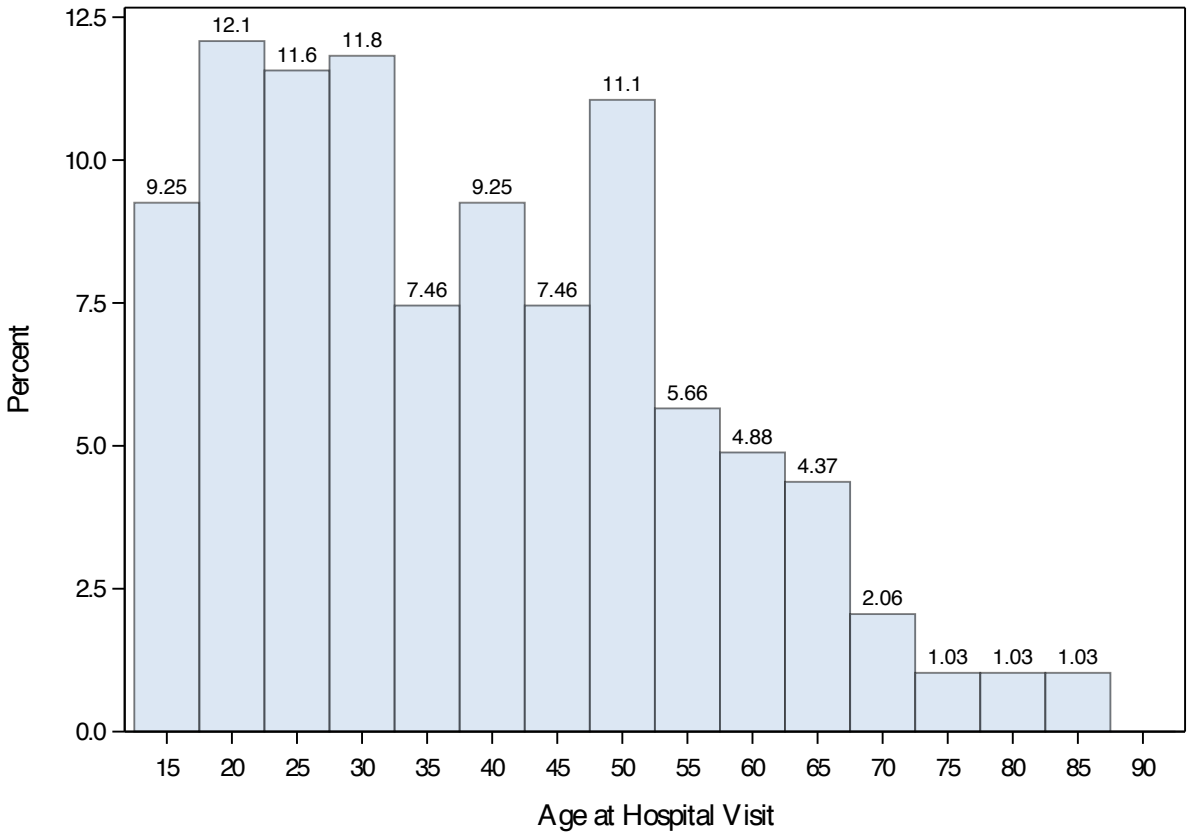
Distribution of age at time of suicide, suicide attempt, or self-inflicted injury in Coconino County, 2014 (*n* = 273)



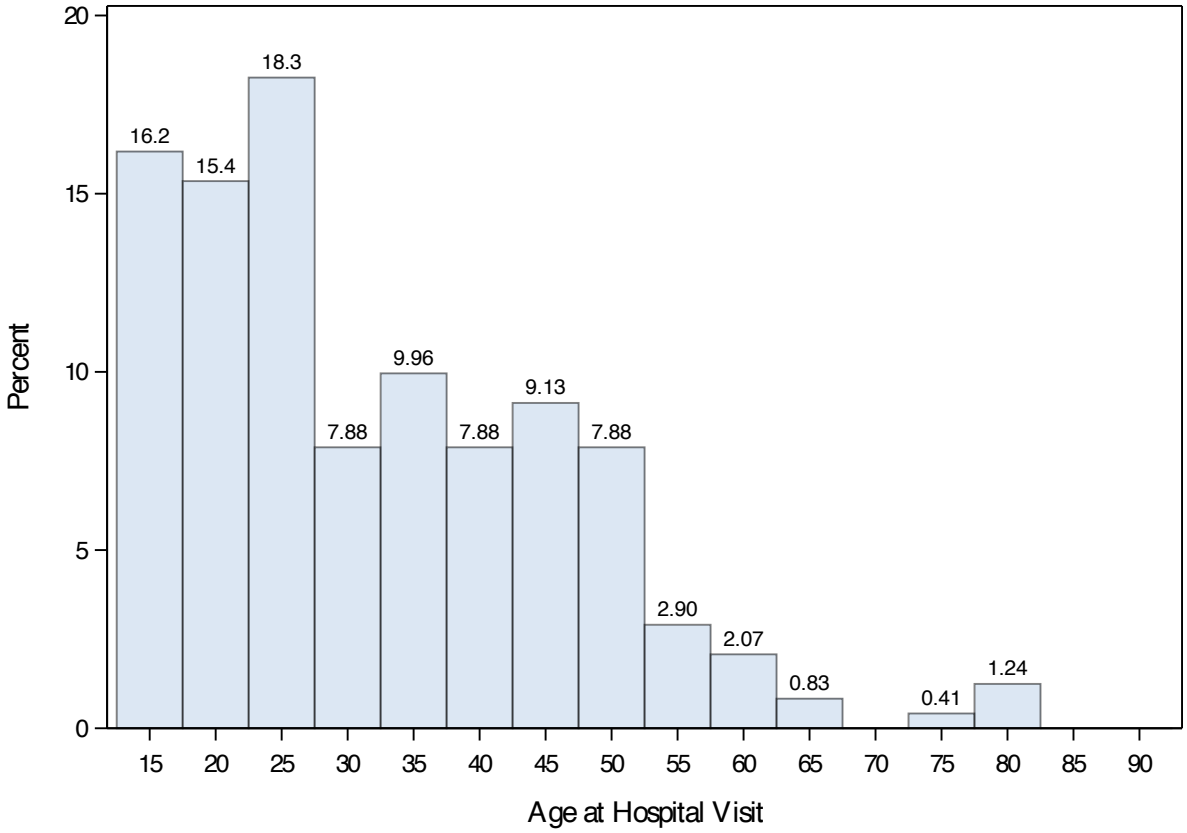
Distribution of age at time of suicide, suicide attempt, or self-inflicted injury in Gila County, 2014 (*n* = 112)



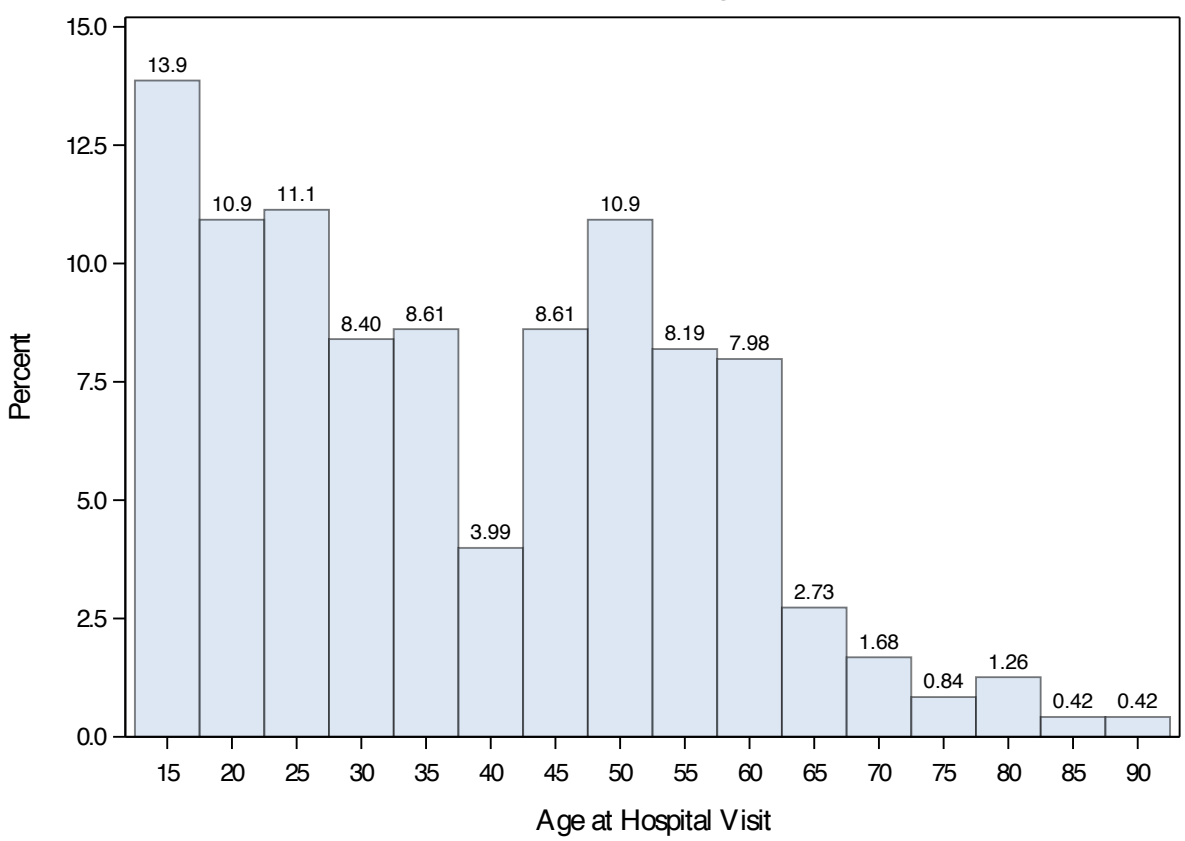
Distribution of age at time of suicide, suicide attempt, or self-inflicted injury in Mohave County, 2014 (*n* = 389)



Distribution of age at time of suicide, suicide attempt, or self-inflicted injury in Navajo County, 2014 (*n* = 241)



Distribution of age at time of suicide, suicide attempt, or self-inflicted injury in Yavapai County, 2014 (*n* = 476)



Appendix F

Top 15 Hospital Discharge Diagnoses for Inpatient Admission and ED Visits by Urban Area and Rural Areas, 2010 and 2014

Inpatient 2010

Top 15 discharge codes for inpatients, Urban Area, 2010 (*n* = 237,574)					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	599.0	Diseases of the genitourinary system	Urinary tract infection, site not specified	4000	19,236,240
2	786.59	Symptoms, signs, and ill-defined conditions	Other chest pain	3646	36,313,951
3	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	3429	16,396,879
4	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	3365	3,273,018
5	784.0	Symptoms, signs, and ill-defined conditions	Headache	3365	10,522,353
6	V30.00	Supplementary classification of factors influencing health status and contact with health services	Single liveborn, born in hospital, delivered without mention of cesarean section	3328	16,820,950
7	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media	3130	2,265,483
8	486.	Diseases of the respiratory system	Pneumonia, organism unspecified	2861	33,031,339
9	462.	Diseases of the respiratory system	Acute pharyngitis	2860	2,572,475
10	786.50	Symptoms, signs, and ill-defined conditions	Chest pain, unspecified	2816	15,359,297
11	724.2	Diseases of the musculoskeletal system	Lumbago	2490	5,003,935
12	466.0	Diseases of the respiratory system	Acute bronchitis	2222	4,807,957
13	490.	Diseases of the respiratory system	Bronchitis, not specified as acute or chronic	2143	3,919,841
14	780.2	Symptoms, signs, and ill-defined conditions	Syncope and collapse	1905	13,449,768
15	787.01	Symptoms, signs, and ill-defined conditions	Nausea with vomiting	1867	5,527,480

Top 15 discharge codes for inpatients, Rural Area Level 1, 2010 (*n* = 5,528)					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	599.0	Diseases of the genitourinary system	Urinary tract infection, site not specified	150	893,044
2	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	102	652,026
3	786.59	Symptoms, signs, and ill-defined conditions	Other chest pain	86	1,408,750
4	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	75	101,839
5	466.0	Diseases of the respiratory system	Acute bronchitis	75	306,655
6	305.00	Mental	Alcohol abuse, unspecified	73	347,172
7	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media	69	59,084
8	486.	Diseases of the respiratory system	Pneumonia, organism unspecified	69	1,374,570
9	V30.00	Supplementary classification of factors influencing health status and contact with health services	Single liveborn, born in hospital, delivered without mention of cesarean section	60	127,219
10	920.	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	53	268,744
11	462.	Diseases of the respiratory system	Acute pharyngitis	52	74,933
12	682.6	Diseases of the skin and subcutaneous tissue	Cellulitis and abscess of leg, except foot	52	418,777
13	780.97	Symptoms, signs, and ill-defined conditions	Altered mental status	48	87,281
14	787.03	Symptoms, signs, and ill-defined conditions	Vomiting alone	43	167,411
15	491.21	Diseases of the respiratory system	Obstructive chronic bronchitis with (acute) exacerbation	42	998,437

Top 15 discharge codes for inpatients, Rural Area Level 2, 2010 (*n* = 19,217)					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	V30.00	Supplementary classification of factors influencing health status and contact with health services	Single liveborn, born in hospital, delivered without mention of cesarean section	451	1,641,864
2	784.0	Symptoms, signs, and ill-defined conditions	Headache	270	816,263
3	599.0	Diseases of the genitourinary system	Urinary tract infection, site not specified	253	1,195,158
4	786.59	Symptoms, signs, and ill-defined conditions	Other chest pain	248	2,188,637
5	786.50	Symptoms, signs, and ill-defined conditions	Chest pain, unspecified	242	1,684,725
6	486.	Diseases of the respiratory system	Pneumonia, organism unspecified	211	2,992,503
7	789.09	Symptoms, signs, and ill-defined conditions	Abdominal pain, other specified site	210	1,081,902
8	847.0	Injury and poisoning	Sprain of neck	192	874,543
9	V58.31	Supplementary classification of factors influencing health status and contact with health services	Encounter for change or removal of surgical wound dressing	181	51,173
10	079.99	Infectious and parasitic diseases	Unspecified viral infection	177	337,356
11	682.6	Diseases of the skin and subcutaneous tissue	Cellulitis and abscess of leg, except foot	164	583,084
12	490.	Diseases of the respiratory system	Bronchitis, not specified as acute or chronic	164	324,596
13	780.2	Symptoms, signs, and ill-defined conditions	Syncope and collapse	162	1,392,428
14	462.	Diseases of the respiratory system	Acute pharyngitis	152	148,374
15	592.1	Diseases of the genitourinary system	Calculus of ureter	141	1,126,499

Top 15 discharge codes for inpatients, Rural Area Level 3, 2010 (*n* = 911)					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	869	101,914
2	599.0	Diseases of the genitourinary system	Urinary tract infection, site not specified	569	1,195,158
3	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media	539	91,825
4	V30.00	Supplementary classification of factors influencing health status and contact with health services	Single liveborn, born in hospital, delivered without mention of cesarean section	493	1,641,864
5	462.	Diseases of the respiratory system	Acute pharyngitis	456	148,374
6	486.	Diseases of the respiratory system	Pneumonia, organism unspecified	431	2,992,503
7	305.00	Mental	Alcohol abuse, unspecified	399	429,573
8	558.9	Diseases of the digestive system	Other and unspecified noninfectious gastroenteritis and colitis	327	856,752
9	784.0	Symptoms, signs, and ill-defined conditions	Headache	307	816,263
10	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	297	456,860
11	034.0	Infectious and parasitic diseases	Streptococcal sore throat	285	79,478
12	466.0	Diseases of the respiratory system	Acute bronchitis	273	290,783
13	786.50	Symptoms, signs, and ill-defined conditions	Chest pain, unspecified	252	1,684,725
14	493.92	Diseases of the respiratory system	Asthma, unspecified type, with (acute) exacerbation	252	259,931
15	920.	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	231	457,454

Top 15 discharge codes for inpatients, Rural Area Level 4, 2010 (*n* = 8,303)					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	242	186,963
2	305.00	Mental	Alcohol abuse, unspecified	236	456,364
3	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media	156	99,600
4	V30.00	Supplementary classification of factors influencing health status and contact with health services	Single liveborn, born in hospital, delivered without mention of cesarean section	154	491,543
5	599.0	Diseases of the genitourinary system	Urinary tract infection, site not specified	149	626,023
6	486.	Diseases of the respiratory system	Pneumonia, organism unspecified	134	3,030,370
7	786.50	Symptoms, signs, and ill-defined conditions	Chest pain, unspecified	93	716,899
8	462.	Diseases of the respiratory system	Acute pharyngitis	88	70,505
9	034.0	Infectious and parasitic diseases	Streptococcal sore throat	78	74,039
10	558.9	Diseases of the digestive system	Other and unspecified noninfectious gastroenteritis and colitis	76	247,066
11	784.0	Symptoms, signs, and ill-defined conditions	Headache	76	223,809
12	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	68	385,724
13	724.2	Diseases of the musculoskeletal system	Lumbago	68	137,912
14	466.0	Diseases of the respiratory system	Acute bronchitis	66	141,631
15	786.59	Symptoms, signs, and ill-defined conditions	Other chest pain	86	801,852

Inpatient 2014

Top 15 discharge codes for inpatients, Urban Area, 2014 (*n* = 232,783)					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	786.50	Symptoms, signs, and ill-defined conditions	Chest pain, unspecified	4181	34,833,409
2	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	3919	24,312,013
3	599.0	Diseases of the genitourinary system	Urinary tract infection, site not specified	3860	18,193,057
4	786.59	Symptoms, signs, and ill-defined conditions	Other chest pain	3691	48,621,287
5	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	3561	5,584,953
6	784.0	Symptoms, signs, and ill-defined conditions	Headache	3451	14,947,970
7	V30.00	Supplementary classification of factors influencing health status and contact with health services	Single liveborn, born in hospital, delivered without mention of cesarean section	3363	21,206,513
8	724.2	Diseases of the musculoskeletal system	Lumbago	2710	7,746,073
9	787.01	Symptoms, signs, and ill-defined conditions	Nausea with vomiting	2605	10,896,473
10	466.0	Diseases of the respiratory system	Acute bronchitis	2482	8,237,179
11	780.2	Symptoms, signs, and ill-defined conditions	Syncope and collapse	2120	19,589,435
12	462.	Diseases of the respiratory system	Acute pharyngitis	2116	2,690,657
13	959.01	Injury and poisoning	Head injury, unspecified	2015	11,346,067
14	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media	1994	1,958,939
15	780.4	Symptoms, signs, and ill-defined conditions	Dizziness and giddiness	1974	12,602,023

Top 15 discharge codes for inpatients, Rural Area Level 1, 2014 (*n* = 5,363)					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	786.59	Symptoms, signs, and ill-defined conditions	Other chest pain	119	2,231,282
2	599.0	Diseases of the genitourinary system	Urinary tract infection, site not specified	117	718,109
3	784.0	Symptoms, signs, and ill-defined conditions	Headache	79	483,229
4	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	77	678,814
5	786.50	Symptoms, signs, and ill-defined conditions	Chest pain, unspecified	74	1,066,678
6	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	69	188,798
7	466.0	Diseases of the respiratory system	Acute bronchitis	63	314,169
8	305.00	Mental	Alcohol abuse, unspecified	61	273,165
9	V30.00	Supplementary classification of factors influencing health status and contact with health services	Single liveborn, born in hospital, delivered without mention of cesarean section	60	227,848
10	724.2	Diseases of the musculoskeletal system	Lumbago	57	248,985
11	789.07	Symptoms, signs, and ill-defined conditions	Abdominal pain, generalized	53	491,879
12	491.21	Diseases of the respiratory system	Obstructive chronic bronchitis with (acute) exacerbation	49	598,212
13	920.	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	48	347,781
14	462.	Diseases of the respiratory system	Acute pharyngitis	46	70,406
15	564.00	Diseases of the digestive system	Constipation, unspecified	46	473,949

Top 15 discharge codes for inpatients, Rural Area Level 2, 2014 (*n* = 20,323)					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	786.59	Symptoms, signs, and ill-defined conditions	Other chest pain	528	626,4952
2	V30.00	Supplementary classification of factors influencing health status and contact with health services	Single liveborn, born in hospital, delivered without mention of cesarean section	412	3,314,207
3	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	260	358,348
4	784.0	Symptoms, signs, and ill-defined conditions	Headache	258	1,142,540
5	959.01	Injury and poisoning	Head injury, unspecified	244	1,478,177
6	599.0	Diseases of the genitourinary system	Urinary tract infection, site not specified	238	1,168,981
7	786.50	Symptoms, signs, and ill-defined conditions	Chest pain, unspecified	226	2,184,636
8	789.09	Symptoms, signs, and ill-defined conditions	Abdominal pain, other specified site	215	1,369,394
9	780.4	Symptoms, signs, and ill-defined conditions	Dizziness and giddiness	193	958,621
10	462.	Diseases of the respiratory system	Acute pharyngitis	172	274,374
11	558.9	Diseases of the digestive system	Other and unspecified noninfectious gastroenteritis and colitis	172	1,213,112
12	486.	Diseases of the respiratory system	Pneumonia, organism unspecified	171	1,162,268
13	787.01	Symptoms, signs, and ill-defined conditions	Nausea with vomiting	167	787,573
14	490.	Diseases of the respiratory system	Bronchitis, not specified as acute or chronic	166	487,064
15	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	163	1,016,724

Top 15 discharge codes for inpatients, Rural Area Level 3, 2014 (*n* = 29,970)					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	462.	Diseases of the respiratory system	Acute pharyngitis	1151	902,379
2	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	855	860,049
3	599.0	Diseases of the genitourinary system	Urinary tract infection, site not specified	703	1,731,121
4	034.0	Infectious and parasitic diseases	Streptococcal sore throat	657	714,387
5	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media	464	331,847
6	V30.00	Supplementary classification of factors influencing health status and contact with health services	Single liveborn, born in hospital, delivered without mention of cesarean section	451	2,473,136
7	784.0	Symptoms, signs, and ill-defined conditions	Headache	370	923,427
8	558.9	Diseases of the digestive system system	Other and unspecified noninfectious gastroenteritis and colitis	360	1,154,264
9	786.59	Symptoms, signs, and ill-defined conditions	Other chest pain	344	2,529,153
10	486.	Diseases of the respiratory system	Pneumonia, organism unspecified	338	1,942,678
11	305.00	Mental	Alcohol abuse, unspecified	306	1,061,377
12	724.2	Diseases of the musculoskeletal system	Lumbago	301	563,454
13	V67.59	Supplementary classification of factors influencing health status and contact with health services	Other follow-up 3examination	258	141,723
14	490.	Diseases of the respiratory system	Bronchitis, not specified as acute or chronic	246	507,719
15	959.01	Injury and poisoning	Head injury, unspecified	232	1,109,244

Top 15 discharge codes for inpatients, Rural Area Level 4, 2014 (*n* = 8,635)					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	305.00	Mental	Alcohol abuse, unspecified	202	601,875
2	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	191	210,315
3	V30.00	Supplementary classification of factors influencing health status and contact with health services	Single liveborn, born in hospital, delivered without mention of cesarean section	167	1,726,759
4	462.	Diseases of the respiratory system	Acute pharyngitis	155	129,161
5	599.0	Diseases of the genitourinary system	Urinary tract infection, site not specified	144	529,959
6	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media	113	86,449
7	786.59	Symptoms, signs, and ill-defined conditions	Other chest pain	109	1,368,272
8	786.50	Symptoms, signs, and ill-defined conditions	Chest pain, unspecified	96	700,625
9	291.2	Mental	Alcohol-induced persisting dementia	94	267,342
10	724.2	Diseases of the musculoskeletal system	Lumbago	93	187,487
11	959.01	Injury and poisoning	Head injury, unspecified	92	534,756
12	486.	Diseases of the respiratory system	Pneumonia, organism unspecified	91	1,755,224
13	784.0	Symptoms, signs, and ill-defined conditions	Headache	88	286,398
14	034.0	Infectious and parasitic diseases	Streptococcal sore throat	87	93,909
15	038.9	Infectious and parasitic diseases	Unspecified septicemia	87	6,847,520

ED Visits 2010

Top 15 discharge codes for ED Visits, Urban Area, 2010 (*n* = 15,528)					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	486.	Diseases of the respiratory system	Pneumonia, organism unspecified	589	18,717,023
2	491.21	Diseases of the respiratory system	Obstructive chronic bronchitis with (acute) exacerbation	402	14,571,176
3	038.9	Infectious and parasitic diseases	Unspecified septicemia	365	30,256,394
4	577.0	Diseases of the digestive system	Acute pancreatitis	324	11,686,097
5	427.31	Diseases of the circulatory system	Atrial fibrillation	302	8,178,859
6	786.59	Symptoms, signs, and ill-defined conditions	Other chest pain	281	7,669,976
7	584.9	Diseases of the genitourinary system	Acute kidney failure, unspecified	261	10,542,816
8	410.71	Diseases of the circulatory system	Subendocardial infarction, initial episode of care	253	20,374,393
9	599.0	Diseases of the genitourinary system	Urinary tract infection, site not specified	251	7,271,584
10	434.91	Diseases of the circulatory system	Cerebral artery occlusion, unspecified with cerebral infarction	243	9,262,626
11	414.01	Diseases of the circulatory system	Coronary atherosclerosis of native coronary artery	224	18,380,848
12	518.81	Diseases of the respiratory system	Acute respiratory failure	208	14,228,454
13	415.19	Diseases of the circulatory system	Other pulmonary embolism and infarction	187	6,981,696
14	682.6	Diseases of the skin and subcutaneous tissue	Cellulitis and abscess of leg, except foot	185	5,874,931
15	428.0	Diseases of the circulatory system	Congestive heart failure, unspecified	171	6,506,661

Top 15 discharge codes for ED Visits, Rural Area Level 1, 2010 (*n* = 529)					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	491.21	Diseases of the respiratory system	Obstructive chronic bronchitis with (acute) exacerbation	23	774,933
2	786.59	Symptoms, signs, and ill-defined conditions	Other chest pain	21	657,302
3	486.	Diseases of the respiratory system	Pneumonia, organism unspecified	19	600,689
4	493.22	Diseases of the respiratory system	Chronic obstructive asthma with (acute) exacerbation	13	461,358
5	577.0	Diseases of the digestive system	Acute pancreatitis	12	423,930
6	414.01	Diseases of the circulatory system	Coronary atherosclerosis of native coronary artery	11	886,939
7	410.71	Diseases of the circulatory system	Subendocardial infarction, initial episode of care	9	1,302,371
8	599.0	Diseases of the genitourinary system	Urinary tract infection, site not specified	9	319,363
9	427.31	Diseases of the circulatory system	Atrial fibrillation	8	244,925
10	428.0	Diseases of the circulatory system	Congestive heart failure, unspecified	8	642,404
11	584.9	Diseases of the genitourinary system	Acute kidney failure, unspecified	8	628,423
12	682.6	Diseases of the skin and subcutaneous tissue	Cellulitis and abscess of leg, except foot	8	276,306
13	415.19	Diseases of the circulatory system	Other pulmonary embolism and infarction	7	459,557
14	434.91	Diseases of the circulatory system	Cerebral artery occlusion, unspecified with cerebral infarction	7	535,029
15	558.9	Diseases of the digestive system	Other and unspecified noninfectious gastroenteritis and colitis	7	268,203

Top 15 discharge codes for ED Visits, Rural Area Level 2, 2010 (*n* = 971)					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	486.	Diseases of the respiratory system	Pneumonia, organism unspecified	46	833,330
2	038.9	Infectious and parasitic diseases	Unspecified septicemia	29	1,087,200
3	577.0	Diseases of the digestive system	Acute pancreatitis	25	661,209
4	427.31	Diseases of the circulatory system	Atrial fibrillation	23	544,196
5	415.19	Diseases of the circulatory system	Other pulmonary embolism and infarction	18	511,400
6	562.11	Diseases of the digestive system	Diverticulitis of colon (without mention of hemorrhage)	16	303,965
7	491.21	Diseases of the respiratory system	Obstructive chronic bronchitis with (acute) exacerbation	15	315,994
8	410.71	Diseases of the circulatory system	Subendocardial infarction, initial episode of care	15	570,884
9	560.9	Diseases of the digestive system	Unspecified intestinal obstruction	14	273,000
10	682.6	Diseases of the skin and subcutaneous tissue	Cellulitis and abscess of leg, except foot	13	277,570
11	599.0	Diseases of the genitourinary system	Urinary tract infection, site not specified	12	228,939
12	558.9	Diseases of the digestive system	Other and unspecified noninfectious gastroenteritis and colitis	11	230,073
13	574.00	Diseases of the digestive system	Calculus of gallbladder with acute cholecystitis, without mention of obstruction	11	259,971
14	518.81	Diseases of the respiratory system	Acute respiratory failure	11	362,467
15	584.9	Diseases of the genitourinary system	Acute kidney failure, unspecified	10	398,552

Top 15 discharge codes for ED Visits, Rural Area Level 3, 2010 (*n* = 911)					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	486.	Diseases of the respiratory system	Pneumonia, organism unspecified	48	874,182
2	038.9	Infectious and parasitic diseases	Unspecified septicemia	20	3,214,666
3	577.0	Diseases of the digestive system	Acute pancreatitis	20	329,854
4	682.6	Diseases of the skin and subcutaneous tissue	Cellulitis and abscess of leg, except foot	19	255,514
5	599.0	Diseases of the genitourinary system	Urinary tract infection, site not specified	17	265,844
6	415.19	Diseases of the circulatory system	Other pulmonary embolism and infarction	14	300,655
7	291.81	Mental	Alcohol withdrawal	14	262,865
8	491.21	Diseases of the respiratory system	Obstructive chronic bronchitis with (acute) exacerbation	13	184,641
9	574.00	Diseases of the digestive system	Calculus of gallbladder with acute cholecystitis, without mention of obstruction	11	343,788
10	590.10	Diseases of the genitourinary system	Acute pyelonephritis without lesion of renal medullary necrosis	11	94,075
11	276.51	Endocrine, nutritional, and metabolic diseases, and immunity disorders	Dehydration	10	58,691
12	558.9	Diseases of the digestive system	Other and unspecified noninfectious gastroenteritis and colitis	9	183,051
13	518.81	Diseases of the respiratory system	Acute respiratory failure	9	526,993
14	584.9	Diseases of the genitourinary system	Acute kidney failure, unspecified	9	486,987
15	540.9	Diseases of the digestive system	Acute appendicitis without mention of peritonitis	9	206,589

Top 15 discharge codes for ED Visits, Rural Area Level 4, 2010 (*n* = 488)					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	038.9	Infectious and parasitic diseases	Unspecified septicemia	15	1,446,419
2	682.6	Diseases of the skin and subcutaneous tissue	Cellulitis and abscess of leg, except foot	13	277,988
3	414.01	Diseases of the circulatory system	Coronary atherosclerosis of native coronary artery	11	728,580
4	584.9	Diseases of the genitourinary system	Acute kidney failure, unspecified	10	437,078
5	486.	Diseases of the respiratory system	Pneumonia, organism unspecified	9	261,735
6	427.31	Diseases of the circulatory system	Atrial fibrillation	8	178,022
7	577.0	Diseases of the digestive system	Acute pancreatitis	7	270,516
8	518.81	Diseases of the respiratory system	Acute respiratory failure	7	339,198
9	599.0	Diseases of the genitourinary system	Urinary tract infection, site not specified	6	163,332
10	574.00	Diseases of the digestive system	Calculus of gallbladder with acute cholecystitis, without mention of obstruction	6	155,611
11	558.9	Diseases of the digestive system	Other and unspecified noninfectious gastroenteritis and colitis	6	131,651
12	805.4	Injury and poisoning	Closed fracture of lumbar vertebra without mention of spinal cord injury	6	592,989
13	786.59	Symptoms, signs, and ill-defined conditions	Other chest pain	6	150,179
14	250.12	Endocrine, nutritional, and metabolic diseases, and immunity disorders	Diabetes with ketoacidosis, type II or unspecified type, uncontrolled	6	212,569
15	415.19	Diseases of the circulatory system	Other pulmonary embolism and infarction	5	217,663

ED Visits 2014

Top 15 discharge codes for ED Visits, Urban Area, 2014 (*n* = 32,418)					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	038.9	Infectious and parasitic diseases	Unspecified septicemia	1704	121,415,322
2	486.	Diseases of the respiratory system	Pneumonia, organism unspecified	1250	52,133,566
3	491.21	Diseases of the respiratory system	Obstructive chronic bronchitis with (acute) exacerbation	912	44,535,113
4	427.31	Diseases of the circulatory system	Atrial fibrillation	748	28,823,021
5	584.9	Diseases of the genitourinary system	Acute kidney failure, unspecified	620	28,172,347
6	410.71	Diseases of the circulatory system	Subendocardial infarction, initial episode of care	593	51,204,978
7	434.91	Diseases of the circulatory system	Cerebral artery occlusion, unspecified with cerebral infarction	552	26,897,638
8	577.0	Diseases of the digestive system	Acute pancreatitis	548	21,747,566
9	599.0	Diseases of the genitourinary system	Urinary tract infection, site not specified	461	14,790,126
10	428.23	Diseases of the circulatory system	Acute on chronic systolic heart failure	388	21,077,348
11	518.81	Diseases of the respiratory system	Acute respiratory failure	375	30,185,999
12	415.19	Diseases of the circulatory system	Other pulmonary embolism and infarction	374	18,069,805
13	682.6	Diseases of the skin and subcutaneous tissue	Cellulitis and abscess of leg, except foot	365	14,010,020
14	786.59	Symptoms, signs, and ill-defined conditions	Other chest pain	351	12,001,713
15	518.84	Diseases of the respiratory system	Acute and chronic respiratory failure	346	22,619,881

Top 15 discharge codes for ED Visits, Rural Area Level 1, 2014 (*n* = 1,142)					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	491.21	Diseases of the respiratory system	Obstructive chronic bronchitis with (acute) exacerbation	61	4,053,474
2	410.71	Diseases of the circulatory system	Subendocardial infarction, initial episode of care	38	5,153,986
3	486.	Diseases of the respiratory system	Pneumonia, organism unspecified	38	1,834,704
4	038.9	Infectious and parasitic diseases	Unspecified septicemia	29	3,324,476
5	584.9	Diseases of the genitourinary system	Acute kidney failure, unspecified	27	2,070,308
6	427.31	Diseases of the circulatory system	Atrial fibrillation	25	1,150,173
7	577.0	Diseases of the digestive system	Acute pancreatitis	25	931,192
8	682.6	Diseases of the skin and subcutaneous tissue	Cellulitis and abscess of leg, except foot	23	1,081,355
9	518.81	Diseases of the respiratory system	Acute respiratory failure	20	3,339,187
10	599.0	Diseases of the genitourinary system	Urinary tract infection, site not specified	17	836,229
11	250.12	Endocrine, nutritional, and metabolic diseases, and immunity disorders	Diabetes with ketoacidosis, type II or unspecified type, uncontrolled	15	453,960
12	428.23	Diseases of the circulatory system	Acute on chronic systolic heart failure	15	1,201,473
13	491.22	Diseases of the respiratory system	Obstructive chronic bronchitis with acute bronchitis	15	696,866
14	493.22	Diseases of the respiratory system	Chronic obstructive asthma with (acute) exacerbation	15	743,255
15	428.33	Diseases of the circulatory system	Acute on chronic diastolic heart failure	13	696,396

Top 15 discharge codes for ED Visits, Rural Area Level 2, 2014 (*n* = 20,323)					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	038.9	Infectious and parasitic diseases	Unspecified septicemia	191	9,141,505
2	486.	Diseases of the respiratory system	Pneumonia, organism unspecified	90	2,201,071
3	410.71	Diseases of the circulatory system	Subendocardial infarction, initial episode of care	56	4,224,307
4	434.91	Diseases of the circulatory system	Cerebral artery occlusion, unspecified with cerebral infarction	51	1,774,429
5	415.19	Diseases of the circulatory system	Other pulmonary embolism and infarction	43	1,162,473
6	491.21	Diseases of the respiratory system	Obstructive chronic bronchitis with (acute) exacerbation	42	936,631
7	577.0	Diseases of the digestive system	Acute pancreatitis	41	1,178,043
8	682.6	Diseases of the skin and subcutaneous tissue	Cellulitis and abscess of leg, except foot	31	715,427
9	518.84	Diseases of the respiratory system	Acute and chronic respiratory failure	28	1,224,830
10	584.9	Diseases of the genitourinary system	Acute kidney failure, unspecified	27	708,779
11	427.31	Diseases of the circulatory system	Atrial fibrillation	27	633,895
12	820.21	Injury and poisoning	Closed fracture of intertrochanteric section of neck of femur	26	1,511,070
13	491.22	Diseases of the respiratory system	Obstructive chronic bronchitis with acute bronchitis	25	508,101
14	558.9	Diseases of the digestive system	Other and unspecified noninfectious gastroenteritis and colitis	22	745,204
15	414.01	Diseases of the circulatory system	Coronary atherosclerosis of native coronary artery	21	1,183,455

Top 15 discharge codes for ED Visits, Rural Area Level 3, 2014 (*n* = 1,895)					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	486.	Diseases of the respiratory system	Pneumonia, organism unspecified	118	2677792
2	038.9	Infectious and parasitic diseases	Unspecified septicemia	69	3544515
3	599.0	Diseases of the genitourinary system	Urinary tract infection, site not specified	44	734246
4	577.0	Diseases of the digestive system	Acute pancreatitis	34	1309019
5	434.91	Diseases of the circulatory system	Cerebral artery occlusion, unspecified with cerebral infarction	28	1150691
6	682.6	Diseases of the skin and subcutaneous tissue	Cellulitis and abscess of leg, except foot	28	787870
7	491.21	Diseases of the respiratory system	Obstructive chronic bronchitis with (acute) exacerbation	26	669710
8	291.81	Mental	Alcohol withdrawal	25	533536
9	584.9	Diseases of the genitourinary system	Acute kidney failure, unspecified	17	499446
10	250.13	Endocrine, nutritional, and metabolic diseases, and immunity disorders	Diabetes with ketoacidosis, type I [juvenile type], uncontrolled	17	314971
11	415.19	Diseases of the circulatory system	Other pulmonary embolism and infarction	15	624693
12	518.81	Diseases of the respiratory system	Acute respiratory failure	15	775612
13	574.00	Diseases of the digestive system	Calculus of gallbladder with acute cholecystitis, without mention of obstruction	15	598343
14	276.51	Endocrine, nutritional, and metabolic diseases, and immunity disorders	Dehydration	15	160169
15	572.2	Diseases of the digestive system	Hepatic encephalopathy	15	536396

Top 15 discharge codes for ED Visits, Rural Area Level 4, 2014 (*n* = 1,066)					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	038.9	Infectious and parasitic diseases	Unspecified septicemia	74	4598,433
2	577.0	Diseases of the digestive system	Acute pancreatitis	27	870,243
3	486.	Diseases of the respiratory system	Pneumonia, organism unspecified	26	992,540
4	491.21	Diseases of the respiratory system	Obstructive chronic bronchitis with (acute) exacerbation	21	509,802
5	682.6	Diseases of the skin and subcutaneous tissue	Cellulitis and abscess of leg, except foot	17	634,784
6	427.31	Diseases of the circulatory system	Atrial fibrillation	16	488,939
7	599.0	Diseases of the genitourinary system	Urinary tract infection, site not specified	14	338,153
8	578.9	Diseases of the digestive system	Hemorrhage of gastrointestinal tract, unspecified	14	654,832
9	518.81	Diseases of the respiratory system	Acute respiratory failure	13	494,638
10	584.9	Diseases of the genitourinary system	Acute kidney failure, unspecified	12	456,305
11	428.23	Diseases of the circulatory system	Acute on chronic systolic heart failure	12	390,519
12	434.91	Diseases of the circulatory system	Cerebral artery occlusion, unspecified with cerebral infarction	11	359,886
13	574.00	Diseases of the digestive system	Calculus of gallbladder with acute cholecystitis, without mention of obstruction	11	324,603
14	410.71	Diseases of the circulatory system	Subendocardial infarction, initial episode of care	10	1,206,276
15	428.33	Diseases of the circulatory system	Acute on chronic diastolic heart failure	10	380,626

Appendix G
Leading Causes of Mortality by Ethnicity and County

Data from Centers for Disease Control and Prevention, National Center for Health Statistics. Multiple Cause of Death. 1999–2015 on CDC WONDER Online Database, released December, 2016. Compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Rates are per 100,000 individuals. Population size is the cumulative sum across all 5 years.

American Indian: Apache County: 2011–2015; total population size of 266,642

15 Leading Causes of Death	Causes of Death Code	Deaths	Crude Rate	Age Adjusted Rate	Age Adjusted Rate Lower 95% CI	Age Adjusted Rate Upper 95% CI
Accidents (unintentional injuries) (V01-X59,Y85-Y86)	GR113-112	433	162.4	178.2	161.1	195.3
Malignant neoplasms (C00-C97)	GR113-019	285	106.9	124.7	110.1	139.3
Diseases of heart (I00-I09,I11,I13,I20-I51)	GR113-054	259	97.1	115.4	101.2	129.6
Diabetes mellitus (E10-E14)	GR113-046	148	55.5	62.6	52.4	72.8
Chronic liver disease and cirrhosis (K70,K73-K74)	GR113-093	120	45	51.7	42.3	61.1
Influenza and pneumonia (J09-J18)	GR113-076	92	34.5	41.7	33.5	51.2
Intentional self-harm (suicide) (*U03,X60-X84,Y87.0)	GR113-124	88	33	34.2	27.3	42.3
Cerebrovascular diseases (I60-I69)	GR113-070	70	26.3	31.6	24.6	40
Assault (homicide) (*U01-*U02,X85-Y09,Y87.1)	GR113-127	46	17.3	19.3	14.1	25.8
Septicemia (A40-A41)	GR113-010	44	16.5	19.1	13.9	25.8
Nephritis, nephrotic syndrome and nephrosis (N00-N07,N17-N19,N25-N27)	GR113-097	24	9	10.3	6.5	15.4
Alzheimer's disease (G30)	GR113-052	18	Unreliable	Unreliable	5.1	13.6
Congenital malformations, deformations and chromosomal abnormalities (Q00-Q99)	GR113-109	17	Unreliable	Unreliable	3.4	9.7
Chronic lower respiratory diseases (J40-J47)	GR113-082	17	Unreliable	Unreliable	4.3	11.9
Parkinson's disease (G20-G21)	GR113-051	15	Unreliable	Unreliable	4	11.8

Non-Hispanic White: Apache County: 2011–2015; total population size of 71,540

15 Leading Causes of Death	15 Leading Causes of Death Code	Deaths	Crude Rate	Age Adjusted Rate	Age Adjusted Rate Lower 95% CI	Age Adjusted Rate Upper 95% CI
Diseases of heart (I00-I09,I11,I13,I20-I51)	GR113-054	169	236.2	180.7	151.8	209.6
Malignant neoplasms (C00-C97)	GR113-019	164	229.2	154.8	129.4	180.3
Chronic lower respiratory diseases (J40-J47)	GR113-082	65	90.9	64.3	48.7	83.4
Accidents (unintentional injuries) (V01-X59,Y85-Y86)	GR113-112	38	53.1	50.8	35	71.4
Intentional self-harm (suicide) (*U03,X60-X84,Y87.0)	GR113-124	29	40.5	42.5	27.2	63.2
Diabetes mellitus (E10-E14)	GR113-046	24	33.5	25.4	15.7	38.8
Cerebrovascular diseases (I60-I69)	GR113-070	23	32.1	25.8	16.1	39
Alzheimer's disease (G30)	GR113-052	22	30.8	28.3	17.7	42.8
Chronic liver disease and cirrhosis (K70,K73-K74)	GR113-093	13	Unreliable	Unreliable	7.8	29.7
Influenza and pneumonia (J09-J18)	GR113-076	12	Unreliable	Unreliable	7	25

Hispanic Latino: Apache County: 2011–2015; total population size of 16,300

15 Leading Causes of Death	15 Leading Causes of Death Code	Deaths	Crude Rate	Age Adjusted Rate	Age Adjusted Rate Lower 95% CI	Age Adjusted Rate Upper 95% CI
Malignant neoplasms (C00-C97)	GR113-019	30	184	185.3	124.1	266.2
Diseases of heart (I00-I09,I11,I13,I20-I51)	GR113-054	26	159.5	181	117.1	267.2
Accidents (unintentional injuries) (V01-X59,Y85-Y86)	GR113-112	10	Unreliable	Unreliable	33.3	127.6

American Indian: Coconino County: 2011–2015; total population size of 192,877

15 Leading Causes of Death	15 Leading Causes of Death Code	Deaths	Crude Rate	Age Adjusted Rate	Age Adjusted Rate Lower 95% CI	Age Adjusted Rate Upper 95% CI
Accidents (unintentional injuries) (V01-X59,Y85-Y86)	GR113-112	236	122.4	134.9	116.9	152.8
Diseases of heart (I00-I09,I11,I13,I20-I51)	GR113-054	146	75.7	115.4	96.3	134.5
Malignant neoplasms (C00-C97)	GR113-019	110	57	81.9	66.2	97.5
Chronic liver disease and cirrhosis (K70,K73-K74)	GR113-093	64	33.2	40.7	31.2	52.2
Cerebrovascular diseases (I60-I69)	GR113-070	49	25.4	39.9	29.4	52.9
Diabetes mellitus (E10-E14)	GR113-046	46	23.8	35.5	25.9	47.5
Intentional self-harm (suicide) (*U03,X60-X84,Y87.0)	GR113-124	46	23.8	22.6	16.4	30.4
Influenza and pneumonia (J09-J18)	GR113-076	38	19.7	32.1	22.6	44.2
Assault (homicide) (*U01-*U02,X85-Y09,Y87.1)	GR113-127	31	16.1	16.2	11	23.2
Nephritis, nephrotic syndrome and nephrosis (N00-N07,N17-N19,N25-N27)	GR113-097	18	Unreliable	Unreliable	9.1	24.4
Septicemia (A40-A41)	GR113-010	17	Unreliable	Unreliable	7.4	20.9
Parkinson’s disease (G20-G21)	GR113-051	16	Unreliable	Unreliable	8	22.6
Chronic lower respiratory diseases (J40-J47)	GR113-082	13	Unreliable	Unreliable	5.7	18.4
Congenital malformations, deformations and chromosomal abnormalities (Q00-Q99)	GR113-109	12	Unreliable	Unreliable	3.3	11.1
Pneumonitis due to solids and liquids (J69)	GR113-088	11	Unreliable	Unreliable	4.9	17.4

Non-Hispanic White: Coconino County: 2011–2015; total population size of 383,032

15 Leading Causes of Death	15 Leading Causes of Death Code	Deaths	Crude Rate	Age Adjusted Rate	Age Adjusted Rate Lower 95% CI	Age Adjusted Rate Upper 95% CI
Malignant neoplasms (C00-C97)	GR113-019	513	133.9	130.5	118.6	142.5
Diseases of heart (I00-I09,I11,I13,I20-I51)	GR113-054	465	121.4	132.3	119.8	144.8
Chronic lower respiratory diseases (J40-J47)	GR113-082	167	43.6	50	42.2	57.9
Accidents (unintentional injuries) (V01-X59,Y85-Y86)	GR113-112	163	42.6	44.1	37	51.3
Cerebrovascular diseases (I60-I69)	GR113-070	88	23	25.8	20.5	32.1
Intentional self-harm (suicide) (*U03,X60-X84,Y87.0)	GR113-124	87	22.7	23	18.1	28.7
Alzheimer's disease (G30)	GR113-052	80	20.9	26.8	21.2	33.4
Diabetes mellitus (E10-E14)	GR113-046	47	12.3	11.3	8.2	15.3
Chronic liver disease and cirrhosis (K70,K73-K74)	GR113-093	36	9.4	7.2	4.9	10.1
Parkinson's disease (G20-G21)	GR113-051	25	6.5	8.4	5.4	12.6
Influenza and pneumonia (J09-J18)	GR113-076	21	5.5	6.7	4.1	10.4
Nephritis, nephrotic syndrome and nephrosis (N00-N07,N17-N19,N25-N27)	GR113-097	16	Unreliable	Unreliable	2.5	7.5
Aortic aneurysm and dissection (I71)	GR113-073	15	Unreliable	Unreliable	2.3	7
Septicemia (A40-A41)	GR113-010	11	Unreliable	Unreliable	1.7	6.6

Hispanic Latino: Coconino County: 2011–2015; total population size of 79,648

15 Leading Causes of Death	15 Leading Causes of Death Code	Deaths	Crude Rate	Age Adjusted Rate	Age Adjusted Rate Lower 95% CI	Age Adjusted Rate Upper 95% CI
Malignant neoplasms (C00-C97)	GR113-019	53	66.5	120.3	89	159
Diseases of heart (I00-I09,I11,I13,I20-I51)	GR113-054	46	57.8	121	88	162.5
Accidents (unintentional injuries) (V01-X59,Y85-Y86)	GR113-112	33	41.4	60.2	40	87
Intentional self-harm (suicide) (*U03,X60-X84,Y87.0)	GR113-124	10	Unreliable	Unreliable	5.5	22.9
Diabetes mellitus (E10-E14)	GR113-046	10	Unreliable	Unreliable	8.5	35.3
Chronic lower respiratory diseases (J40-J47)	GR113-082	10	Unreliable	Unreliable	12.5	52.1
Chronic liver disease and cirrhosis (K70,K73-K74)	GR113-093	10	Unreliable	Unreliable	7.6	31.4

American Indian in Gila County: 2011–2015; total population size of 44,385

15 Leading Causes of Death	15 Leading Causes of Death Code	Deaths	Crude Rate	Age Adjusted Rate	Age Adjusted Rate Lower 95% CI	Age Adjusted Rate Upper 95% CI
Accidents (unintentional injuries) (V01-X59,Y85-Y86)	GR113-112	61	137.4	154.3	115.9	201.3
Malignant neoplasms (C00-C97)	GR113-019	52	117.2	154	113.6	204.2
Diseases of heart (I00-I09,I11,I13,I20-I51)	GR113-054	52	117.2	171	125.6	227.4
Diabetes mellitus (E10-E14)	GR113-046	46	103.6	137.9	99.4	186.4
Chronic liver disease and cirrhosis (K70,K73-K74)	GR113-093	40	90.1	114.2	80.8	156.8
Nephritis, nephrotic syndrome and nephrosis (N00-N07,N17-N19,N25-N27)	GR113-097	18	Unreliable	Unreliable	40.1	110.2
Cerebrovascular diseases (I60-I69)	GR113-070	13	Unreliable	Unreliable	21.2	75.9
Intentional self-harm (suicide) (*U03,X60-X84,Y87.0)	GR113-124	13	Unreliable	Unreliable	15.7	53.1
Chronic lower respiratory diseases (J40-J47)	GR113-082	12	Unreliable	Unreliable	20.1	72
Essential hypertension and hypertensive renal disease (I10,I12,I15)	GR113-069	11	Unreliable	Unreliable	19.6	75
Septicemia (A40-A41)	GR113-010	10	Unreliable	Unreliable	13.2	54.6

Non-Hispanic White: Gila County: 2011–2015; total population size of 171,072

15 Leading Causes of Death	15 Leading Causes of Death Code	Deaths	Crude Rate	Age Adjusted Rate	Age Adjusted Rate Lower 95% CI	Age Adjusted Rate Upper 95% CI
Diseases of heart (I00-I09,I11,I13,I20-I51)	GR113-054	645	377	182.2	166.8	197.6
Malignant neoplasms (C00-C97)	GR113-019	640	374.1	167.1	153	181.3
Chronic lower respiratory diseases (J40-J47)	GR113-082	273	159.6	70.8	62.1	79.5
Accidents (unintentional injuries) (V01-X59,Y85-Y86)	GR113-112	141	82.4	71.9	57.1	86.6
Cerebrovascular diseases (I60-I69)	GR113-070	138	80.7	36.2	30	42.4
Alzheimer's disease (G30)	GR113-052	107	62.5	28.7	23.2	34.1
Diabetes mellitus (E10-E14)	GR113-046	67	39.2	17.9	13.4	23.5
Chronic liver disease and cirrhosis (K70,K73-K74)	GR113-093	57	33.3	22.4	15.6	31.2
Intentional self-harm (suicide) (*U03,X60-X84,Y87.0)	GR113-124	56	32.7	31.6	22.4	43.4
Nephritis, nephrotic syndrome and nephrosis (N00-N07,N17-N19,N25-N27)	GR113-097	47	27.5	12.2	9	16.3
Influenza and pneumonia (J09-J18)	GR113-076	36	21	11.9	7.6	17.9
Parkinson's disease (G20-G21)	GR113-051	31	18.1	7.8	5.3	11
Essential hypertension and hypertensive renal disease (I10,I12,I15)	GR113-069	23	13.4	6.8	3.9	11
Septicemia (A40-A41)	GR113-010	22	12.9	5.6	3.5	8.5
In situ neoplasms, benign neoplasms and neoplasms of uncertain or unknown behavior (D00-D48)	GR113-044	15	Unreliable	Unreliable	2.2	6.9

Hispanic Latino in Gila County: 2011–2015; total population size of 45,113

15 Leading Causes of Death	15 Leading Causes of Death Code	Deaths	Crude Rate	Age Adjusted Rate	Age Adjusted Rate Lower 95% CI	Age Adjusted Rate Upper 95% CI
Diseases of heart (I00-I09,I11,I13,I20-I51)	GR113-054	73	161.8	150.1	117.3	189.4
Malignant neoplasms (C00-C97)	GR113-019	71	157.4	143.2	111.4	181.2
Alzheimer's disease (G30)	GR113-052	29	64.3	61.6	41.2	88.4
Accidents (unintentional injuries) (V01-X59,Y85-Y86)	GR113-112	23	51	52	32.2	79.5
Diabetes mellitus (E10-E14)	GR113-046	21	46.5	40.3	24.9	61.5
Cerebrovascular diseases (I60-I69)	GR113-070	18	Unreliable	Unreliable	22	60.4
Chronic liver disease and cirrhosis (K70,K73-K74)	GR113-093	16	Unreliable	Unreliable	17.3	50.9
Chronic lower respiratory diseases (J40-J47)	GR113-082	15	Unreliable	Unreliable	15.6	46
Intentional self-harm (suicide) (*U03,X60-X84,Y87.0)	GR113-124	10	Unreliable	Unreliable	11.9	45.6

American Indian: Mojave County: 2011–2015; total population size of 32,937

15 Leading Causes of Death	15 Leading Causes of Death Code	Deaths	Crude Rate	Age Adjusted Rate	Age Adjusted Rate Lower 95% CI	Age Adjusted Rate Upper 95% CI
Diseases of heart (I00-I09,I11,I13,I20-I51)	GR113-054	45	136.6	191.1	135.9	261.2
Malignant neoplasms (C00-C97)	GR113-019	39	118.4	146.7	101.6	204.9
Accidents (unintentional injuries) (V01-X59,Y85-Y86)	GR113-112	35	106.3	119.2	82.1	167.4
Chronic liver disease and cirrhosis (K70,K73-K74)	GR113-093	29	88	92.9	61.2	135.2
Diabetes mellitus (E10-E14)	GR113-046	15	Unreliable	Unreliable	25.6	75.5
Intentional self-harm (suicide) (*U03,X60-X84,Y87.0)	GR113-124	11	Unreliable	Unreliable	17.3	66.3

Non-Hispanic White: Mojave County: 2011–2015; total population size of 806,437

15 Leading Causes of Death	15 Leading Causes of Death Code	Deaths	Crude Rate	Age Adjusted Rate	Age Adjusted Rate Lower 95% CI	Age Adjusted Rate Upper 95% CI
Diseases of heart (I00-I09,I11,I13,I20-I51)	GR113-054	3763	466.6	245.8	237.5	254.2
Malignant neoplasms (C00-C97)	GR113-019	3222	399.5	199.3	191.9	206.8
Chronic lower respiratory diseases (J40-J47)	GR113-082	1108	137.4	66.6	62.5	70.6
Accidents (unintentional injuries) (V01-X59,Y85-Y86)	GR113-112	623	77.3	68.1	61.9	74.3
Cerebrovascular diseases (I60-I69)	GR113-070	491	60.9	31.9	28.9	34.8
Intentional self-harm (suicide) (*U03,X60-X84,Y87.0)	GR113-124	323	40.1	36.3	31.7	40.9
Diabetes mellitus (E10-E14)	GR113-046	310	38.4	21.9	19.1	24.7
Alzheimer's disease (G30)	GR113-052	299	37.1	19.4	17.2	21.7
Chronic liver disease and cirrhosis (K70,K73-K74)	GR113-093	281	34.8	22.4	19.4	25.4
Influenza and pneumonia (J09-J18)	GR113-076	251	31.1	17.1	14.8	19.5
Nephritis, nephrotic syndrome and nephrosis (N00-N07,N17-N19,N25-N27)	GR113-097	214	26.5	13.6	11.7	15.6
Septicemia (A40-A41)	GR113-010	121	15	8	6.4	9.5
Essential hypertension and hypertensive renal disease (I10,I12,I15)	GR113-069	113	14	7.2	5.8	8.5
Parkinson's disease (G20-G21)	GR113-051	98	12.2	5.9	4.7	7.2
In situ neoplasms, benign neoplasms and neoplasms of uncertain or unknown behavior (D00-D48)	GR113-044	79	9.8	4.9	3.8	6.2

Hispanic Latino: Mojave County: 2011–2015; total population size of 143,775

15 Leading Causes of Death	15 Leading Causes of Death Code	Deaths	Crude Rate	Age Adjusted Rate	Age Adjusted Rate Lower 95% CI	Age Adjusted Rate Upper 95% CI
Diseases of heart (I00-I09,I11,I13,I20-I51)	GR113-054	139	96.7	129.3	107.2	151.4
Malignant neoplasms (C00-C97)	GR113-019	138	96	119.7	99.1	140.3
Accidents (unintentional injuries) (V01-X59,Y85-Y86)	GR113-112	53	36.9	39.8	29.5	52.5
Cerebrovascular diseases (I60-I69)	GR113-070	40	27.8	38.7	27.4	53.1
Chronic liver disease and cirrhosis (K70,K73-K74)	GR113-093	31	21.6	24.2	16.3	34.5
Chronic lower respiratory diseases (J40-J47)	GR113-082	28	19.5	28.6	18.7	41.9
Diabetes mellitus (E10-E14)	GR113-046	27	18.8	23.9	15.5	35.3
Nephritis, nephrotic syndrome and nephrosis (N00-N07,N17-N19,N25-N27)	GR113-097	13	Unreliable	Unreliable	5.5	18.6
Intentional self-harm (suicide) (*U03,X60-X84,Y87.0)	GR113-124	13	Unreliable	Unreliable	5	17
Influenza and pneumonia (J09-J18)	GR113-076	12	Unreliable	Unreliable	5.8	20.8
Septicemia (A40-A41)	GR113-010	10	Unreliable	Unreliable	3.7	15.5

American Indian: Navajo County: 2011–2015; total population size of 244,376

15 Leading Causes of Death	15 Leading Causes of Death Code	Deaths	Crude Rate	Age Adjusted Rate	Age Adjusted Rate Lower 95% CI	Age Adjusted Rate Upper 95% CI
Accidents (unintentional injuries) (V01-X59,Y85-Y86)	GR113-112	341	139.5	157	139.9	174
Diseases of heart (I00-I09,I11,I13,I20-I51)	GR113-054	250	102.3	133.1	116.3	149.9
Malignant neoplasms (C00-C97)	GR113-019	217	88.8	112.9	97.6	128.2
Chronic liver disease and cirrhosis (K70,K73-K74)	GR113-093	140	57.3	66.3	55.1	77.5
Diabetes mellitus (E10-E14)	GR113-046	128	52.4	66.7	54.9	78.4
Influenza and pneumonia (J09-J18)	GR113-076	67	27.4	35.8	27.7	45.7
Intentional self-harm (suicide) (*U03,X60-X84,Y87.0)	GR113-124	67	27.4	27.5	21.2	35.1
Cerebrovascular diseases (I60-I69)	GR113-070	57	23.3	31.7	24	41.2
Assault (homicide) (*U01-*U02,X85-Y09,Y87.1)	GR113-127	46	18.8	20.1	14.6	27
Septicemia (A40-A41)	GR113-010	34	13.9	16.9	11.6	23.7
Alzheimer's disease (G30)	GR113-052	31	12.7	18.5	12.6	26.3
Nephritis, nephrotic syndrome and nephrosis (N00-N07,N17-N19,N25-N27)	GR113-097	29	11.9	16.5	11	23.8
Pneumonitis due to solids and liquids (J69)	GR113-088	25	10.2	13.6	8.7	20.2
Essential hypertension and hypertensive renal disease (I10,I12,I15)	GR113-069	23	9.4	11.9	7.4	17.9
Parkinson's disease (G20-G21)	GR113-051	21	8.6	12.7	7.8	19.4

Non-Hispanic White: Navajo County: 2011–2015; total population size of 766,628

15 Leading Causes of Death	15 Leading Causes of Death Code	Deaths	Crude Rate	Age Adjusted Rate	Age Adjusted Rate Lower 95% CI	Age Adjusted Rate Upper 95% CI
Malignant neoplasms (C00-C97)	GR113-019	1771	231	171.8	163.5	180.2
Diseases of heart (I00-I09,I11,I13,I20-I51)	GR113-054	1652	215.5	177.3	168.4	186.1
Chronic lower respiratory diseases (J40-J47)	GR113-082	521	68	53.3	48.6	58
Accidents (unintentional injuries) (V01-X59,Y85-Y86)	GR113-112	514	67	68.4	62.2	74.6
Cerebrovascular diseases (I60-I69)	GR113-070	397	51.8	43.6	39.2	48
Alzheimer's disease (G30)	GR113-052	241	31.4	29.4	25.7	33.2
Diabetes mellitus (E10-E14)	GR113-046	214	27.9	21.3	18.3	24.3
Intentional self-harm (suicide) (*U03,X60-X84,Y87.0)	GR113-124	203	26.5	27	23.1	30.9
Influenza and pneumonia (J09-J18)	GR113-076	144	18.8	16.8	14	19.6
Chronic liver disease and cirrhosis (K70,K73-K74)	GR113-093	125	16.3	12.1	9.9	14.4
Nephritis, nephrotic syndrome and nephrosis (N00-N07,N17-N19,N25-N27)	GR113-097	100	13	10.4	8.3	12.5
Septicemia (A40-A41)	GR113-010	70	9.1	7.2	5.5	9.2
Essential hypertension and hypertensive renal disease (I10,I12,I15)	GR113-069	64	8.3	6.9	5.2	8.8
Aortic aneurysm and dissection (I71)	GR113-073	53	6.9	5.5	4.1	7.3
In situ neoplasms, benign neoplasms and neoplasms of uncertain or unknown behavior (D00-D48)	GR113-044	50	6.5	5.3	3.9	7

Hispanic Latino: Navajo County: 2011–2015; total population size of 47,885

15 Leading Causes of Death	15 Leading Causes of Death Code	Deaths	Crude Rate	Age Adjusted Rate	Age Adjusted Rate Lower 95% CI	Age Adjusted Rate Upper 95% CI
Malignant neoplasms (C00-C97)	GR113-019	46	96.1	122.2	88.8	164
Diseases of heart (I00-I09,I11,I13,I20-I51)	GR113-054	42	87.7	115.4	82.4	157.1
Accidents (unintentional injuries) (V01-X59,Y85-Y86)	GR113-112	26	54.3	57.4	37.1	84.7
Diabetes mellitus (E10-E14)	GR113-046	21	43.9	56.5	34.5	87.3
Cerebrovascular diseases (I60-I69)	GR113-070	18	Unreliable	Unreliable	29.9	79.8
Chronic liver disease and cirrhosis (K70,K73-K74)	GR113-093	14	Unreliable	Unreliable	19.2	58.9
Chronic lower respiratory diseases (J40-J47)	GR113-082	11	Unreliable	Unreliable	14.7	52.8

American Indian: Yavapai County: 2011–2015; total population size of 27,076

15 Leading Causes of Death	15 Leading Causes of Death Code	Deaths	Crude Rate	Age Adjusted Rate	Age Adjusted Rate Lower 95% CI	Age Adjusted Rate Upper 95% CI
Malignant neoplasms (C00-C97)	GR113-019	23	84.9	91.9	56.1	141.9
Diseases of heart (I00-I09,I11,I13,I20-I51)	GR113-054	22	81.3	113.9	69.6	175.9
Diabetes mellitus (E10-E14)	GR113-046	18	Unreliable	Unreliable	47.9	136.2
Chronic liver disease and cirrhosis (K70,K73-K74)	GR113-093	14	Unreliable	Unreliable	30	96.2
Accidents (unintentional injuries) (V01-X59,Y85-Y86)	GR113-112	12	Unreliable	Unreliable	26.4	94.5

Non-Hispanic White: Yavapai County: 2011–2015; total population size of 888,131

15 Leading Causes of Death	15 Leading Causes of Death Code	Deaths	Crude Rate	Age Adjusted Rate	Age Adjusted Rate Lower 95% CI	Age Adjusted Rate Upper 95% CI
Malignant neoplasms (C00-C97)	GR113-019	3004	338.2	161.6	155.2	167.9
Diseases of heart (I00-I09,I11,I13,I20-I51)	GR113-054	2764	311.2	147.5	141.6	153.4
Chronic lower respiratory diseases (J40-J47)	GR113-082	1034	116.4	53.8	50.3	57.2
Accidents (unintentional injuries) (V01-X59,Y85-Y86)	GR113-112	739	83.2	66.2	60.4	72
Cerebrovascular diseases (I60-I69)	GR113-070	606	68.2	31.1	28.5	33.6
Alzheimer's disease (G30)	GR113-052	477	53.7	24	21.8	26.2
Intentional self-harm (suicide) (*U03,X60-X84,Y87.0)	GR113-124	331	37.3	34.8	30.4	39.3
Influenza and pneumonia (J09-J18)	GR113-076	245	27.6	13.3	11.4	15.1
Diabetes mellitus (E10-E14)	GR113-046	230	25.9	14.5	12.2	16.7
Chronic liver disease and cirrhosis (K70,K73-K74)	GR113-093	217	24.4	15.3	12.9	17.7
Parkinson's disease (G20-G21)	GR113-051	208	23.4	10.4	9	11.9
Essential hypertension and hypertensive renal disease (I10,I12,I15)	GR113-069	154	17.3	8.2	6.8	9.6
Nephritis, nephrotic syndrome and nephrosis (N00-N07,N17-N19,N25-N27)	GR113-097	135	15.2	7.2	5.9	8.6
In situ neoplasms, benign neoplasms and neoplasms of uncertain or unknown behavior (D00-D48)	GR113-044	88	9.9	4.7	3.7	5.8
Septicemia (A40-A41)	GR113-010	80	9	4.4	3.4	5.6

Hispanic Latino: Yavapai County: 2011–2015; total population size of 139,002

15 Leading Causes of Death	15 Leading Causes of Death Code	Deaths	Crude Rate	Age Adjusted Rate	Age Adjusted Rate Lower 95% CI	Age Adjusted Rate Upper 95% CI
Diseases of heart (I00-I09,I11,I13,I20-I51)	GR113-054	110	79.1	118.9	96.2	141.6
Malignant neoplasms (C00-C97)	GR113-019	109	78.4	107	86.4	127.5
Accidents (unintentional injuries) (V01-X59,Y85-Y86)	GR113-112	52	37.4	47.4	34.9	62.8
Cerebrovascular diseases (I60-I69)	GR113-070	32	23	36.1	24.5	51.2
Diabetes mellitus (E10-E14)	GR113-046	23	16.5	23.2	14.5	35.1
Chronic lower respiratory diseases (J40-J47)	GR113-082	20	14.4	21.5	12.9	33.5
Chronic liver disease and cirrhosis (K70,K73-K74)	GR113-093	20	14.4	18.2	11	28.4
Intentional self-harm (suicide) (*U03,X60-X84,Y87.0)	GR113-124	16	Unreliable	Unreliable	7	19.9
Influenza and pneumonia (J09-J18)	GR113-076	13	Unreliable	Unreliable	7.4	25
Alzheimer's disease (G30)	GR113-052	10	Unreliable	Unreliable	6.1	23.3

Appendix H

Top 15 Discharge Diagnoses for Selected Age Groups by County, 2010 and 2014

2010: Age Less than 1 Year

Top 15 discharge codes for inpatient and emergency department visits, < 1 year (all counties), *n* = 15,068					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	V30.00	Type of birth	Single, live born, born in hospital, delivered without mention of cesarean section	4,908	22,857,572
2	V30.01	Type of birth	Single, live born, born in hospital, delivered by cesarean section	1,846	20,591,503
3	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	978	843,291
4	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	718	497,288
5	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	467	759,701
6	466.19	Diseases of the respiratory system	Acute bronchiolitis due to other infectious organism	346	1,743,801
7	466.11	Diseases of the respiratory system	Acute bronchiolitis due to respiratory syncytial virus	331	3,982,298
8	486.x	Diseases of the respiratory system	Pneumonia	294	1,852,575
9	787.03	Symptoms, signs, and ill-defined conditions	Vomiting alone	244	251,844
10	079.99	Infectious	Unspecified viral infection	227	321,635
11	V31.01	Type of birth	Twin birth, mate live born, born in hospital, delivered by cesarean section	147	3,809,288
12	774.6	Certain conditions originating in the perinatal period	Unspecified fetal and neonatal jaundice	141	750,343
13	786.2	Symptoms, signs, and ill-defined conditions	Cough	137	100,800
14	464.4	Diseases of the respiratory system	Croup	128	197,744
15	779.89	Certain conditions originating in the perinatal period	Certain conditions originating in the perinatal period	120	527,026

Top 15 discharge codes for inpatient and emergency department visits, < 1 year (Apache County), *n* = 1,003					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	V30.00	Type of birth	Single, live born, born in hospital, delivered without mention of cesarean section	195	1,001,445
2	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	108	45,479
3	V30.01	Type of birth	Single, live born, born in hospital, delivered by cesarean section	73	655,863
4	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	71	25,911
5	466.11	Diseases of the respiratory system	Acute bronchiolitis due to respiratory syncytial virus	42	458,957
6	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	27	48,342
7	466.19	Diseases of the respiratory system	Acute bronchiolitis due to other infectious organism	24	152,066
8	486.x	Diseases of the respiratory system	Pneumonia	24	137,328
9	487.1	Diseases of the respiratory system	Influenza with other respiratory manifestations	23	13,786
10	558.9	Diseases of the digestive system	Other and unspecified noninfectious gastroenteritis and colitis	19	7,498
11	V65.5	Persons encountering health services in other circumstances	Person with feared complaint in whom no diagnosis was made	17	3,611
12	372.00	Diseases of the nervous system and sense organs	Acute conjunctivitis, unspecified	16	5,209
13	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	15	3,734
14	079.99	Infectious	Unspecified viral infection	14	37,439
15	464.4	Diseases of the respiratory system	Croup	11	11,259

Top 15 discharge codes for inpatient and emergency department visits, < 1 year (Coconino County), *n* = 2,964					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	V30.00	Type of birth	Single, live born, born in hospital, delivered without mention of cesarean section	1,103	7,526,012
2	V30.01	Type of birth	Single, live born, born in hospital, delivered by cesarean section	335	6,076,281
3	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	233	201,245
4	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	120	110,272
5	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	78	196,906
6	466.11	Diseases of the respiratory system	Acute bronchiolitis due to respiratory syncytial virus	76	1,398,961
7	466.19	Diseases of the respiratory system	Acute bronchiolitis due to other infectious organism	58	498,525
8	486.x	Diseases of the respiratory system	Pneumonia	55	695,267
9	079.99	Infectious	Unspecified viral infection	34	40,996
10	787.03	Symptoms, signs, and ill-defined conditions	Vomiting alone	31	26,697
11	558.9	Diseases of the digestive system	Other and unspecified noninfectious gastroenteritis and colitis	29	27,244
12	779.89	Certain conditions originating in the perinatal period	Certain conditions originating in the perinatal period	27	264,431
13	V31.01	Type of birth	Twin birth, mate live born, born in hospital, delivered by cesarean section	25	2,051,644
14	464.4	Diseases of the respiratory system	Croup	22	55,858
15	787.91	Symptoms, signs, and ill-defined conditions	Diarrhea	22	38,299

Top 15 discharge codes for inpatient and emergency department visits, < 1 year (Gila County), *n* = 1,211					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	V30.00	Type of birth	Single, live born, born in hospital, delivered without mention of cesarean section	382	1,040,236
2	V30.01	Type of birth	Single, live born, born in hospital, delivered by cesarean section	121	1,722,215
3	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	105	50,544
4	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	73	53,984
5	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	36	41,474
6	466.19	Diseases of the respiratory system	Acute bronchiolitis due to other infectious organism	28	97,962
7	466.11	Diseases of the respiratory system	Acute bronchiolitis due to respiratory syncytial virus	26	187,845
8	787.03	Symptoms, signs, and ill-defined conditions	Vomiting alone	18	15,024
9	486.x	Diseases of the respiratory system	Pneumonia	15	95,193
10	786.2	Symptoms, signs, and ill-defined conditions	Cough	14	5,600
11	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	13	14,124
12	478.19	Diseases of the respiratory system	Other disease of nasal cavity and sinuses	13	9,649
13	079.99	Infectious	Unspecified viral infection	12	5,766
14	372.3	Diseases of the nervous system and sense organs	Other and unspecified conjunctivitis	12	3,053
15	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	12	20,992

Top 15 discharge codes for inpatient and emergency department visits, < 1 year (Mohave County), *n* = 3,844					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	V30.00	Type of birth	Single, live born, born in hospital, delivered without mention of cesarean section	1,162	3,998,660
2	V30.01	Type of birth	Single, live born, born in hospital, delivered by cesarean section	518	2,055,056
3	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	248	253,732
4	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	184	155,445
5	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	156	275,467
6	466.19	Diseases of the respiratory system	Acute bronchiolitis due to other infectious organism	92	227,808
7	079.99	Infectious	Unspecified viral infection	80	102,328
8	787.03	Symptoms, signs, and ill-defined conditions	Vomiting alone	74	83,476
9	486.x	Diseases of the respiratory system	Pneumonia	60	214,911
10	774.6	Certain conditions originating in the perinatal period	Unspecified fetal and neonatal jaundice	58	115,126
11	478.19	Diseases of the respiratory system	Other disease of nasal cavity and sinuses	50	44,679
12	V31.01	Type of birth	Twin birth, mate live born, born in hospital, delivered by cesarean section	44	153,093
13	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	40	29,743
14	786.2	Symptoms, signs, and ill-defined conditions	Cough	34	27,112
15	564.00	Diseases of the digestive system	Constipation, unspecified	31	20,112

Top 15 discharge codes for inpatient and emergency department visits, < 1 year (Navajo County), *n* = 2,352					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	V30.00	Type of birth	Single, live born, born in hospital, delivered without mention of cesarean section	866	4,218,216
2	V30.01	Type of birth	Single, live born, born in hospital, delivered by cesarean section	297	4,093,255
3	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	99	108,771
4	466.11	Diseases of the respiratory system	Acute bronchiolitis due to respiratory syncytial virus	89	1,206,544
5	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	68	42,821
6	466.19	Diseases of the respiratory system	Acute bronchiolitis due to other infectious organism	63	492,615
7	079.99	Infectious	Unspecified viral infection	57	99,135
8	486.x	Diseases of the respiratory system	Pneumonia	51	453,155
9	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	40	42,295
10	787.03	Symptoms, signs, and ill-defined conditions	Vomiting alone	40	41,797
11	V31.01	Type of birth	Twin birth, mate live born, born in hospital, delivered by cesarean section	33	602,462
12	774.6	Certain conditions originating in the perinatal period	Unspecified fetal and neonatal jaundice	28	407,798
13	464.4	Diseases of the respiratory system	Croup	19	26,816
14	787.91	Symptoms, signs, and ill-defined conditions	Diarrhea	18	11,263
15	564.00	Diseases of the digestive system	Constipation, unspecified	17	17,578

Top 15 discharge codes for inpatient and emergency department visits, < 1 year (Yavapai County), *n* = 3,694					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	V30.00	Type of birth	Single, live born, born in hospital, delivered without mention of cesarean section	1,200	5,086,231
2	V30.01	Type of birth	Single, live born, born in hospital, delivered by cesarean section	502	6,003,332
3	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	217	184,389
4	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	170	115,310
5	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	130	159,434
6	486.x	Diseases of the respiratory system	Pneumonia	89	278,451
7	466.19	Diseases of the respiratory system	Acute bronchiolitis due to other infectious organism	81	295,284
8	787.03	Symptoms, signs, and ill-defined conditions	Vomiting alone	76	83,950
9	466.11	Diseases of the respiratory system	Acute bronchiolitis due to respiratory syncytial virus	69	581,299
10	786.2	Symptoms, signs, and ill-defined conditions	Cough	58	42,518
11	779.89	Certain conditions originating in the perinatal period	Certain conditions originating in the perinatal period	55	69,281
12	464.4	Diseases of the respiratory system	Croup	43	66,974
13	959.01	Injury and poisoning	Head injury, unspecified	39	45,114
14	079.99	Infectious	Unspecified viral infection	30	47,392
15	564.00	Diseases of the digestive system	Constipation, unspecified	29	24,937

2010: Ages 1–4

Top 15 discharge codes for inpatient and emergency department visits, 1–4 years (all counties), *n* = 18,347					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	1,908	1,254,493
2	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	1,537	1,071,632
3	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	891	1,174,051
4	486.x	Diseases of the respiratory system	Pneumonia	647	3,157,501
5	464.4	Diseases of the respiratory system	Croup	546	715,709
6	787.03	Symptoms, signs, and ill-defined conditions	Vomiting alone	456	522,172
7	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	434	290,484
8	079.99	Infectious	Unspecified viral infection	385	393,525
9	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	384	436,095
10	873.42	Injury and poisoning	Open wound of forehead, without mention of complication	345	368,885
11	466.19	Diseases of the respiratory system	Acute bronchiolitis due to other infectious organism	314	1,136,135
12	959.01	Injury and poisoning	Head injury, unspecified	285	396,167
13	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	267	719,260
14	034.0	Infectious	Streptococcal sore throat	236	210,333
15	558.9	Diseases of the digestive system	Other and unspecified noninfectious gastroenteritis and colitis	229	314,228

Top 15 discharge codes for inpatient and emergency department visits, 1–4 years (Apache County), *n* = 1,622					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	189	64,566
2	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	168	55,549
3	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	69	21,156
4	486.x	Diseases of the respiratory system	Pneumonia	55	285,798
5	558.9	Diseases of the digestive system	Other and unspecified noninfectious gastroenteritis and colitis	50	18,906
6	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	47	49,150
7	466.11	Diseases of the respiratory system	Acute bronchiolitis due to respiratory syncytial virus (RSV)	42	366,681
8	034.0	Infectious	Streptococcal sore throat	33	13,405
9	372.00	Diseases of the nervous system and sense organs	Acute conjunctivitis, unspecified	33	6,895
10	466.0	Diseases of the respiratory system	Acute bronchitis	32	14,740
11	464.4	Diseases of the respiratory system	Croup	29	31,359
12	487.1	Diseases of the respiratory system	Influenza with other respiratory manifestations	27	9,800
13	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	26	15,494
14	079.99	Infectious	Unspecified viral infection	24	41,020
15	786.2	Symptoms, signs, and ill-defined conditions	Cough	24	23,673

Top 15 discharge codes for inpatient and emergency department visits, 1–4 years (Coconino County), *n* = 2,995					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	336	199,731
2	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	241	168,117
3	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	117	200,326
4	486.x	Diseases of the respiratory system	Pneumonia	113	786,539
5	464.4	Diseases of the respiratory system	Croup	99	170,984
6	959.01	Injury and poisoning	Head injury, unspecified	74	86,362
7	873.42	Injury and poisoning	Open wound of forehead, without mention of complication	73	95,939
8	466.19	Diseases of the respiratory system	Acute bronchiolitis due to other infectious organism	66	394,379
48+	787.01	Symptoms, signs, and ill-defined conditions	Nausea with vomiting	58	67,690
10	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	57	36,713
11	079.99	Infectious	Unspecified viral infection	56	46,967
12	873.0	Injury and poisoning	Open wound of scalp, without mention of complication	54	52,629
13	558.9	Diseases of the digestive system	Other and unspecified noninfectious gastroenteritis and colitis	48	45,481
14	466.11	Diseases of the respiratory system	Acute bronchiolitis due to respiratory syncytial virus (RSV)	44	3427,487
15	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	41	26,520

Top 15 discharge codes for inpatient and emergency department visits, 1–4 years (Gila County), *n* = 1,421					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	183	91,700
2	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	129	51,544
3	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	63	88,960
4	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	41	29,816
5	464.4	Diseases of the respiratory system	Croup	40	43,191
6	787.03	Symptoms, signs, and ill-defined conditions	Vomiting alone	39	31,489
7	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	36	74,606
8	079.99	Infectious	Unspecified viral infection	28	17,525
9	493.92	Diseases of the respiratory system	Asthma, unspecified type, with acute exacerbation	25	69,101
10	486.x	Diseases of the respiratory system	Pneumonia	24	138,943
11	558.9	Diseases of the digestive system	Other and unspecified noninfectious gastroenteritis and colitis	23	28,514
12	372.30	Diseases of the nervous system and sense organs	Conjunctivitis, unspecified,	22	11,278
13	682.5	Diseases of the skin and subcutaneous tissue	Cellulitis and abscess of buttock	21	50,912
14	490.x	Diseases of the respiratory system	Bronchitis, not specified as acute or chronic	20	12,857
15	873.42	Injury and poisoning	Open wound of forehead, without mention of complication	20	19,902

Top 15 discharge codes for inpatient and emergency department visits, 1–4 years (Mohave County), *n* = 5,300					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	631	514,109
2	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	388	400,621
3	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	315	477,432
4	486.x	Diseases of the respiratory system	Pneumonia	147	551,812
5	787.03	Symptoms, signs, and ill-defined conditions	Vomiting alone	142	159,742
6	464.4	Diseases of the respiratory system	Croup	141	207,686
7	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	137	120,013
8	079.99	Infectious	Unspecified viral infection	130	136,072
9	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	126	123,889
10	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	101	522,001
11	873.42	Injury and poisoning	Open wound of forehead, without mention of complication	100	131,941
12	372.30	Diseases of the nervous system and sense organs	Conjunctivitis, unspecified	87	103,774
13	466.19	Diseases of the respiratory system	Acute bronchiolitis due to other infectious organism	86	158,653
14	786.2	Symptoms, signs, and ill-defined conditions	Cough	72	72,107
15	466.0	Diseases of the respiratory system	Acute bronchitis	66	95,887

Top 15 discharge codes for inpatient and emergency department visits, 1–4 years (Navajo County), *n* = 2,082					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	146	110,345
2	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	129	153,979
3	486.x	Diseases of the respiratory system	Pneumonia	109	904,746
4	079.99	Infectious	Unspecified viral infection	101	111,864
5	466.19	Diseases of the respiratory system	Acute bronchiolitis due to other infectious organism	67	330,908
6	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	65	78,961
7	464.4	Diseases of the respiratory system	Croup	61	101,623
8	466.11	Diseases of the respiratory system	Acute bronchiolitis due to respiratory syncytial virus (RSV)	56	628,751
9	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	45	67,707
10	787.03	Symptoms, signs, and ill-defined conditions	Vomiting alone	41	81,623
11	493.92	Diseases of the respiratory system	Asthma, unspecified type, with acute exacerbation	39	183,911
12	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	35	43,264
13	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	31	21,579
14	873.42	Injury and poisoning	Open wound of forehead, without mention of complication	28	29,853
15	873.0	Injury and poisoning	Open wound of scalp, without mention of complication	27	38,389

Top 15 discharge codes for inpatient and emergency department visits, 1–4 years (Yavapai County), *n* = 4,927					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	539	316,677
2	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	366	204,853
3	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	284	285,395
4	486.x	Diseases of the respiratory system	Pneumonia	199	522,091
5	464.4	Diseases of the respiratory system	Croup	176	165,113
6	787.03	Symptoms, signs, and ill-defined conditions	Vomiting alone	161	182,405
7	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	115	73,631
8	959.01	Injury and poisoning	Head injury, unspecified	109	133,079
9	873.42	Injury and poisoning	Open wound of forehead, without mention of complication	102	76,960
10	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	96	97,298
11	034.0	Infectious	Streptococcal sore throat	87	58,664
12	786.2	Symptoms, signs, and ill-defined conditions	Cough	68	43,045
13	466.19	Diseases of the respiratory system	Acute bronchiolitis due to other infectious organism	65	183,748
14	873.0	Injury and poisoning	Open wound of scalp, without mention of complication	61	58,331
15	787.01	Symptoms, signs, and ill-defined conditions	Nausea with vomiting	56	44,821

2010: Ages 5–9

Top 15 discharge codes for inpatient and emergency department visits, 5–9 years (all counties), *n* = 11,381					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	660	453,934
2	465.9	Diseases of the respiratory system	Acute558 upper respiratory infections of unspecified site	558	334,878
3	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	525	349,637
4	034.0	Infectious	Streptococcal sore throat	400	300,123
5	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	257	344,244
6	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	246	376,780
7	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	236	503,916
8	486.x	Diseases of the respiratory system	Pneumonia	218	1,353,943
9	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	209	236,911
10	493.92	Diseases of the respiratory system	Asthma, unspecified type, with acute exacerbation	207	430,652
11	873.42	Injury and poisoning	Open wound of forehead, without mention of complication	170	190,827
12	873.0	Injury and poisoning	Open wound of scalp, without mention of complication	168	297,046
13	959.01	Injury and poisoning	Head injury, unspecified	163	338,110
14	079.99	Infectious	Unspecified viral infection	138	155,362
15	466.0	Diseases of the respiratory system	Acute bronchitis	136	142,236

Top 15 discharge codes for inpatient and emergency department visits, 5–9 years (Apache County), *n* = 1,111					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	98	28,736
2	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	56	23,896
3	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	54	16,393
4	034.0	Infectious	Streptococcal sore throat	51	21,958
5	493.92	Diseases of the respiratory system	Asthma, unspecified type, with acute exacerbation	43	22,716
6	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	38	18,021
7	372.00	Diseases of the nervous system and sense organs	Acute conjunctivitis, unspecified	23	6,576
8	466.0	Diseases of the respiratory system	Acute bronchitis	22	8,748
9	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	19	34,462
10	276.51	Endocrine, nutritional, and metabolic diseases, and immunity disorders	Dehydration	17	12,485
11	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	17	22,310
12	558.9	Disease of the digestive system	Other and unspecified noninfectious gastroenteritis and colitis	16	29,163
13	684.x	Diseases of the skin and subcutaneous tissue	Impetigo	15	5,459
14	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	15	15,840
15	487.1	Diseases of the respiratory system	Influenza with other respiratory manifestations	14	3,745

Top 15 discharge codes for inpatient and emergency department visits, 5–9 years (Coconino County), *n* = 1,633					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	116	98,126
2	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	100	55,338
3	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	55	38,815
4	034.0	Infectious	Streptococcal sore throat	40	36,967
5	486.x	Diseases of the respiratory system	Pneumonia	40	279,477
6	873.42	Injury and poisoning	Open wound of forehead, without mention of complication	40	41,114
7	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	33	58,490
8	873.0	Injury and poisoning	Open wound of scalp, without mention of complication	32	28,804
9	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	29	60,777
10	493.92	Diseases of the respiratory system	Asthma, unspecified type, with acute exacerbation	28	126,458
11	787.01	Symptoms, signs, and ill-defined conditions	Nausea with vomiting	26	55,575
12	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	26	30,073
13	959.01	Injury and poisoning	Head injury, unspecified	25	24,186
14	558.9	Disease of the digestive system	Other and unspecified noninfectious gastroenteritis and colitis	24	42,082
15	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	23	33,293

Top 15 discharge codes for inpatient and emergency department visits, 5–9 years (Gila County), *n* = 909					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	64	33,967
2	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	48	19,436
3	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	36	13,594
4	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	36	62,122
5	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	29	44,577
6	034.0	Infectious	Streptococcal sore throat	22	17,791
7	463.x	Diseases of the respiratory system	Acute tonsillitis	22	.
8	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	21	20,349
9	486.x	Diseases of the respiratory system	Pneumonia	15	59,288
10	490.x	Diseases of the respiratory system	Bronchitis, not specified as acute or chronic	15	9,981
11	493.92	Diseases of the respiratory system	Asthma, unspecified type, with acute exacerbation	15	13,091
12	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	15	36,951
13	079.99	Infectious	Unspecified viral infection	14	6,663
14	873.42	Injury and poisoning	Open wound of forehead, without mention of complication	13	24,239
15	989.5	Injury and poisoning	Toxic effect of venom	12	9,517

Top 15 discharge codes for inpatient and emergency department visits, 5–9 years (Mohave County), *n* = 3,154					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	205	149,883
2	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	173	141,744
3	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	109	100,294
4	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	88	160,346
5	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	83	148,970
6	034.0	Infectious	Streptococcal sore throat	75	86,394
7	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	68	202,406
8	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	65	75,848
9	466.0	Diseases of the respiratory system	Acute bronchitis	57	71,812
10	486.x	Diseases of the respiratory system	Pneumonia	57	522,515
11	493.92	Diseases of the respiratory system	Asthma, unspecified type, with acute exacerbation	53	92,766
12	787.01	Symptoms, signs, and ill-defined conditions	Nausea with vomiting	45	53,445
13	873.42	Injury and poisoning	Open wound of forehead, without mention of complication	41	63,185
14	493.90	Diseases of the respiratory system	Asthma, unspecified type, unspecified	40	75,359
15	564.00	Diseases of the digestive system	Constipation, unspecified	40	104,615

Top 15 discharge codes for inpatient and emergency department visits, 5–9 years (Navajo County), *n* = 1,187					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	55	35,166
2	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	46	37,501
3	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	42	55,946
4	079.99	Infectious	Unspecified viral infection	36	41,768
5	486.x	Diseases of the respiratory system	Pneumonia	28	227,145
6	034.0	Infectious	Streptococcal sore throat	27	34,605
7	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	27	35,935
8	873.0	Injury and poisoning	Open wound of scalp, without mention of complication	26	75,053
9	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	24	32,817
10	564.00	Diseases of the digestive system	Constipation, unspecified	23	86,660
11	493.92	Diseases of the respiratory system	Asthma, unspecified type, with acute exacerbation	21	84,447
12	493.90	Diseases of the respiratory system	Asthma, unspecified type, unspecified	20	42,631
13	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	20	27,115
14	490.x	Diseases of the respiratory system	Bronchitis, not specified as acute or chronic	19	19,338
15	787.03	Symptoms, signs, and ill-defined conditions	Vomiting alone	19	28,304

Top 15 discharge codes for inpatient and emergency department visits, 5–9 years (Yavapai County), *n* = 3,387					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	195	144,083
2	034.0	Infectious	Streptococcal sore throat	185	106,160
3	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	147	90,787
4	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	144	62,740
5	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	82	90,939
6	959.01	Injury and poisoning	Head injury, unspecified	80	160,996
7	486.x	Diseases of the respiratory system	Pneumonia	67	288,210
8	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	67	130,423
9	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	55	63,794
10	873.0	Injury and poisoning	Open wound of scalp, without mention of complication	55	125,162
11	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	55	63,725
12	873.42	Injury and poisoning	Open wound of forehead, without mention of complication	52	46,906
13	464.4	Diseases of the respiratory system	Croup	51	49,757
14	490.x	Diseases of the respiratory system	Bronchitis, not specified as acute or chronic	50	60,382
15	493.92	Diseases of the respiratory system	Asthma, unspecified type, with acute exacerbation	47	108,595

2010: Ages 10–14

Top 15 discharge codes for inpatient and emergency department visits, 10–14 years (all counties), *n* = 11,321					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	387	286,836
2	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	274	173,380
3	034.0	Infectious	Streptococcal sore throat	238	168,315
4	845.00	Injury and poisoning	Ankle sprain	230	288,369
5	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	219	126,281
6	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	209	691,041
7	493.92	Diseases of the respiratory system	Asthma, unspecified type, with acute exacerbation	172	360,906
8	784.0	Symptoms, signs, and ill-defined conditions	Headache	167	348,527
9	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	160	267,429
10	842.00	Injury and poisoning	Sprain of wrist, unspecified	135	188,293
11	959.01	Injury and poisoning	Head injury, unspecified	124	311,821
12	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	118	450,339
13	883.0	Injury and poisoning	Open wound of finger(s), without mention of complication	115	103,746
14	463.x	Diseases of the respiratory system	Acute tonsillitis	107	71,999
15	789.03	Symptoms, signs, and ill-defined conditions	Abdominal pain, right lower quadrant	107	667,450

Top 15 discharge codes for inpatient and emergency department visits, 10–14 years (Apache County), *n* = 1,088					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	62	19,039
2	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	57	21,178
3	034.0	Infectious	Streptococcal sore throat	37	27,241
4	493.92	Diseases of the respiratory system	Asthma, unspecified type, with acute exacerbation	37	42,821
5	558.9	Diseases of the digestive system	Other and unspecified noninfectious gastroenteritis and colitis	21	19,915
6	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	19	8,522
7	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	19	15,666
8	372.00	Diseases of the nervous system and sense organs	Acute conjunctivitis, unspecified	17	3,818
9	845.09	Injury and poisoning	Other sprains and strains of the ankle	15	6,741
10	891.0	Injury and poisoning	Open wound of knee, leg (except thigh), and ankle, without mention of complication	15	8,611
11	466.0	Diseases of the respiratory system	Acute bronchitis	14	6,739
12	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	14	24,262
13	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	14	25,759
14	276.51	Endocrine	Dehydration	13	9,987
15	463.x	Diseases of the respiratory system	Acute tonsillitis	10	3,518

Top 15 discharge codes for inpatient and emergency department visits, 10–14 years (Coconino County), *n* = 1,548					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	47	34,427
2	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	33	18,078
3	784.0	Symptoms, signs, and ill-defined conditions	Headache	30	53,326
4	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	29	19,633
5	959.01	Injury and poisoning	Head injury, unspecified	25	44,816
6	034.0	Infectious	Streptococcal sore throat	23	18,041
7	845.00	Injury and poisoning	Ankle sprain	23	26,960
8	883.0	Injury and poisoning	Open wound of finger(s), without mention of complication	22	21,652
9	493.92	Diseases of the respiratory system	Asthma, unspecified type, with acute exacerbation	21	129,381
10	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	20	29,239
11	558.9	Diseases of the digestive system	Other and unspecified noninfectious gastroenteritis and colitis	18	39,309
12	891.0	Injury and poisoning	Open wound of knee, leg (except thigh), and ankle, without mention of complication	17	17,144
13	305.00	Mental	Alcohol abuse, unspecified	16	59,955
14	486.x	Diseases of the respiratory system	Pneumonia, unspecified organism	16	144,684
15	493.90	Diseases of the respiratory system	Asthma, unspecified type, unspecified	16	21,222

Top 15 discharge codes for inpatient and emergency department visits, 10–14 years (Gila County), *n* = 854					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	40	23,636
2	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	30	72,918
3	845.00	Injury and poisoning	Ankle sprain	26	21,998
4	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	18	38,550
5	463.x	Diseases of the respiratory system	Acute tonsillitis	17	6,235
6	034.0	Infectious	Streptococcal sore throat	16	10,105
7	493.92	Diseases of the respiratory system	Asthma, unspecified type, with acute exacerbation	16	16,729
8	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	15	6,350
9	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	15	24,387
10	784.0	Symptoms, signs, and ill-defined conditions	Headache	13	28,136
11	891.0	Injury and poisoning	Open wound of knee, leg (except thigh), and ankle, without mention of complication	13	15,412
12	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	11	5,900
13	729.5	Symptoms, signs, and ill-defined conditions	Pain in limb	11	9,560
14	486.x	Diseases of the respiratory system	Pneumonia, unspecified organism	10	104,596
15	844.9	Injury and poisoning	Sprain and strain of unspecified site of knee and leg	10	12,411

Top 15 discharge codes for inpatient and emergency department visits, 10–14 years (Mohave County), *n* = 3,098					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	114	119,883
2	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	70	45,925
3	845.00	Injury and poisoning	Ankle sprain	64	107,772
4	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	56	94,907
5	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	54	64,723
6	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	47	195,532
7	842.00	Injury and poisoning	Sprain of wrist, unspecified	46	66,397
8	034.0	Infectious	Streptococcal sore throat	44	47,058
9	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	43	122,654
10	493.92	Diseases of the respiratory system	Asthma, unspecified type, with acute exacerbation	41	57,631
11	789.03	Symptoms, signs, and ill-defined conditions	Abdominal pain, right lower quadrant	38	230,717
12	842.10	Injury and poisoning	Sprain of hand, unspecified site	37	45,602
13	787.01	Symptoms, signs, and ill-defined conditions	Nausea with vomiting	36	93,025
14	784.0	Symptoms, signs, and ill-defined conditions	Headache	34	95,304
15	493.90	Diseases of the respiratory system	Asthma, unspecified type, unspecified	33	51,074

Top 15 discharge codes for inpatient and emergency department visits, 10–14 years (Navajo County), *n* = 1,376					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	35	38,427
2	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	26	110,770
3	845.00	Injury and poisoning	Ankle sprain	26	39,342
4	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	23	14,844
5	784.0	Symptoms, signs, and ill-defined conditions	Headache	23	52,694
6	883.0	Injury and poisoning	Open wound of finger(s), without mention of complication	22	22,457
7	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	22	59,549
8	564.00	Diseases of the digestive system	Constipation, unspecified	21	87,905
9	842.00	Injury and poisoning	Sprain of wrist, unspecified	17	21,770
10	813.44	Injury and poisoning	Closed fracture of lower end of radius with ulna	16	54,849
11	540.9	Diseases of the digestive system	Acute appendicitis without mention of peritonitis	15	300,009
12	789.03	Symptoms, signs, and ill-defined conditions	Abdominal pain, right lower quadrant	15	76,076
13	789.09	Symptoms, signs, and ill-defined conditions	Abdominal pain, other specified site	15	53,162
14	034.0	Infectious	Streptococcal sore throat	14	12,537
15	493.92	Diseases of the respiratory system	Asthma, unspecified type, with acute exacerbation	14	35,940

Top 15 discharge codes for inpatient and emergency department visits, 10–14 years (Yavapai County), *n* = 3,357					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	112	65,383
2	034.0	Infectious	Streptococcal sore throat	104	55,748
3	845.00	Injury and poisoning	Ankle sprain	81	83,801
4	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	77	36,993
5	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	76	225,281
6	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	69	36,920
7	784.0	Symptoms, signs, and ill-defined conditions	Headache	59	115,422
8	463.x	Diseases of the respiratory system	Acute tonsillitis	44	26,100
9	493.92	Diseases of the respiratory system	Asthma, unspecified type, with acute exacerbation	43	82,778
10	959.01	Injury and poisoning	Head injury, unspecified	43	107,965
11	842.00	Injury and poisoning	Sprain of wrist, unspecified	41	70,137
12	780.2	Symptoms, signs, and ill-defined conditions	Syncope and collapse	40	111,305
13	780.6	Symptoms, signs, and ill-defined conditions	Fever and other physiologic disturbances of temperature regulation	37	100,471
14	789.03	Symptoms, signs, and ill-defined conditions	Abdominal pain, right lower quadrant	37	269,150
15	813.42	Injury and poisoning	Other closed fractures of distal end of radius (alone)	37	55,920

2010: Ages 15–24

Top 15 discharge codes for inpatient and emergency department visits, 15–24 years (all counties), *n* = 48,130					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	1,180	1,072,193
2	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	936	2,146,454
3	784.0	Symptoms, signs, and ill-defined conditions	Headache	701/830	2,238,289
4	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	801	3,543,740
5	648.93	Complications of pregnancy childbirth and the puerperium	Other current conditions classifiable elsewhere of mother, antepartum condition or complication	701	2,192,918
6	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	621	454,686
7	845.00	Injury and poisoning	Ankle sprain	615	806,683
8	883.0	Injury and poisoning	Open wound of finger(s), without mention of complication	481	525,391
9	466.0	Diseases of the respiratory system	Acute bronchitis	475	581,384
10	847.0	Injury and poisoning	Sprain of neck	475	1,309,888
11	305.00	Mental	Alcohol abuse, unspecified	466	1,283,068
12	787.01	Symptoms, signs, and ill-defined conditions	Nausea with vomiting	450	1,128,052
13	789.09	Symptoms, signs, and ill-defined conditions	Abdominal pain, other specified site	446	2,106,853
14	034.0	Infectious	Streptococcal sore throat	423	506,783
15	920.x	Injury and poisoning	Contusion of the face, scalp, and neck, except eye(s)	416	1,393,497

Top 15 discharge codes for inpatient and emergency department visits, 15–24 years (Apache County), *n* = 2,873					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	103	63,167
2	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	87	62,273
3	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	70	23,075
4	034.0	Infectious	Streptococcal sore throat	54	44,525
5	784.0	Symptoms, signs, and ill-defined conditions	Headache	47	111,009
6	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	39	140,844
7	493.92	Diseases of the respiratory system	Asthma, unspecified type, with acute exacerbation	34	27,467
8	845.09	Injury and poisoning	Other sprains and strains of ankle	33	15,805
9	883.0	Injury and poisoning	Open wound of finger(s), without mention of complication	31	22,807
10	558.9	Diseases of the digestive system	Other and unspecified noninfectious gastroenteritis and colitis	30	56,938
11	882.0	Injury and poisoning	Open wound of hand except finger(s) alone, without mention of complication	28	52,581
12	305.00	Mental	Alcohol abuse, unspecified	27	87,259
13	648.93	Complications of pregnancy childbirth and the puerperium	Other current conditions classifiable elsewhere of mother, antepartum condition or complication	27	30,410
14	920.x	Injury and poisoning	Contusion of the face, scalp, and neck, except eye(s)	26	115,956
15	845.00	Injury and poisoning	Ankle sprain	25	24,869

Top 15 discharge codes for inpatient and emergency department visits, 15–24 years (Coconino County), *n* = 8,084					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	305.00	Mental	Alcohol abuse, unspecified	182	348,583
2	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	164	120,019
3	784.0	Symptoms, signs, and ill-defined conditions	Headache	144	312,042
4	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	139	136,064
5	648.93	Complications of pregnancy childbirth and the puerperium	Other current conditions classifiable elsewhere of mother, antepartum condition or complication	124	246,765
6	847.0	Injury and poisoning	Sprain of neck	106	238,638
7	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	102	349,529
8	845.00	Injury and poisoning	Ankle sprain	102	132,830
9	883.0	Injury and poisoning	Open wound of finger(s), without mention of complication	102	110,837
10	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	97	217,126
11	959.01	Injury and poisoning	Head injury, unspecified	96	459,241
12	789.09	Symptoms, signs, and ill-defined conditions	Abdominal pain, other specified site	93	282,961
13	920.x	Injury and poisoning	Contusion of the face, scalp, and neck, except eye(s)	86	198,716
14	789.06	Symptoms, signs, and ill-defined conditions	Abdominal pain, epigastric	82	198,830
15	787.01	Symptoms, signs, and ill-defined conditions	Nausea with vomiting	81	180,124

Top 15 discharge codes for inpatient and emergency department visits, 15–24 years (Gila County), *n* = 3,670					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	92	429,743
2	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	79	68,237
3	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	78	144,677
4	648.93	Conditions of pregnancy, childbirth, and the puerperium	Other current conditions classifiable elsewhere of other, antepartum condition or complication	70	541,286
5	845.00	Injury and poisoning	Ankle sprain	54	65,365
6	784.0	Symptoms, signs, and ill-defined conditions	Headache	53	148,466
7	466.0	Diseases of the respiratory system	Acute bronchitis	43	27,422
8	920.x	Injury and poisoning	Contusion of the face, scalp, and neck, except eye(s)	43	182,457
9	650.x	Complications of pregnancy childbirth and the puerperium	Normal delivery	40	329,530
10	463.x	Diseases of the respiratory system	Acute tonsillitis	39	31,223
11	847.0	Injury and poisoning	Sprain of neck	39	174,476
12	558.9	Diseases of the digestive system	Other and unspecified noninfectious gastroenteritis and colitis	38	274,435
13	490.x	Diseases of the respiratory system	Bronchitis, not specified as acute or chronic	37	30,615
14	724.2	Diseases of the musculoskeletal system and connective tissue	Lumbago	36	71,802
15	786.52	Symptoms, signs, and ill-defined conditions	Painful respiration	35	80,456

2014

2014: Ages Less than 1 Year

Top 15 discharge codes for inpatient and emergency department visits, < 1 year (all counties), *n* = 20,051					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	V30.00	Type of birth	Single, live born, born in hospital, delivered without mention of cesarean section	4,768	30,330,961
2	V30.01	Type of birth	Single, live born, born in hospital, delivered by cesarean section	1,827	29,020,204
3	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	968	1,372,134
4	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	458	1,144,244
5	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	428	380,607
6	486.x	Diseases of the respiratory system	Pneumonia	367	5,214,139
7	466.19	Diseases of the respiratory system	Acute bronchiolitis due to other infectious organism	325	1,663,930
8	787.03	Symptoms, signs, and ill-defined conditions	Vomiting alone	311	534,962
9	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	295	3,312,972
10	466.11	Diseases of the respiratory system	Acute bronchiolitis due to respiratory syncytial virus	261	3,104,660
11	079.99	Infectious	Unspecified viral infection	249	363,183
12	959.01	Injury and poisoning	Head injury, unspecified	208	931,983
13	786.2	Symptoms, signs, and ill-defined conditions	Cough	186	246,905
14	564.00	Diseases of the digestive system	Constipation, unspecified	158	685,602
15	487.1	Diseases of the respiratory system	Influenza with other respiratory manifestations	145	615,640

Top 15 discharge codes for inpatient and emergency department visits, < 1 year (Apache County), *n* = 956					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	V30.00	Type of birth	Single, live born, born in hospital, delivered without mention of cesarean section	144	514,273
2	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	93	81,054
3	V30.01	Type of birth	Single, live born, born in hospital, delivered by cesarean section	65	2,763,196
4	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	62	41,125
5	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	38	268,044
6	486.x	Diseases of the respiratory system	Pneumonia	28	287,995
7	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	23	17,892
8	276.51	Endocrine, Nutritional, and metabolic diseases and immunity disorders	Dehydration	16	119,253
9	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	13	16,805
10	034.0	Infectious	Streptococcal sore throat	12	18,379
11	079.99	Infectious	Unspecified viral infection	11	10,694
12	464.4	Diseases of the respiratory system		11	19,454
13	466.11	Diseases of the respiratory system	Acute bronchiolitis due to respiratory syncytial virus	11	65,532
14	466.19	Diseases of the respiratory system	Acute bronchiolitis due to other infectious organism	11	92,065
15	V65.5	Persons encountering health services in other circumstances	Person with feared complaint in whom no diagnosis was made	11	6,782

Top 15 discharge codes for inpatient and emergency department visits, < 1 year (Coconino County), *n* = 3,119					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	V30.00	Type of birth	Single, live born, born in hospital, delivered without mention of cesarean section	1,028	7,869,298
2	V30.01	Type of birth	Single, live born, born in hospital, delivered by cesarean section	287	7,934,457
3	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	170	242,896
4	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	90	273,590
5	787.03	Symptoms, signs, and ill-defined conditions	Vomiting alone	50	49,751
6	079.99	Infectious	Unspecified viral infection	48	70,018
7	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	48	35,229
8	466.11	Diseases of the respiratory system	Acute bronchiolitis due to respiratory syncytial virus	48	824,481
9	486.x	Diseases of the respiratory system	Pneumonia	38	351,996
10	466.19	Diseases of the respiratory system	Acute bronchiolitis due to other infectious organism	35	381,262
11	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	29	318,798
12	786.2	Symptoms, signs, and ill-defined conditions	Cough	24	21,313
13	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	24	37,770
14	779.89	Certain conditions originating in the perinatal period	Certain conditions originating in the perinatal period	22	1,005,631
15	959.01	Injury and poisoning	Head injury, unspecified	22	51,511

Top 15 discharge codes for inpatient and emergency department visits, < 1 year (Gila County), *n* = 1,715					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	V30.00	Type of birth	Single, live born, born in hospital, delivered without mention of cesarean section	388	1,936,040
2	V30.01	Type of birth	Single, live born, born in hospital, delivered by cesarean section	131	944,339
3	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	103	119,756
4	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	74	55,714
5	486.x	Diseases of the respiratory system	Pneumonia	34	397,473
6	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	28	68,226
7	787.03	Symptoms, signs, and ill-defined conditions	Vomiting alone	25	50,732
8	959.01	Injury and poisoning	Head injury, unspecified	22	158,614
9	079.99	Infectious	Unspecified viral infection	21	37,527
10	428.0	Diseases of the circulatory system	Heart failure, unspecified	21	3,359,304
11	466.19	Diseases of the respiratory system	Acute bronchiolitis due to other infectious organism	20	116,449
12	564.00	Diseases of the digestive system	Constipation, unspecified	19	64,838
13	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	18	153,604
14	038.9	Infectious	Unspecified septicemia	17	648,120
15	410.71	Diseases of the circulatory system	Subendocardial infarction, initial episode of care	16	655,024

Top 15 discharge codes for inpatient and emergency department visits, < 1 year (Mohave County), *n* = 5,255					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	V30.00	Type of birth	Single, live born, born in hospital, delivered without mention of cesarean section	1,148	5,572,904
2	V30.01	Type of birth	Single, live born, born in hospital, delivered by cesarean section	493	4,327,084
3	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	208	372,954
4	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	117	291,804
5	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	96	1,358,667
6	486.x	Diseases of the respiratory system	Pneumonia	89	2,275,506
7	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	83	102,087
8	787.03	Symptoms, signs, and ill-defined conditions	Vomiting alone	79	184,194
9	079.99	Infectious	Unspecified viral infection	78	109,680
10	786.2	Symptoms, signs, and ill-defined conditions	Cough	77	90,580
11	466.11	Diseases of the respiratory system	Acute bronchiolitis due to respiratory syncytial virus	60	356,723
12	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	57	282,025
13	466.19	Diseases of the respiratory system	Acute bronchiolitis due to other infectious organism	56	244,949
14	487.1	Diseases of the respiratory system	Influenza with other respiratory manifestations	50	170,235
15	V20.2	Persons encountering health services in other circumstances	Routine infant or child health check	50	39,433

Top 15 discharge codes for inpatient and emergency department visits, < 1 year (Navajo County), *n* = 2,969					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	V30.00	Type of birth	Single, live born, born in hospital, delivered without mention of cesarean section	852	6,615,990
2	V30.01	Type of birth	Single, live born, born in hospital, delivered by cesarean section	289	6,550,807
3	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	174	226,477
4	466.19	Diseases of the respiratory system	Acute bronchiolitis due to other infectious organism	106	506,284
5	486.x	Diseases of the respiratory system	Pneumonia	80	733,249
6	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	62	155,589
7	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	58	46,392
8	079.99	Infectious	Unspecified viral infection	46	62,663
9	466.11	Diseases of the respiratory system	Acute bronchiolitis due to respiratory syncytial virus	44	727,863
10	787.03	Symptoms, signs, and ill-defined conditions	Vomiting alone	43	136,649
11	564.00	Diseases of the digestive system	Constipation, unspecified	31	110,659
12	382.00	Diseases of the nervous system and sense organs	Acute suppurative otitis media without spontaneous rupture of eardrum	29	33,324
13	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	28	168,669
14	487.1	Diseases of the respiratory system	Influenza with other respiratory manifestations	24	182,835
15	959.01	Injury and poisoning	Head injury, unspecified	24	59,887

Top 15 discharge codes for inpatient and emergency department visits, < 1 year (Yavapai County), *n* = 5,995					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	V30.00	Type of birth	Single, live born, born in hospital, delivered without mention of cesarean section	1,208	7,833,683
2	V30.01	Type of birth	Single, live born, born in hospital, delivered by cesarean section	562	6,519,426
3	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	220	333,975
4	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	148	356,350
5	787.03	Symptoms, signs, and ill-defined conditions	Vomiting alone	104	177,664
6	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	103	106,339
7	486.x	Diseases of the respiratory system	Pneumonia	98	1,254,781
8	466.19	Diseases of the respiratory system	Acute bronchiolitis due to other infectious organism	97	340,915
9	959.01	Injury and poisoning	Head injury, unspecified	89	425,916
10	466.11	Diseases of the respiratory system	Acute bronchiolitis due to respiratory syncytial virus	86	1,070,639
11	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	86	1,109,066
12	780.79	Symptoms, signs, and ill-defined conditions	Other malaise and fatigue	73	405,009
13	487.1	Diseases of the respiratory system	Influenza with other respiratory manifestations	49	159,654
14	786.2	Symptoms, signs, and ill-defined conditions	Cough	49	86,950
15	787.91	Symptoms, signs, and ill-defined conditions	Diarrhea	46	76,607

2014: Ages 1–4

Top 15 discharge codes for inpatient and emergency department visits, 1–4 years (all counties), *n* = 16,370					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	1,438	1,632,358
2	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	1,194	1,071,139
3	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	834	1,321,249
4	787.03	Symptoms, signs, and ill-defined conditions	Vomiting alone	454	563,083
5	486.x	Diseases of the respiratory system	Pneumonia	443	2,276,034
6	079.99	Infectious	Unspecified viral infection	433	533,273
7	464.4	Diseases of the respiratory system	Croup	424	764,102
8	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	370	369,840
9	959.01	Injury and poisoning	Head injury, unspecified	299	504,595
10	034.0	Infectious	Streptococcal sore throat	295	374,199
11	466.19	Diseases of the respiratory system	Acute bronchiolitis due to other infectious organism	292	1,108,379
12	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	263	369,146
13	487.1	Diseases of the respiratory system	Influenza with other respiratory manifestations	242	542,622
14	786.2	Symptoms, signs, and ill-defined conditions	Cough	231	249,840
15	787.01	Symptoms, signs, and ill-defined conditions	Nausea with vomiting	229	296,645

Top 15 discharge codes for inpatient and emergency department visits, 1–4 years (Apache County), *n* = 1,403					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	168	104,713
2	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	130	96,437
3	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	114	84,828
4	034.0	Infectious	Streptococcal sore throat	86	79,340
5	558.9	Diseases of the digestive system	Other and unspecified noninfectious gastroenteritis and colitis	45	57,695
6	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	31	31,644
7	V67.59	Persons encountering health services in other circumstances	Other follow-up examination	26	13,282
8	466.19	Diseases of the respiratory system	Acute bronchiolitis due to other infectious organism	23	63,985
9	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	22	26,263
10	787.03	Symptoms, signs, and ill-defined conditions	Vomiting alone	22	18,689
11	372.3	Diseases of the nervous system and sense organs	Other and unspecified conjunctivitis	21	13,000
12	464.4	Diseases of the respiratory system	Croup	21	51,824
13	873.0	Injury and poisoning	Open wound of scalp, without mention of complication	21	34,946
14	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	19	27,610
15	486.x	Diseases of the respiratory system	Pneumonia	17	53,444

Top 15 discharge codes for inpatient and emergency department visits, 1–4 years (Coconino County), *n* = 2,456					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	246	234,386
2	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	142	147,341
3	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	121	89,045
4	787.03	Symptoms, signs, and ill-defined conditions	Vomiting alone	84	87,067
5	079.99	Infectious	Unspecified viral infection	81	102,267
6	464.4	Diseases of the respiratory system	Croup	63	111,948
7	959.01	Injury and poisoning	Head injury, unspecified	56	74,874
8	873.42	Injury and poisoning	Open wound of forehead, without mention of complication	50	56,466
9	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	47	49,931
10	486.x	Diseases of the respiratory system	Pneumonia	43	329,275
11	786.2	Symptoms, signs, and ill-defined conditions	Cough	36	34,172
12	873.0	Injury and poisoning	Open wound of scalp, without mention of complication	36	38,100
13	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	35	133,506
14	466.19	Diseases of the respiratory system	Acute bronchiolitis due to other infectious organism	31	218,331
15	787.01	Symptoms, signs, and ill-defined conditions	Nausea with vomiting	31	32,862

Top 15 discharge codes for inpatient and emergency department visits, 1–4 years (Gila County), *n* = 1,467					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	163	134,636
2	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	160	105,764
3	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	52	63,169
4	079.99	Infectious	Unspecified viral infection	42	23,660
5	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	37	30,548
6	787.03	Symptoms, signs, and ill-defined conditions	Vomiting alone	33	25,755
7	959.01	Injury and poisoning	Head injury, unspecified	33	39,016
8	490.x	Diseases of the respiratory system	Bronchitis, not specified as acute or chronic	29	23,613
9	486.x	Diseases of the respiratory system	Pneumonia	28	103,926
10	464.4	Diseases of the respiratory system	Croup	27	29,823
11	466.0	Diseases of the respiratory system	Acute bronchitis	27	337,356
12	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	25	58,638
13	787.01	Symptoms, signs, and ill-defined conditions	Nausea with vomiting	24	28,383
14	372.30	Diseases of the nervous system and sense organs	Conjunctivitis, unspecified	22	9,048
15	V68.89	Persons encountering health services in other circumstances	Encounters for other specified administrative purpose	22	5,654

Top 15 discharge codes for inpatient and emergency department visits, 1–4 years (Mohave County), *n* = 4,810					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	352	469,931
2	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	336	395,833
3	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	312	600,300
4	787.03	Symptoms, signs, and ill-defined conditions	Vomiting alone	145	197,123
5	079.99	Infectious	Unspecified viral infection	135	159,958
6	034.0	Infectious	Streptococcal sore throat	133	178,761
7	486.x	Diseases of the respiratory system	Pneumonia	124	492,742
8	464.4	Diseases of the respiratory system	Croup	109	211,610
9	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	98	129,962
10	786.2	Symptoms, signs, and ill-defined conditions	Cough	83	100,171
11	487.1	Diseases of the respiratory system	Influenza with other respiratory manifestations	82	133,791
12	372.30	Diseases of the nervous system and sense organs	Conjunctivitis, unspecified	81	53,542
13	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	78	89,943
14	959.01	Injury and poisoning	Head injury, unspecified	75	107,205
15	873.42	Injury and poisoning	Open wound of forehead, without mention of complication	72	115,623

Top 15 discharge codes for inpatient and emergency department visits, 1–4 years (Navajo County), *n* = 2,323					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	210	222,169
2	486.x	Diseases of the respiratory system	Pneumonia	109	791,612
3	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	108	109,881
4	466.19	Diseases of the respiratory system	Acute bronchiolitis due to other infectious organism	97	392,869
5	079.99	Infectious	Unspecified viral infection	79	132,230
6	464.4	Diseases of the respiratory system	Croup	70	125,105
7	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	70	129,853
8	382.00	Diseases of the nervous system and sense organs	Acute suppurative otitis media without spontaneous rupture of eardrum	57	65,714
9	959.01	Injury and poisoning	Head injury, unspecified	48	102,219
10	787.03	Symptoms, signs, and ill-defined conditions	Vomiting alone	41	73,237
11	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	39	50,269
12	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	32	148,544
13	787.01	Symptoms, signs, and ill-defined conditions	Nausea with vomiting	30	42,498
14	487.1	Diseases of the respiratory system	Influenza with other respiratory manifestations	27	102,406
15	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	26	53,738

Top 15 discharge codes for inpatient and emergency department visits, 1–4 years (Yavapai County), *n* = 3,911					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	337	478,873
2	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	301	269,928
3	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	236	362,927
4	464.4	Diseases of the respiratory system	Croup	134	238,460
5	787.03	Symptoms, signs, and ill-defined conditions	Vomiting alone	129	165,467
6	486.x	Diseases of the respiratory system	Pneumonia	122	513,610
7	487.1	Diseases of the respiratory system	Influenza with other respiratory manifestations	91	181,994
8	079.99	Infectious	Unspecified viral infection	83	105,429
9	959.01	Injury and poisoning	Head injury, unspecified	82	178,750
10	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	77	90,397
11	786.2	Symptoms, signs, and ill-defined conditions	Cough	73	94,576
12	787.01	Symptoms, signs, and ill-defined conditions	Nausea with vomiting	70	93,176
13	787.91	Symptoms, signs, and ill-defined conditions	Diarrhea	64	84,238
14	873.42	Injury and poisoning	Open wound of forehead, without mention of complication	62	85,795
15	466.19	Diseases of the respiratory system	Acute bronchiolitis due to other infectious organism	61	220,910

2014: Ages 5–9

Top 15 discharge codes for inpatient and emergency department visits, 5–9 years (all counties), *n* = 12,750					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	639	729,894
2	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	616	537,076
3	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	584	432,484
4	034.0	Infectious	Streptococcal sore throat	537	585,115
5	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	291	619,329
6	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	267	586,311
7	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	248	700,993
8	487.1	Diseases of the respiratory system	Influenza with other respiratory manifestations	240	472,205
9	079.99	Infectious	Unspecified viral infection	215	247,222
10	486.x	Diseases of the respiratory system	Pneumonia	188	837,704
11	493.92	Diseases of the respiratory system	Asthma, unspecified type, with acute exacerbation	185	674,605
12	787.01	Symptoms, signs, and ill-defined conditions	Nausea with vomiting	184	322,800
13	959.01	Injury and poisoning	Head injury, unspecified	177	396,551
14	786.2	Symptoms, signs, and ill-defined conditions	Cough	173	191,352
15	920.x	Injury and poisoning	Contusion of face, scalp, and nec19+1k except eye(s)	170	215,614

Top 15 discharge codes for inpatient and emergency department visits, 5–9 years (Apache County), *n* = 1,488					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	211	147,033
2	034.0	Infectious	Streptococcal sore throat	179	152,359
3	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	93	58,729
4	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	86	166,590
5	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	49	68,190
6	558.9	Disease of the digestive system	Other and unspecified noninfectious gastroenteritis and colitis	28	43,084
7	372.30	Diseases of the nervous system and sense organs	Conjunctivitis, unspecified	27	15,018
8	873.0	Injury and poisoning	Open wound of scalp, without mention of complication	21	40,252
9	V67.59	Persons encountering health services in other circumstances	Other follow-up examination	21	11,271
10	486.x	Diseases of the respiratory system	Pneumonia	19	226,691
11	493.92	Diseases of the respiratory system	Asthma, unspecified type, with acute exacerbation	19	38,024
12	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	18	22,504
13	079.99	Infectious	Unspecified viral infection	16	22,976
14	692.9	Diseases of the skin and subcutaneous tissue	Contact dermatitis and other eczema, unspecified cause	15	12,335
15	786.2	Symptoms, signs, and ill-defined conditions	Cough	15	8,774

Top 15 discharge codes for inpatient and emergency department visits, 5–9 years (Coconino County), *n* = 1,834					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	116	89,496
2	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	81	47,050
3	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	58	39,122
4	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	55	59,104
5	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	46	78,383
6	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	39	99,991
7	079.99	Infectious	Unspecified viral infection	37	29,969
8	787.03	Symptoms, signs, and ill-defined conditions	Vomiting alone	34	27,548
9	873.0	Injury and poisoning	Open wound of scalp, without mention of complication	33	42,949
10	959.01	Injury and poisoning	Head injury, unspecified	33	58,669
11	787.01	Symptoms, signs, and ill-defined conditions	Nausea with vomiting	31	54,638
12	873.42	Injury and poisoning	Open wound of forehead, without mention of complication	31	43,778
13	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	30	31,207
14	564.00	Diseases of the digestive system	Constipation, unspecified	28	34,123
15	493.92	Diseases of the respiratory system	Asthma, unspecified type, with acute exacerbation	63925	103,075

Top 15 discharge codes for inpatient and emergency department visits, 5–9 years (Gila County), *n* = 1,026					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	67	40,224
2	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	66	58,890
3	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	46	32,219
4	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	30	67,005
5	079.99	Infectious	Unspecified viral infection	29	12,833
6	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	29	77,853
7	034.0	Infectious	Streptococcal sore throat	25	23,821
8	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	25	36,454
9	787.03	Symptoms, signs, and ill-defined conditions	Vomiting alone	20	45,916
10	372.30	Diseases of the nervous system and sense organs	Conjunctivitis, unspecified	17	5,791
11	463.x	Diseases of the respiratory system	Acute tonsillitis	17	16,719
12	466.0	Diseases of the respiratory system	Acute bronchitis	17	39,358
13	493.92	Diseases of the respiratory system	Asthma, unspecified type, with acute exacerbation	17	50,248
14	787.01	Symptoms, signs, and ill-defined conditions	Nausea with vomiting	15	9,051
15	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	15	44,884

Top 15 discharge codes for inpatient and emergency department visits, 5–9 years (Mohave County), *n* = 3,472					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	034.0	Infectious	Streptococcal sore throat	164	202,207
2	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	156	141,129
3	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	132	184,480
4	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	116	132,101
5	487.1	Diseases of the respiratory system	Influenza with other respiratory manifestations	101	171,567
6	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	77	164,770
7	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	69	184,370
8	786.2	Symptoms, signs, and ill-defined conditions	Cough	69	81,651
9	564.00	Diseases of the digestive system	Constipation, unspecified	68	172,218
10	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	65	291,730
11	787.01	Symptoms, signs, and ill-defined conditions	Nausea with vomiting	60	117,579
12	079.99	Infectious	Unspecified viral infection	58	68,899
13	372.30	Diseases of the nervous system and sense organs	Conjunctivitis, unspecified	53	33,757
14	486.x	Diseases of the respiratory system	Pneumonia	50	239,370
15	782.1	Symptoms, signs, and ill-defined conditions	Rash and other nonspecific skin eruption	49	42,129

Top 15 discharge codes for inpatient and emergency department visits, 5–9 years (Navajo County), *n* = 1,635					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	96	99,888
2	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	64	64,609
3	493.92	Diseases of the respiratory system	Asthma, unspecified type, with acute exacerbation	45	213,269
4	079.99	Infectious	Unspecified viral infection	43	70,611
5	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	43	34,715
6	034.0	Infectious	Streptococcal sore throat	42	79,402
7	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	37	80,713
8	486.x	Diseases of the respiratory system	Pneumonia	30	173,944
9	959.01	Injury and poisoning	Head injury, unspecified	30	84,324
10	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	28	101,772
11	382.00	Diseases of the nervous system and sense organs	Acute suppurative otitis media without spontaneous rupture of eardrum	25	24,714
12	873.42	Injury and poisoning	Open wound of forehead, without mention of complication	24	33,678
13	684.x	Diseases of the skin and subcutaneous tissue	Impetigo	23	13,850
14	490.x	Diseases of the respiratory system	Bronchitis, not specified as acute or chronic	20	29,478
15	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	20	28,597

Top 15 discharge codes for inpatient and emergency department visits, 5–9 years (Yavapai County), *n* = 3,295					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	144	113,145
2	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	143	186,648
3	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	121	125,741
4	034.0	Infectious	Streptococcal sore throat	109	107,561
5	487.1	Diseases of the respiratory system	Influenza with other respiratory manifestations	102	185,234
6	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	94	229,024
7	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	84	226,750
8	486.x	Diseases of the respiratory system	Pneumonia	69	252,362
9	464.4	Diseases of the respiratory system	Croup	61	93,223
10	787.01	Symptoms, signs, and ill-defined conditions	Nausea with vomiting	60	107,464
11	959.01	Injury and poisoning	Head injury, unspecified	57	154,960
12	786.2	Symptoms, signs, and ill-defined conditions	Cough	52	69,714
13	873.42	Injury and poisoning	Open wound of forehead, without mention of complication	49	71,758
14	493.92	Diseases of the respiratory system	Asthma, unspecified type, with acute exacerbation	46	168,800
15	787.03	Symptoms, signs, and ill-defined conditions	Vomiting alone	45	76,023

2014: Ages 10–14

Top 15 discharge codes for inpatient and emergency department visits, 10–14 years (all counties), *n* = 11,049					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	442	381,519
2	845.00	Injury and poisoning	Ankle sprain	298	453,173
3	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	296	309,922
4	034.0	Infectious	Streptococcal sore throat	280	323,491
5	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	223	957,593
6	784.0	Symptoms, signs, and ill-defined conditions	Headache	171	429,953
7	959.01	Injury and poisoning	Head injury, unspecified	153	485,687
8	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	149	112,774
9	842.00	Injury and poisoning	Sprain of wrist, unspecified	141	219,597
10	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	135	293,675
11	493.92	Diseases of the respiratory system	Asthma, unspecified type, with acute exacerbation	133	346,801
12	813.42	Injury and poisoning	Other closed fractures of distal end of radius	103	253,095
13	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	101	227,287
14	564.00	Diseases of the digestive system	Constipation, unspecified	98	433,966
15	079.99	Infectious	Unspecified viral infection	97	130,469

Top 15 discharge codes for inpatient and emergency department visits, 10–14 years (Apache County), *n* = 1,167					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	167	101,870
2	034.0	Infectious	Streptococcal sore throat	106	97,660
3	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	60	41,864
4	558.9	Diseases of the digestive system	Other ad unspecified noninfectious gastroenteritis and colitis	30	70,742
5	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	28	17,520
6	V67.59	Persons encountering health services in other circumstances	Other follow-up examination	26	12,112
7	845.00	Injury and poisoning	Ankle sprain	22	20,846
8	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	15	19,031
9	372.30	Diseases of the nervous system and sense organs	Conjunctivitis, unspecified	14	8,788
10	703.0	Diseases of the skin and subcutaneous tissue	Ingrown nail	14	9,092
11	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	14	15,848
12	487.1	Diseases of the respiratory system	Influenza with other respiratory manifestations	11	14,548
13	493.92	Diseases of the respiratory system	Asthma, unspecified type, with acute exacerbation	10	16,267
14	684.x	Diseases of the skin and subcutaneous tissue	Impetigo	10	7,170
15	493.90	Diseases of the respiratory system	Asthma, unspecified type	9	14,566

Top 15 discharge codes for inpatient and emergency department visits, 10–14 years (Coconino County), *n* = 1,532					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	52	47,792
2	845.00	Injury and poisoning	Ankle sprain	44	52,268
3	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	42	36,094
4	784.0	Symptoms, signs, and ill-defined conditions	Headache	34	70,858
5	959.01	Injury and poisoning	Head injury, unspecified	26	52,598
6	780.60	Symptoms, signs, and ill-defined conditions	Fever, unspecified	25	41,462
7	813.42	Injury and poisoning	Other closed fractures of distal end of radius	24	63,460
8	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	21	42,826
9	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	21	33,241
10	079.99	Infectious	Unspecified viral infection	20	19,302
11	780.2	Symptoms, signs, and ill-defined conditions	Syncope and collapse	20	63,163
12	493.92	Diseases of the respiratory system	Asthma, unspecified type, with acute exacerbation	18	47,799
13	784.7	Symptoms, signs, and ill-defined conditions	Epistaxis, nose bleed	17	74,382
14	842.00	Injury and poisoning	Sprain of wrist, unspecified	17	18,519
15	844.9	Injury and poisoning	Sprain and strain of unspecified site of knee and leg	17	20,847

Top 15 discharge codes for inpatient and emergency department visits, 10–14 years (Gila County), *n* = 913					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	31	150,272
2	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	23	12,421
3	463.x	Diseases of the respiratory system	Acute tonsillitis	23	20,886
4	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	23	18,653
5	845.00	Injury and poisoning	Ankle sprain	23	24,996
6	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	17	9,406
7	466.0	Diseases of the respiratory system	Acute bronchitis	16	15,774
8	959.01	Injury and poisoning	Head injury, unspecified	15	35,620
9	079.99	Infectious	Unspecified viral infection	14	21,834
10	493.92	Diseases of the respiratory system	Asthma, unspecified type, with acute exacerbation	14	24,085
11	784.0	Symptoms, signs, and ill-defined conditions	Headache	14	37,975
12	842.00	Injury and poisoning	Sprain of wrist, unspecified	13	20,629
13	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	11	13,948
14	250.13	Endocrine, nutritional, and metabolic diseases and immunity disorders	Diabetes with ketoacidosis, type 1 (juvenile type), uncontrolled	10	143,477
15	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	10	20,643

Top 15 discharge codes for inpatient and emergency department visits, 10–14 years (Mohave County), *n* = 3,127					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	845.00	Injury and poisoning	Ankle sprain	86	165,102
2	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	84	437,443
3	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	80	90,028
4	034.0	Infectious	Streptococcal sore throat	75	100,854
5	784.0	Symptoms, signs, and ill-defined conditions	Headache	53	140,784
6	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	45	61,919
7	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	43	134,313
8	564.00	Diseases of the digestive system	Constipation, unspecified	41	206,249
9	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	40	36,371
10	493.92	Diseases of the respiratory system	Asthma, unspecified type, with acute exacerbation	40	132,866
11	959.01	Injury and poisoning	Head injury, unspecified	37	117,707
12	842.00	Injury and poisoning	Sprain of wrist, unspecified	36	70,204
13	487.1	Diseases of the respiratory system	Influenza with other respiratory manifestations	34	52,211
14	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	34	77,586
15	891.0	Injury and poisoning	Open wound of knee, leg (except thigh), and ankle, without mention of complication	34	66,868

Top 15 discharge codes for inpatient and emergency department visits, 10–14 years (Navajo County), *n* = 1,385					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	57	66,385
2	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	49	60,561
3	845.00	Injury and poisoning	Ankle sprain	31	49,679
4	034.0	Infectious	Streptococcal sore throat	28	37,738
5	920.x	Injury and poisoning	Contusion of face, scalp, and neck except eye(s)	24	56,827
6	784.0	Symptoms, signs, and ill-defined conditions	Headache	21	58,952
7	959.01	Injury and poisoning	Head injury, unspecified	19	50,855
8	844.9	Injury and poisoning	Sprain and strain of unspecified site of knee and leg	18	28,209
9	079.99	Infectious	Unspecified viral infection	17	22,097
10	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	16	10,956
11	490.x	Diseases of the respiratory system	Bronchitis, not specified as acute or chronic	16	33,410
12	789.09	Symptoms, signs, and ill-defined conditions	Abdominal pain, other specified site	16	61,386
13	564.00	Diseases of the digestive system	Constipation, unspecified	15	67,364
14	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	15	78,259
15	493.92	Diseases of the respiratory system	Asthma, unspecified type, with acute exacerbation	14	44,995

Top 15 discharge codes for inpatient and emergency department visits, 10–14 years (Yavapai County), *n* = 2,925					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	845.00	Injury and poisoning	Ankle sprain	92	147,922
2	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	73	79,137
3	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	67	84,110
4	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	67	252,124
5	842.00	Injury and poisoning	Sprain of wrist, unspecified	58	91,835
6	034.0	Infectious	Streptococcal sore throat	57	74,902
7	959.01	Injury and poisoning	Head injury, unspecified	52	205,640
8	784.0	Symptoms, signs, and ill-defined conditions	Headache	41	125,086
9	789.03	Symptoms, signs, and ill-defined conditions	Abdominal pain, right lower quadrant	41	208,253
10	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	37	34,213
11	493.92	Diseases of the respiratory system	Asthma, unspecified type, with acute exacerbation	37	94,833
12	850.0	Injury and poisoning	Concussion with no loss of consciousness	36	119,415
13	487.1	Diseases of the respiratory system	Influenza with other respiratory manifestations	34	90,067
14	842.10	Injury and poisoning	Sprain of hand, unspecified site	34	49,705
15	789.06	Symptoms, signs, and ill-defined conditions	Abdominal pain, epigastric	33	83,095

2014: Ages 15–24

Top 15 discharge codes for inpatient and emergency department visits, 15–24 years (all counties), *n* = 44,828					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	1,077	1,211,189
2	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	829	2,763,551
3	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	814	4,120,382
4	648.93	Complications of pregnancy childbirth and the puerperium	Other current conditions classifiable elsewhere of mother, antepartum condition or complication	779	2,477,599
5	784.0	Symptoms, signs, and ill-defined conditions	Headache	748	2,536,861
6	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	621	790,249
7	845.00	Injury and poisoning	Ankle sprain	617	1,077,431
8	787.01	Symptoms, signs, and ill-defined conditions	Nausea with vomiting	576	2,082,479
9	640.03	Complications of pregnancy childbirth and the puerperium	Threatened abortion, antepartum condition or complication	443	1,544,977
10	883.0	Injury and poisoning	Open wound of finger(s), without mention of complication	422	684,330
11	789.09	Symptoms, signs, and ill-defined conditions	Abdominal pain, other specified site	421	2,133,080
12	034.0	Infectious	Streptococcal sore throat	418	598,646
13	789.06	Symptoms, signs, and ill-defined conditions	Abdominal pain, epigastric	418	1,587,458
14	300.00	Mental	Anxiety state, unspecified	391	896,086
15	959.01	Injury and poisoning	Head injury, unspecified	379	2,393,233

Top 15 discharge codes for inpatient and emergency department visits, 15–24 years (Apache County), *n* = 2,799					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	247	160,220
2	034.0	Infectious	Streptococcal sore throat	113	108,442
3	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	91	132,971
4	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	67	56,638
5	845.00	Injury and poisoning	Ankle sprain	51	59,713
6	V67.59	Persons encountering health services in other circumstances	Other follow-up examination	49	35,470
7	382.9	Diseases of the nervous system and sense organs	Unspecified otitis media, ear infection	42	31,135
8	558.9	Diseases of the digestive system	Other and unspecified noninfectious gastroenteritis and colitis	42	122,139
9	784.0	Symptoms, signs, and ill-defined conditions	Headache	32	69,908
10	883.0	Injury and poisoning	Open wound of finger(s), without mention of complication	25	33,479
11	724.2	Diseases of the musculoskeletal system and connective tissue	Lumbago	24	41,077
12	882.0	Injury and poisoning	Open wound of hand except finger(s) alone, without mention of complication	24	46,197
13	305.00	Mental	Alcohol abuse, unspecified	21	71,876
14	372.3	Diseases of the nervous system and sense organs	Other and unspecified conjunctivitis	21	11,852
15	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	21	81,196

Top 15 discharge codes for inpatient and emergency department visits, 15–24 years (Coconino County), *n* = 7,288					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	169	167,104
2	648.93	Complications of pregnancy childbirth and the puerperium	Other current conditions classifiable elsewhere of mother, antepartum condition or complication	158	470,360
3	305.00	Mental	Alcohol abuse, unspecified	143	306,625
4	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	132	120,809
5	784.0	Symptoms, signs, and ill-defined conditions	Headache	116	273,079
6	845.00	Injury and poisoning	Ankle sprain	115	160,885
7	787.01	Symptoms, signs, and ill-defined conditions	Nausea with vomiting	110	374,366
8	883.0	Injury and poisoning	Open wound of finger(s), without mention of complication	92	113,989
9	789.06	Symptoms, signs, and ill-defined conditions	Abdominal pain, epigastric	90	273,201
10	338.19	Diseases of the nervous system and sense organs	Other acute pain	85	265,299
11	780.2	Symptoms, signs, and ill-defined conditions	Syncope and collapse	83	254,766
12	300.00	Mental	Anxiety state, unspecified	81	129,700
13	959.01	Injury and poisoning	Head injury, unspecified	80	320,278
14	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	75	289,327
15	789.09	Symptoms, signs, and ill-defined conditions	Abdominal pain, other specified site	74	318,750

Top 15 discharge codes for inpatient and emergency department visits, 15–24 years (Gila County), *n* = 3,375					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	94	409,059
2	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	82	227,974
3	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	67	49,163
4	845.00	Injury and poisoning	Ankle sprain	55	131,942
5	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	50	52,074
6	784.0	Symptoms, signs, and ill-defined conditions	Headache	50	126,694
7	463.x	Diseases of the respiratory system	Acute tonsillitis	40	119,436
8	780.2	Symptoms, signs, and ill-defined conditions	Syncope and collapse	37	206,017
9	493.92	Diseases of the respiratory system	Asthma, unspecified type, with acute exacerbation	36	141,584
10	650.x	Complications of pregnancy childbirth and the puerperium	Normal delivery	36	367,167
11	466.0	Diseases of the respiratory system	Acute bronchitis	35	98,258
12	664.01	Complications of pregnancy childbirth and the puerperium	First-degree perineal laceration, delivered, with or without mention of antepartum condition	34	498,111
13	682.3	Diseases of the skin and subcutaneous tissue	Cellulitis and abscess of upper arm and forearm	34	86,971
14	787.01	Symptoms, signs, and ill-defined conditions	Nausea with vomiting	34	56,363
15	786.59	Symptoms, signs, and ill-defined conditions	Other chest pain	32	146,402

Top 15 discharge codes for inpatient and emergency department visits, 15–24 years (Mohave County), *n* = 13,670					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	326	2,015,851
2	648.93	Complications of pregnancy childbirth and the puerperium	Other current conditions classifiable elsewhere of mother, antepartum condition or complication	318	1,096,731
3	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	309	1,249,586
4	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	269	401,418
5	784.0	Symptoms, signs, and ill-defined conditions	Headache	230	865,064
6	787.01	Symptoms, signs, and ill-defined conditions	Nausea with vomiting	211	1,018,214
7	845.00	Injury and poisoning	Ankle sprain	183	387,085
8	640.03	Complications of pregnancy childbirth and the puerperium	Threatened abortion, antepartum condition or complication	174	705,298
9	525.9	Diseases of the digestive system	Unspecified disorder of the teeth and supporting structures	148	143,286
10	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	138	252,615
11	646.63	Complications of pregnancy childbirth and the puerperium	Infectious of genitourinary tract in pregnancy, antepartum condition or complication	137	713,440
12	034.0	Infectious	Streptococcal sore throat	124	259,545
13	466.0	Diseases of the respiratory system	Acute bronchitis	123	356,507
14	786.59	Symptoms, signs, and ill-defined conditions	Other chest pain	116	743,599
15	300.00	Mental	Anxiety state, unspecified	114	359,382

Top 15 discharge codes for inpatient and emergency department visits, 15–24 years (Navajo County), *n* = 5,852					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	119	162,473
2	784.0	Symptoms, signs, and ill-defined conditions	Headache	93	289,695
3	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	81	338,589
4	648.93	Complications of pregnancy childbirth and the puerperium	Other current conditions classifiable elsewhere of mother, antepartum condition or complication	80	226,146
5	789.09	Symptoms, signs, and ill-defined conditions	Abdominal pain, other specified site	72	381,552
6	640.03	Complications of pregnancy childbirth and the puerperium	Threatened abortion, antepartum condition or complication	70	221,533
7	845.00	Injury and poisoning	Ankle sprain	69	113,486
8	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	67	100,933
9	959.01	Injury and poisoning	Head injury, unspecified	67	484,450
10	645.11	Complications of pregnancy childbirth and the puerperium	Post term pregnancy, delivered, with or without mention of antepartum condition	62	747,705
11	847.0	Injury and poisoning	Sprain of neck	59	381,036
12	305.00	Mental	Alcohol abuse, unspecified	57	270,274
13	311.x	Mental	Depressive disorder, not elsewhere classified	54	284,959
14	620.2	Diseases of the genitourinary system	Other and unspecified ovarian cyst	52	344,248
15	789.06	Symptoms, signs, and ill-defined conditions	Abdominal pain, epigastric	50	179,930

Top 15 discharge codes for inpatient and emergency department visits, 15–24 years (Yavapai County), *n* = 11,844					
Ranking	ICD-9	Category	Description	Encounters	Pay
1	789.00	Symptoms, signs, and ill-defined conditions	Abdominal pain, unspecified site	249	1,110,094
2	784.0	Symptoms, signs, and ill-defined conditions	Headache	227	926,005
3	462.x	Diseases of the respiratory system	Acute pharyngitis, inflammation of the throat	206	283,629
4	599.0	Diseases of the genitourinary system	Urinary tract infection, not specified	194	646,148
5	789.09	Symptoms, signs, and ill-defined conditions	Abdominal pain, other specified site	189	922,281
6	648.93	Complications of pregnancy childbirth and the puerperium	Other current conditions classifiable elsewhere of mother, antepartum condition or complication	187	542,520
7	787.01	Symptoms, signs, and ill-defined conditions	Nausea with vomiting	176	514,106
8	465.9	Diseases of the respiratory system	Acute upper respiratory infections of unspecified site	167	211,041
9	845.00	Injury and poisoning	Ankle sprain	144	234,282
10	786.50	Symptoms, signs, and ill-defined conditions	Chest pain, unspecified	141	598,070
11	300.00	Mental	Anxiety state, unspecified	136	302,655
12	883.0	Injury and poisoning	Open wound of finger(s), without mention of complication	131	204,637
13	466.0	Diseases of the respiratory system	Acute bronchitis	128	274,530
14	789.06	Symptoms, signs, and ill-defined conditions	Abdominal pain, epigastric	125	487,869
15	311.x	Mental	Depressive disorder, not elsewhere classified	123	566,304