

TEXAS HEALTHCARE TRANSFORMATION AND QUALITY
IMPROVEMENT PROGRAM
MEDICAID 1115 WAIVER

Regional Health Partnership 9: Community Needs Assessment Report



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Submitted to: Regional Health Partnership 9

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Executive Summary

Background: The Regional Healthcare Partnership (RHP 9) is one of 20 regional partnerships the Texas Health and Human Services Commission (HHSC) has defined for the Centers for Medicare & Medicaid Services (CMS) funded 1115 waiver program. RHP 9 includes Dallas, Denton, and Kaufman counties in the North Texas region. Parkland Health & Hospital System is the anchoring entity for RHP 9. The RHP 9 includes 25 providers serving the population with uniquely diversified characteristics. As per the program requirement, since the last community needs assessment in 2012 participants within the RHP's developed a regional plan identifying partners, community needs, proposed projects, and funding distribution focused on improving healthcare delivery. The DFW Hospital Council Foundation was engaged to perform this Community Health Needs Assessment to provide an updated analysis of the healthcare needs of the Regional Health Partnership 9 (RHP 9).

Purpose: This needs assessment was completed in fulfillment of the Texas Healthcare Transformation and Quality Improvement Program 1115 Waiver extension process. Over the last five years, the providers within these Counties have incorporated novel approaches in the areas of infrastructure development, program innovation and redesign, quality improvements, and population-based improvements to collectively address the health needs identified in the previous community needs assessment. The purpose of this community needs assessment is to update and bring current the identified health needs of the Counties and providers participating within RHP 9. The specific objectives of this assessment are:

- Identify the current regional health trends.
- Identify differences in trends from the previous Community Health Needs Assessment.
- Identify any improvements in healthcare trends.
- Provide a resource for stakeholders to make informed decisions in regard to the programs. and initiatives that will improve the health of people within the region.

Report development process: This data-driven process involved a comprehensive data collection strategy including hospitals, primary care providers, local agencies, community health data sources, county and state agencies as well as national datasets.

Key findings from previous Community Health Needs Assessment (2012)

The following regional priorities were identified as primary community health needs in the previous CHNA conducted in 2012:

- Capacity - Primary and Specialty Care
- Behavioral Health - Adult, Pediatric, and Jail Populations
- Chronic Diseases - Adult and Pediatric
- Patient Safety and Hospital Acquired Conditions
- Emergency Department Usage and Readmissions
- Palliative Care
- Oral Health

Key findings from current Community Health Needs Assessment (2017)

This new assessment presents an updated set of regional priorities as the primary community health needs within RHP 9. The following priorities and high-level strategies were the region's major community health needs:

- A. Capacity And Access- More Providers and Better Health Care Coverage: Improve Access to Primary and Specialty Care in Rural Areas.
- B. Chronic Diseases Care – Focused Care on Specific Chronic Diseases: Cardiovascular, Diabetes, Lung Cancer, Breast Cancer, Colorectal Cancer, and Respiratory Diseases.
- C. Care Coordination- Organized Culturally Competent Patient Care: Activities and Sharing of Information Across all Patient Care Participants including Oral Health and Palliative Care.
- D. Behavioral Health - Mental Health And Substance Abuse: Collaborative and Coordinated Efforts to Address Disparities Associated with Mental Health and Substance Abuse.
- E. Infant And Maternal Health: Community-Level Education, Awareness, and Coordination with Social Services to Reduce Infant and Maternal Mortality.

Bridging the Gap: In addition to above-focused priorities the following themes are key factors across all priority areas towards the ability to implement sustainable and improved care for the patient populations identified in this community needs assessment:

- Technology in Healthcare
 - Promoting Telehealth/Telepsych
 - Use of technology to improve health outcomes
 - Health Information Sharing Strategies
- Addressing Social Determinants of Health
- Advancing Nursing Workforce

Introduction

Overview: In December 2011, the Texas Health and Human Services Commission (HHSC) received approval from the Centers for Medicare & Medicaid Services (CMS) for a section 1115 Demonstration waiver that allows the state to expand Medicaid managed care while preserving hospital funding, provides incentive payments for health care improvements, and directs more funding to hospitals that serve large numbers of uninsured patients. The Texas 1115 Waiver started as a five-year demonstration program. Funding for programs are distributed to hospitals and other providers to support the following objectives: (1) for uncompensated care programs; and (2) to incentivize hospitals and other providers to transform their service delivery practices through Delivery System Reform Incentive Payment (DSRIP) programs.

Under the transformation waiver, eligibility to get Uncompensated Care or DSRIP payments required participation in a regional healthcare partnership (RHP). Participants in RHP's had to develop a regional plan identifying partners, community needs, the proposed projects, and funding distribution. HHSC identified 20 regions in Texas that define the geographic boundaries of the regional healthcare partnerships.

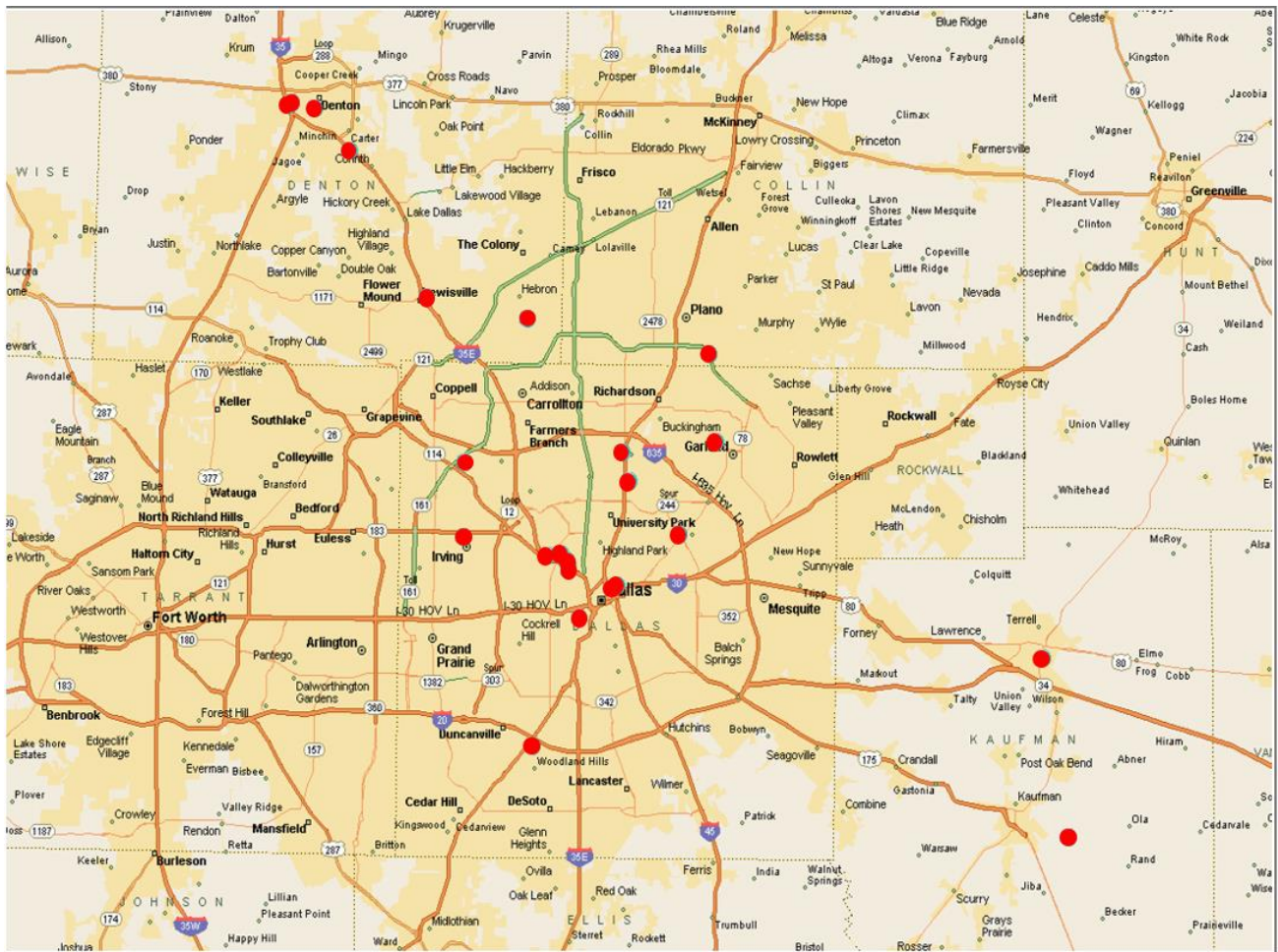
Partnership: Regional Healthcare Partnership (RHP) 9 includes Dallas, Denton, and Kaufman counties in the North Texas region. Parkland Health & Hospital System was designated as the anchoring entity for RHP 9. RHP 9 includes 25 providers serving the RHP 9 population with uniquely diversified characteristics.



These partners are:

	Name of the Organization		Name of the Organization
1.	Baylor Scott & White Medical Center – Carrollton	14.	Lakes Regional MHMR
2.	Baylor Scott & White Medical Center – Irving	15.	Methodist Charlton Medical Center
3.	Baylor Scott & White Medical Center – White Rock	16.	Methodist Dallas Medical Center
4.	Baylor Scott & White Medical Center – Garland	17.	Methodist Richardson Medical Center
5.	Baylor University Medical Center at Dallas	18.	Metrocare Services
6.	Children’s Health SM Dallas	19.	Parkland Health & Hospital System
7.	Dallas County Health & Human Services	20.	Texas A&M University Baylor College of Dentistry
8.	Denton County Health & Human Services	21.	Texas Health Presbyterian Hospital Dallas
9.	Denton County MHMR Center	22.	Texas Health Presbyterian Hospital Denton
10.	Medical City Denton	23.	Texas Health Presbyterian Hospital Kaufman
11.	Medical City Las Colinas	24.	UTSW - Faculty Practice Plan
12.	Medical City Lewisville	25.	UTSW - William P. Clemmons Jr. University Hospital
13.	Medical City Dallas	26.	Timberlawn (2013-2015)

Geographic area: RHP 9 partners indicated (in red) in North Texas Map.



Population: RHP 9 had an estimated population 3,448,687 in 2015, with 10.04 percent population growth between 2010 to 2015. The population of RHP 9 was about 12.6 percent of the state of Texas in 2015. RHP 9 had 29 percent uninsured residents in Dallas, 17 percent in Denton and 23 percent in Kaufman. Nearly 40 percent of RHP 9 residents were low-income earners (below 200 percent of poverty) in 2015. The total land mass of RHP 9 is 2,530 square miles.

Community Health Needs Assessment (CHNA)

This needs assessment was completed in fulfillment of the Texas Healthcare Transformation and Quality Improvement Program 1115 Waiver extension process. Over the last five years, the providers within these counties have incorporated novel approaches in the areas of infrastructure

development, program innovation and redesign, quality improvements, and population-based improvements to collectively address the health needs identified in the previous community needs assessment. The purpose of this community needs assessment is to update and bring current the identified health needs of the counties participating within the RHP 9. RHP 9 includes three counties: Dallas, Denton, and Kaufman. The specific objectives of this assessment are:

- Identify the current regional health trends
- Identify differences in trends from the previous Community Health Needs Assessment
- Identify any improvements in healthcare trends.
- Provide a resource for stakeholders to make informed decisions in regards to the programs and initiatives that will improve the health of people within the region.

Summary from Previous Community Health Needs Assessment 2012

In 2012, the following regional priorities were identified as primary community health needs and were recommended for consideration as a context for identification of strategies and recommended actions of the Regional Health Partnership 9 plan:

- Capacity - Primary and Specialty Care: The demand for primary and specialty care services exceeds that of available medical physicians in these areas, thus limiting healthcare access for much low-level management or specialized treatment for prevalent health conditions.
- Behavioral Health - Adult, Pediatric, and Jail Populations: Behavioral health, either as a primary or secondary condition, accounts for substantial volume and costs for existing healthcare providers, and is often utilized at capacity, despite a substantial unmet need in the population.
- Chronic Disease - Adult and Pediatric: Many individuals in North Texas suffer from chronic diseases that present earlier in life, are becoming more prevalent, and exhibit more severe complications.
- Patient Safety and Hospital Acquired Conditions: Continued coordinated effort is needed to improve regional patient safety and quality.
- Emergency Department Usage and Readmissions: Emergency departments are treating high volumes of patients with preventable conditions or conditions that are suitable to be addressed in a primary care setting. Additionally, readmissions are higher than desired, particularly for those with severe chronic diseases or behavioral health.
- Palliative Care: Overall, costs are high in skilled nursing facilities, long-term care facilities, hospice and home health sectors, and slightly higher in physician services.

- Oral Health: In Texas, preventative visits are below the recommended levels, and access can be a problem for minorities, the elderly, children on Medicaid, and other low-income children. Compounding the issue is the shortage of dentists in Texas as approximately 60 percent of the national ration of the dentists to the population.

Summary from the Current Community Health Needs Assessment 2017

This new assessment presents an updated set of regional priorities as the primary community health needs within RHP 9. The following priorities and high-level strategies were identified as RHP 9's major community health needs.

- A. Capacity and Access- More providers and better health care coverage: Improve access to care to primary and specialty care especially in rural areas.
- B. Chronic Diseases Care – Focused Care on Specific Chronic Diseases: Cardiovascular Diseases, Diabetes, Lung Cancer, Breast Cancer, Colorectal Cancer, and Respiratory diseases.
- C. Care Coordination- Organized Culturally Competent Patient Care Activities and Sharing of Information Across all Patient Care Participants.
 - a. Preventative Care
 - b. Immunization and Communicable diseases
 - c. Patient Safety and Quality-Hospital Acquired Conditions
 - d. Oral Health
 - e. Palliative Care
- D. Behavioral Health - Mental Health and Substance Abuse: Collaborative and coordinated efforts to address specific disparities associated with mental health and substance abuse.
- E. Infant and Maternal Health: Community-level education, awareness, and coordination with social services to reduce infant and maternal mortality.
- F. Bridging the Gap: Sustainability Themes

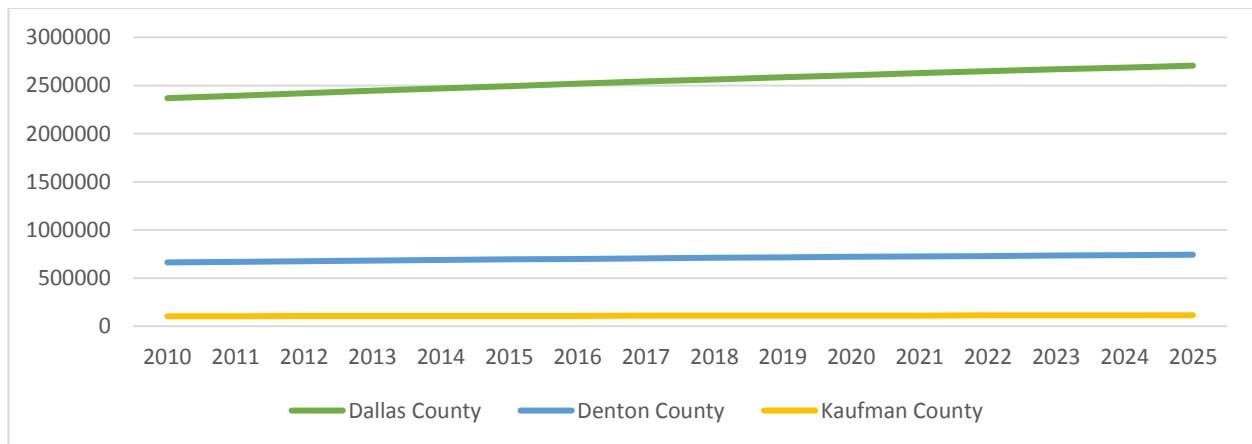
RHP 9 Demographics

In population, Texas is the second largest state in the nation, with more than 27,469,114 million people in 2015. From 2010 to 2015, Texas experienced a 9.24 percent growth in population, as compared to a 4.08 percent increase nationally in the same time frame.¹ The population of Texas is projected to grow by 8.9 percent to about 29.9 million people in 2020.

Regional Healthcare Partnership (RHP) 9 includes Dallas, Denton, and Kaufman counties in the North Texas region. It had an estimated population 3,448,687 in 2015, with 10.04 percent population growth between 2010 to 2015.² The population of the RHP 9 area was about 12.6 percent of the state of Texas in 2015.³

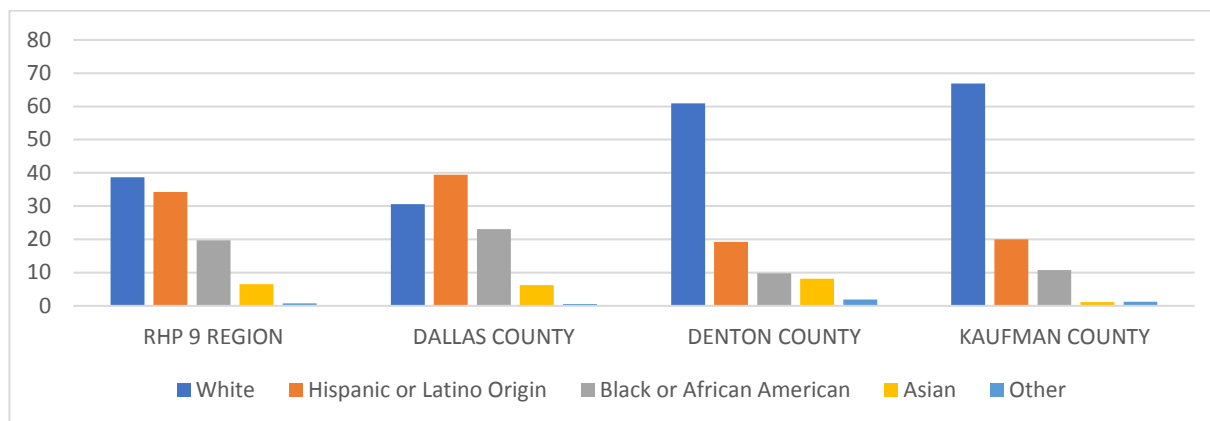
The North Texas area has experienced significant population growth and economic indicators point to continued population growth. RHP 9 has had a steady increase in its population from 2010 to 2015, and that trend is estimated to continue up to the year 2025. The region is expected to experience an 8.12 percent population growth between 2015 to 2025 with an estimated population of 3,561,812 in 2025. Dallas County is expected to grow its population by 8.5 percent between 2015 to 2025, while Denton and Kaufman counties are expected to grow 7.1 percent and 6.5 percent **(Figure 1)**.

Figure 1: Population estimate of Dallas, Denton and Kaufman Counties⁸



Females represented about 50.79 percent of the total population in the area in 2015². The whites (non-Hispanic) were the dominant racial group in RHP 9 making up approximately 38.65 percent of the total population in 2015. The Hispanic and Latino population was 34.30 percent of the total population in 2015 followed by the Black/African American population (19.7percent)². **Figure A.2** explains race /ethnic distribution in different RHP 9 counties.

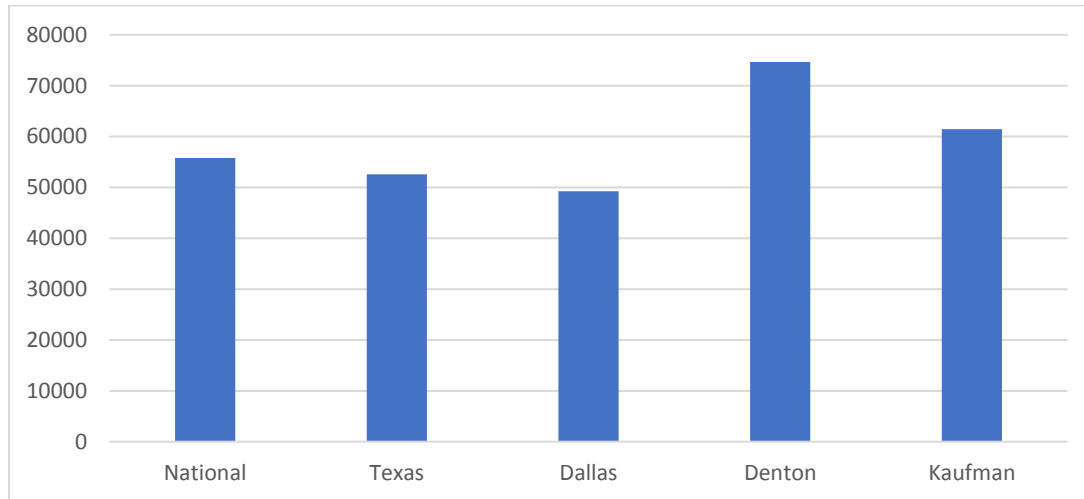
Figure 2: Race and Ethnicity Distribution of RHP 9 Counties in 2015⁹



Most of the residents (62.73 percent) in RHP 9 were between the ages of 18 and 65 years⁴. In addition, nearly, 26.50 percent of the residents were under 18 years, while 10.77 percent were over 65 years. An estimated 7.40 percent of the total population were children under the age of 5 years. The prevalence of disability among people under 65 years old in 2014 was 6.6 percent³.

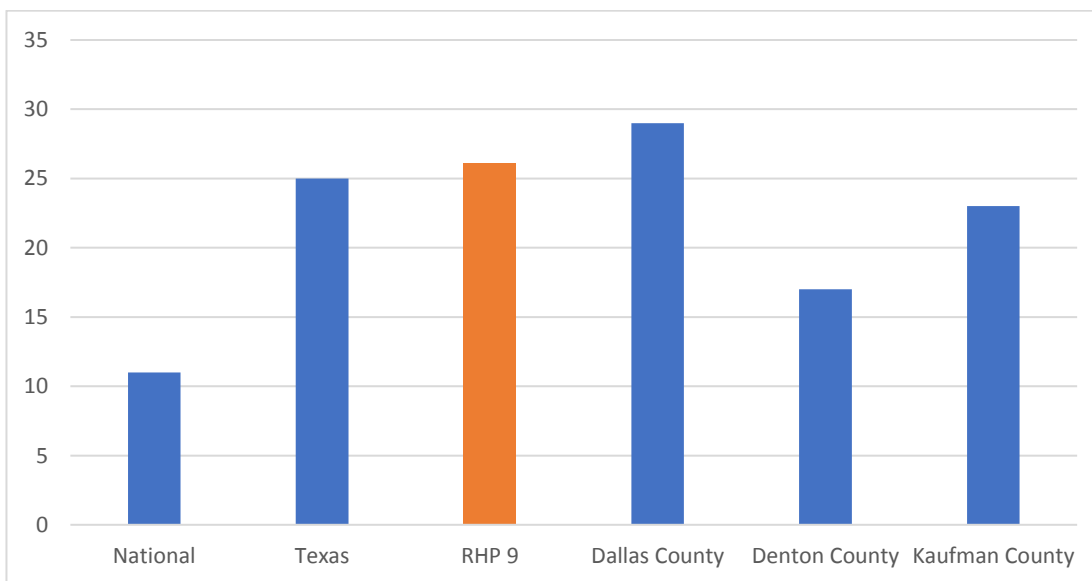
Poverty can be both a cause and effect of adverse health outcome. Dallas County had the highest number (19.3 percent) of people living in poverty in RHP 9 in 2014. The prevalence of poverty in Dallas County was greater than the rate in Texas (17.2 percent) and nationally in the USA (14 percent) average. In comparison, Kaufman and Denton counties had poverty rates 13.8 percent and 8.7 percent in 2014.^{3,4} Nearly 40 percent of Dallas County residents are low-income earners³. Dallas County had a median household income lower than the state and national median (**Figure 3**). Dallas County had the least median household income in the RHP 9 area (\$49,225) as compared to Denton (\$74,662) and Kaufman (\$61,459) counties from 2010 to 2014. This is consistent with the prevalence of poverty in the region, with Dallas County having the highest prevalence of poverty, followed by Kaufman County and Denton counties. At the same time, Denton and Kaufman counties are less populated (754.3 and 132.4 per square mile respectively) than Dallas County (2,950 per square mile).

Figure 3: Median Household Income of RHP 9 Counties in 2014



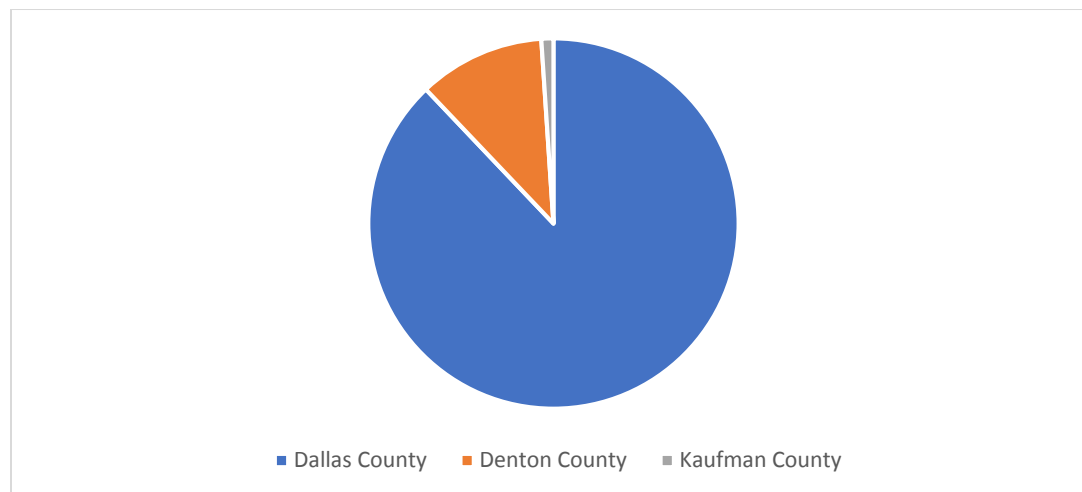
There is a significant correlation between poverty and health insurance status. The uninsured rate in RHP 9 is 29 percent in Dallas County, 17 percent in Denton County and 23 percent in Kaufman County. Evidence suggests that 26.1 percent of the people under the age of 65 years in RHP 9 did not have health insurance in 2015 (**Figure 4**). Lack of insurance impacts accessibility to health care which leads to adverse health outcomes and a higher costs of treatment in hospital emergencies.⁷

Figure 4: Percent of Population under age 65 without health insurance in RHP 9 Region Counties¹⁰



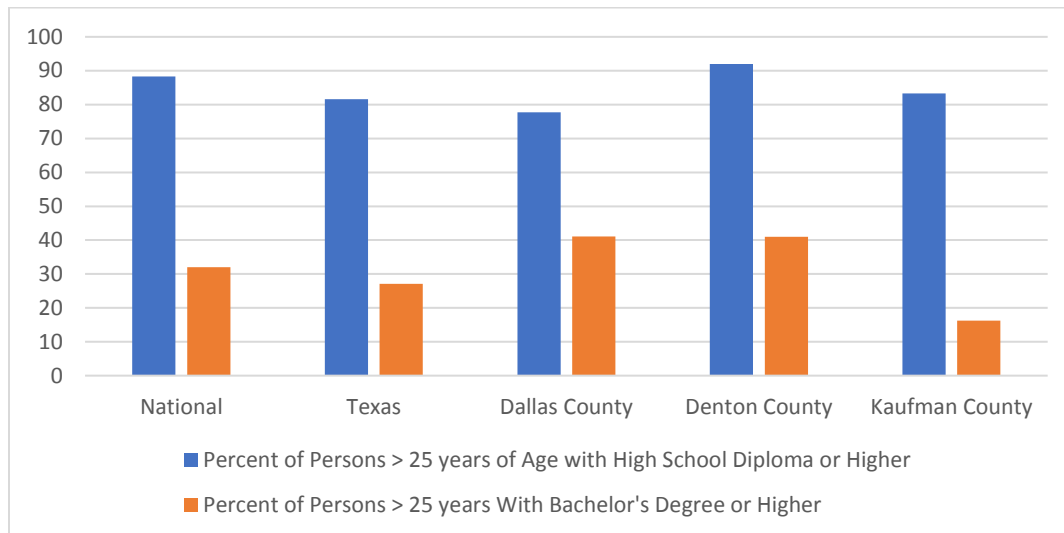
The total healthcare expenditure in RHP 9 in 2014 was \$22,392,504,000. This healthcare spending is approximately 15.4 percent of the total health care expenditure in the state of Texas. **Figure 5** explains that Dallas County accounted for the largest share of the expenditure with about 88 percent of the total spending of RHP 9. Denton County (11 percent) was next and Kaufman County (1 percent) was least.⁵

Figure 5: Total Healthcare and Social Assistance Receipt and Revenue in RHP 9 Counties in 2014⁵



Educational attainment: The percentage of the population 25 years of age or older with a high school diploma or higher, and the percentage of the people 25 years or older with a bachelor's degree or higher are generally used to assess the educational attainment in a geographical region. RHP 9 had higher educational attainment in both categories (84.2 percent and 32.73 percent respectively) as compared to the state average (81.6 percent and 27.1 percent respectively). In RHP 9, Denton County had the highest educational attainment in both categories between 2010 and 2014 in the RHP 9 area^{4,6} (**Figure 6**). RHP 9 has total 32 higher education institutions (colleges and universities) providing a wide range of opportunities to residents from this area.

Figure 6: Educational Attainment in RHP 9 Counties⁶



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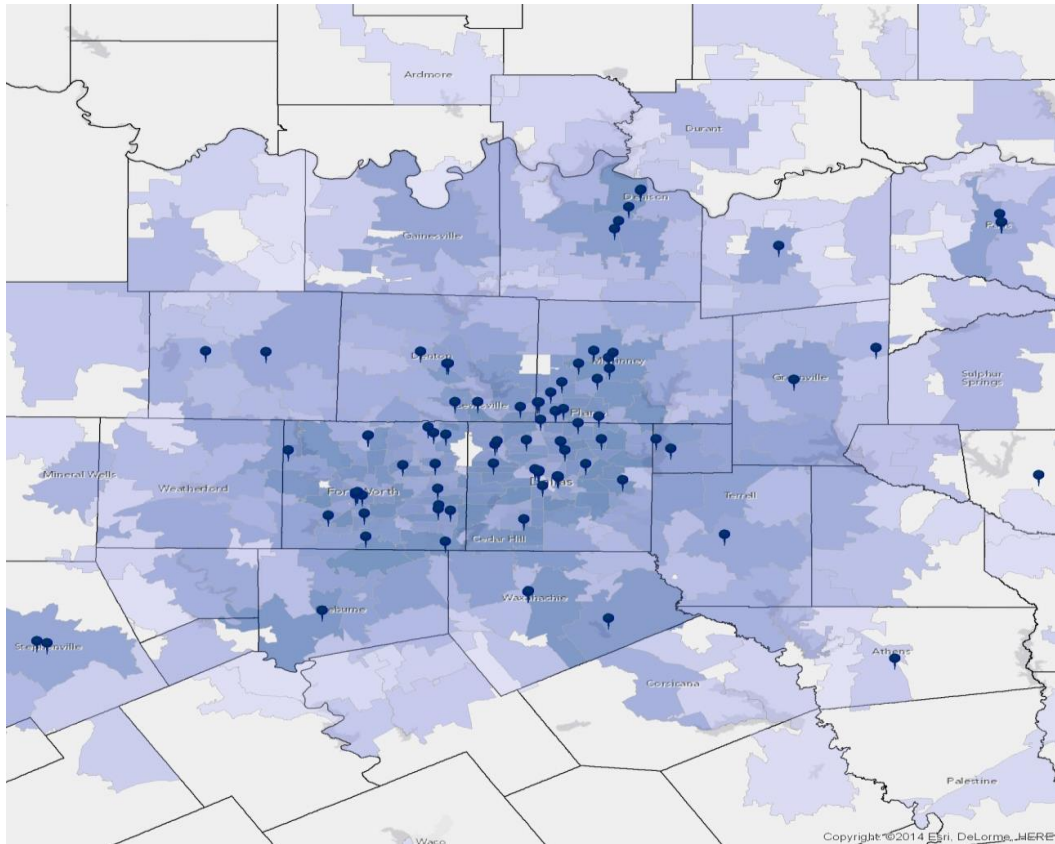
Methods

Clinical Data Source: The Dallas- Fort Worth Hospital Council Foundation (DHWCF) is a collaborative data warehouse containing hospital related information on 11.5 million patients, with more than 53 million encounters since 1999. This warehouse collects data from 95 percent of the hospitals in North Texas that serves 97.67 percent of the Dallas-Fort Worth-Arlington Metroplex and surrounding communities in rural, urban and community settings (86 hospitals, 17 counties and over 5.5 million hospital visits per year). These records reveal demographic data, payer types, up to 25 diagnoses and surgical/testing procedure codes, charges, current procedural terminology (CPT) codes, the severity of disease, and other information. With the regional enterprise master patient index (REMPI), the DFWHC Foundation assigns a unique identifier to all patients using Regional Enterprise Master Patient Index (REMPI), allowing the Foundation researchers to track any patient over time by the hospital and by payer^{1,8}.

For RHP 9, DFWHC Foundation's warehouse contains 100 percent hospital claims data for Dallas, Denton and Kaufman Counties. Data includes 37 hospitals (9,177 beds) including acute care, rehab/ LTC/ SNF, psychiatric, pediatric and ambulatory surgery in Dallas County, total 7 acute care facilities (923 beds in total) in Denton County and 1 acute care facility (91 bed) in Kaufman County.

Map 1. indicates DFWHC Foundation's data initiative partner hospitals in the North Texas region (17 Counties). Total 86 facilities are currently participating in this initiative. Dallas, Tarrant, Collin and Denton Counties cover the majority of the healthcare market in this region.

Map 1: DFWHC Foundation's Healthcare claims data initiative coverage



Note: Color intensity on map is normalized against the population for the Zip Code

Other Data Sources include national and state health database, Health and Human Service Department, Department of State Health Services, Center for Medicare and Medicaid Services (CMMS), Center for Disease Control (CDC), Healthy People 2020, Census Data, Healthy North Texas Website based community health and disparity data, County Health ranking, Labor statistics, Reports from Institute of Medicine, Reports from American Hospital Association, Workforce reports, state, regional and local county reports and reports published by local community-based organizations and non-profits.

Strategic Priorities and Findings

A: Capacity and Access

Health Delivery System and Capacity: In the North Texas region, there are many outpatient clinics, surgical centers, physician-owned hospitals, long-term acute care centers, rehabilitation centers, urgent care facilities, and other health provider services that are available to children and adults. **Table A.1** shows healthcare facilities in RHP 9 Counties.

Table A.1: Healthcare facilities in RHP 9 region*

	Dallas County	Denton County	Kaufman County
All-State Listed Healthcare Facilities*	134	34	3
Cases (hospital visits) in 2015	7,493,569	1,203,345	123,983

*Including Hospitals (82), ambulatory and Surgery centers (51), Rehab facilities, specialty hospitals, Timberlawn and Green Oaks behavior health Center, children’s surgery centers, GI endoscopy centers and eye surgery centers.

Acute care facilities: A report on the utilization data of Acute Care Hospitals in Texas by the Texas Department of State Health Services² showed that there are 56 acute care hospitals and 4 psychiatric hospitals in RHP 9. Dallas County has 75 percent of the acute care facilities (42), followed by Denton County (13) and Kaufman county having only one at the time of the assessment. Data from five hospitals are not included in this study, these hospitals are Crescent Medical Center Dallas; North Texas Hospital Denton; Victory Medical Center Plano; Acute Rehabilitation Hospital Plano and Renaissance Hospital Terrell.

Psychiatric facilities: There are four psychiatric/mental health hospitals in RHP 9 with a combined capacity of 632 beds². Three of the four hospitals are in Dallas and one is in Kaufman. The psychiatric hospitals are listed as below:

- Green Oaks Behavioral Healthcare Services, Dallas – 124 beds
- Timberlawn Mental Health System, Dallas – 144 beds
- Hickory Trail (Former Cedars) Hospital, Desoto, Dallas – 76 beds
- Terrell State Hospital, Kaufman – 288 beds

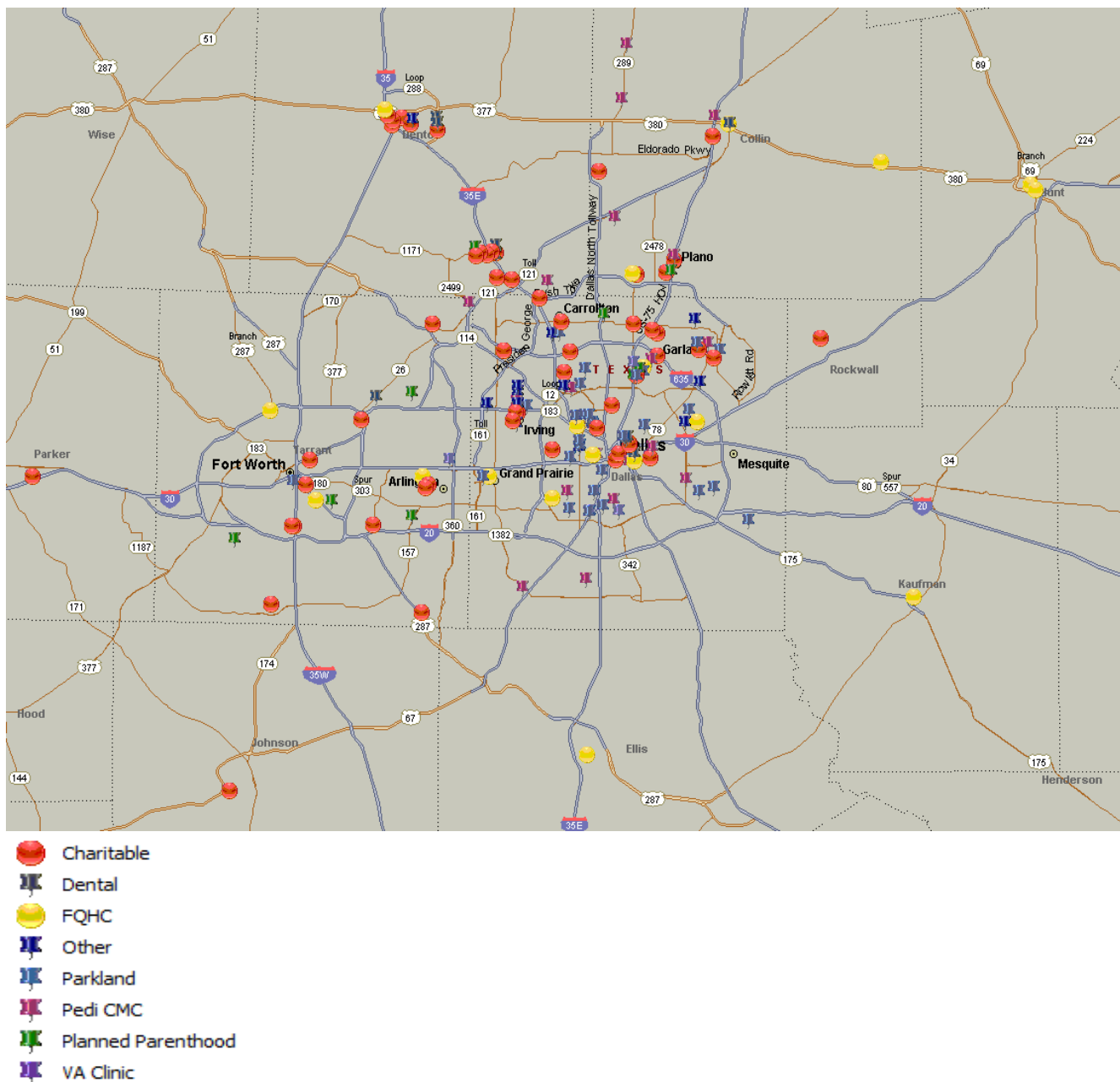
Additionally, other hospitals listed below also have beds (479 in total) specifically allocated to psychiatric patients (**Table A.2**).

Table A.2: Psych bed numbers in RHP 9 hospitals.²

Hospital	County	Number of Beds
University of Texas Southwestern Medical Center	DALLAS	18
Dallas Behavioral Healthcare Hospital LLC	DALLAS	102
Sundance Hospital Dallas	DALLAS	100
Children's Medical Center of Dallas	DALLAS	21
Parkland Memorial Hospital	DALLAS	12
Texas Health Presbyterian Hospital Dallas	DALLAS	48
University Behavioral Health of Denton	DENTON	100
Mayhill Hospital	DENTON	49
Carrollton Springs	DENTON	29

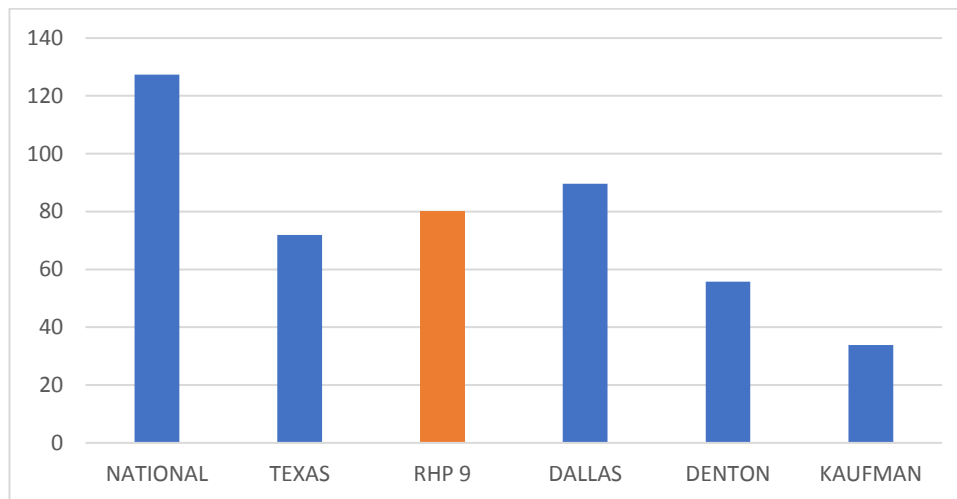
Community Clinics: Charitable clinics are an important community resource for underserved and uninsured communities (**Figure A.1**). Dallas has a total of 145 community clinics including 29 charitable clinics, 10 federally qualified health centers (FQHC), 49 Parkland Hospital and Health System's clinics, 14 pediatric clinics by Children's Health, 4 Planned Parenthood clinics, 4 Veteran Administration clinics, 18 Dental community clinics and 12 other family clinics. Denton County has 17 charitable clinics, 1 FQHC, 2 Planned Parenthood Clinics, 3 Dental and 1 community clinic. Kaufman County has only one FQHC.

Figure A.1: Location of Community Clinics in North Texas³



Primary care services: RHP 9 and the state of Texas, in general, are affected by limited physician capacity in primary and select specialties. A study by the North Texas Regional Extension Center on physician demography in Texas during 2015, revealed that Texas ranks 47th in the nation in terms of Primary Care Physicians per 100,000 population⁴. The Primary Care Physician per 100,000 population in RHP 9 is 79.7 per 100,000 people which are slightly higher than the Texas average of 71.9 Primary Care Physician per 100,000⁵ (**Figure A.2**). However, both RHP 9 and Texas lag significantly behind the national average of 127.4 Primary Care Physician per 100,000 people.

Figure A.2: Primary Care Physician Per 100,000 Population in RHP 9 Counties (2015)¹



There is a disparity in the availability of primary care physicians in urban and rural areas, with significantly limited access in remote and rural geographies.

When considering physicians of all specialties per population in 2014, Texas has an average of 182.6 per 100,000 population and it is ranked 41st nationally⁶. There are more physicians of all specialties per population in RHP 9 than the state of Texas. The RHP 9 area has an average physician per population of 208.9/100,000 people. However, there is a disproportionate distribution of the physicians in the region as Dallas County accounts for 85 percent of the physician population in the area. Dallas County is home to over 134 healthcare facilities and it has a physician per population average of 238.7/100,000 people, which is higher than the national average. Denton has a physician to a population density of 131.4/100,000 individuals while Kaufman has the least with 46.9 physicians/100,000 people.

The physician supply trends in Texas have consistently increased over the past 5 years. The number of physicians in Texas grew by 39 percent during 2004 to 2014 and RHP 9 experienced a growth of 45 percent in physician supply over the same period including a 47 percent increase in Dallas, 41 percent in Denton and 21 percent in Kaufman counties.

Federal designations: A health professional shortage area, or an HPSA, is an area or population group with a shortage of primary care physicians, as defined by a population-to-primary care physician ratio of at least 3,500:1 and other requirements designated by the US Department of Health and Human Services. The poverty rate, infant mortality rate, fertility rate and physical distance from care are all considered in scoring HPSA designation.

Medically Underserved Areas or Populations (MUAs/MUPs) are generally defined by the federal government to include areas of populations with a shortage of personal health care services. Originally, community health center grant funds were sent to areas of greatest need based on MUA/MUP designation. Scores can be a composite index for MUAs, or unusual local conditions resulting in barriers to access medical services.

For RHP 9 counties, the number of federally designated MUA/ MUP and HPSA are:

- Dallas County has 38 HPSA 's and 19 MUA regions that overlap
- Denton is a county-level HPSA and 1 MUA
- Kaufman County is a county-level HPSA and 2 MUA's

Federal Qualified Health Center (FQHC): health facilities that are situated in an underserved area or population and provide comprehensive healthcare to the community including medical health care, oral care, behavioral health, women and pediatric health care. There are four FQHCs' in the Dallas County:

1. Healing Hands Ministries
2. Las Barrios Unidos Community Clinic
3. Mission East Dallas
4. Foremost Family

Denton County has one FQHC (Health Services of North Texas) while Kaufman county does not have an FQHC. In Kaufman County, basic health services are provided by county health department. Also, Health Services of North Texas provides HIV related services for Kaufman County residents.

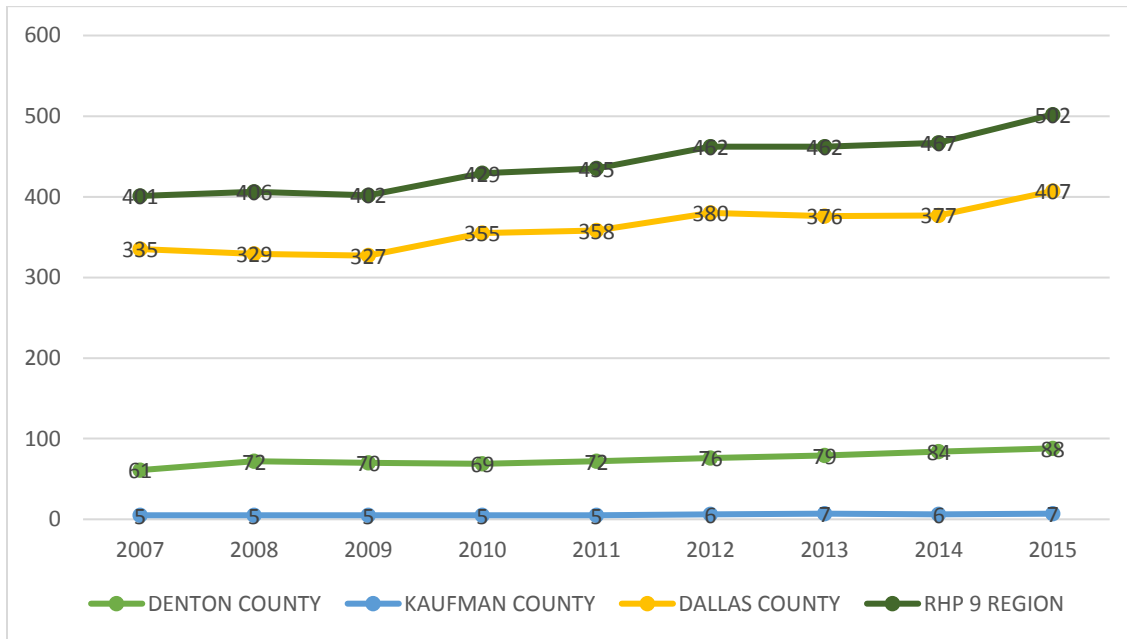
Children/Youth: The impact of the limited primary and specialty care is significantly profound for children and families in the region. With the current pediatric need being more than 80 percent of the current supply, in rural and urban areas the demand for primary care services is much higher than what is currently provided. In Dallas county, 15.2 percent of children had no health insurance in 2013 and Denton County reported about 10.6 percent uninsured rate for children in 2013, this has exacerbated the issue of availability of primary care access and treatment⁷. Additionally, data indicates that many of the pediatric specialists are limited creating a backlog pipeline for those needing specialty services after seeking primary care.

In 2015, there were 502 pediatricians in RHP 9 for an estimated pediatric (under-18 years of age) population of 913,902 people. The pediatrician/100,000 population ratio in RHP 9 is 54.9/100,000

people under-18 years. Dallas County has the highest pediatrician concentration with a pediatrician/population estimate of 59.6/100,000, Denton County is next with a ratio of 43.7/100,000 while Kaufman County has the least number of pediatricians with a ratio of 22.1/100,000 in 2015⁴.

Over the past 10 years, there has been a steady growth in the number of pediatricians in RHP 9 (Figure A.3).

Figure A.3: The number of Pediatricians in RHP 9 from 2007 to 2015.⁴



Patient Migration Pattern and Healthcare Access: An analysis of the Dallas-Fort Worth Hospital Council Foundation's Information and Quality Services Data Warehouse identified significant patient migration patterns within multiple RHP regions. As demonstrated in the commute patterns of North Texas, many individuals receive health care services in nearby counties, in some cases even when services may be available in their county of residence. In the Dallas County, 87 percent residents accessed their health care in Dallas County hospitals. In Denton County, 63 percent residents used health care in Denton County (Figure A.4) and in Kaufman county, only 29 percent of residents accessed health care in Kaufman County (Figure A.5).

Figure A.4: Denton County Patient Migration between 2012 to 2015.

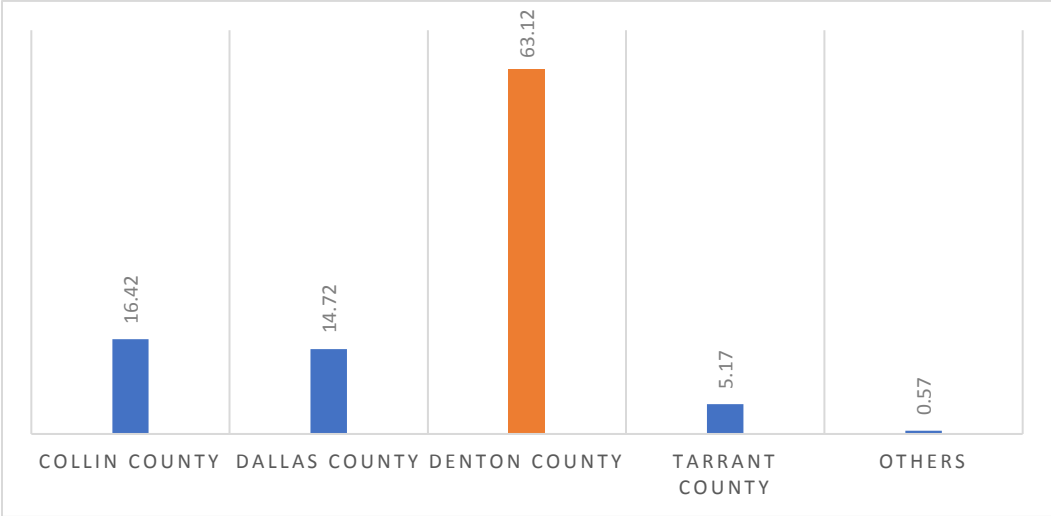
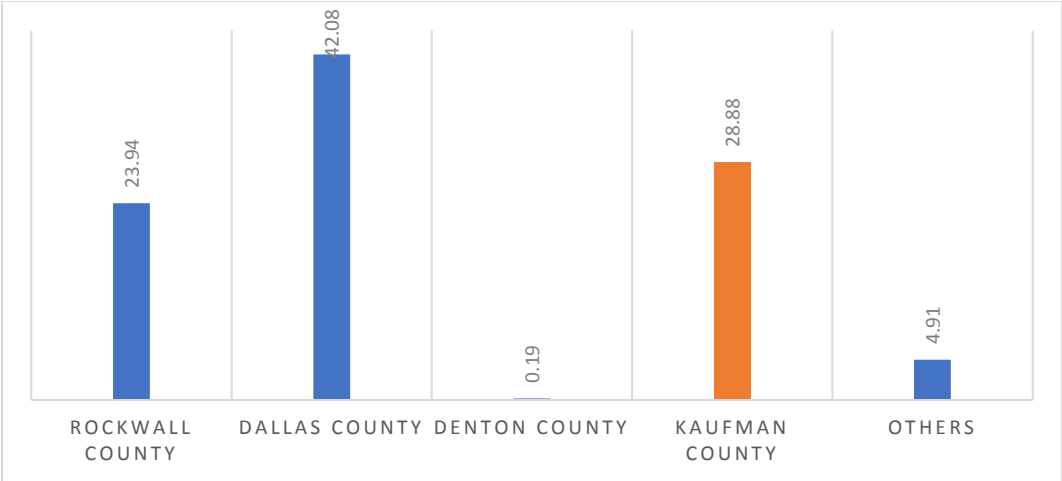
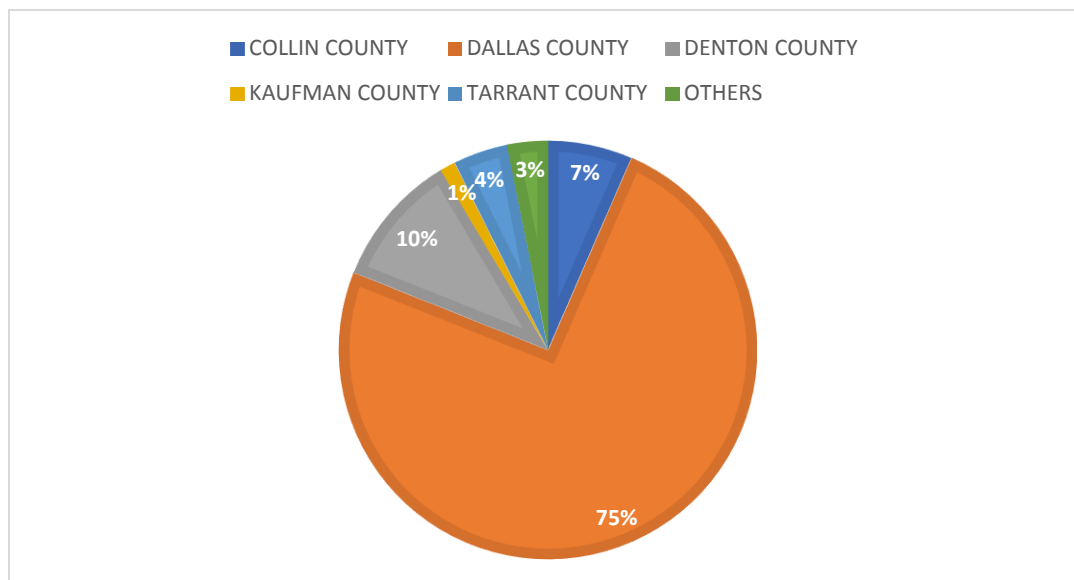


Figure A.5: Kaufman County Patient Migration between 2012 to 2015.



Dallas County serves as the primary hospital care provider for RHP 9 residents (75 percent) followed by Denton County (**Figure A.6**).

Figure A.6: Hospital County where RHP 9 residents accessed healthcare during 2012-2015.



***Summary:** Evidences suggest severe healthcare provider shortage in rural areas. Kaufman County has primary care provider to people (adult and pediatric both) ratio far below the national and state average. 100 percent of Denton and Kaufman counties are Health Professional shortage areas as designated by the US Dept. of Health and Human Services. Patient migration patterns show that not having adequate primary and specialty care in surrounding counties causes additional burden on Dallas County care providers, especially on Parkland Health & Hospital System.*

In RHP 9, Dallas County has a higher concentration of primary and specialty care as compared to Denton and Kaufman Counties. Provider growth data show an increase in Dallas County whereas Denton and Kaufman Counties show slow growth between 2007 to 2015. Five Years of Physician Supply Increases about 4 percent per year in Texas from 2004 to 2014 (39 percent over the period). Data show similar growth in RHP 9, but with only half the rate in Kaufman (21 percent over the period). In the future, continued expansion of the provider population will be necessary to provide timely access to care in all areas of RHP 9 and in all specialties – primary care, pediatrics and most specialty physicians. Continued efforts to increase the provider population and programs that incentivize access in rural areas would benefit the populace of RHP 9. These could include additional workforce members, expanded practice scopes, and technological innovations to allow for remote access to care when appropriate for the patients.

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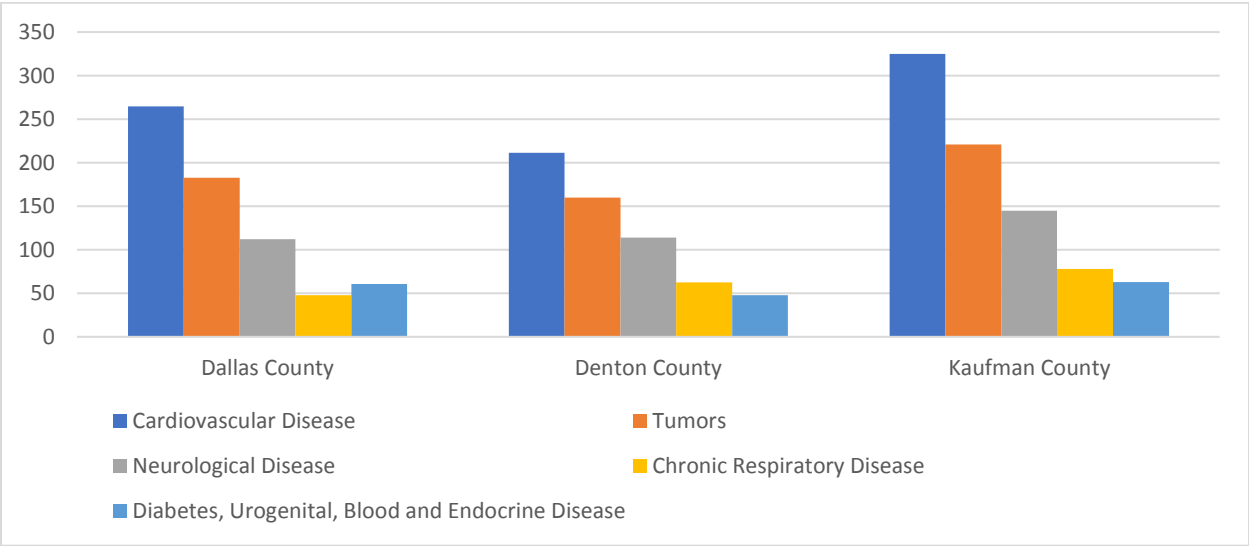
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B: Chronic Disease Care & Prevention

Chronic diseases, generally defined as a condition that is slow in progression and long in duration, are increasing in the general population and significantly impacting individuals' function, productivity, and quality of life¹. Chronic illnesses have a significant impact on the social and economic aspects of many residents of North Texas.

Like national trends, RHP 9 and North Texas are experiencing increasing rates of many chronic diseases. A review of a county-level trend in mortality rate for leading causes of death, from 1980 to 2014 in the United States revealed that the five leading causes of mortality across the three counties in the RHP 9 area are chronic diseases². The five diseases contributing the most to the mortality rate in RHP 9 include Cardiovascular Disease, Tumors, Neurological Disease, Diabetes Mellitus/Urogenital/Blood/and other Endocrine diseases and Chronic Respiratory Disease (**Figure B.1**).

Figure B.1: Top five leading causes of death (mortality rate per 100,000 people) in RHP 9 counties between 1980 to 2014.⁷



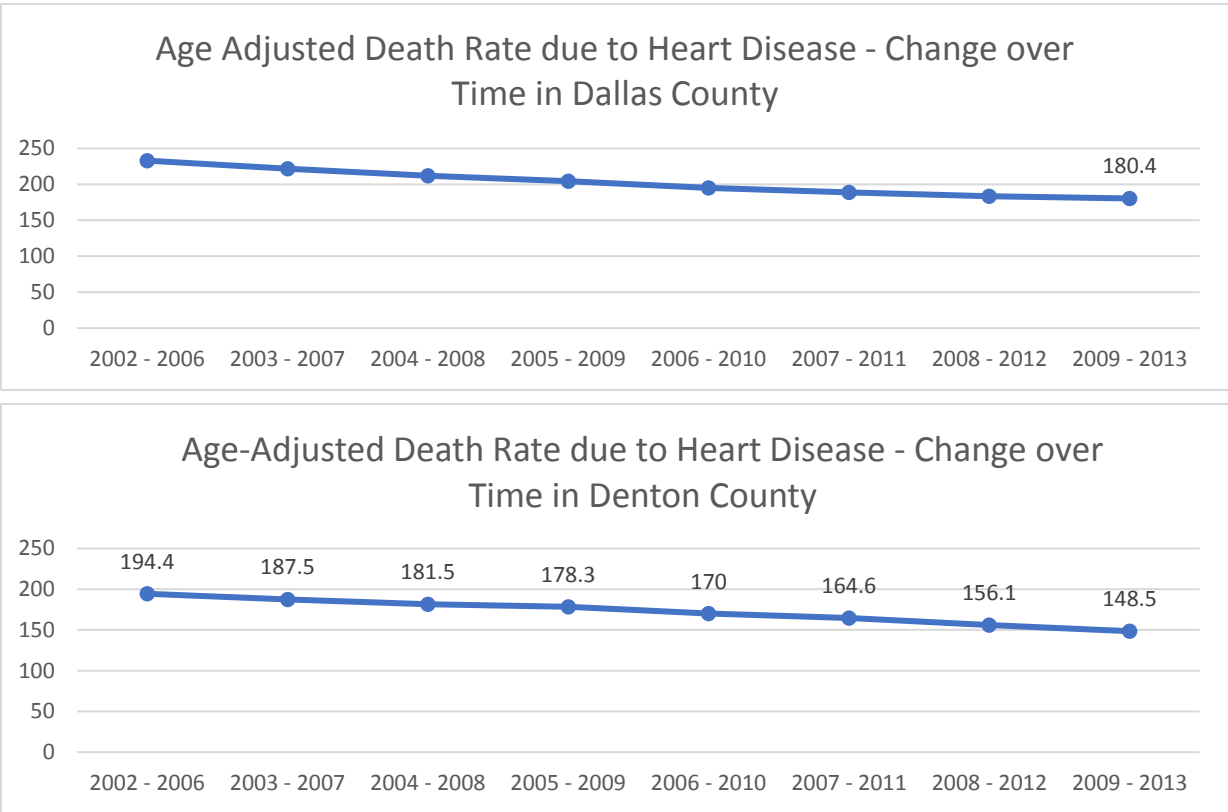
Heart Disease and Stroke Cardiovascular disease is the leading cause of death in RHP 9, and nationally in the United States. Stroke is the third leading cause of death in the United States. The mortality associated with heart disease and stroke are interlinked, as cardiovascular disease can lead to stroke, which can worsen the morbidity and mortality related to cardiovascular disease. Heart disease related readmissions are increasingly being used as a quality metric, a basis for hospital reimbursement, and an outcome measure in related clinical trials³. An expanded focus on

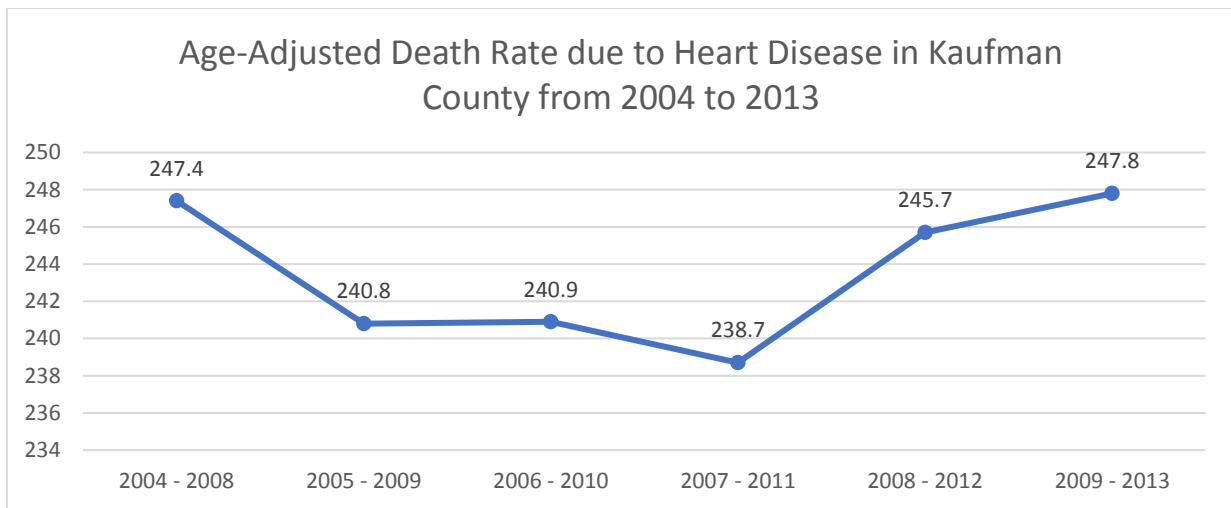
the coronary vascular disease as well as the promotion of positive cardiovascular health should be incorporated into the population health strategies^{4,5}.

The mortality associated with heart disease in the Dallas and Denton counties has progressively declined over the past 15 years. Although recently reported 2014 data suggest a further reduction in all three counties (178.3/100,000 in Dallas County, 139.5/100,000 in Denton County and 245.1/100,000 in Kaufman County) as compared to 2013 data shown below (**Figure B.2**). Dallas and Kaufman Counties still have a higher rate as compared to the Texas state value (175.5/100,000) and national value (171.9/100,000)⁷.

The age-adjusted death rate for Kaufman County has been consistently higher than Dallas and Denton Counties. Also, the trend of the age-adjusted mortality rate in Kaufman County has been vacillating, it declined from 2004 to 2009 and subsequently increased from 2009 to 2013.

Figure B.2: Age-Adjusted Death Rate due to Heart Disease in Dallas, Denton and Kaufman Counties.⁷





Males suffered more mortality from heart disease than females in all three counties. Racial distribution showed higher mortality in blacks followed by whites and Hispanics.

A recent study by DFWHC Foundation’s researchers³ indicates that heart-related disease was the number one cause of hospital 30-day readmissions in North Texas facilities between 2013-2015 ranging 17.5 percent to 18 percent. The readmissions rate varied by patient residence county. Residents of Dallas and Tarrant Counties had the highest readmission rate between 10-34 percent whereas Denton and Collin counties represented 5-10 percent of all 30-day readmissions. Kaufman County had a 1-2 percent 30- day readmission rate. Results also indicate that patients 65 or older were nearly five times as likely to readmit than patients in the 18-44 age group. Whites patients had the highest proportion of 30-day readmissions than all other races. Non-Hispanic patients had proportionally higher readmissions than the Hispanic or Latino group. Medicare had the highest 30-day readmission rate of all payers. Also, patients who were discharged to home had the highest proportion (57-60 percent) of readmissions as opposed to discharged to hospice or transferred to another care facility.

Facilitated by DFWHC Foundation, Cardiothoracic Surgeons in DFW region are working towards developing best practices in surgical procedures related to the heart. This initiative is known as Texas Quality Initiative (TQI) and is focused on improvement of the quality of clinical/ surgical practice and developing best practices in cardiac surgery.

Stroke: The age-adjusted death rate due to stroke in Texas has been higher than the national average and Healthy People 2020 target. Dallas and Kaufman Counties have higher age-adjusted death rate due to stroke as compared to the state and national average as well as Healthy People

2020 target (**Table B.1**). Denton County meets the Healthy People 2020 target with much lower death rate (34.8) due to stroke than Dallas and Kaufman Counties. In RHP 9 Counties Kaufman County has the highest rate (47.5) of age-adjusted death rate due to stroke.

Data suggest that stroke (percent population) in Medicare population in Texas is higher than the national average. Dallas County has higher stroke percent in Medicare population than state and national average. Kaufman County and Denton County have higher percent than the national average but below the state average^{6,7}.

Table B.1: Age-Adjusted Death Rate due to Stroke in Dallas, Denton and Kaufman Counties.⁷

Stroke	Dallas	Denton	Kaufman	TX Value	US Value	HP 2020 Target
Age-Adjusted Death Rate Due to Stroke 2010-2014 (deaths per 100,000 population)	45.2	34.8	47.5	42.6	37.3	34.8
Stroke in Medicare Population 2015 (Percent)	4.6	4.1	4.4	4.5	4.0	—

Type 2 Diabetes (T2DM) is the 7th leading cause of death. Nearly 25 percent of Americans with diabetes are undiagnosed, and 57 million have blood glucose levels that increase the risk of developing this condition in the next few years. Diabetes lowers life expectancy by up to 15 years, increases the risk of heart disease by 2 to 4 times, and is the leading cause of kidney failure, lower limb amputation, and adult-onset blindness. Dallas County’s estimated diabetes prevalence is 11 percent, matching the State of Texas. In comparison, Denton County’s diabetes prevalence rate sits at 10 percent and Kaufman County at 10.7 percent. In the State of Texas African Americans and Hispanics are twice as likely to die from diabetes-related causes than Caucasians. The top five inpatient diagnosis with Type 2 Diabetes were acute kidney failure, septicemia, urinary tract infection, rehabilitation, and pneumonia. In 2015, Dallas county had 32,368 inpatient and 76,161 outpatient visits by T2DM patients. More visits were made by females and Medicare payers. Uninsured patients made 1,282 inpatient and 4,665 outpatient visits in Dallas County in 2015. Hospital visits by T2DM patients with chronic kidney disease (CKD) indicated 47,382 inpatient and 101,894 outpatient/ED visits in Dallas County in 2015. These high number of outpatient visits by T2DM patients with CKD indicate an unmet need of T2DM self-management programs and CKD screening in the Dallas community^{1,2,6,7}.

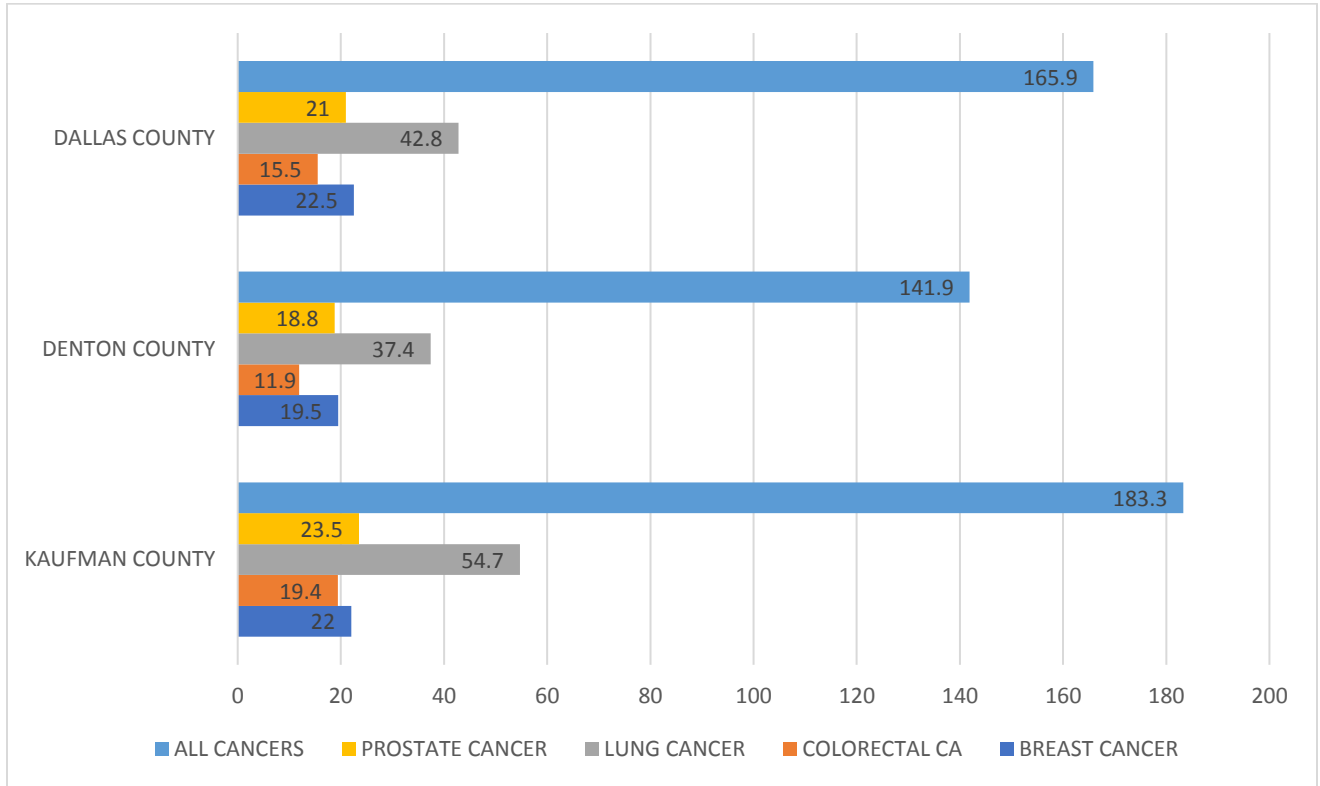
Cancer is one of the leading cause of death in RHP 9 and the United States. There are over 100 different types of cancer. The age-adjusted death rate due to all cancers in Texas (410.2 deaths per 100,000 population) was lower than the national average (448.4 deaths per 100,000 population). All RHP 9 Counties had higher average rates than Texas state average. Kaufman County had highest rate 446.3 followed by Dallas and Denton (**Table B.2**). Also, cancer in Medicare Population was higher in all RHP 9 Counties as compared to Texas state average (7.1 percent).

Table B.2: Age-Adjusted Death Rate due to Cancers in Dallas, Denton and Kaufman Counties (2010-2013).^{2,7}

All Cancer	Dallas	Denton	Kaufman	TX Value	US Value
Age-Adjusted Death Rate Due to Cancer 2010-2013 (deaths per 100,000 population)	426.3	415.7	446.3	410.2	448.4
Cancer in Medicare Population 2015 (Percent)	8.0%	7.9%	7.3%	7.1%	7.8%

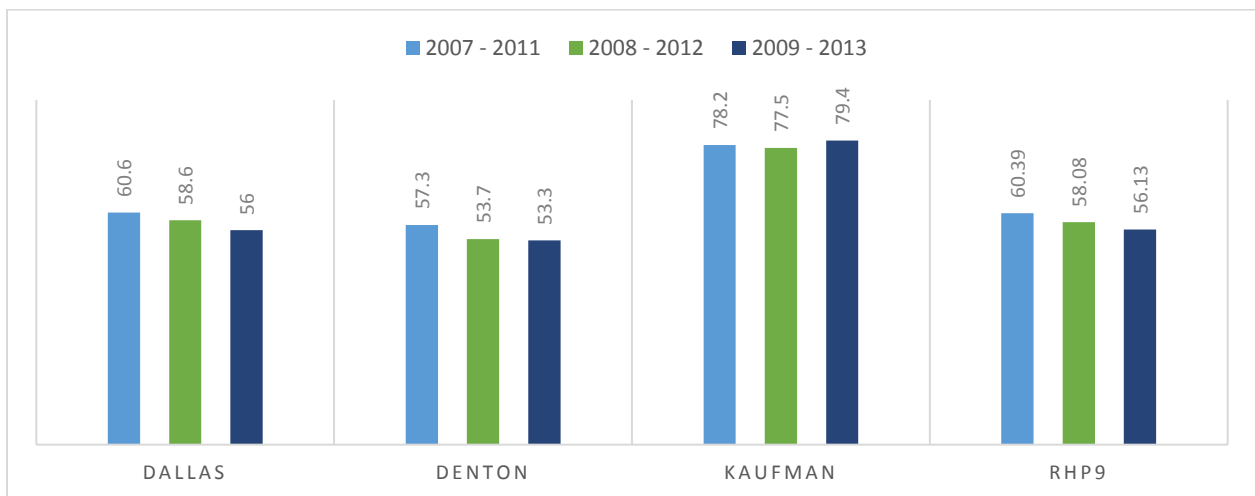
Lung, Breast, Prostate, Colorectal and Pancreatic cancers accounted for the greatest percentage of mortality in the USA, according to the National Cancer Institute^{1,2}. Lung cancer accounted for the highest percentage of mortalities associated with cancer in RHP 9 (**Figure B.3**). This is consistent with the trend nationally, as per the CDC^{2,9}.

Figure B.3: Age-Adjusted Death Rate due to Selected Cancers in the RHP 9 Counties.^{7,10}



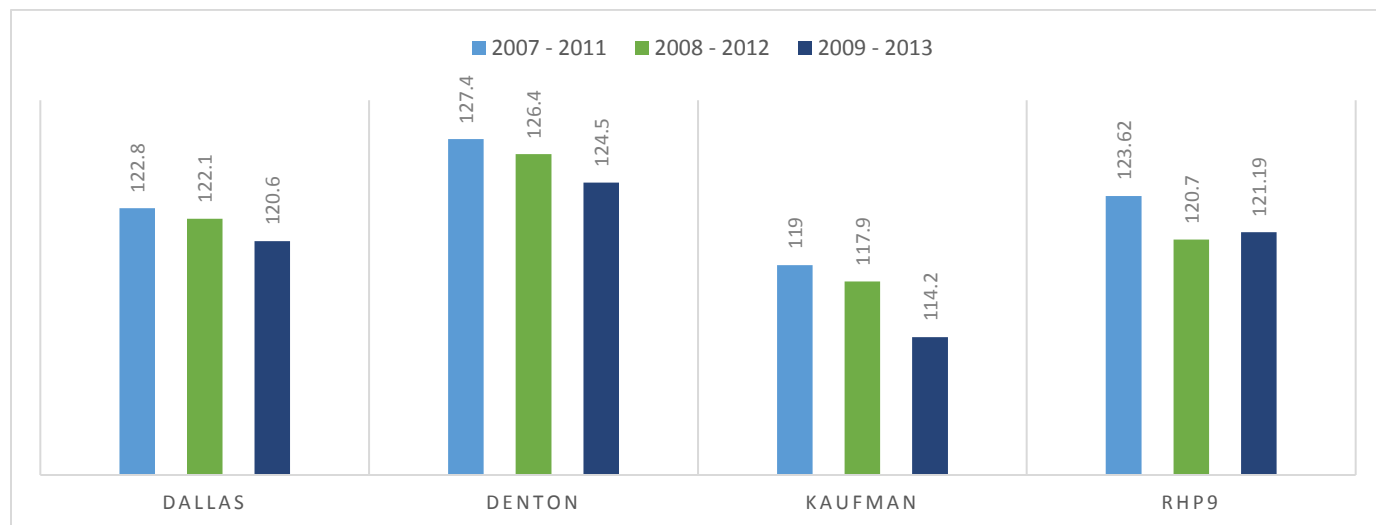
The incidence rate of lung and bronchus cancer in Texas in 2013 was 56.1 cases/100,000 people and 62.4 cases/100,000 people in the United States. The aggregate incidence rate for 2009 to 2013 was 56.13 cases/100,000 in the RHP 9 (Figure B.4)⁷.

Figure B.4: Incidence Rate of Lung Cancer in the RHP 9 Counties.^{7,9}



Breast Cancer is the leading cause of death among women in the United States. The aggregate incidence rate of breast cancer in Texas in 2013 is 112.3 cases/100,000 females and 123.3 cases/100,000 females in the United States. The five-year aggregate incidence rate for breast cancer in the RHP 9 area has not had a consistent pattern in the past 10 years. The aggregate incidence rate for 2009 to 2013 is 121.9 cases/100,000 females in the RHP 9 (**Figure B.5**).

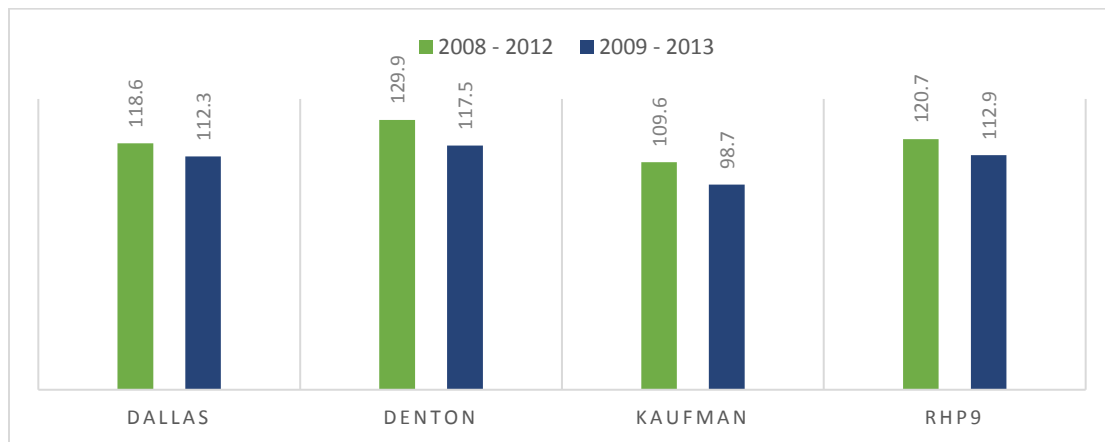
Figure B.5: Incidence Rate of Breast Cancer in the RHP 9 Counties.⁷



The breast cancer death rate experienced by Black/African-American women is 1.4 times higher than the combined rate for all women living in Dallas County¹². Black/African-American women in Dallas County have higher death rates per 100,000 women than any other population group. Similar to the disparity in death rates, Black/African-American women experience a greater burden of late-stage diagnoses than any other population group in the county. The late-stage diagnosis rate of Black/African-American women in Dallas County is 1.2 times higher than the rate experienced collectively by all women in the county¹².

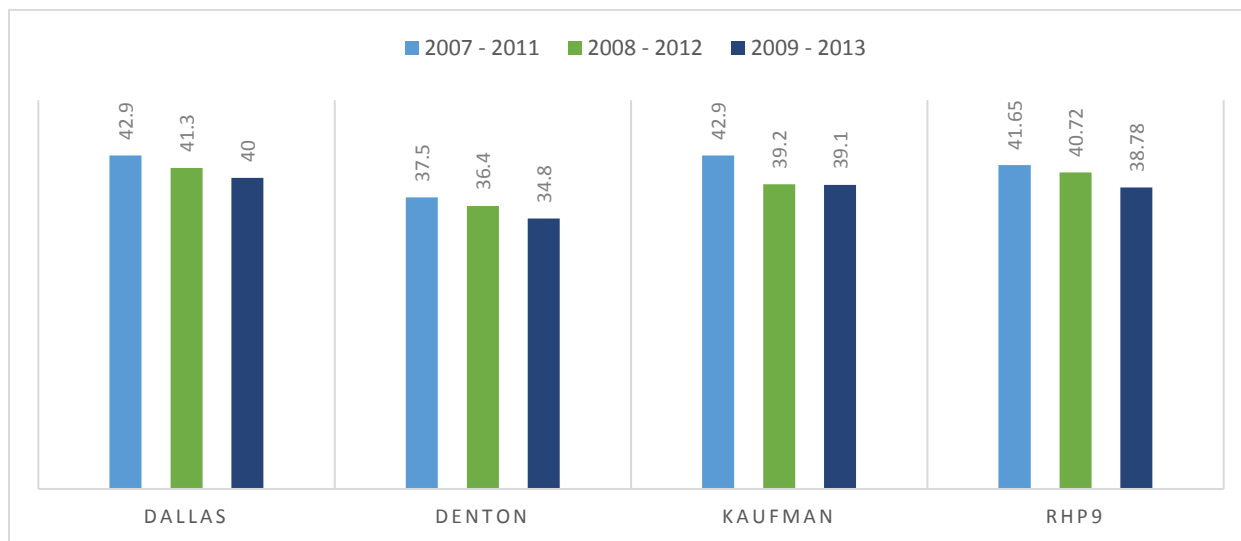
The prostate cancer incidence rate in Dallas and Denton Counties was higher than the state average (106.4 cases per 100,000 males) in 2013. The National average of prostate cancer incidence rate was 123.1 cases per 100,000 males in 2013 (**Figure B.6**).

Figure B.6: Incidence Rate of Prostate Cancer in RHP 9 Counties.⁷



Colorectal cancer is cancer of the colon or rectum. It has been one of the most commonly diagnosed cancers in the United States with incidence rate 40.6 cases per 100,000 population. The Texas state average was 39.2 cases per 100,000 population in 2013. The five years aggregate cumulative incidence rate for colorectal cancer has been declining in RHP 9 (**Figure B.7**). Dallas County had higher incidence rate (40.0) than the state average. Denton and Kaufman Counties have lower incidence rate than state and national average rate.

Figure B.7: Incidence Rate of Colorectal Cancer in the RHP 9 Counties.⁷



Chronic Obstructive Pulmonary Disease is an umbrella term used to describe progressive lung diseases including emphysema, asthma, chronic bronchitis and some form of bronchiectasis⁸. Asthma is a chronic inflammatory disease characterized by spasm of the bronchi of the lungs

causing attacks of reversible breathing problems. Chronic respiratory diseases are one of the leading causes of mortality in RHP 9 and the United States of America¹⁰.

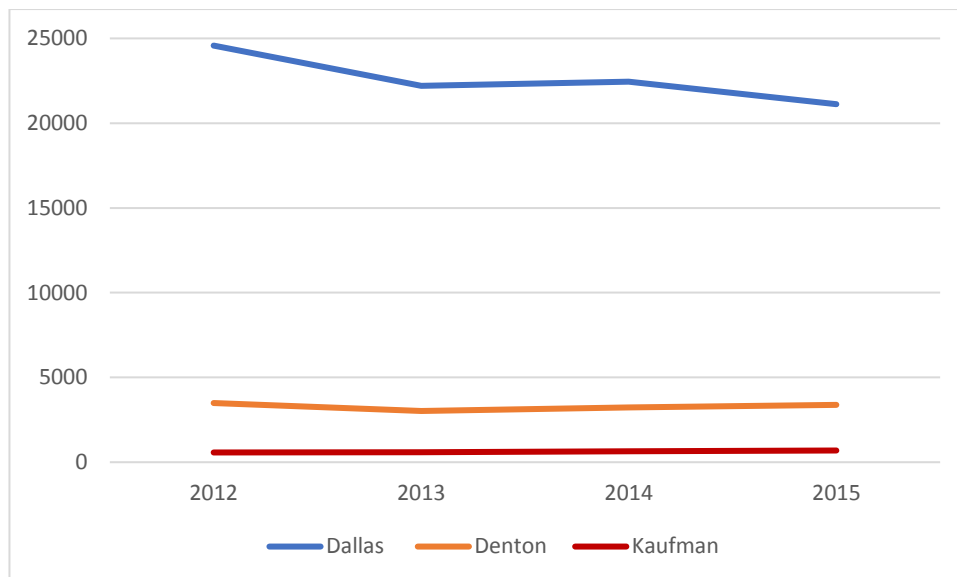
Table B.3 shows hospital visits (in and outpatient visits) related to asthma and COPD patients in 2015. Kaufman County has highest prevalence of asthma and COPD in Medicare population among RHP 9 Counties. All three RHP 9 Counties have less percentage of reported smokers than the state average.

Table B.3: Prevalence of Asthma and COPD in RHP 9 in 2014.^{9,10}

	DALLAS	DENTON	KAUFMAN	Texas Average
Hospitals Visits by Adults with Asthma (2015)	121,013	35,022	5,278	-
Hospital Visits by Adults with COPD	87,305	24,614	4,118	-
Adults with Asthma	10.7%	10.5%	10.8%	10.9%
Asthma: Medicare Population	8.3%	8.3%	9.1%	8.2%
Adults with COPD: Medicare population	9.9%	10.5%	15.4%	11.1%
Percentage of Adult Smokers	16.2%	14%	15%	18.2%

Pediatric Chronic Diseases: Childhood asthma is number one reason for hospital visits in the pediatric population. DFWHC Foundation’s data suggested that more visits were made by boys than girls in all three counties¹¹. In Dallas, non-Hispanic and black children made more visits as compared to children from other race and ethnicities. In Denton and Kaufman Counties, non-Hispanic and Whites made more visits. **Figure B.8** shows a reduction in asthma-related hospital visits between 2014 to 2016. Hospitals visits were consistent in Denton and Kaufman Counties.

Figure B.8: Childhood Asthma hospital visits 2012-2015 by Dallas, Denton and Kaufman County residents.¹¹



Childhood Obesity¹²: A study conducted in Texas population in 2011 revealed that one in three Texan children was overweight or obese, including almost half of Hispanic children in the state. Today’s obese children are poised to triple Texas’ current adult obesity rates by 2040. Obese children are more likely than their normal-weight counterparts to become obese adults. These children have greater than two-thirds chance of remaining obese at age 35. Therefore, obesity trends among children may predict higher mortality rates among future adults.

Top few conditions for hospital visits among overweight/ obese children in RHP 9 region were diabetes, bipolar disorders, asthma, pneumonia, seizures, depressive disorders and digestive system diagnosis. The percentage of hospital charges spent on overweight/obese pediatric patients were nearly three times higher than the proportion of visits i.e. 7.52 percent, 7.89 percent, 7.98 percent and 8.45 percent (**Table B.4 and B.5**).

Table B.4: Trend in hospital visits among Total pediatric population vs Overweight/Obese and Total Charges filed in North Texas for years 2012-2015.

Year	Total Pediatric Visits (N)	Total Hospital Charges	Pediatric visits by Overweight/Obese children (N)	Overweight/Obese Pediatric Population
2012	1,230,075	\$ 5,461,486,884	30014 (2.44%)	\$ 410,747,697 (7.52%)
2013	1,247,675	\$ 5,842,575,553	31632 (2.54%)	\$ 461,379,585 (7.89%)
2014	1,244,305	\$ 6,198,821,255	32814 (2.64%)	\$ 494,820,642 (7.98%)
2015	1,337,114	\$ 6,763,106,765	34415 (2.57%)	\$ 571,350,875 (8.45%)

Table B.5: Summary of hospital visits of pediatric population in RHP 9 Counties 2015.

County	Total Pediatric Population	Total Pediatric Visits	Pediatric visits by Obese children [No. (%)]
Dallas	682,551	540,206 (79.15%)	17322 (3.21%)
Denton	199,641	92,753 (46.46%)	1848 (1.99%)
Kaufman	31,035	23,713 (76.41%)	617 (2.61%)

These results indicate the economic burden of childhood obesity as obese children’s hospitalization expenses are nearly three times higher due to longer lengths of stay and additional clinical costs for more investigations.

Summary: Cardiovascular disease remains number one cause of death in RHP 9. Dallas and Kaufman Counties have higher death rate due to heart disease and stroke as compared to the national and state average. The report highlights multiple disparities associated with heart disease in RHP 9. T2DM and related comorbidities still present challenges in RHP 9 and indicate the need for more prevention and management efforts in the community. African American and Hispanics in Texas are twice as likely to die from diabetes-related causes than Caucasians. RHP 9 Counties have a higher rate of cancer-related deaths as compared to the state average. Lung cancer, prostate cancer, and breast cancer are top the leading causes of cancer-related deaths in RHP 9. Racial disparities associated with breast cancer have been reported. COPD related data show the need for more prevention and management efforts in Kaufman County, especially in older adults. Asthma and obesity are top chronic diseases in the pediatric population in RHP 9. The report shows the economic burden of these childhood chronic conditions and demonstrates the need for prevention and coordinated care efforts in the region.

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C: Care Coordination

Emergency Department Overuse

Emergency departments (ED) play a key role in the delivery of healthcare services to all people regardless of insurance status or ability to pay for medical needs. According to the US Census Bureau, Texas has the highest number of uninsured people (25 percent) in the United States. In Dallas County 29 percent, Denton County 17 percent and in Kaufman County 23 percent of its residents are uninsured⁴. However, the ED is not an optimal setting for many presenting conditions. An analysis of the emergency department encounters demonstrates that many in the population are accessing emergency departments for both urgent and non-urgent conditions (**Table C.1**).

Table C.1: Inpatient and Outpatient visits in RHP 9 counties.

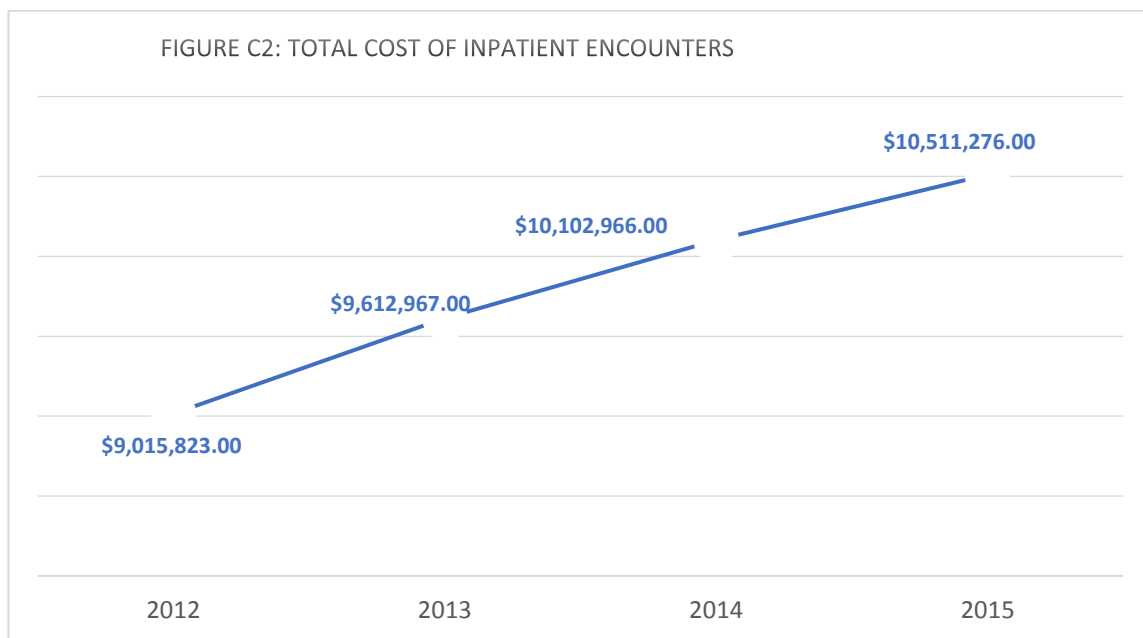
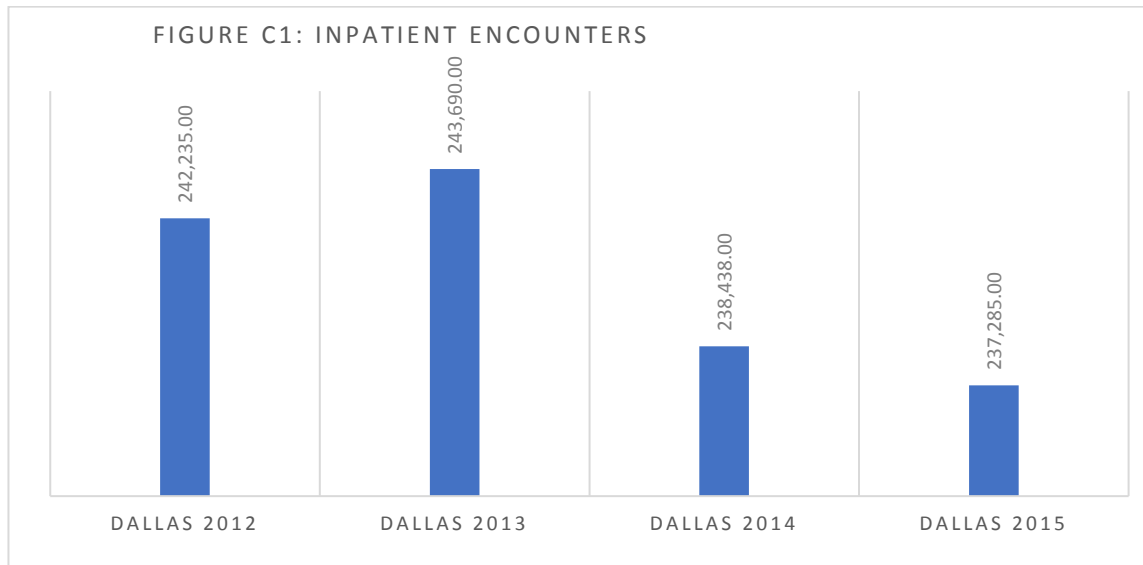
	RHP 9	DALLAS	DENTON	KAUFMAN
Inpatient (count*)	1,211,896	961,648	210,403	39,845
Total Charges	\$50,605,343,189	\$39,243,034,123	\$9,733,865,664	\$1,628,443,392
Outpatient (count**)	8,814,566	7,174,743	1,319,975	319,848
Total Charges filed by Hospitals	\$32,292,436,751	\$25,145,294,473	\$5,971,631,788	\$1,175,510,490

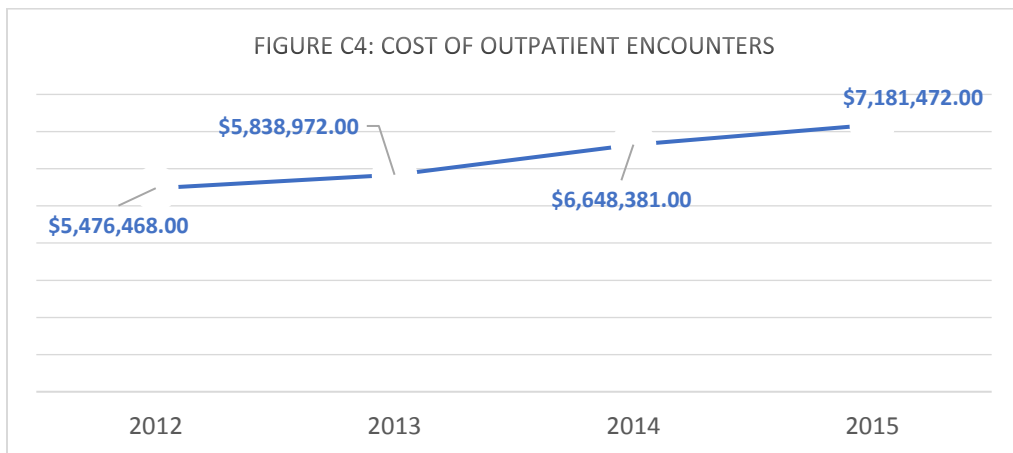
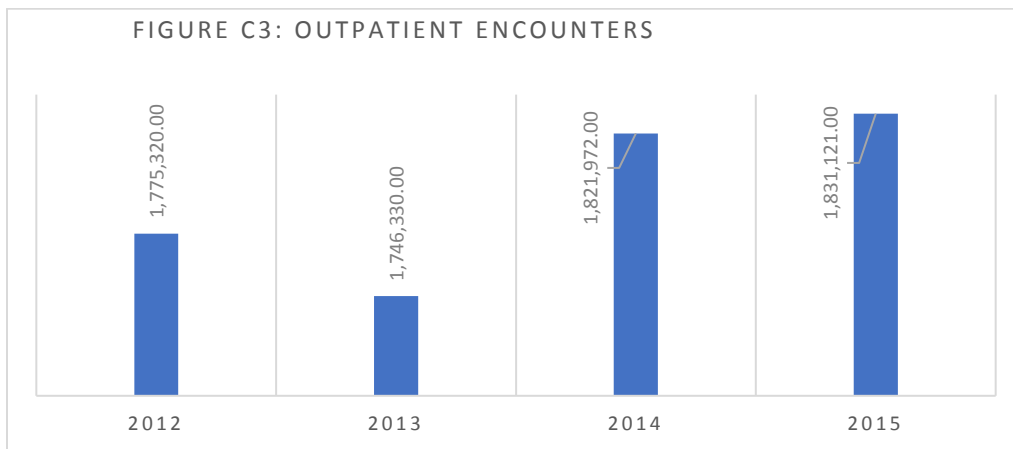
*Inpatients: hospitalization through the emergency department or/and planned procedure.

**Outpatients: emergency department visits without hospitalization and outpatient clinic visits.



Figure C.1-4: Table displaying the frequency and total cost of inpatient and outpatient encounters in Dallas County between 2012 to 2015.



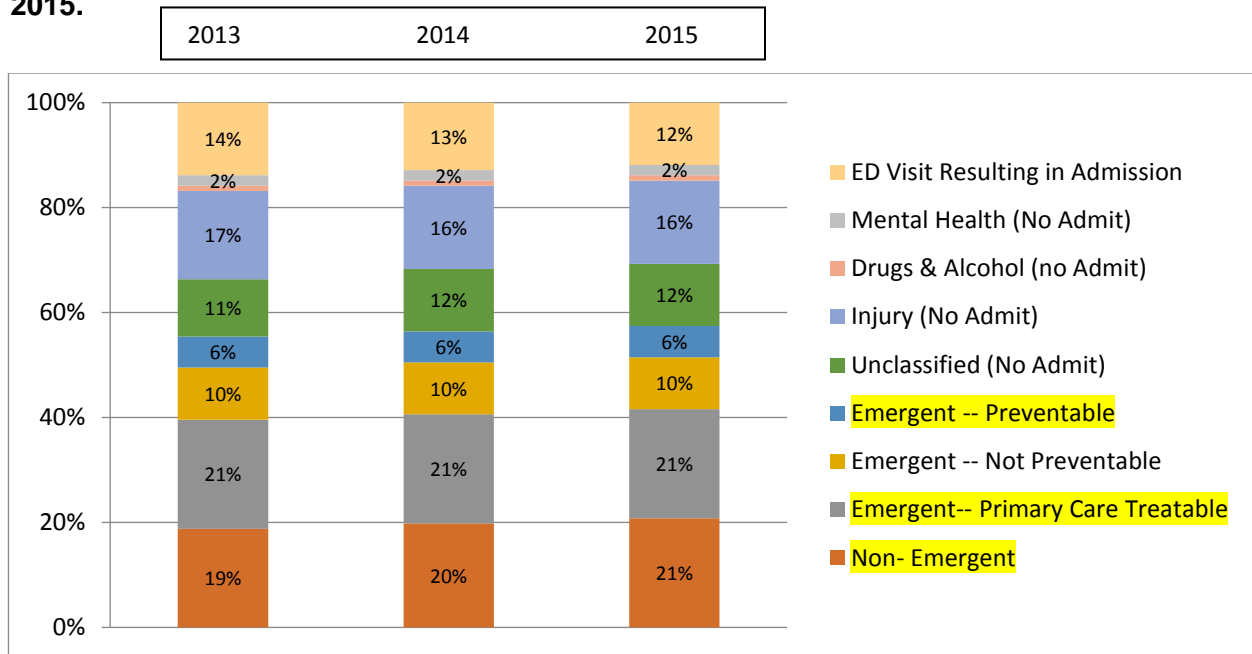


Above results show a significant reduction in inpatients ED encounters in Dallas County since 2013 whereas outpatient visits increased (**Figure C.1-4**). Total charges filed for inpatients and outpatient visits increased all four years indicating an increase in overall cost of care¹. For emergency department encounters that resulted in a hospital admission, the most common health conditions by volume are COPD, stroke, diabetes, congestive heart failure, weak/failing kidneys, chronic bronchitis and heart attack. In total, these conditions accounted for 60 percent of all the inpatient emergency department encounters in the region. In these cases, oftentimes the severity of illness of the diagnosis, based on the specific diagnosis and the procedures performed during the medical encounter, were either moderate or major in nature. Slight variations occur between payer types, but Uninsured and Medicaid were the primary groups in overall RHP 9 region.

Hospital visits diagnosis data for ED outpatient visits of Dallas County patients were analyzed using the validated New York University Emergency Department (NYU) visit severity algorithm³. This algorithm classifies the ED diagnosis in different categories. Namely, emergent; not emergent (preventable, primary care treatable, non-emergent); injury; mental health, alcohol, substance

abuse; and inpatient hospital admission. NYU algorithm explains that 48 percent of these ED visits were either non-emergent/ preventable emergent or primary care treatable (**Figure C.5**). This classification suggests that these 48 percent ED visits could have been avoided by treating these patients in an out of hospital setting.

Figure C.5: NYU algorithm explains ED visits classification for Dallas County patients 2013-2015.



Hospital Readmission is an inpatient admission occurring for any reason within 30 days from the date of discharge at index (previous) hospitalization. Based on DFWHCF's data, in North Texas total charges increased from \$4,352,747,692 in 2013 to \$4,763,558,429 in 2015. However, while charges increased the readmission rates for 2013, 2014 and 2015 decreased and were 14.72 percent, 14.40 percent, and 14.34 percent, respectively. The decrease in readmission rate from 14.72 percent in 2013 to 14.40 percent in 2014 was statistically significant ($p < 0.0001$). For 2015, the top ten conditions for readmissions were: Diseases of the Heart, Bacterial Infection, Surgical Complications, Diseases of the Urinary System, Fractures, Complications Mainly Related to Pregnancy, Cerebrovascular Disease, Respiratory Infections, Lower Gastrointestinal Disorders, and Diabetes Mellitus with Complications (**Table: C.2**). In 2015, the five leading conditions presented by patients at index hospitalization (diseases of the heart, bacterial infections, surgical complications, diseases of the urinary system and fractures) together had total charges \$1,787,516,943, 23,330 in 30-day readmissions, represent 25.36 percent of all index hospitalizations, 31.26 percent of all 30-day readmissions, and 37.52 percent of total charges for readmission in 2015.

RHP 9 trends in readmissions are in alignment with the North Texas area. Based on the 2015 data, the following disparities associated with hospital readmissions have been identified in RHP 9:

- Gender: Rates for index hospitalizations and for readmissions were higher for females than males for all three years.
- Age: Patients at the age of 65 and older were almost twice as likely to be readmitted as patients aged 18-44 years.
- Race: Whites had the highest 30-day readmission rate than all other races (data not adjusted for population). In 2015, 71.31 percent were Whites, 19.91 percent were Blacks, 2.26 percent were Asians and 6.52 percent were others.
- Ethnicity: Non-Hispanic patients had higher 30-day readmission rates than Hispanic or Latino patients (89.78 percent vs 10.09 percent in 2015).
- Insurance Status: Medicare had the highest 30-day readmission rate than all of the other payers. Readmission rates were lowest in the uninsured and Medicaid categories. In 2015, 41.31 percent of Medicare Patients, 38.73 percent of insured, 8.78 percent of Medicaid and 11.19 percent uninsured patients readmitted.
- Length of Stay in hospital: In 2015 1.49 percent spent less than 1 day for their index hospitalization, while 23.50 percent spent 1-2 days; 36.34 percent spent 3-5 days; 17.59 percent spent 6-8 days; 12.59 percent spent 9-14 days and 7.55 percent stayed 15 or more.
- Location of post-hospital discharge: Patients who were discharged to home had an 18.54 percent higher 30-day readmission rate as compared to those patients who were discharged to hospice or transferred to another care facility.

Table C.2: Top Ten Conditions (Index Hospitalization) for Patients who had a Readmission within 30 Days for 2013-2015.

2013	2014	2015
Diseases of the Heart	Diseases of the Heart	Diseases of the Heart
Surgical Complications ⁶	Bacterial Infection	Bacterial Infection
Diseases of the Urinary System	Surgical Complications ⁶	Surgical Complications ⁶
Bacterial Infection	Diseases of the Urinary System	Diseases of the Urinary System
Complications Mainly Related to Pregnancy	Complications Mainly Related to Pregnancy	Fractures
Cerebrovascular Disease	Cerebrovascular Disease	Complications Mainly Related to Pregnancy
Respiratory Infections	Respiratory Infections	Cerebrovascular Disease
Fractures	Fractures	Respiratory Infections

Effective in 2013, hospitals began receiving a penalty based on whether their readmission rates exceeded a standard set by the Hospital Readmission Reduction Program (HRRP). In 2013, there were about 500,000 readmissions totaling \$7 billion in aggregate hospital costs for four high-volume conditions—acute myocardial infarction (AMI), congestive heart failure (CHF), chronic obstructive pulmonary disease (COPD), and pneumonia². Since 2012, the opportunity for penalties imposed for failure to meet performance metrics for Medicare payments, not just those involving a 30-day readmission, has increased from 1 percent to the full penalty of 3 percent in 2015. As penalties continue to increase, hospitals are focusing on readmissions reduction and health improvement programs to reduce readmissions.

Since the previous CHNA, a total 129 programs have been implemented in RHP 9 region through the 1115 Medicaid Waiver funds. Most of these programs have directly or indirectly helped hospitals reducing 30-day readmissions and preventable emergency department visits. Several chronic disease prevention and management programs have reduced preventable hospitalizations from the RHP 9 community.

References:

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3. Ballard DW, Price M, Fung V et al. Validation of an algorithm for categorizing the severity of hospital emergency department visits. *Med Care* (2010); 48(1):58-63.
4. Sushma Sharma and Cathy Knoff. Hospital Readmissions in North Texas. A comprehensive overview of statistics, demographics, and charges to identify disparities. The white paper by hospital Council Foundation (In press) 2017.
5. DFWHC Foundation, Information and Quality Services Data Warehouse, 2017.
6. Surgical complications - AHRQ patient safety indicators. <https://www.medicare.gov/hospitalcompare/Data/Serious-Complications.html>

Immunizations and Communicable diseases: Healthy People 2020 goals call for increasing immunization rates and reduction of preventable infectious diseases. In RHP 9, Dallas and Kaufman counties do not appear to have experienced the high rates of unvaccinated children for conscientious or religious beliefs that other parts of the country are experiencing. Both childcare and school going children's immunization data indicated high rates (85-98 percent for childcare and 94-99% for school age children) in these counties.

Dallas and Kaufman counties had a very low (0.64 percent and 0.85 percent respectively) percent of students with conscientious exemptions filed during the 2016-2017 school year^{1,2,3,4}. Denton County had 2.92 percent of students with conscientious exemptions filed in 2016-2017 school year. Relatively low rates of unvaccinated children still worry public health officials because evidence suggests increasing incidences of vaccine-preventable diseases like measles, mumps, and pertussis due to these waivers⁵. Communities like Denton are showing an increasing trend of conscientious exemptions every year which is alarming and needs attention.

Table C.3 below shows that death rates due to communicable diseases in RHP counties Dallas County had a higher rate of Chlamydia, Gonorrhea, HIV Diagnosis, Syphilis and Tuberculosis incidence than state and national values. Data indicate an urgent need to implement communicable diseases prevention programs in Dallas communities.

The table below shows that flu vaccine rate in adults is increasing in all three RHP counties ranging between 68 percent to 71.6 percent in 2014. In Adults age 65+, flu vaccine rate was 52.3 percent in 2014 in Dallas county which was lower than the national and state average. Dallas County had higher vaccination rate for adult 65+ whereas Denton County had higher Age-Adjusted death rate due to Influenza and Pneumonia as compared to national and state values.

Data related to age-adjusted death rate due to Influenza and Pneumonia in Denton County (20.6 as compared to state average 14.6) are alarming and need attention. This could be because of increasing trends of conscientious exemptions every year as mentioned above.

Table C.3: Immunizations and communicable diseases in RHP 9 Counties.^{6,7}

	Dallas	Denton	Kaufman	US Value	TX Value	HP 2020 Target
Chlamydia Incidence Rate (2015)	600.8	282.5	313.0	478.8	487.3	NA
Gonorrhea Incidence Rate (2015)	208.9	69.3	73.2	123.9	136.7	NA
HIV Diagnosis Rate (2015)	31.0	9.7	10.5	NA	16.3	NA
Syphilis Incidence Rate (2015)	10.9	2.0	1.7	7.5	6.2	NA
Tuberculosis Incidence Rate (2011-2015)	7.4	2.4	2.9	3.0	4.8	1.0
Adults 65+ with influenza vaccination (2014 data)	52.3%	NA	NA	60.1%	59.4%	NA
Adults 65+ with pneumonia vaccination (2014 data)	71.2%	NA	NA	68.8%	70.3%	90.0%
Age-Adjusted Death Rate due to Influenza and Pneumonia (2010-2014 data)	13.2	20.6	12.7	15.2	14.6	NA

Incidence rate: deaths per 100,000 population

References:

1. Texas Department of Health Services. <http://www.dshs.texas.gov/chs/hprc/tables/2015/15PC.aspx>; <https://www.dshs.texas.gov/immunize/coverage/Conscientious-Exemptions-Data.shtm>
2. <https://www.aamc.org/download/426260/data/physiciansupplyanddemandthrough2025keyfindings.pdf>
3. "Trend of No Vaccines Worries Doctors". Dallas Morning News. April 14, 2016. <http://interactives.dallasnews.com/2016/vaccinations/>
4. Ibid: Region 2/3 includes Dallas County and 47 other counties.
5. Phadke VK, Bednarczyk RA, Salmon DA, et al. Association between vaccine refusal and vaccine-preventable diseases United States: a review of measles and pertussis. JAMA 2016 Mar 15;315(11):1149-58
6. DFWHC Foundation Healthy North Texas (2017). Retrieved from www.healthyntexas.org
7. DFWHC Foundation, Information and Quality Services Data Warehouse, 2017.

Oral Health: Oral diseases ranging from dental caries (cavities) to oral cancers cause pain and disability for millions of Americans. The impact of these diseases does not stop at the mouth and teeth. A growing body of evidence has linked oral health, particularly periodontal (gum) disease, to several chronic diseases, including diabetes, heart disease, and stroke.

The number of dentists per 100,000 persons declined from 60 to 59 between 1995 and 2000 nationally and is expected to decline more dramatically — from 59 percent to 54 percent between 2000 and 2020. This decline could result in a shortfall of 16,046 dentists by 2020¹. Also, nationally 65 percent of dentists are 45 years of age and older with an average age of a dentist being about 50 years². Dallas County has 78 dentists per 100,000 population which is higher than national and state average (46 dentists per 100,000 population).

Oral cavity and pharynx cancer incidence rate in Dallas County is 10.5 cases per 100,000 population which is below national and state value. Nearly 52.1 percent Dallas County adult residents visited a dentist in 2012 which is lower than the national and state average³.

Denton County has 52 dentists per 100,000 population and a reported 8.8 cases per 100,000 population for oral cavity and pharynx cancer incidence rate. Kaufman County has 37 dentists per 100,000 population and a reported 12.5 cases per 100,000 population for oral cavity and pharynx cancer incidence rate. The data clearly indicates less oral care providers in rural areas as compared to urban areas.

References:

1. <http://www.dentaleconomics.com/articles/print/volume-93/issue-2/features/the-changing-demographics-of-dentistry.html>
2. <http://www.nationalacademies.org/hmd/~media/Files/Activity%20Files/Workforce/oralhealthworkforce/2009-Feb-09/1%20-%20Valachovic.ashx>
3. DFWHC Foundation Healthy North Texas (2017). Retrieved from www.healthytexas.org

Palliative care: is focused on providing relief from the symptoms and stress of a serious illness. The goal is to improve the quality of life for both the patient and the family. It is provided by a specially-trained team of doctors, nurses and other specialists who work together with a patient's other doctors to provide an extra layer of support. It is appropriate at any age and at any stage in a serious illness, and it can be provided along with curative treatment. Palliative care is different than hospice. In hospice patients receive medications necessary to relieve pain and other symptoms, but they do not receive treatment for their condition. Hospice is reserved for terminally ill patients when treatment is no longer curative. In the DFW region, all health systems provide specialized palliative care to their patients. There are community centers and private care providers who also provide palliative care services.

A review article published in the New England Journal of Medicine suggests that over the past decade, the field has undergone substantial growth and change, including an expanded evidence base, new care-delivery models, innovative payment mechanisms, and increasing public and professional awareness¹. There is still a severe shortage of palliative care specialists and workforce training programs nationally, statewide and in the DFW region. With increasing aging population and chronic disease prevalence, more resources should be diverted towards this specialty.

Reference:

1. AS Kelley, RS Morrison (2015) - Palliative Care for the Seriously Ill. N Engl J Med 2015; 373:747-755: 2015DOI: 10.1056/NEJMra1404684.

Patient Safety and Quality and Hospital Acquired Conditions: In-hospital adverse events are a serious problem for patients, providers, and insurers. An adverse event is an injury caused by medical management rather than the underlying condition of the patient. An adverse event attributable to error is a "preventable adverse event" and in a systematic review of adverse event studies, 274,485 patient records reported an incidence rate of about 9.3 percent (about 1 in 10) adverse events and of those, 43.5 percent were avoidable. Most of those patients in de Vries' study (56.3 percent) experienced minor or no disability with 7.4 percent of those patients dying as result of the adverse event. In fiscal year (FY) 2015, the Centers for Medicare & Medicaid Services (CMS) instituted the Hospital-Acquired Condition (HAC) Reduction Program, which reduces payments to the lowest-performing hospitals (**Table C.4; Table C.5**). Hospitals in this program are evaluated against two domains^{1,2,3}. Domain 1 constitutes 35 percent of the total score and is solely based on the Agency for Healthcare Research and Quality's (AHRQ) Patient Safety for Selected Indicators (PSI)-90 composite measure. Domain 2 accounts for the remaining 65 percent of the total score and consists of an average of two intensive care unit-based nosocomial infections:

central line-associated bloodstream infections (CLABSI) and catheter-associated urinary tract infections (CAUTI). Beginning October 2014 (the fiscal year 2015), hospitals scoring in the worst quartile had their Centers for Medicare & Medicaid Services' (CMS') payments reduced by one percent, totaling approximately \$373 million nationally^{4,5}.

Table C.4: Hospital Acquired Conditions (HAC) measures based on CMS guideline (2016).

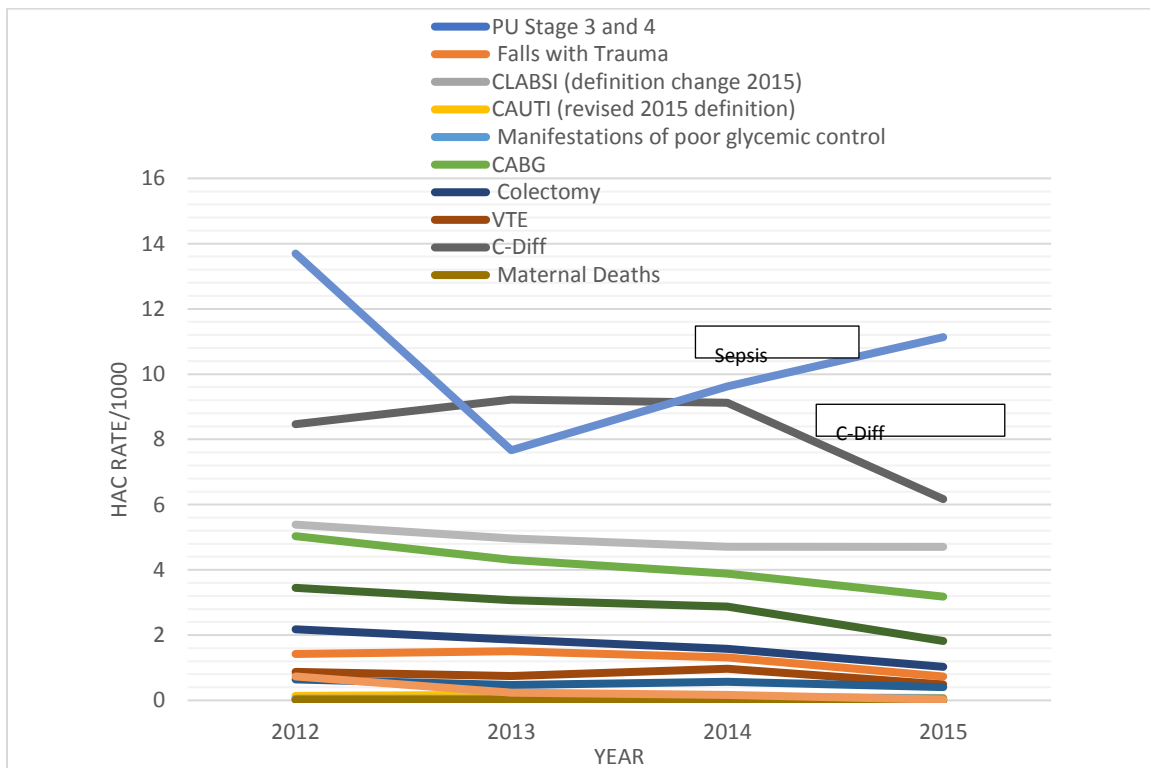
HAC	CMS MEASURES
Hac 4	Pressure Ulcer Stages 3 and 4
Hac 5	Falls and Trauma
Hac 6	CLABSI (definition change 2015) - Vascular Catheter-Associated Infection
Hac 7	CAUTI (revised 2015 definition) - Catheter-Associated Urinary Tract Infection
Hac 8	Manifestations of poor glycemic control
Reg 100	SSI CABG
Reg 101	SSI Colectomy
Reg 105	PE VTE All-Cause - Venous Thromboembolism
Reg 106	C-Diff - <i>Clostridium Difficile</i>
Reg 801	Maternal Deaths
Reg 805	Birth Trauma
Reg 810	3rd or 4 th -degree Perineal Laceration
Readmission	Readmission
PSI 13	Post-Op Sepsis
PSI 3	Pressure ulcer 3+ (same as HAC 4)
PSI 12	Pulmonary Embolism PE/Deep Vein Thrombosis

Central Line–Associated Blood Stream Infections (CLABSI); Catheter-Associated Urinary Tract Infections (CAUTI); Coronary Artery Bypass Grafting (CABG); Surgical Site Infection (SSI)

Table C.5: Comparison of Hospital Acquired Infections rate/100 in RHP 9 2012-2015.

Comparison of Hospital Acquired Infections rate/100 from 2012-2015				
	2012-2015 HAC rate/1000			
Hospital Acquired Conditions	2012	2013	2014	2015
PU Stage 3 and 4	0.028	0.055	0.078	0.03
Falls with Trauma	1.424	1.506	1.311	0.732
CLABSI (definition change 2015)	0.084	0.075	0.057	0.007
CAUTI (revised 2015 definition)	0.14	0.17	0.107	0.074
Manifestations of poor glycemic control	0.049	0.048	0.1	0.059
SSI CABG	5.033	4.306	3.883	3.18
SSI Colectomy	2.178	1.86	1.575	1.028
VTE	0.873	0.749	0.969	0.488
C-Diff	8.461	9.219	9.127	6.169
Maternal Deaths	0.014	0.014	0	0
Birth Trauma	0.642	0.47	0.57	0.407
3rd or 4th-degree perineal laceration	3.449	3.073	2.871	1.82
Post-Op Sepsis	13.695	7.667	9.623	11.133
Pressure ulcer 3+ (same as HAC 4)	0.733	0.232	0.164	0.022
PE/DVT	5.386	4.964	4.706	4.705

Figure C.6 HAC Rate comparisons 2012-2015 for RHP 9 region hospitals.



National costs (lost income), lost household production, disability and health care costs of preventable adverse events (medical errors resulting in injury) are estimated to be between \$17 billion and \$29 billion, of which health care costs represent over one-half of the charges. Approximately 87,000 fewer patients died in the hospital nationally because of the reduction in HACs, and approximately \$19.8 billion in health care costs were saved from 2010-2014. Comparison of HAC rates (per 1000) for RHP 9 hospitals from 2012-2015 is seen in **Figure C.6**.

Sepsis has been named as the most expensive inpatient cost in American hospitals in 2014 at \$24 billion each year. Forty percent of patients diagnosed with severe sepsis do not survive. Up to 50 percent of survivors suffer from post-sepsis syndrome⁸. Until a cure for sepsis is found, early detection is the surest hope for survival and limiting disability for survivors. In RHP 9, the rate of postoperative sepsis has been increasing since 2013 (**Figure C.6**). DFWHC Foundation's Patient Safety department facilitates a regional sepsis committee of hospital executives. This committee is developing best practices and guidelines for hospitals as an effort to reduce sepsis rate.

Clostridium Difficile (C-Diff): Health care costs due to this infection are estimated to be \$5 billion annually, and it is a leading cause of gastroenteritis associated deaths. C-diff rate dropped in 2013 and has been rising since. In 2015, DFWHC Foundation conducted a region-wide C-Diff education campaign to raise community awareness. DFWHC Foundation also conducted a research study to investigate environmental contamination with C-Diff, with spores recovered from both community clinic examination and hospital rooms sampled. Based on results, there is clearly the potential for clinics to be a source of community exposure to C-Diff and subsequent development of disease, which is like that documented for hospital-acquired infections⁷.

Summary: Report emphasizes an urgent need for improvement in care coordination in RHP 9. Data suggests 48 percent of emergency visits in RHP 9 could be managed outside of hospital emergency rooms. Providing coordinated care for disease prevention and management efforts in the community could reduce readmissions rates. Data indicates the need for education and awareness to increase immunization. Data suggests Dallas County needs communicable diseases prevention programs. Similar to other areas, oral health care faces challenges with workforce shortage in Kaufman County. The report suggests more prevention and screening for oral diseases. Palliative care has emerged as an evidence-based innovative care delivery model providing care to critically ill patients through a trained team of providers. With increasing aging population and chronic disease prevalence, resources should be diverted towards expanding this specialty. DFW region including RHP 9 has shown significant improvement in "preventable in-hospital adverse events" since last assessment (2012). From 12 selected hospital-acquired conditions (HAC), C-Diff and Sepsis prevention have been challenging. Collaborative efforts need to be implemented to develop best practices and guidelines to prevent these conditions.

References:

1. deVries et al. The incidence and nature of in-hospital adverse events: a systematic review. 2008.
2. Patient Protection and Affordable Care Act, 42 USC §18001 et seq, (2010).
3. Scoring methodology: Hospital-Acquired Condition (HAC) Reduction Program. QualityNet. <https://www.qualitynet.org/dcs/ContentServer?c=Page&pagename=QnetPublic%2FPage%2FQnetTier3&cid=1228774298601>. Accessed May 27, 2015.
4. Hospital-Acquired Condition (HAC) Reduction Program. Centers for Medicare & Medicaid Services. <http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/HAC-Reduction-Program.html>. Accessed March 13, 2015.
5. Medicare Program. Federal Register. <https://www.federalregister.gov/articles/2014/10/03/2014-23630/medicare-program-hospital-inpatient-prospective-payment-systems-for-acute-care-hospitals-and-the>. Accessed March 18, 2015.
6. Department of Health and Human Services. Federal Register. <http://www.gpo.gov/fdsys/pkg/FR-2014-08-22/pdf/2014-18545.pdf>. Accessed March 18, 2015.
7. Clostridium difficile (C-Diff) prevalence in healthcare settings: An Environmental Screening Study in Dallas-Fort Worth region. DFW Hospital Council Foundation. 2015 (Under Review).
8. Sepsis: <https://www.cdc.gov/sepsis/index.html>.

D: Behavioral Health

Behavioral Health System, Structure and Funding

Behavioral health is defined as ways of promoting well-being by preventing or intervening in mental illness, and also has an aim preventing or intervening in substance abuse and other addictions. Behavioral health disorders are among the most common causes of disability.

The toll of behavioral health-related disparities is staggering across the nation and in the State of Texas. The estimated prevalence of behavioral health conditions in Texas populations in 2014 was 2,035,243 youths and adults with severe mental illness and 1,783,034 youth and adults with substance use disorders. The percentage of adolescents experiencing a major depressive episode in Texas increased from 8 percent (national average 8.1 percent) in 2010 to 11.2 percent (national average 11.0 percent) in 2014. Past-Year Serious mental Illness for adults in Texas is on track to surpass the national average has increased from 3.4 percent (national average 3.9 percent) in 2010 to 4.1 percent (national average 4.1 percent) in 2014. Adult mental health patients reporting improved functioning from treatment received in the public mental health system was only 45.9 percent as opposed to a national average of 70.9 percent¹. Counties in Texas report that 20 to 25 percent of their average daily jail populations have a behavioral health problem and between

12,000 and 16,000 people with mental illnesses are in jail in Texas, at a cost of over \$450 million dollars a year to incarcerate them.

The Texas State budget for the fiscal year 2016-17 biennium specifically identified \$3.6 billion revenue related to behavioral health services¹. Texas Medicaid is a major source of behavioral health funding, both through payments to health care providers for behavioral services and through the Delivery System Reform Incentive Payments (DSRIP) program included in the state's 1115 Transformation Waiver. Behavioral health-related provider payments were estimated to be \$3.1 billion in the 2016-17 biennium.

State level provider capacity: The majority of Texas counties are severely underserved when it comes to mental health services². According to a 2013 Department of State Health Services (DSHS) study, 207 of Texas' 254 counties have been designated as Mental Health Professional Shortage Areas, meaning they have fewer than one mental health clinician per 30,000 individuals³. Texas currently has only 1,460 licensed psychiatrists available to treat a state of nearly 27 million residents. In addition to that 532 of these psychiatrists are nearing retirement age (55 years or older), experts stress that Texas needs at least 1,000 additional adult psychiatrists and 200 child psychiatrists just to meet current needs³.

New legislative efforts: A bill was presented in 85th Texas legislative session relating to an expedited licensing process for certain physicians specializing in psychiatry requiring the Texas Medical Board (TMB) to create an expedited licensure process that would allow out-of-state psychiatrists to treat Texas patients in need of care. Currently, Texas is one of only eight states to offer no reciprocal licensure for out-of-state physicians⁴.

On May 12, 2017, the Texas State Legislature passed SB 1107, a law expanding the use of telemedicine and allows physicians in Texas to use telemedicine to establish a valid physician-patient relationship without the need for an in-person exam. Unfortunately, the statute clarifies that the provisions of the new law do not apply to mental health services. Experts from American Psychological Association suggest that being more open to telepsychology is really going to help many needy people who just can't meet the requirements of current face-to-face practice⁵.

Behavioral health services in RHP 9: These services in RHP 9 are provided by two local authorities. In Dallas County, since 2010, a Behavioral Health Leadership Team (BHLT) has been functioning as a single point of accountability, planning, oversight, and funding coordination for all Dallas County behavioral health services. In 2011, the Dallas County BHLT partnered with neighboring

counties (Collin, Hunt, Rockwall, Ellis, Navarro and Kaufman County) to develop a strong regional behavioral health care system in the North Texas region known as North Texas Behavioral Health Authority (NTBHA)⁶. NTBHA has been the Local Behavioral Health Authority (LBHA) as defined in Texas Law for the “NorthSTAR” area which served the behavioral health needs in these counties until 2016. The NorthSTAR program was a unique public behavioral health treatment program serving indigent and Medicaid clients residing in these seven-county North Texas service area.

In December 2016, NTBHA in conjunction with the Texas Department of State Health Services developed a local service area plan to address the transition of NorthSTAR from the current service model to an updated model of indigent only behavioral healthcare. Under the current agreement with HHSC and DSHS, since January 2017, NTBHA has been serving as the LBHA for six County service area that includes Dallas County, Ellis County, Navarro County, Kaufman County, Hunt County, and Rockwall County. LifePath Systems serves as the LBHA for Collin County. While Dallas County and Kaufman County from RHP 9 region are served by NTBHA, Denton County MHMR Center is designated as the local Mental Health and Intellectual & Developmental Disabilities Authority for Denton County, Texas. Denton County MHMR Center is a non-profit community center administered by Board of Trustees⁷.

Capacity and Resources: Lack of resources and healthcare infrastructure in a huge concern in the behavioral health area. Based on 2017 County Health Ranking data, the patient to provider ratio for Texas state is 1,130:1. Dallas County has 870 patients per provider, Denton County 1,180 patients per provider and Kaufman County has 1,210 patients per provider^{2,3}. In RHP 9, health systems have been collaborating with state agencies and community-based organizations to address community’s needs. The closure of NorthSTAR program presented some challenges on the mental health care infrastructure. A survey conducted by United Way of Metropolitan Dallas and DFWHC Foundation, providers who were supported by the NorthSTAR provided following feedback:

1. The transition from NorthStar to NTBHA has affected referrals to outpatient services for patients who present to hospitals.
2. Under the current system, providers have identified some clinical information exchange related challenges which are affecting follow-up appointments and care coordination.
3. Although NTBHA has worked very diligently to educate the community and the mental health agencies regarding their processes, programming, and intentions, for patients, the mental health system remains challenging and sometimes difficult to navigate. These patients often delay their treatment and eventually present themselves in emergency departments.

4. Some key in-network mental health providers under the NorthStar system are not currently an in-network provider with NTBHA which is a barrier in care coordination. Efforts are in progress to develop new partnerships.

In RHP 9, Metrocare Services and the NTBHA in Dallas, MHMR of Denton and NTBHA in Kaufman are leading organizations in behavioral healthcare with all health systems. There are four psychiatric/mental health hospitals in RHP 9 with a combined capacity of 632 beds¹. Three of the four hospitals are in Dallas and one is in Kaufman. The psychiatric hospitals are listed:

- Green Oaks Behavioral Healthcare Services, Dallas – 124 beds
- Timberlawn Mental Health System, Dallas – 144 beds
- Hickory Trail (Former Cedars) Hospital, Desoto (Dallas County) – 76 beds
- Terrell State Hospital, Kaufman – 288 beds

Other hospitals in RHP 9 region have total 479 beds specifically allocated to psychiatric patients. But, these resources are not enough to address increasing demands from the community. Severe healthcare disparities have been reported in behavioral healthcare in North Texas. There has been a growing concern over supply and demand ratio of the trained healthcare workforce in this area.

Workforce: There is an urgent need for more workforce with multiple specialties, workforce training programs, and workforce retention strategies. Ensuring access to adequate mental health and substance abuse treatment and services requires a robust and diverse mental health workforce. Mental health providers include: certified peer specialists; certified substance use recovery coaches; certified family partners; community health workers or promoters; licensed clinical social workers; primary care physicians; physician's assistants; licensed professional counselors; licensed marriage and family therapists; licensed dependency addiction counselors; psychiatric nurses; psychiatrists; psychologists and advance nurse practitioners⁸.

These professionals work with individuals in a variety of settings to help them achieve recovery and mental wellness. In addition to increasing the quantity and quality of mental health practitioners in these professions, it is also important to increase diversity in the workforce as well as improve the cultural and linguistic competency of the mental health workforce.

Integration between Behavioral Health and Primary care: Lack of behavioral health-related primary care services is a well-documented disparity in RHP 9. Efforts have been made to integrate basic

behavioral health service into existing primary care services. The integration of behavioral health services in primary care has been referred to in many ways, but ultimately refers to common structures and processes. Integration increases the effectiveness and efficiency of providing care and reduces costs in the care of primary care patients. Reimbursement is one factor, that determines the level of integration that can be achieved. The federal health reform agenda supports changes that will eventually permit behavioral health to be fully integrated and will allow the health of the population to be the primary target of intervention. Recommendations to increase integration include adopting a disease management model with care management, planned guideline-based stepped care, follow-up, and treatment monitoring. Population-based interventions including patient-centered medical home have also shown success in this area.

Data and Cost Trends in the Behavioral Health Population: Based on DFWHCFoundation’s data, total 225,775 Emergency Department visits were made by mental health and substance abuse patients in 2016 (**Table D.1**).

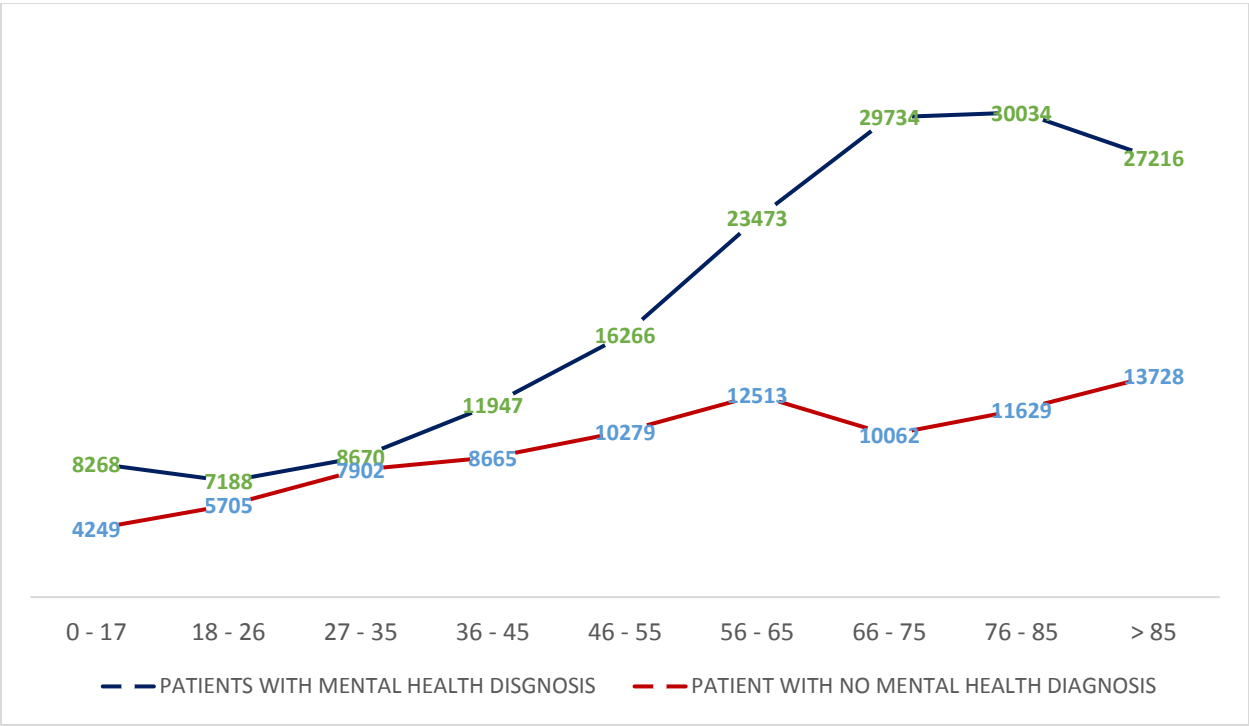
Table D.1: Emergency Department Visits by mental health and substance abuse patients in 2016.⁹

Hospital System	Cases	Cases % (of total)
	225,775	100%
Medical City Healthcare	63,239	28%
Texas Health Resources	37,784	17%
Tarrant County Hospital District	35,892	16%
Parkland Health & Hospital System	25,028	11%
Baylor Scott & White Health	24,663	11%
Methodist Health System	11,901	5%
Baylor Scott & White (Tenet)	4,928	2%
Childrens’ Medical Center of Dallas	4,784	2%
Cook Children’s’ Health Care System	4,743	2%
Hunt Memorial Hospital District	2,461	1%
Essent Healthcare	2,184	1%
UTSW Medical Center University Hospitals	1,992	1%
Texas Health Partners	1,822	1%
Wise Regional Health System	1,530	1%
Dallas Regional Medical Center	1,017	0%
Universal Health Services	834	0%
Province Healthcare	654	0%
WNJ Regional Health System	188	0%

Financial implications of caring for those with behavioral health conditions are substantial and impact resources within the healthcare institutions of RHP 9. Analysis of DFW Hospital Council Foundation data showed a sharp rise in charges for mental health encounters with age.

In Dallas County, 275,277 mental health-related visits were reported in 2015 with total charges \$4,394,043,693 and an average charge \$15,962. A total 44,229 hospital visit were reported for substance abuse diagnosis in 2015. Total cost for those visits were \$ 902,908,882 with average cost \$21,414. RHP 9 had a total 1,622,998 mental health-related visits between 2012-2015 with an average of charge \$16,307 per visit. RHP 9 had a total 232,017 visits for substance abuse between 2012-2015 with an average total charge \$21,183 (Figure D.1).

Figure D.1: Comparison of the average cost of care per patient encounter for patients with mental health diagnosis vs patients with no mental health diagnosis by age in RHP 9 between 2012 to 2015.⁹



Drug and Substance Abuse: In 2014, Dallas County had more drug-related death rates (14.1 per 100,000) than the state average 10.1. Denton County had 7.0 and Kaufman County had 14 percent drug-related poisonings^{10,11}. Based on Poison center call rates, most common drugs used were Marijuana & Synthetic Marijuana, Heroin and Benzodiazepines¹².

Excessive alcohol consumption was 17 percent in Dallas County, 20 percent Denton County and 19 percent in Kaufman County. Alcohol-related traffic fatalities are on the rise in RHP 9. Blood Alcohol content data in 2014 showed 149 fatalities in Dallas County^{10,11}. Alcohol-attributable deaths are also disparately spread throughout the region with a rate as high as 96.2 per 100,000 in one Dallas zip code to rates of 21 per 100,000 and below in Denton County

Increasing rates of opioid use continue to be an issue nationwide. Of the more than 33,000 opioid-related deaths in the United States in 2015, 1,186 (3.6 percent) were in Texas. Opioids are often the drug of choice for pain relief after major surgeries, but their use is often followed by adverse drug event (ADE). Opioids include drugs such as morphine, hydrocodone, oxycodone, tramadol, fentanyl, codeine, meperidine, and much more. The most common opioids associated with overdose include methadone, oxycodone, and hydrocodone^{12,13}. Results indicate that in 2014, 456 adverse drug events were observed from 11,718 total cases in the three opioid-related surgeries included large & small bowel procedures, hip and knee replacements. The average charges filed for drug-related complications were \$174,119 as compared to \$90,104 for without complications⁹. These results identify the need for Opioid Safety Programs to reduce in-hospital opioid adverse events^{12,15}.

Special Population and Impact on System

Law Enforcement and Criminal Justice System: Behavior health issues cause additional burden on other systems as well as on social services. Based on law enforcement data, from 2012 through 2015, the number of mental health calls to 911 (known as “46 calls”) increased by 18 percent (from 10,319 to 12,141) with some districts in Dallas city seeing an 85 percent increase in these calls. Those same calls with a request for an ambulance (“46A call”) increased by 59 percent, from 2,176 to 3,452 during the same period^{13,14}.

Jail data suggest that although the average monthly population in the Dallas County Jail was considerably lower in 2014 (6,086) than it was in 1994 (8,884), the number of people in jail awaiting trial nearly doubled, from 2,307 in 1994 to 4,182 in 2014. Of the large urban counties in Texas, Dallas has the highest rate of pretrial detention. People released from jail while still awaiting trial had a comparable risk of recidivism regardless of whether they had prior contact with the behavioral health care system (the best available indicator of potential behavioral health needs). But it typically took longer for someone with such needs to be released from jail than someone who had not had prior contact with the behavioral health system. The three-year re-arrest rate for people without prior contact with the behavioral health system was 43 percent, compared to 58 percent for

those who had contact with the system, and the one-year rearrest rate is higher across every level of risk for people with prior contact with the behavioral health system.

People with serious mental illness (SMI), due to their severe and poorly managed treatment needs, have frequent and repeated use of the jail, local emergency rooms, hospitals, homeless services, and other services. Meadows Foundation researchers estimated that over 6,000 people in Dallas (of whom nearly 4,000 live in poverty) are “super-utilizers” of services¹⁴. In Dallas County alone, estimated housing and booking costs for people with mental illnesses were \$47 million in 2013. Medication and other treatment services provided to people with mental illnesses while incarcerated cost an additional \$7 million. Once emergency room costs were added in, the total costs of mental health care wasted on temporary fixes for crisis situation without linkage to effective ongoing care exceeds \$210 million every year^{13,14, 16}.

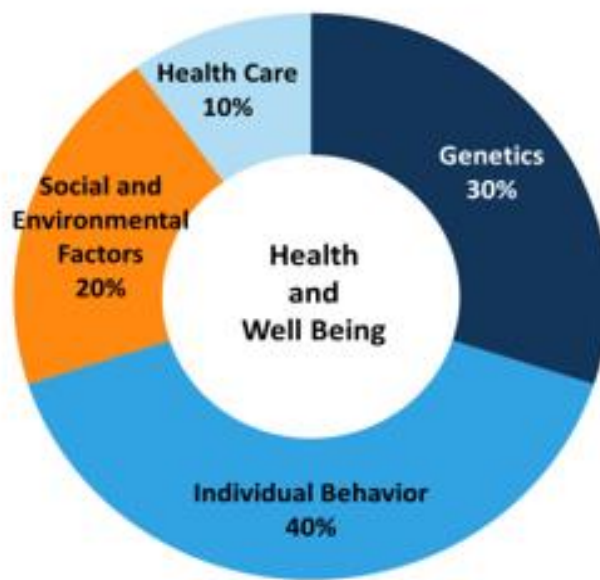
Homeless Population: The total homeless population in Dallas County increased from 2,972 in 2013 to 3,314 in 2016, according to the Metro Dallas Homeless Alliance’s annual report. Based on the Dallas Commission on Homelessness 2016 report, on the day of the count, 3,904 homeless individuals were identified in Dallas. Of those, 739 were unsheltered. Among the 304 veterans identified, 54 were unsheltered. In 2016, Denton city alone had about 465 of Denton County’s 1,340 homeless population. No data available for Kaufman County but shelters are providing services to homeless and battered men and women in the County. To discover the biggest challenges communities face regarding homelessness and how the effects of homelessness affect these communities, the Dallas Commission on Homelessness conducted a survey. According to survey results, the top three challenges were - lack of housing, lack of mental health care and homeless services being concentrated in one area.

These results suggest that behavioral health is not merely a personal or health issue, it is a complex cluster of socio-economic-environmental and legal factors and conditions that play a crucial role in an individual’s life. Counties in RHP 9 are working collaboratively to address disparities related to these special populations.

Social determinants of Behavior Health: Social determinants play a key role (70 percent vs 30 percent genetics) in development and progression of behavioral health-related conditions (**Figure D.2**). This includes social, emotional and physical environments in homes, schools, workplaces, neighborhoods, and communities.

Based on a meta-analysis of nearly 50 studies, researchers found that social factors, including education, racial segregation, social supports, and poverty accounted for over a third of total deaths in the United States in a year. Evidence suggests that stress negatively impacts health for children and adults across the lifespan¹⁷.

Figure D.2: Social determinants of Behavior Health



SOURCE: Schroeder, SA. (2007). We Can Do Better — Improving the Health of the American People. *NEJM*. 357:1221-8.



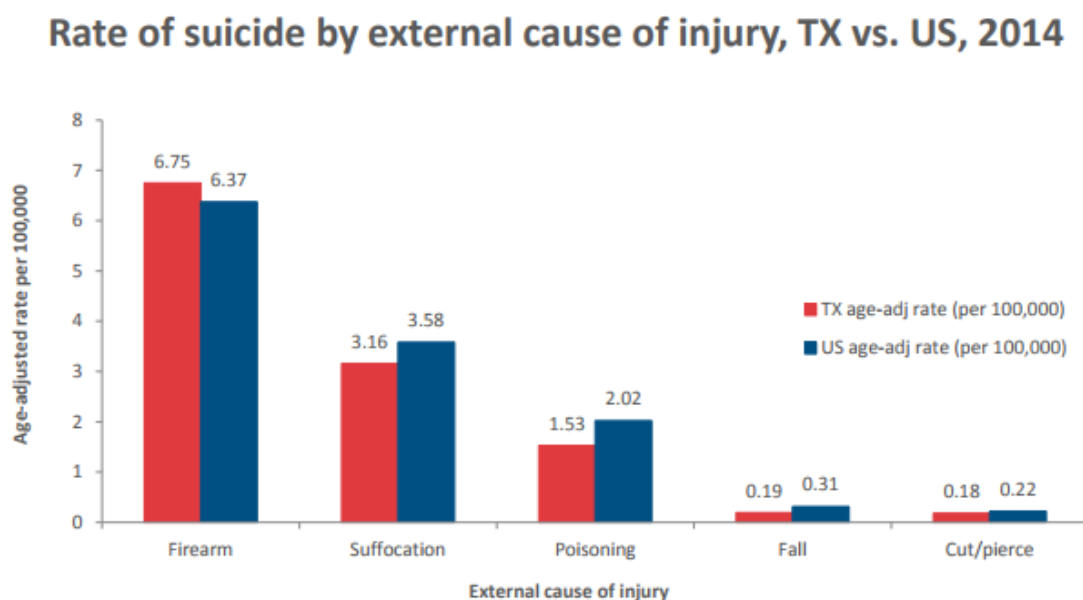
Families living in above-mentioned disparities are more likely to have health and behavioral health issues. Those families have higher rates of mental health, substance abuse and alcohol-related issues, frequent domestic violence and homicides, suicidal ideation, and self-injury, abuses including sexual abuses, motor vehicle accidents, and crimes. **Table D.2** below lists available indicators associated with social determinants of behavioral health in RHP 9 Counties^{10,11}.

Table D.2: Indicators associated with Social Determinants of Behavioral Health in RHP 9 Counties

Indicators	Dallas	Denton	Kaufman	TX Value
Age-Adjusted Death Rate Due to Suicide (deaths per 100,000 population; 2014)	10.4	9.8	13.3	11.6
Homicides (per 100,000 population; 2015)	8	2	5	6
Violent crime (2014)	466	180	278	422
Depression in Medicare Population (2015)	18.2%	19.2%	18.6%	17.0%
Frequent Mental Distress (2015)	10.7%	9.0%	10.3%	10.0%
Poor Mental Health days (2015)	3.2	2.8	3.0	3.0
Drug Overdose Deaths (2014)	11%	7%	13%	9%
Injury deaths (2014)	51	35	58	54
Physical environment (aggregate parameters 2015 data)	236	215	232	NA
Severe housing problems (2015)	22%	14%	16%	18%
Pollution (2016)	9.9	9.9	9.8	9.6
Long Commute to work-driving alone (2014)	40%	45%	54%	35%
Food Environment Index (2015)	6.00	7.0	6.9	6.4
Access to exercise (2015)	98%	96%	67%	84%
Adult Obesity (2015)	28%	25%	31%	28%
Physical Inactivity (2014)	25%	21%	29%	24%

Suicidal Ideation and /or Self-Injury: Suicide was the 10th leading cause of death in the U.S. in 2014 and the second cause among adolescents and young adults between the ages of 10-34 years. However, suicidal ideation is more common than attempted self-injury. In 2008, Texas data as part of the National Survey on Drug Use and Health indicates an estimated 3.2 percent adults aged 18 or older thought about suicide, 0.9 percent planned suicide and 0.65 percent attempted suicide. Suicide rates have increased in both the U.S. and Texas from 2000-2014. In 2014, the suicide rate was 12.96 per 100,000 in U.S. compared to 12.19 per 100,000 in Texas. In 2014, suicide rates in Texas were 3.6 times greater among males compared to females, 1.6 times greater among 45-64 year-olds compared to 15-24 year-olds, and 2.7 times greater among non-Hispanic whites compared to non-Hispanic blacks. In 2014, the firearm was the leading cause of suicide in both Texas and the U.S. The rate of firearm suicide was 6.75 per 100,000 in Texas vs 6.37 per 100,000 in the US (**Figure D.3**)^{18,19}.

Figure D.3: Rate of Suicide by Injury in Texas (2014)

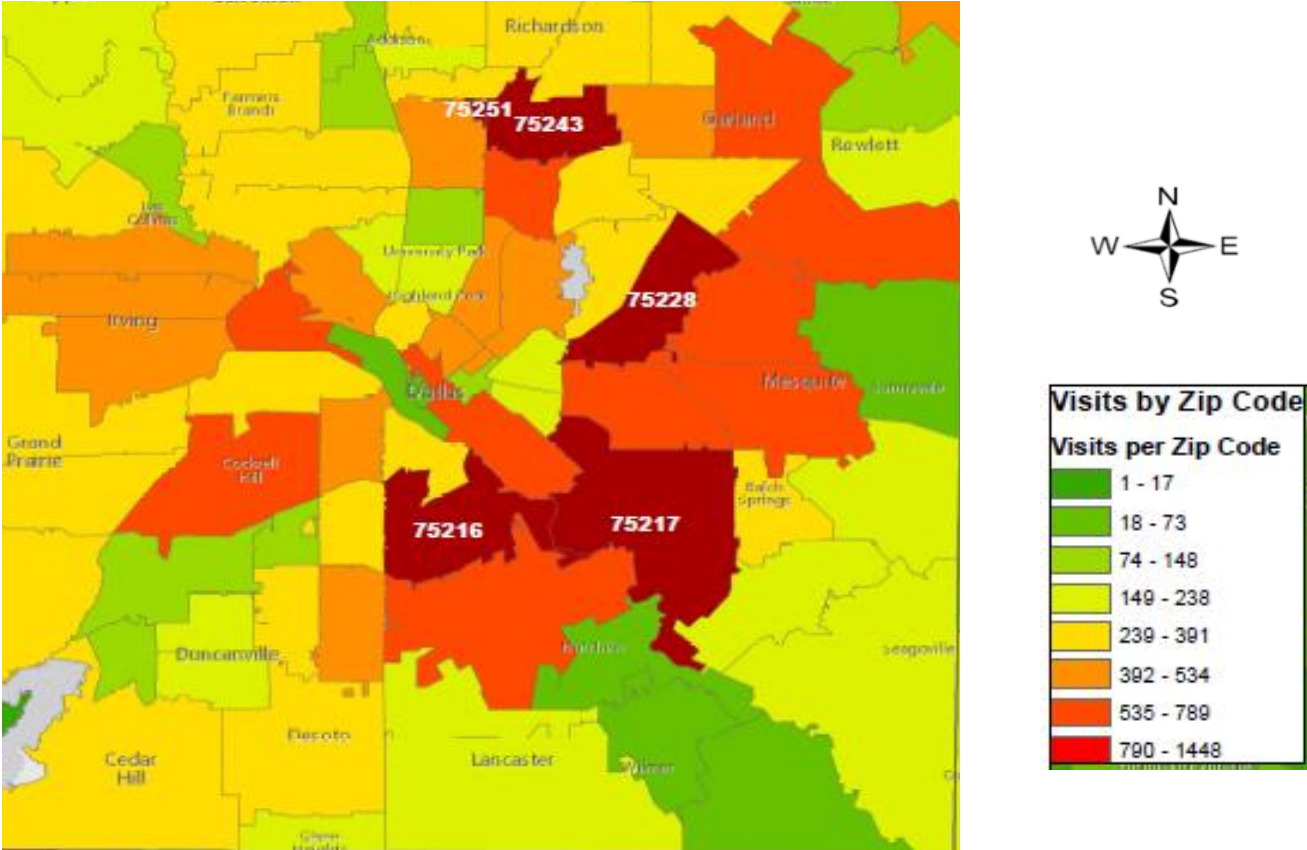


Overall suicide rate in Texas from 2012-2014 was 11.92 per 100,000 and at the same time, county rates based on county health rankings were between 5.24 per 100,000 to 32.16 per 100,000. Dallas and Denton Counties had 5.24-12.92 per 100,000 whereas Kaufman County had 13.15 - 17.05 per 100,000.

For 2010, 2011 and 2012, DFWHC Foundation’s data showed a total of 85,519 inpatient and outpatient visits for suicidal ideation and/or self-injury in all North Texas counties, 41,159 visits for

Dallas County, 4,712 for Denton and 331 visits for Kaufman County⁹. 19 percent of all North Texas Counties visits had an admitting diagnosis of suicidal ideation (V62.84). The Map (**Figure D.4**) below shows zip codes with high hospitals visits in Dallas County. Given this data, with the identification of the characteristics of patients who are seen for suicidal ideation and/or self-injury as well as patients with repeat visits in North Texas, mental and behavioral health care efforts can be more efficiently targeted towards reducing suicide risk and is certainly a community need.

Figure D.4: Residential Zip codes with the Highest Number of Suicidal Ideation and/or Self-injury visits by Patients Who Were Seen in Dallas County 2012-2014.⁹



Domestic violence: In the United States a woman is beaten every 9 seconds. Domestic violence is the leading cause of injury to women ages 15-44 in the United States-more than car accidents, muggings and rapes combined. In 2015, there were nearly 195,00 incidents of family violence in Texas. 158 Texas women were killed by their intimate partner in 2015, the highest ever recorded based on Hope Alliance’s report ²⁰.

According to a 2002 study from the Texas Council on Family Violence, 74 percent of all Texans have either experienced family violence themselves or have a family member or friend who has experienced family violence. According to The Dallas County Intimate Partner, Violence Fatality Review Team (IPVFRT)'s 2015 report suggests that 61.8 percent deaths occurred in the city of Dallas with an average of 11.3 incidents per year. 90 percent incidences occurred in house/apartment and 47 percent deaths involved a firearm²¹. The report also indicates that 65 percent victims and perpetrators were cohabitating at the time of the incident. Behavioral health problems including aggression, anxiety disorder, mood disorder, attention disorder, depression and substance abuse/alcohol were reported in 79 percent of the perpetrators. In addition to that 53 percent had previous violent arrests and 26 percent had non-violent arrests. Unfortunately, 44 percent of the case directly impacted at least one child in the family.

Sexual Assault and Abuse: Data suggest that 6.3 million Texans have experienced some form of sexual assault in their lifetime. Two in 5 women and 1 in 5 men in Texas have been sexually assaulted. 91 percent of sexual assault victims did not report to law enforcement^{22,23}. A research study conducted by DFWHC Foundation reported 2,720 hospital visits for adult sexual abuse, alleged rape, and rape (with physical evidence) in the North Texas Hospitals. The study reported 1,778 Child sexual abuse-related visits in North Texas hospital. County data indicated that residents of Dallas County had 1,378 visits, residents of Denton County had 158 visits and residents of Kaufman County had 58 visits. Results showed that in Dallas County greater proportion of victims were uninsured, Non-Hispanic/Latino, White females aged 10-29 Years²⁴. Findings suggest the need for coordinated efforts for prevention, treatment and advocacy efforts in the communities.

Summary: *The cost of care is higher for patients with mental health diagnoses of any kind than those without. Most notably, cost of care is 51 percent higher for patients 0-17 years and 72 percent higher for patients 36-45 years. Approximately \$47 million is spent annually on inmates with mental illness in Dallas County alone.*

This assessment identifies areas of high need and improvement in behavioral health related services in RHP region. Key strategies to address these disparities should include both direct and indirect correlates of behavioral health problems. Certainly, there is an urgent need for more providers, workforce training programs, the specialized skilled workforce at community level settings and workforce retention strategies. At the same time, political, business, policy and community level efforts should be made to address social determinants of behavioral health.

In addition, through research and innovative programs, use of telehealth and other advanced technologies should be promoted. Legal and policy level barriers which limit the use of these programs should be addressed. Community-wide education and awareness programs play a critical role in the adoption of new health care services by patients.

Community and family support play an important role in the behavioral health and therefore community-based support programs with faith-based institutions should be implemented.

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E: Infant and Maternal Mortality

Infant Mortality: Despite multiple initiatives and efforts to reduce infant mortality, pre-term and low weight births, this is still a critical area of concern. In RHP 9, high infant mortality rate has been reported in Kaufman County (9.3 deaths per 1000 live births) and Dallas County (6.6 deaths per 1000 live births) as compared to the national average (6.0), state average (5.8) and healthy people 2020 target (6.0). Denton County has infant mortality rate 3.6 deaths per 1000 live births (**Table E.1**).

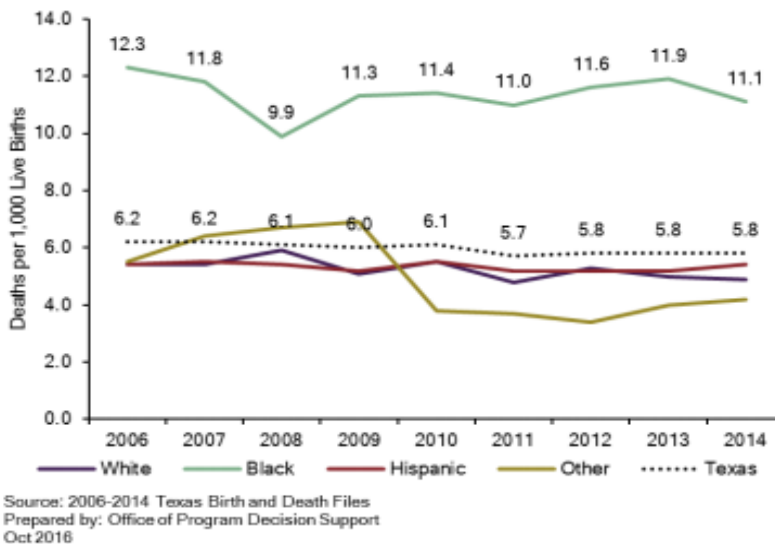
In Kaufman County, infant mortality rate doubled since the previous reporting which was 4.8 deaths per 1000 live births. Dallas County also reported a marginal increase from 6.5 to 6.6 deaths per 1000 live births. Denton County showed a downward trend from 4.6 to 3.6 deaths per 1000 live births.

Table E.1: Comparison of Infant, Child and Maternal Health in RHP 9 Counties.^{1,2,3}

Indicators	Dallas	Denton	Kaufman	US Value	TX Value	HP 2020 Target
Infant Mortality Rate (deaths per 1000 live births)	6.6	3.6	9.3	6.0	5.8	6.0
Babies with Low Birth Weight	8.6%	7.0%	9.3%	8.0%	8.3%	7.8%
Babies with Very Low Birth Weight	1.5%	1.0%	1.3%	1.4%	1.4%	1.4%
Mothers who received Early Prenatal Care	55.0%	66.2%	60.1%	74.2%	59.2%	77.9%
Preterm Births	12.0%	9.5%	12.1%	-	12.0%	11.4%
Infants born to Mother with <12 year Education	21.0%	12.9%	13.5%	15.9%	21.6%	NA
Teen Birth	3.0%	1.0%	2.4%	4.3%	2.8%	NA

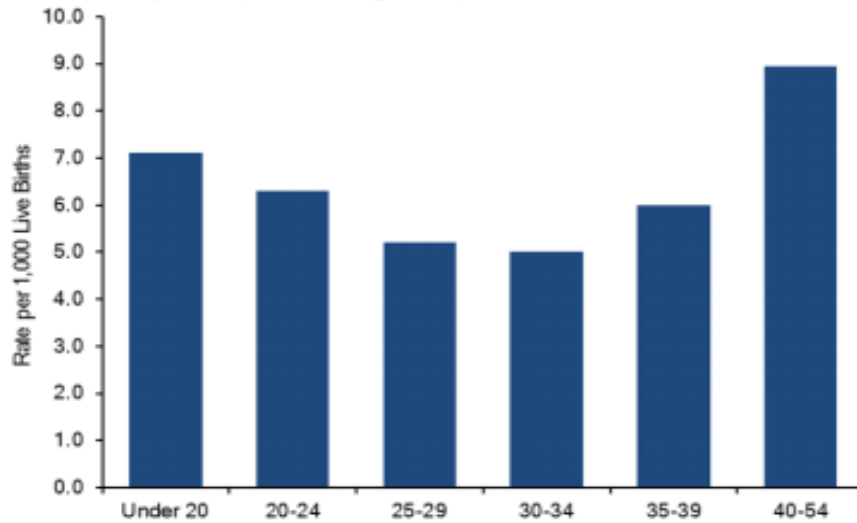
Figure E.1 explains racial and ethnic disparities associated with infant mortality in Texas^{4,5}. Black population has an exceptionally higher rate of infant mortality whereas other populations are below the state average⁶.

Figure E.1: Infant Mortality in Texas by Race and Ethnicity, 2006-2014



Causes of infant death also differ by race/ethnicity. In 2014, the leading cause of death among Black infants was short gestation and low birth weight, whereas congenital malformation was the leading cause of death among infants of all other ethnic groups⁶. Differences in infant mortality also exist by maternal age. Mothers age 40 or older had a higher infant mortality rate than mothers of any other age, followed by young mothers less than 20 years of age (**Figure E.2**). Mothers in these two age groups comprised 12.4 percent of resident births⁶.

Figure E.2: Infant Mortality Rate in Texas by maternal Age group, 2013



Source: 2013 NCHS Linked Birth-Death Files
Prepared by: Office of Program Decision Support
Oct 2016

In addition, Dallas and Kaufman counties had a higher percentage of babies with low birth weight as compared to the national average, state average and healthy people 2020 target (**Table E.1**). Higher infant mortality directly correlates with a mother's access to prenatal care, which is currently lower than the national average in all three counties^{1,2}.

Maternal mortality: Texas has the highest maternal mortality rate in the United States and it has increased sharply since 2010 (**Figure E.3**). Top causes of maternal deaths in Texas (2011-2012) were cardiac arrest, drug overdose, hypertension, hemorrhage, sepsis, homicide and suicide³. In the North Texas region, based on DFWHC Foundation's data, a total 54 maternal deaths were reported between 2010-2015. Similar to the state trend, data indicated a significant increase in 2013 to 2014³.

Figure E.3: The Maternal Mortality Trend in the State of Texas 2000-2014.^{4,5}

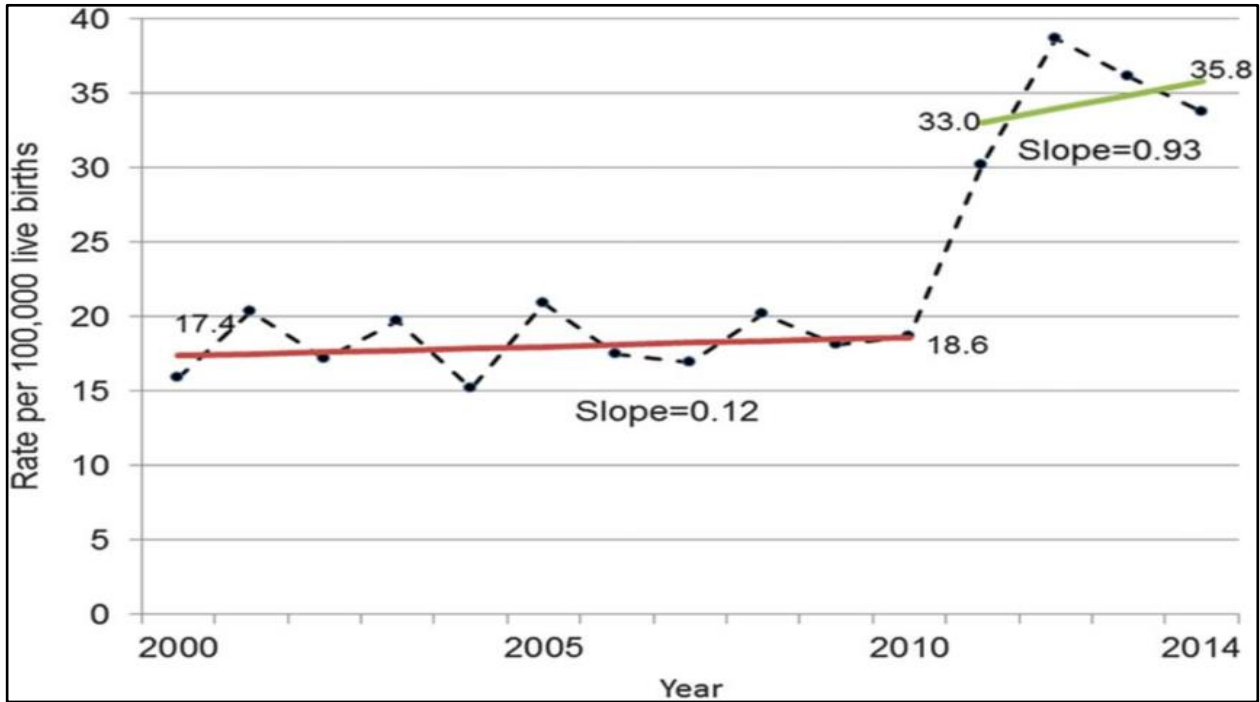
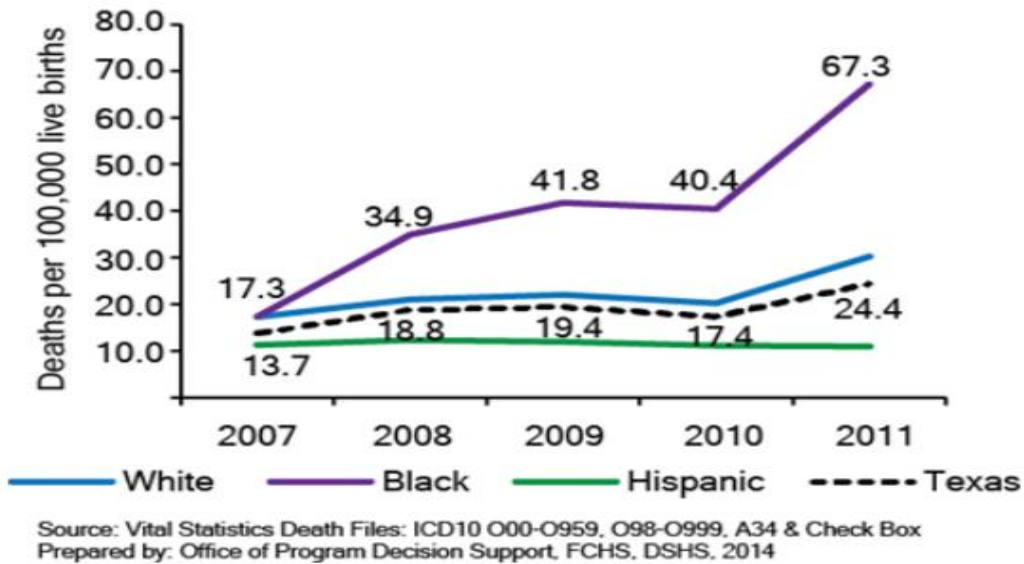


Figure E.4 below explains racial and ethnic disparities associated with maternal mortality in Texas state. The black population has an exceptionally higher rate of maternal mortality than others.

Figure E.4: The Maternal Mortality Rate in Texas by Race and Ethnicity



Based on The Maternal Mortality and Morbidity Task Force (task force) and Department of State Health Services (DSHS) 2016 Biennial report⁷, the key findings are:

- 1) Black women bear the greatest risk of maternal death;
- 2) Cardiac events, overdose by licit or illicit prescription drugs, and hypertensive disorders are the leading causes of maternal death;
- 3) A majority of maternal deaths occur more than 42 days after delivery; and
- 4) The data quality issues related to the death certificate make it difficult to identify a maternal or “obstetric” death.

The task force suggested following recommendations to address above issues⁷:

- 1) Increase access to health services during the year after delivery and throughout the inter-conception period to improve continuity of care, enable effective care transitions, promote safe birth spacing, reduce maternal morbidity, and reduce the cost of care in the Medicaid program.
- 2) Increase provider and community awareness of health inequities and implement programs that increase the ability of women to self-advocate.
- 3) Increase screening for and referral to behavioral health services.
- 4) Increase staffing resources in support of the task force.
- 5) Promote best practices for improving quality of maternal death reporting and investigation.
- 6) Improve the quality of death certificate data.

Summary: Evidences suggest that culturally and linguistically appropriate community-based participatory programs should be implemented in Dallas and Kaufman Counties to reduce infant mortality which is higher than the national and state average. Race, age and socioeconomic disparities associated with Infant and Maternal Mortality have been reported. In addition to that, lack of healthcare access due to a higher uninsured rate in Texas is a major contributing factor in Infant and Maternal Mortality related disparities. Since Texas did not accept a Medicaid expansion, women can only receive postpartum care up to 60 days after delivery. There is an urgency to develop collaborative strategies to address this critical need in our communities.

References:

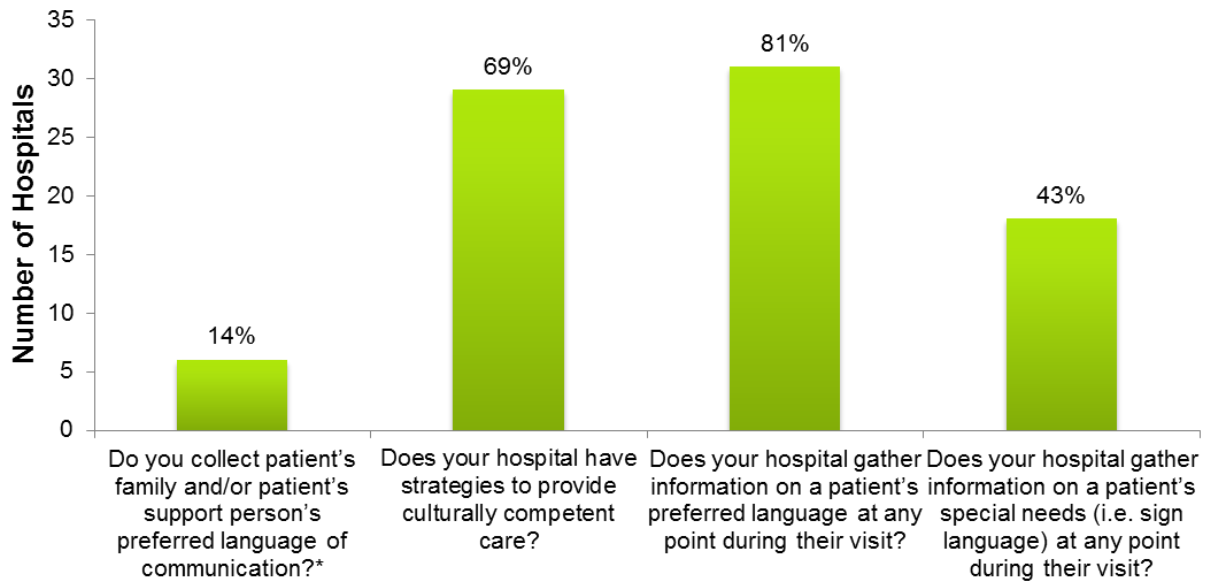
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F: Bridge the Gap

The following secondary strategies have been identified as ways to develop infrastructure for increasing sustainability in transformational initiatives and key items for further advancement in coordinating and continuing patient care at all levels.

Cultural and Linguistic Competency in Healthcare: Cultural and linguistic competence is widely recognized as the fundamental aspect of quality health care (including mental health), particularly for the diverse patient population. It acts as an essential strategy for reducing disparities by improving access, utilization, and quality of care. Our survey-based study reported that 74 percent of hospitals have a policy on collecting patient's preferred/primary language and race/ ethnicity during their hospital visit. However, less than 26 percent of hospitals collect information on the patient's origin (country), sexual orientation, and spiritual tradition. Interpreting phone lines were the top choice for interpretation services and translation services were only offered for the top two languages spoken in the region. Only 45-50 percent of hospitals annually review the demographics of their patient population and market service, workforce and governance representation. Results indicated that the top seven languages spoken by patients were; English, Spanish, Arabic, Vietnamese, Mandarin, Russian and Korean. Additionally, only 26 percent hospitals provide education to their staff on cultural and linguistic factors affecting the care of diverse patients and 38 percent have a mandate for employees to attend any diversity training. These results clearly indicate a need for more efforts in this area to fulfill diverse community's healthcare needs.



Telehealth and Telemedicine: Telehealth is emerging as a critical component of the healthcare crisis solution. Telehealth holds the promise to significantly impact some of the most challenging problems of our current healthcare system: access to care, cost-effective delivery, and distribution of limited providers. Telehealth can change the current paradigm of care and allow for improved access and improved health outcomes in cost-effective ways. Within RHP 9 the following programs have demonstrated successes in several North Texas Counties and the further expansion of these services would improve health outcomes for rural communities where health care access is a disparity.

- ❖ *School-Based Virtual Health Program Children's Health Dallas:* Children's Health System of Texas has established a school-based telehealth program with 97 schools in the Dallas, Collin, Grayson and Tarrant Counties. In 2015, the program reported over 3000 school-based encounters for children during school hours. The program managed to avoid potential ED visits/hospitalization/ ambulatory or physician visits, school absences, parents time off from work and inconvenience for children due to delay in treatment. Only 14 patients used hospital emergency department for the same diagnosis as their school-based encounter in 2015.
- ❖ *Behavioral Activation (BA) teletherapy program at UTSW Center of Depression Research and Clinical Care:* The efficacy of telepsychiatry/teletherapy for treating mood and anxiety disorders has been well-established in research studies, with outcomes like face-to-face visits, and greater efficacy compared to treatment-as-usual or placebo. Patient and provider satisfaction scores with teletherapy/telepsychiatry services by any communication medium are often high.

Telepsychiatry/teletherapy models can be cost-effective and may reduce barriers to accessing care, especially among rural, elderly, underserved, and minority populations. Primary care patients demonstrated improvements in depressive and anxious symptoms throughout BA-based teletherapy. Program outcomes suggest that patients were moderately depressed and anxious at intake. Most patients receiving at least one therapy session achieved depression remission at some point during psychotherapy, and patients completing four or more therapy sessions demonstrated lower final-session median depression and anxiety scores, compared to those completing fewer than four sessions. The program clearly demonstrates that BA-teletherapy is feasible and effective as an adjunct/alternative intervention for primary care providers and in low-income, charity populations.

- ❖ *Use of Technology to improve access to care and care coordination: VitalSign6 program at UTSW Center of Depression Research and Clinical Care:* VitalSign6 utilizes an innovative point-of-care, web-based software program, VS6, to screen all patients for depression in participating primary care practices using the Patient Health Questionnaire-9 (PHQ-9). The PHQ-9 is a brief, reliable, self-report measure of the frequency of depressive symptoms on each of the nine Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) criteria and is available in both English and Spanish for patients ages 12 and older. Patients complete the PHQ-9 on an iPad during the clinic intake process, as a self-report tool, which is intended to reduce any stigma attached to the screening and elicit truthful reporting of symptoms. For patients who screen positive, the VS6 software program assists the primary care provider in monitoring symptoms over time and guides treatment planning and medical decision making using principles of Measurement-Based Care (MBC).

Use of Technology to address diversity and health literacy needs: The North Texas community is one of the fastest growing and rapidly diversifying community in the nation. A report published by DFW International highlighted that approximately 26.10 percent of the residents in Dallas were new Americans (foreign-born population). In addition, a total of 239 languages are spoken in this area and for 43.20 percent of the population, English is not their primary language. These facts describe the diversity related to race, ethnicity, culture, language, and education etc. In addition, this area includes a high number of uninsured people – representing a socioeconomic diversity. DFWHC Foundation’s innovative project “Using Technology to Increase Patient and Caregiver Understanding of Chronic Obstructive Pulmonary Disease (COPD)-Empowering the Patient to Participate in Their Care” successfully addressed above issues by providing COPD management and medicine education instructions on tablets and CDs in top five languages spoken in the area (English, Spanish, Russian, Vietnamese and Mandarin) at fifth grade literacy level. This program

not only improved the clinical and health outcomes (including readmissions reduction) but also showed significant improvement in patient satisfaction, engagement and caregiver involvement. Such programs can be replicated in any community and to address any type of disease disparity.

Mobile apps and other innovations to track and inform patients with chronic illnesses: Children's Health successfully implemented a free mobile app program (My Asthma Pal) aimed at helping youths take more control of their asthma. The app targets ages 13 and older or parents of younger children. The app allows patients to input their asthma action plan and log their daily symptoms. It then allows users to compare those to the ones listed under the green, yellow and red zones, markers that explain the severity of the situation and tells users when they need to seek medical help. Children's Health has reported a remarkable reduction in asthma visits to its Emergency Department. From 2012 to 2015, the number of unique patients visiting the Children's Health emergency department with a primary clinical diagnosis of asthma decreased by 49 percent while overall volume remained relatively flat.

Continuing with innovative approaches, Children's Health also explored similar strategy for Diabetes and injury prevention; a telemedicine robot that allows doctors to communicate with patients via an iPad, remote patient monitoring, which allows transplant patients to be monitored from home, Tele-Emergency care, which gives emergency physicians access to Children's experts when needed, and Tele-plastics and Tele-neurology, which allows for patients to have pre- or postoperative consultations remotely.

Social Determinants of Health (SDOH): Healthy People 2020 highlights the importance of addressing the social determinants of health by including "Create social and physical environments that promote good health for all" as one of the four overarching goals for the decade. Programs related to SDOH are designed to identify ways to create social and physical environments that promote good health for all. These efforts include:

- Explore how programs, practices, and policies in these areas affect the health of individuals, families, and communities.
- Establish common goals, complementary roles, and ongoing constructive relationships between the health sector and these areas.
- Maximize opportunities for collaboration among Federal-, states, and local-level partners related to social determinants of health.



In RHP 9, efforts have been made by Children’s health and Wellness alliance to address SDOH in Dallas and Collin County. The program has identified the need for more broad and robust collaborations with community partners to address a wide range of disparities in those areas. This kind of collaborative effort with RHP 9 community would bring sustainable positive change in health and wellness of RHP 9 residents.

Advancing Nursing Workforce: Based on a recent report published by the Texas Center for Nursing Workforce Studies (Nurse Supply and Demand Projection, 2015-2030), Texas will face a shortage of all nurse types by 2030. The supply of registered nurses (RNs), nurse practitioners (NPs), certified registered nurse anesthetists (CRNAs), and certified nurse-midwives (CNMs) will fall short of demand for those nurse types each year from 2015 to 2030. Based on current trends, the projected number of licensed vocational nurses (LVNs) is expected to exceed demand between 2015 and 2028. These projections should be used as a planning tool for adequately preparing the future workforce to meet the needs of the population in RHP 9. There are several factors that can impact supply, such as the ability to draw nurses to the workforce and train them in adequate numbers and improvements or declines in the economic climate that may drive retirement patterns. There are also factors worth considering that extend beyond just numbers such as such ensuring diversity in the workforce to deliver culturally competent care and the geographical distribution of not just nurses but the right combination of nurses to meet the demand for needed specializations and skill sets.

DFWHC Foundation’s Workforce Center is working collaboratively with DFW area nursing schools and hospitals to address the demand and supply issue in North Texas region. Center is leading advanced/specialized training and educational efforts for nurses in this area. Collaborating with

regional nursing schools and hospitals through DFWHC Foundation' Workforce Center would help RHP 9 to address these challenges and prepare for future workforce demands in RHP 9.

Summary: Evidence related to above secondary strategies suggest that successful incorporation of these ideas into the program planning for RHP 9 core strategies will significantly increase the quality and efficiency of the programs. Use of technology gives an opportunity to address healthcare access related disparities specifically in high shortage areas like pediatric population and rural areas. Although addressing social determinants of health requires comprehensive planning, investment, and collaboration if successfully implemented, it provides a sustainable solution for health disparities in the community. At the same time, planning for the future nursing workforce is critical and needs collaborative planning to address upcoming challenges.

Conclusion

The current community health needs assessment identifies a continued need to address issues related the mental health and substance abuse, workforce capacity and access to care, managing and prevention of chronic diseases, and how to care for the whole person to reduce over utilization of high cost health care. Unique to this current community health needs assessment is the addition of infant and maternal mortality as an area of focus. The key findings identified in this community needs assessment are those areas that need to be addressed to serve the patient populations entrusted to the care of the many providers participating in RHP 9. In summary there is needed programming in the following areas:

Behavioral Health: Mental Health and Substance Abuse-Our Most Pervasive Challenge

- People from all counties in RHP 9 have significant needs related to mental health and wellness as well as substance abuse reduction and systems of care. Almost all quantitative metrics related to these issues are below even the Texas average performance and do not come close to national statistical averages.
- Qualitative measures gleaned from extensive interviews with the community indicate that mental health and substance abuse issues are a top concern and priority for political, community, health and business leaders as well as members of the lay public. The issues of socioeconomic disadvantage, healthcare delivery, built environment and public safety all converge around this topic creating great opportunity to address these issues in our region.
- Programs supporting mental health and substance abuse treatment, prevention, the built environment and social services are needed to even reach average performance status in the populace's mental health and substance abuse conditions.

Capacity and Access: “The Doctor is Not In”

- We have been making strides in physician recruitment and availability, but rural areas have not seen the same gains the urban areas have seen.
- Continued expansion of the provider population will be necessary to provide timely access to care in all areas of RHP 9 and in all specialties – primary care, pediatrics and most specialty physicians.
- Continued efforts to increase the provider population and programs that incentivize access in rural areas would benefit the populace of RHP 9. These could include additional workforce members, expanded practice scopes, and technological innovations to allow for remote access to care when appropriate for the patients.

Chronic Disease Care: Challenges across Disease States

- Heart disease (and its various causes/contributors) is the highest priority for prevention of death in our area.
- There are significant disparities in outcomes for diabetics in minority populations.
- Obesity increases the costs of all types of care – for all age groups – but with the strongest effects in the very young and the middle aged (which are the large Medicaid and uninsured populations in Texas).
- We have a dental services access problem particularly in rural communities.
- RHP 9 community members would benefit from addressing the factors effecting immunization rates and communicable disease in specific areas.

Infant and Maternal Mortality: A Lesson in Disparity

- Maternal mortality rates spiked in Texas and in RHP 9 in 2011-2014.
- Programs to address underlying health issues of the mother – including cardiac issues, drug usage, hypertension and mental health disorders including depression – during and following pregnancy could improve the reported death rates for infants and mothers in RHP 9 and Texas as a whole. This support should be aimed at interventions to increase birth weight during pregnancy and family social/medical support post-delivery to improve maternal wellness and survival.
- African American women’s rate of maternal mortality is approximately 2.5 times the state average and the average for white women and more than 5 times that of Hispanic women.
- Understanding the health, social, and economic issues for new African American mothers and addressing those needs should be prioritized to address significant quantitative disparities in maternal mortality outcomes.

Care Coordination: Caring for the Whole Person:

To provide excellent care, we must understand how to care for each person as an individual and as part of their native culture

- Interventions must continue to encourage and promote access to care outside the emergency department. Emergency department overuse applies to all demographic categories in the region.
- Readmissions are down – but they are still high, especially in the elderly population.
- Cultural competence training for staff and inquiry into what language a patient's caregiver prefers is not occurring in most of RHP 9's health systems. Only a small percent of hospitals engage with patients and their families at this level. Readmission rates and effective use of the systems of care cannot occur if caregivers are unaware of the personal, familial and cultural traits of patients.
- Investment in the cultural competence and linguistic sensitivity of our workforce may have the potential to show significant benefits to patients, their caregivers and providers through improved patient experience, reduced readmissions, reduced unnecessary emergency department use and the same will likely be necessary to achieve high reliability in care delivery through reduction of healthcare acquired conditions

USING WHAT WE KNOW

STUDY: Evaluate how the region's needs meet with your current programming priorities. Are you helping to address the most pressing needs? Does the CHNA information inform your next cycles of organizational strategic planning?

GENERATE IDEAS: What programs would address multiple community needs at the lowest regional cost? Which organizational partnerships would create the greatest value in addressing these multiple needs? Do you need to build, partner, innovate and in what ways?

PLAN: Develop business models to deliver the programming that you envision to meet the needs

ACT: Submit requested information for the RHP 9 plan update to anchor by requested due date.

Participate in learning collaborative activities to ensure alignment and inclusion across RHP 9.