Oklahoma State Innovation Model
Delivery of High-Cost Services

Prepared for
Oklahoma State Department of Health
Center for Health Innovation & Effectiveness

November 6, 2015

Milliman

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I.   EXECUTIVE SUMMARY

The Oklahoma State Department of Health, Center for Health Innovation & Effectiveness (OSDH) requested that we perform an analysis of specified high-cost services and conditions impacting the State of Oklahoma's healthcare system. The purpose of our analysis was to identify high-cost populations and services, analyze the cost and demographics of the high-cost populations, and discuss consideration for optimizing care on the targeted groups. For this purpose, we reviewed available claims and enrollment data along with other publicly reported information. We focused our data review on four identified medical condition population groups specified by the Oklahoma State Innovation Model (OSIM) along with behavioral health conditions. We also analyzed conditions and services incurred by the highest quintile (top 20%) of patients.

High-Cost Conditions

One of the focuses of OSIM is to create population-based health measures for four (4) specific highly prevalent and high-cost conditions: obesity, diabetes, hypertension, and tobacco usage. We analyzed the impact that these physical health conditions have on the different payers across the State of Oklahoma in terms of prevalence and relative cost. In addition to these four high-cost conditions, OSDH requested that we provide accompanying analysis for behavioral health conditions including both mental illness and substance abuse disorders. Figure 1 provides a summary of the estimated prevalence rates for all of these targeted conditions across four main insurance coverages: Commercial, Medicare, Medicaid, and the Employees Group Insurance Division (EGID) in the State of Oklahoma. Note that due to significant under-reporting of obesity and tobacco usage diagnoses in healthcare claims submissions we referred to external sources in developing the prevalence rates for these conditions. Because the prevalence rates are based on multiple sources of information, the time period reflected by the rates vary across the conditions and payers.

<table>
<tr><td colspan="5" align="center">**Figure 1**
State of Oklahoma
OSIM Identified Condition Prevalence</td></tr>
<tr><td></td><td>**Commercial**</td><td>**Medicare**</td><td>**Medicaid**</td><td>**EGID**</td></tr>
<tr><td>Obesity (based on published research)</td><td>29.9%[1,a]</td><td>28.9%[1,a]</td><td>28.9%[1,2,3,a]</td><td>N/A</td></tr>
<tr><td>Diabetes</td><td>5.2%[b]</td><td>25.9%[b]</td><td>4.5%[4,c]</td><td>11.5%[d]</td></tr>
<tr><td>Hypertension</td><td>14.2%[b]</td><td>70.6%[b]</td><td>9.8%[5,c]</td><td>21.0%[d]</td></tr>
<tr><td>Tobacco Usage (based on published research)</td><td>21.1%[6,a]</td><td>9.9%[7,a]</td><td>36.7%[8,a]</td><td>N/A</td></tr>
<tr><td>Behavioral Health Conditions</td><td>9.2%[b]</td><td>22.5%[b]</td><td>N/A</td><td>8.2%[d]</td></tr>
</table>

Notes: a. Obesity and tobacco rates are based on publicly reported information, specific to Oklahoma with age and income adjustments where applicable.

b. Diabetes, hypertension, and behavioral health condition prevalence rates for the commercial and Medicare markets are based on CY 2013 sample claims information.

c. Diabetes and hypertension rates for Medicaid are based on Oklahoma Health Care Authority (OHCA) studies.

d. Diabetes, hypertension, and behavioral health condition prevalence rates for the EGID population are based on report from Truven Health Analytics

The obesity prevalence rates illustrated in Figure 1 were based on the State of Obesity report which is a project of the Trust for America's Health and the Robert Wood Johnson Foundation. The different payer market prevalence rates were calculated based upon age and income adjustments from additional published research and population distribution. Please note that the tobacco usage rates are specific to the adult population across the payer markets. Additionally, the mix of behavioral health conditions can vary widely between populations depending upon the different diagnoses. Prevalence rates specific to behavioral health conditions within the Medicaid population were not available from the provided reports.

We further analyzed these OSIM-identified conditions to understand the financial implications associated with these highly-prevalent diagnoses. Figure 2 provides a summary of the per member per year cost of care, average ages, and potentially avoidable facility claims across the commercial, Medicare, and Medicaid payers for each of the identified conditions within the available claims information and for which these analytics were available.

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[1] Retrieved on September 21, 2015 from The State of Obesity report http://stateofobesity.org/states/ok/

[2] Retrieved on October 5, 2015 at http://www.cdc.gov/nchs/data/databriefs/db51.pdf

[3] The Cost of Obesity in Oklahoma; Watkins, Angela; August 19, 2013

[4] Diabetes Analysis for SoonerCare Members SFY 2014, dated April 17, 2015 and provided by OHCA

[5] Prevalence rate calculated from Hypertension Analysis SFY 2008-2013 documenting 77,047 members as provided by OHCA

[6] Retrieved on November 6, 2015 utilizing CY 2014 BRFSS data accessed at http://www.ok.gov/health/Data_and_Statistics/Center_For_Health_Statistics/Health_Care_Information/Behavioral_Risk_Factor_Surveillance_System/BRFSS_Data/index.html

[7] Retrieved on September 21, 2015 from http://www.americashealthrankings.org/senior/OK

[8] Information obtained from OHCA 2015 CAHPS survey on use of tobacco for Adults in Oklahoma Medicaid

Because it appears that obesity and tobacco usage identified in the claims information represents a fraction of the true prevalence of these conditions, it is expected that costs summarized for diagnosed individuals reflect some of the highest-cost cases within these conditions. For comparison, average population metrics are provided to illustrate the cost and demographic profiles of the composite population within each payer. Ranges for the OSIM conditions reflect calculated values across the indicated conditions within summarized claims information.

Figure 2 State of Oklahoma Population Demographic and Potentially Avoidable Cost Summary			
OSIM Conditions	**Commercial**	**Medicare**	**Medicaid**
Per Member Per Year Cost of Care	$14,129-17,429	$12,481-22,617	$10,300-11,000
Average Age of Identified Population with Highly Prevalent Condition	42.4-51.8	71.6-74.9	N/A[a]
Potentially avoidable facility claims	6-10%[b]	9-13%[b]	4-5%[c]
Composite			
Per Member Per Year Cost of Care	$4,993	$9,865	$4,746
Average Age	33.7	74.2	N/A

Notes: a. Specific ages were not available for Medicaid demographics
  b. Potentially avoidable claims includes both inpatient admissions and emergency department claims for commercial and Medicare
  c. Potentially avoidable claims for Medicaid is based on potentially preventable readmissions

The per member per year cost of care represents the total cost of care for an individual who has been identified as having one of the studied conditions on an allowed amount basis. Due to co-morbid conditions, there is potential overlap between the different groups. Per OSDH's request, we have additionally collected information related to the conditions in the Oklahoma Employees Group Insurance Division (EGID) and summarized information related to the uninsured population in the state. The uninsured population primarily consists of adult individuals because Medicaid traditionally covers children up to a higher income level. Based on a review of the available data, we believe that the EGID population presents characteristics similar to the commercial data; however, detailed level of information was not available to provide an analysis consistent with the three payers illustrated in Figure 2.

In addition to the conditions identified by OSIM, we analyzed sample claims information, studies, and other literature to highlight other high-cost conditions and related services that would indicate an area of focus for OSIM. The analysis of the highest cost patients in these systems enabled us to expand the study scope to include populations for which customized value-based payment and care delivery models may be designed. The following section discusses the optimization of care for these patients and potential strategies to reduce healthcare spend while providing participants with better outcomes.

Optimization

At the request of OSDH, our analysis targeted areas where potential savings could be created to reduce healthcare expenditures. The focus was on services with the highest utilization and those that contribute the largest portion of cost for the most expensive patients. We analyzed the setting of care for these services and identified the portion of the services that could be moved to a more cost-effective setting or avoided altogether. The scope of our analysis centered on identifying the settings of care where the expenditures are being spent and what services are being provided. While identifying specific approaches to avoid costs was outside of the scope, different methods for consideration have been included in this report.

Based on the distribution of cost and the high utilization of hospital services, we performed an analysis on both hospital inpatient admissions and hospital outpatient emergency department visits. Figure 3 provides a summary of the percentage of facility claims (including both inpatient and outpatient facility claims) that could potentially be avoided or moved to a more cost-effective setting. By identifying these potentially preventable or avoidable occurrences, providers may become more efficient and understand where a higher degree of healthcare management is beneficial. A program with better management of healthcare services may produce savings while maintaining or improving the quality of care that is provided to participants. Figure 3 illustrates the estimated savings that may be achieved by applying small percentage reductions in inpatient expenditures across the different payers. As the populations identified for the OSIM conditions are not mutually exclusive, we have provided ranges on the estimates for potential inpatient savings.

Figure 3 State of Oklahoma Estimated Hospital Inpatient Savings by Payer Type			
	Commercial	**Medicare**	**Medicaid**
Population Size	800,000	625,000	789,000
Estimated Savings Per Member Per Year on High-Cost Populations	$60-100	$50-200	$19-20
Claims Information Prevalence Rates	3.2%-20%	5.8%-70%	4.5%-9.8%
Potential Inpatient Savings	$10-20 million	$20-30 million	$800k-$2.3 million

We have limited these estimates to hospital inpatient services within the summarized claims information to reflect an example of the proportion of expenditures that could be reduced under proposed care delivery or payment reform approaches. It is expected that shifting certain services out of the inpatient setting may result in additional services in a lower-cost setting. Therefore, these reductions do not necessarily represent overall system savings.

As the driver of OSIM is to design programs that can help achieve better health outcomes in a cost-effective manner, we have proposed different options based on initiatives that have been implemented in healthcare delivery systems across the country and in the State of Oklahoma. The type of program that will work best to manage a specific condition or service type may not be the best approach for another.

Therefore, instead of a one-size-fits-all approach different suggestions are made depending on the insurance coverage and current treatment profile. Examples of proposed methodologies include, but are not limited to, the following:

- Bundled payments for episodic bases of care
- Shift to risk-based managed care for traditional Medicaid populations
- Additional patient-centered medical homes including care managers
- Expansion of accountable care organizations (ACOs)
- Partnering arrangements between providers and external organizations
- Provider risk-sharing arrangements
- Patient outreach programs (nutritional counseling, mobile clinics, etc.)

The development of a particular payment reform or care delivery approach should be geared towards identifying the areas of greatest impact related to healthcare expenditure reduction without sacrificing the quality of necessary care. For many states, pilot programs that focus on one or a few of the initiatives listed above are used to measure success in the near-term. By ensuring target goals can be met, there is room for expansion to other approaches in the future.

While there are savings that can be generated from applying care management techniques and programs to currently insured individuals with diagnosed conditions, we recognize that there are other aspects of healthcare delivery that would require change to truly meet the State of Oklahoma's healthcare system goals. These would include ways of gaining access to primary care services for the uninsured population and developing preventive measures to help lessen the impact that analyzed conditions have on the healthcare system. For this reason we have provided discussion of these in this report; however, identifying methods to achieve these goals is outside the scope of this analysis.

Additionally, this analysis is not intended to discuss treatment improvements for a disease or condition but rather to encourage discussion on identifying ways to better manage the care of the types of individuals studied in this report. By doing so, the State of Oklahoma may implement targeted optimization strategies that may reduce the overall costs associated with the conditions included in our analysis.

II. BACKGROUND

We were contracted by the Oklahoma State Department of Health, Center for Health Innovation & Effectiveness (OSDH) to provide actuarial and financial expertise related to Oklahoma's State Innovation Model Round 2 Design Grant (OSIM). The goal of OSIM is to provide state-based solutions to the State of Oklahoma's healthcare challenges. The plan contains a triple aim initiative to improve health, provide better care, and reduce health expenditures for Oklahomans. Based on direction from the Oklahoma Health Improvement Plan (OHIP) Coalition, a stakeholder group as part of this innovation, we were requested to evaluate and categorize the delivery of high-cost services in the State of Oklahoma. The specific items initially requested in this analysis included:

- Compare the cost of diabetic, hypertensive, obese, and tobacco use populations across all insurance groups;
- Provide a summary of the demographics of the identified populations;
- Analyze the services utilized by the high-cost populations by current procedure terminology (CPT-4) codes;
- Analyze the diagnosed conditions of target populations by International Classification of Diseases; and,
- Define inpatient and outpatient optimization and total cost of care based on operational benchmarks.

Following discussions with the members and stakeholders of OSIM, the analysis was expanded to include the following items:

- Analyze and discuss other high-cost conditions represented in the State of Oklahoma healthcare system;
- Provide information on the prevalence and cost related to behavioral health conditions;
- Analyze the services utilized by the high-cost populations in the hospital inpatient setting based on diagnosis related group (DRG) codes;
- Provide discussion on the uninsured population in the State of Oklahoma; and,
- Identify areas of potential savings within the healthcare system.

The results of this analysis will be used to assist in the OSIM model design efforts to develop a State Health System Innovation Plan.

III.   PROFILING HIGH-COST INDIVIDUALS

While there is no clear delineation in identifying a high-cost patient, we can follow a general rule of thumb. The 80/20 rule indicates that approximately 80% of goods or services are consumed by approximately 20% of the consumers, and this can be extended to the healthcare system. Oftentimes, the highest cost individuals are those diagnosed with a high-cost and chronic condition and potentially even multiple high-cost and chronic conditions.

Figure 4 provides an illustration of the 80/20 rule, defined as the Pareto Principle, using calendar year 2013 commercial insurance claims data for the State of Oklahoma. This chart was created by plotting the percentage of total expenditures, from 0% to 100%, on the y-axis and the percentage of members observed on the x-axis. Thus, in the upper right corner of the graph we reflect that 100% of dollars have been utilized by 100% of the patients.

Figure 4
State of Oklahoma
Claims Distribution
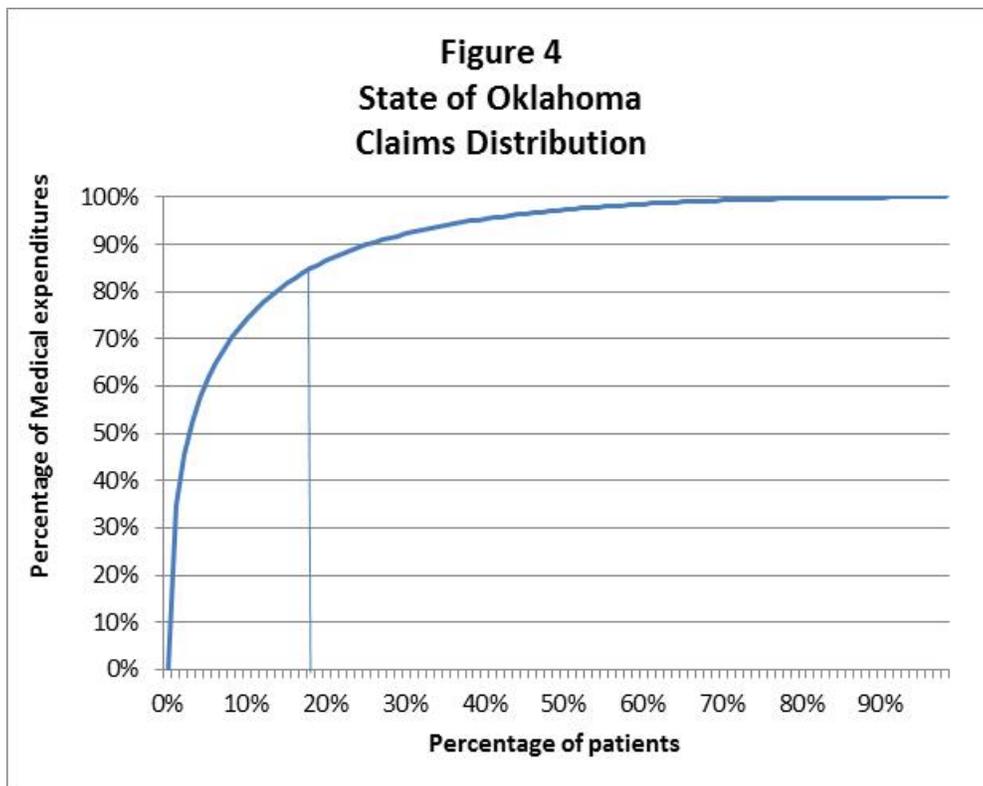
Note: Based on total cost of patients residing in the State of Oklahoma from Milliman's internal commercial database.

In this illustration slightly higher than 80% of the healthcare dollars are being spent on the highest cost individuals, as shown by the vertical line positioned at the 20th percentile of beneficiaries. This supports the expectation that the highest cost individuals will consume a disproportionate share of the medical expenditures. Cost reduction measures have often been aimed at impacting the lower cost 80% of the population; however, these measures are typically only targeting 20% of total spend.

While it is still necessary to create programs and initiatives to maintain quality of care and keep spending down for this part of the population, more can be gained by understanding the needs of the 20% of the population with the highest expenditure volume. Therefore, it is critical that we analyze the utilization patterns of these high-cost individuals. The application of this principle is not specific to any one segment of the healthcare system, rather it can be observed across all payers. Based on data availability, we have chosen the commercial population to illustrate this concept.

In addition to analyzing the high-cost conditions identified by the OSIM plan we also looked at the high-cost members identified in the payer markets regardless of diagnosed condition. The focus for this part of the analysis was to remove conditional limitations for diagnosis and identify patients only based on total cost of care. Due to the fact that the OSIM-identified conditions are also costly, some of the individuals grouped in the most expensive 20% population are included in one or more of these conditions. However, our objective for examining the high-cost members was to identify any particular services or cases that consume a sizable portion of total healthcare costs. A potential outcome from this exercise is to identify episodes of care that may be beneficial to consider for certain care delivery models that are examined.

The methodology for identifying the OSIM conditions and determining what conditions were most prevalent within the most expensive 20% population was based on International Statistical Classification of Disease, 9th Revision, Clinical Modification (ICD-9) codes. A diagnosis code provides a description for specific disease states or ailments attributed to an individual. The ICD-9 codes are reported on an individual's claim by a healthcare provider to explain the reason for services performed. Obesity and tobacco usage have ICD-9 codes associated with their respective conditions; however, their usage in medical claims is often under-reported. These conditions are typically termed as "lifestyle conditions," and the lack of claims may be due in part to the absence of provider payment or physician interpreted irrelevance of the diagnosis in relation to the provided service.

IV. IDENTIFYING HIGH-COST CONDITIONS

Beyond the definition of a high-cost patient, this section considers that both the treatment cost associated with each patient and the overall prevalence of the condition are key components in identifying high-cost conditions. Certain conditions that are highly prevalent but on average may not be as high-cost on an individual basis can be targeted as areas of potential savings. It is important to strike a balance between coordinating care for the most prevalent conditions and the low-frequency/high-severity conditions particularly when limited resources are at stake.

As defined by the World Health Organization (WHO), a chronic disease is one that is not passed from person to person and is of long duration and generally slow progression[9]. Based on information reported by the Centers for Disease Control and Prevention (CDC), chronic diseases and conditions are among the most common, costly, and preventable of all health problems[10]. With approximately half of American adults having one or more chronic conditions (as of 2012), it is no surprise to discover that 7 out of the 10 leading causes of death in the United States were chronic diseases. Although not all chronic conditions are discussed in this report, it is critical for any healthcare system to have an understanding of the prevalence of these conditions and be able to appropriately manage diagnosed patients.

Given that there are a variety of approaches in defining high-cost patients and conditions, our analysis is focused on the chronic medical conditions identified in the OSIM application, behavioral health conditions and the beneficiaries categorized as the most expensive 20% of the respective payer populations. Defined by the structure of OSIM, the initial phase is to achieve consensus among the OHIP coalition stakeholders on the alignment of a socio-ecological model that includes clinical and population-based health measures for selected health topics: obesity, diabetes, hypertension and tobacco.[11] Each of the conditions targeted by OSIM is further discussed below.

- **Obesity.** The clinical definition, based on the WHO, is a condition where an individual's body mass index (BMI) is over 30[12]. BMI measures weight versus height by dividing a person's weight in kilograms by one's height in meters squared (kg/m^2). Obesity itself may not be defined as a high-cost condition; however, it is typically a signaling diagnosis and can be a precursor to other conditions including, but not limited to, heart disease and diabetes. The claims information related to obesity was observed to be severely under-reported

- **Diabetes.** Individuals with diabetes are unable to produce a sufficient amount of insulin to reduce levels of glucose in the blood and urine. There are two types of diabetes: Type 1 which is often referred to as juvenile diabetes and Type 2.

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[9] World Health Organization definition of chronic disease http://www.who.int/topics/noncommunicable_diseases/en/

[10] Centers for Disease Control and Prevention http://www.cdc.gov/chronicdisease/overview/

[11] Oklahoma State Innovation Model homepage http://www.ok.gov/health/Organization/ Center_for_Health_Innovation_and_Effectiveness/ Oklahoma_State_Innovation_Model_(OSIM)/

[12] WHO's definition of obesity http://www.who.int/mediacentre/factsheets/fs311/en/

Type 2 diabetes affects both children and adults and is the most common form of this disease. The total estimated population with diabetes is 29 million people in the United States. It is estimated that approximately 25% of that population is undiagnosed.[13]   Diabetes can be a manageable condition with proper treatment and healthy behaviors, but it remains a leading cause of death in the United States and costs more than $176 billion[14] in direct medical costs per year.

- **Hypertension.**   An individual with hypertension is diagnosed as having abnormally high blood pressure. Based on statistics provided by the CDC, hypertension is prevalent in over 29% of the United States adult population[15] with roughly 75% of these individuals seeking active treatment. Additionally, the largest portion of the hypertensive population comprises patients over the age of 65, as presented in Figure 1. As is the case with each of the conditions identified by OSIM, hypertension can lead to a number of other medical conditions including heart attack and stroke.

- **Tobacco usage.** According to the United States Department of Health and Human Services (HHS), tobacco use is the leading cause of preventable illness and death in the United States. The use of tobacco can lead to respiratory health issues, different forms of cancer, fertility issues, and problems with general health. [16] Exacerbating the issue of tobacco usage is the damage on those who are surrounded by tobacco users (e.g., secondhand smoke). For this analysis, we focused on the costs related to the primary tobacco users and not the additional costs for individuals impacted by secondhand smoke. As was the case with obesity, tobacco usage claims information was grossly under reported in our sample data.

- **Behavioral health.**   In the context of this report, behavioral health conditions include issues related to either mental health or substance abuse. There is a wide variety of behavioral health conditions identified within this category which includes anxiety disorder, depression, and substance abuse disorders. For purposes of this report we have grouped all conditions together under one comprehensive category. While behavioral health costs for impacted individuals linked to their type of behavioral health diagnosis can also be an effect on other medical categories, costs associated with individuals diagnosed with a behavioral health condition are associated with the total cost of care. Therefore, costs related to both the medical and behavioral health condition where co-morbidities exist is included in our analysis.

Using ICD-9 codes to identify patients in each of the claims databases, we developed a mapping of patients from our sample databases, where available, to the population condition groupings identified for this analysis. In order to obtain the total cost of care for affected individuals, we did not develop the mappings to be mutually exclusive because many of the individuals may have multiple conditions. Therefore, a summation of the calculated aggregate spend for all noted conditions would overstate the true medical claims cost for these conditions. The ICD-9 codes utilized in our mapping are illustrated in Figure 5.

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[13] Please see http://www.diabetes.org/diabetes-basics/statistics/ for more statistics on diabetes
[14] http://www.diabetes.org/advocacy/news-events/cost-of-diabetes.html
[15] http://www.cdc.gov/nchs/data/databriefs/db133.pdf
[16] HHS Be Tobacco Free information http://betobaccofree.hhs.gov/about-tobacco/facts-figures/

Figure 5 State of Oklahoma OSIM Condition Diagnosis Code Mapping	
Diabetes Mellitus	249-250, 357.2, 362.0, 366.41
Hypertension	362.11, 401-405, 437.2
Obesity	278.0
Tobacco Use Disorder	305.1
Behavioral Health	See Appendix A

In addition to the OSIM-identified conditions, our report presents an overview of other high-cost conditions based on our analysis of the high-cost population. The different conditions noted in the most expensive 20% of the population vary based on the different payer market being analyzed. Information on these conditions is provided in more detail for each of the separate payers in sections VI through IX.

The key to understanding how high-cost conditions influence spending within the healthcare system lies in identifying what they are and who has them. Following this step, it was important to expand the scope of our analysis beyond direct treatment of specific conditions and focus on total cost of care for a patient. Simply looking at the services and treatments provided for a particular disease state may not help to identify the causes of the problem. For example, the treatment costs associated with services to help an individual clinically defined as obese may not be significant; however, the treatment for related conditions such as heart disease or stroke serves to amplify the overall treatment cost attached to an obese individual.

V.   COST OF CARE

The total cost of care for an individual diagnosed with a high-cost condition can vary considerably across payers, within the population, and even for an individual over the span of the diagnosis. Most of the conditions discussed in this report are generally considered highly preventable or treatable but can also be fatal if not appropriately addressed. While the average member may not incur a single high-cost event associated with a specific disease in their lifetime, the combination of higher than average treatment cost and overall prevalence contributes to certain conditions receiving close attention.

The values in Figure 6 illustrate the disparity in overall treatment cost between each analyzed condition and the average annual cost for a member.

Figure 6 State of Oklahoma High-Cost Condition Cost Relative to Average Member			
	Commercial	**Medicare**	**Medicaid**
Obesity (based on coding)	343%	229%	N/A
Adult Obesity (based on published research)	122%[17]		
Diabetes	349%	157%	232%
Hypertension	283%	127%	217%
Tobacco Usage (based on coding)	345%	213%	N/A
Adult Tobacco Usage(based on published research)	115%[17]		
Behavioral Health Conditions	313%	224%	N/A
Top 20% Population	490%	413%	N/A
Entire Population	100%	100%	100%
Average Annual Cost for entire population	$4,993	$9,865	$4,746

Notes: 1. Values for commercial market based on calendar year 2013 claims information from Milliman internal databases limited to State of OK experience.
2. Values for Medicare market based on calendar year 2013 claims information from CMS 5% sample without prescription drug experience limited to state of OK.
3. Values for Medicaid information are based on OHCA provided reports specific to Diabetes, Hypertension and SoonerCare SFY 2014 annual report.

The average annual costs illustrated in Figure 6 are based on allowed amounts, or prior to member cost-sharing, and reflect per member per year estimates. The costs associated with obesity and tobacco usage that are based on coding represent limited number of individuals identified in the sample claims information. The actual prevalence rates for these populations identified in the claims represent fractions of the estimated payer-specific population for these noted conditions.

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[17] Based on health care expenses summarized in *Health care expneses in relation to obesity and smoking among US adults by gender, race/ethnicity, and age group: 1998-2011; An, R, December 24, 2014*

The relative costs for these limited sets of data represent individuals who are anticipated to have a manifested co-morbid condition that is driving the higher costs represented. Therefore, we have provided cost relativities in the overall United State adult population based on published research.

The average annual cost of $4,993 illustrated for the commercial population reflects the average per year cost for covering a beneficiary for that payer. The cost of diabetes is shown as 349% of the average for a commercially insured life. This indicates that the cost for covering a diabetic patient in the commercial population is $17,430 per year, or 3.49 times as much as the average beneficiary.

The percentages shown in Figure 6 highlight the significant cost of providing medical and behavioral health services across these conditions. In particular, the average cost of a participant within the most expensive 20% of the population is over 4 times as expensive as the entire population's average participant. The difference in prevalence across the payer markets, as illustrated in Figure 1, serves to highlight the importance of separately identifying the condition populations within each payer. This stratification helps to assess the areas of focus to impact the highest portion of spending.

Due to a lack of available claims information, published literature, and condition specific reports, we were unable to provide relative costs for certain conditions and payer combinations. In particular, this included certain areas of the Medicaid market. Many of the relative costs within the Medicaid population are listed as not available due to the limited amount of data provided for this analysis. It is expected that these conditions would produce significant expenditures to the overall Medicaid spend, but we were not able to specifically summarize the related costs. In particular, behavioral health impacts a number of Medicaid beneficiaries and spending on behavioral services averages 9% of the overall SoonerCare budget. [18]

The average annual cost for Medicaid lives is based on information reported in the OHCA SFY 2014 annual report with nursing facility services excluded. Although some of the most expensive services provided under the Medicaid program are for long-term services and support (i.e., nursing facility, HCBS waiver services, etc.), the ability to identify savings for these services under the OSIM plan was not a focus of this report. Therefore, we removed the impact that these services may have on overall Medicaid spending.

The insurance coverage markets that we analyzed were commercial, Medicare, Medicaid, and the Oklahoma EGID, along with consideration of the uninsured population. While the basic premise of the different insurance coverages is the same, there are significant differences in the way benefits are covered, the level at which services are reimbursed, and the demographics of each market. Healthcare insurance can be generally described as providing access to medical benefits through a network of providers (hospitals, physicians, pharmacies, etc.). In this way, the coverage offered under the three forms is not truly different. Each establishes a network of providers within regions throughout the country and covered services are provided for certain level of out-of-pocket exposure to the patient.

Beyond this basic structure, the insurance coverages vary greatly. The variances, as well as economies of scale, presented by these programs are key factors in the total cost of care in each program. The following chart provides a summary of the major characteristics of the three insurance coverages.

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[18] Retrieved on October 25, 2015 from OHCA Behavioral Health Fast Facts – September 2015 www.okhca.org

We have not included the EGID population in this comparison, as the benefits and plans vary across the different employee types covered through the program.

Figure 7 State of Oklahoma Insurance Coverage Comparison			
Characteristic	**Commercial**	**Medicare**	**Medicaid**
Eligibility	Often Employer sponsored	Over 65 for those who paid in and some disability eligibility	Income based with variation on FPL and health status
Services	Market-based benefits	Routine and emergency care, hospice, with limited dental and vision	Comprehensive coverage for children with potential limitations on adults
Cost to enrollees	Premium contribution plus deductible, coinsurance, and copays	Part B premium, coinsurance, Part D costs, and Medigap premiums if applicable	Usually nominal
Governance	Regulated by NAIC and CMS for fully insured business	Federal government with CMS oversight	State and Federal government with CMS oversight
Funding	Operated by commercial insurance companies that receive member and sponsor premiums	Payroll taxes and premiums	Most through federal government with state portion

The total cost of care (or claims cost) for the conditions analyzed in this report consumes a large portion of the total healthcare spend. Specific to each payer, we provided a summary of the cost, identified prevalence, characteristics of the population, and possible ways to optimize savings on these groups based upon the data that was available. More discussion is provided in the Methodology and Assumptions section regarding the data sources utilized in our analysis. Our analysis focused on the overall impact that these high-cost conditions have in relation to the total spend within each respective payer system.

To set the stage for the aggregate volume of beneficiaries and to provide a scale for the prevalence of the various high-cost conditions that were studied; the following items provide an overview of the estimated number of enrollees within each payer:

- According to the State of Oklahoma insurance market analysis performed by Milliman as part of our work with OSDH on OSIM, it is estimated that over 800,000 Oklahomans received health insurance coverage through the fully insured commercial market in calendar year 2013.

- Kaiser Family Foundation State Health Facts website indicates that over 625,000[19] Oklahomans were on Medicare, in some form as of calendar year 2012.
- Based on the July 2015 SoonerCare fast facts, enrollment in SoonerCare was listed as 846,888 including the InsureOklahoma population.
- The Oklahoma EGID population studied in this report consists of approximately 125,000 members as of June 30, 2015 with an additional 60,000 covered dependents.

Additionally, according to the State of Oklahoma insurance market analysis performed by Milliman as part of our work with OSDH on OSIM, it is estimated that approximately 543,800 Oklahomans are uninsured during 2015.

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[19] http://kff.org/medicare/state-indicator/total-medicare-beneficiaries/

VI.   MEDICAID

Medicaid coverage is provided to low-income families and individuals that traditionally comprise children, parents, pregnant women and certain aged, blind, and disabled individuals. Medicaid is a governmental program that is administered at the state level and is jointly funded by the federal government and the individual states. Members are not obligated to remit many payments to the system to cover cost-sharing or premiums that are prevalent in other insurance coverages. Therefore, consideration of service cost is not typically a concern for Medicaid beneficiaries and can result in higher utilization in what may be an inefficient setting. At the same time, Medicaid reimbursement levels are often lower than Medicare and significantly lower than commercial levels. The Medicaid program in the State of Oklahoma, referred to as SoonerCare, is operated on a fee-for-service basis with a primary care case management fee paid to contracted providers for coordinating care for roughly two-thirds of SoonerCare enrollment.[20] As the State of Oklahoma provides funding for a portion of the Medicaid expenditures, savings generated in the Medicaid segment will result in direct savings to the state.

Prevalence

Figure 8 provides a summary of the prevalence rates of the OSIM identified conditions for the Medicaid insured lives in the State of Oklahoma.

Figure 8 State of Oklahoma OSIM Condition Prevalence Rates-Medicaid	
Obesity	28.9%[21,22,,23,a]
Diabetes	4.5%[24,b]
Hypertension	9.8%[25,b]
Tobacco Usage	36.7%[26,a]
Behavioral Health	N/A

Notes: a. Obesity and tobacco rates are based upon publicly reported information, specific to Oklahoma with age and income adjustments where applicable.

b. Diabetes and hypertension rates for Medicaid are based on Oklahoma Health Care Authority (OHCA) studies.

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[20] SoonerCare Fast Facts for July 2015, downloaded from www.okhca.org
[21] Retrieved on September 21, 2015 from The State of Obesity report http://stateofobesity.org/states/ok/ - Medicaid rate calculated based on blend of child and adult obesity rates
[22] Retrieved on October 5, 2015 at http://www.cdc.gov/nchs/data/databriefs/db51.pdf
[23] The Cost of Obesity in Oklahoma; Watkins, Angela; August 19, 2013
[24] Diabetes Analysis for SoonerCare Members SFY 2014, dated April 17, 2015 and provided by OHCA
[25] Prevalence rate calculated from Hypertension Analysis SFY 2008-2013 documenting 77,047 members as provided by OHCA
[26] Information obtained from OHCA 2015 CAHPS survey on use of tobacco for Adults in Oklahoma Medicaid

The obesity prevalence rate illustrated in Figure 8 was based on utilizing age and income-adjusted figures from the noted studies. Diabetes and hypertension prevalence rates were determined utilizing a study of the two conditions in separate reports produced by the Oklahoma Health Care Authority (OHCA). These reports were built utilizing actual SoonerCare claims experience.

Reports were not developed for the obesity and tobacco usage rates due to the under-reporting of these conditions with applicable diagnosis codes in healthcare claims submission. The lack of claims associated with lifestyle condition diagnosis codes is due in part to the absence of provider payment linked to reporting of these codes. Thus, a provider will be less likely to report all applicable diagnosis codes for an individual if their reimbursement is not influenced by whether that code appears on the claim. For example, the statewide adult obesity rate for Oklahoma is documented as 33% in the most recently available State of Obesity report. Based on information developed from Oklahoma Medicaid experience, the true obesity percentage for adults is higher for lower income individuals. Additionally, the majority of Medicaid enrollment is made up of children. Given that childhood obesity rates are lower than reported adults, we would anticipate the Medicaid obesity rate to be a blend of the child obesity and adult obesity rates within the state. We must also consider that at lower income levels childhood obesity rates will also rise and have been noted as 1.7 times the average rate in the noted study. The composite of this information results in an estimated prevalence of 28.9% in the Medicaid population as a whole. In comparison, the prevalence rate based on claims information summarized by OHCA was only 4%. A study specific to tobacco usage was not performed, thus the noted 36.7% is specific to adults in the 2015 CAHPS survey information.

Behavioral health conditions significantly impact the Medicaid population. Based on information analyzed by OHCA, services related to behavioral health account for approximately 9% of the SoonerCare budget. A member utilization rate for behavioral health conditions can be calculated using the number of members utilizing behavioral health services in a given month, but this may not represent an actual prevalence rate for unique individuals. It is expected that the actual prevalence may be higher to the extent that not all members with diagnosed behavioral health conditions utilize a service every month.

Due to the limited amount of data provided for the SoonerCare population, we were not able to analyze actual claims information to determine other costly conditions in the SoonerCare program. We did, however, review and summarize information reported in the SFY 2014 SoonerCare Health Management Program (HMP) Evaluation report[27]. The program evaluation provides details on the disease management programs within the Medicaid population and assesses performance from both a participant and health coach standpoint. The goals of the HMP are to improve outcomes for participants and reduce long-term spending. Although the program currently provides services to only approximately 5,000 lives, it provides a look into top diagnostic categories for chronic conditions.

Figure 9 provides a summary of the most prevalent conditions assigned to members of the SoonerCare population within SoonerCare HMP.

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[27] Downloaded from http://www.okhca.org/ on September 22, 2015

In addition to these conditions, the program considers five additional chronic conditions as high priority. Those include asthma, COPD, coronary artery disease, heart failure, and hypertension.

Figure 9 State of Oklahoma Top SoonerCare HMP Conditions	
	Percent of HMP enrollees
Disease of musculoskeletal system	25.9%
Neurotic, personality or other mental disorder	15.3%
Psychoses	11.7%
Diabetes	8.1%
Injury	5.3%
Disease of genital organs	5.1%

The conditions noted above account for a large percentage of the SoonerCare HMP enrollment. Of note in this summary is that two behavioral health conditions appeared in a large portion of the population.

While the conditions noted in Figure 9 indicate the top conditions, it is important to note that co-morbidities may occur. A beneficiary may have 2 or more chronic conditions emerge, and oftentimes that can be a behavioral health issue combined with a physical health issue which can exacerbate overall costs.

According to a study by the American Hospital Association, approximately 17% of American adults had comorbid mental health and physical health conditions. Beneficiaries with these co-morbidities result in higher total health care costs than those without the behavioral health condition. Differences between these populations are often attributed to higher expenditures related to physical health services[28]. Based on the 2015 Mental Health America report of overall prevalence of mental illness in Oklahoma, it is important for the state to identify and understand the increased costs associated with behavioral health conditions. The report indicates that Oklahoma has one of the highest percentages of individuals with mental illness and lower rates on access to care.[29] The report acknowledges that while a bigger issue exists for adults, the prevalence of behavioral health conditions amongst children is also among the higher states in America.

Demographics

The prevalence of the conditions noted above is heavily influenced by the demographics of the individuals covered under the Medicaid program. In general, we would expect to see adults being impacted by the conditions present in Figure 9.

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[28] Bringing Behavioral Health into the Care Continuum: Opportunities to Improve Quality, Costs and Outcomes; *TrendWatch,* American Hospital Association, January 2012
[29] Parity or Disparity: The State of Mental Health in America 2015, *Mental Health America*

Figure 10 provides a breakdown of the age and gender statistics for the information that was available in the OHCA studies. For purposes of this information, we have defined the percentage of adults in the identified population.

Adults are defined as beneficiaries over the age of 18, and the composite population metrics indicate that children make up approximately two-thirds of total SoonerCare enrollment. Detailed claim level data was not available in the reports to calculate accurate average ages across the conditions. We did not have access to eligibility information for the SoonerCare HMP enrollment. Therefore we have summarized demographic information specific to the OSIM-identified conditions. For purposes of this information, we have limited the obesity usage demographics to those identified in the claims data by OHCA which represents only a small portion of the obese population within SoonerCare. Unfortunately, information on tobacco usage was not available. Due to a lack of claims information, we were unable to calculate average age for the condition populations but have reflected the percentage of these identified populations that are adults (over the age of 18). Per member per year values represent the total cost of care for individuals within the identified populations on an allowed amount basis.

Figure 10 State of Oklahoma Demographic Information-Medicaid			
	Percentage of Population - Adult	Percentage of Population - Female	Per Member per Year
Obesity (population based on coding)	64%	71%	N/A
Diabetes	95%	67%	$11,005
Hypertension	98%	65%	$10,305
Tobacco Usage	N/A	N/A	N/A
Behavioral Health	35%	N/A	N/A
Composite Population	34%	N/A	$4,746

Notes: a. Obesity information included in OHCA Obesity and Chronic Illness report.
   b. Diabetes information is estimated based on OHCA SFY 2014 analysis on diabetes.
   c. Hypertension information is estimated based on OHCA SFY 2013 report on hypertension.
   d. Behavioral health condition percentage is based on distribution of population based on services utilized.
   e. Adults are defined as individuals over the age of 18

The information in Figure 10 illustrates that while the majority of enrollment in the Medicaid program are children, the population diagnosed with chronic conditions is heavily weighted toward the adult population, with the exception of behavioral health. Additionally, Medicaid enrollment includes a higher percentage of females which is exemplified in the high-cost condition populations. As adults constitute only one-third of total Medicaid enrollment, it is important to note that costs for adult lives are typically higher on a per member basis and utilize higher cost services.

The reported percentage of beneficiaries utilizing behavioral health services by age is consistent with the actual distribution of Medicaid lives between adults and children. As behavioral health conditions can affect children as much as adults, it is important to establish approaches for reaching all portions of the affected population.

Although costs related to behavioral health services was not summarized on a per member per year basis, studies point to the intensified costs of behavioral health conditions when coupled with physical health conditions.

Based on a report by the Center for Prevention and Health Services, the presence of a behavioral health condition along with a physical health condition can increase costs by 2 to 4 times than if the behavioral health condition were absent.[30]

Provided Services

As part of our analysis, we were requested to analyze the specific types of services being provided to the beneficiaries identified in the high-cost populations. More specifically, we were asked to look at CPT-4 and DRG codes that produced the largest amount of expenditures in patients' cost of care. An analysis of these services can help pinpoint service areas and systems to reduce healthcare costs. Claim costs are typically divided into 5 major service categories based upon the setting of care and the type of service provided. These would include the following:

- Hospital inpatient
- Hospital outpatient
- Professional (e.g., office visits, professional component of service provided in facility)
- Pharmacy, and
- Ancillary services (e.g., transportation, durable medical equipment)

The allocation of medical cost for high-cost patients across these different categories will vary slightly depending upon a person's condition, severity level, and general demographics. However, we have focused on reducing healthcare expenditures for claims arising from a facility setting. The most expensive facility services are found in the hospital inpatient setting.

The common way to define the condition associated with an inpatient admission is through the use of diagnosis-related groups (DRGs) which classify hospital cases into categories based on the required level of care and the primary scope of services provided during the inpatient admission. With the limited amount of claims information that was available for the SoonerCare population, we did not have a set of hospital inpatient claims to summarize for this analysis. Therefore, we have utilized Oklahoma specific hospital inpatient discharge data for calendar year 2011 to produce a listing of the top DRGs that were paid by Medicaid. Figure 11 provides a summary of the DRGs associated with the highest aggregate expenditures across the identified patient populations for Medicaid claims. The expenditure amounts illustrated in Figure 11 represent billed charges which is a different cost level than the allowed amounts reflected in other sources of information in this report. Billed charges were utilized based on the information reported in the state discharge data.

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[30] An Employer's Guide to Behavioral Health Services, *Center for Prevention and Health Services,* 2006

	Figure 11 **State of Oklahoma** **Most Prevalent DRGs in High-Cost Conditions – Medicaid**		
DRG and Description	**Percent of Inpatient Expenditures**	**Percent of Admits**	**Billed Charge per Admit**
885 – Psychoses	3.0%	7.2%	$14,480
207 – Respiratory system diagnosis with ventilator support	2.7%	0.6%	$147,075
871 – Septicemia or severe sepsis without mechanical ventilation, greater than 96 hours	2.6%	1.7%	$51,254
003 – ECMO or Tracheostomy with mechanical ventilation greater than 96 hours	2.2%	0.2%	$479,841
004 –Tracheostomy with mechanical ventilation greater than 96 hours	2.2%	0.3%	$283,086
460 – Spinal fusion except cervical without major complications	1.7%	0.7%	$81,810
470 – Major joint replacement or reattachment of lower extremity	1.6%	1.3%	$45,454
765 – Cesarean section with major complications or comorbidities	1.4%	2.3%	$21,796

The DRGs illustrated in Figure 11 emphasize that there can be a wide variety of reasons for a patient being admitted into the hospital regardless of their diagnosis. While identifying high-cost services within the Medicaid population for potential savings is key, it can be noted that costs related to some of the services above may be for end of life care. There are a few services that were collected in our analysis which may be prime targets for payment reform initiatives.

In particular, these would be joint replacements, maternity deliveries, and behavioral health admissions.

Joint replacements CMS has previously announced the Comprehensive Care for Joint Replacement Model, which would test bundled payment and quality measurement for an episode of care associated with hip and knee replacements. The premise behind this initiative is to get all providers within a delivery system (hospitals, physicians, and post-acute care providers) to work together on improving quality and coordination of care on a particular episode.[31] Moving towards episode based care for services such as these can aid in lowering total cost for an individual case. The development of this model would also be applicable to the Medicare population where it is anticipated that a higher portion of these services are performed.

Maternity deliveries Maternity deliveries provide an opportunity to align reimbursement of an entire pregnancy (pre and post-partum along with the delivery) consistent with targeted levels.

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[31] Accessed on September 21, 2015 at http://innovation.cms.gov/initiatives/ccjr/

The introduction of a capitated payment, typically called a maternity case rate, can produce a reduction in overall spending associated with deliveries. Over recent years, the cesarean section rate in maternity deliveries has increased to over 30% on a nationwide basis. The inpatient hospital cost for these types of deliveries are more costly than for vaginal deliveries. As such, the maternity case rate can be structured to target a desired mix of cesarean and vaginal deliveries.

Behavioral health admissions Because of differing utilization and cost patterns, the inpatient admissions for behavioral health are typically reported separately from other inpatient medical services. A strategy for managing these services may involve contracting with an external organization. Behavioral health organizations can focus on appropriately coordinating care for these specialized services and divert utilization of inpatient services to more cost-effective settings of care.

Given the large increase in risk-based managed care organization coverage of Medicaid beneficiaries over recent years, the state could consider shifting portions of the SoonerCare population away from the current PCCM program. Earlier in the 2000s, the State of Oklahoma did operate an urban capitated arrangement for Medicaid beneficiaries but that was eliminated and replaced with the statewide PCCM program. Allowing risk-based managed care organizations to participate in the state can help to achieve the goals of reducing overall Medicaid healthcare costs.

In recognition of the wide variety of reasons for being admitted to the hospital, varying value-based payment methodologies may align reimbursement with the goals of reducing expenditures related to these admissions. While certain traumas and accidents are not avoidable, a portion of inpatient hospital costs can be reduced or eliminated by identifying unnecessary expenditures and adjusting provider reimbursement accordingly. The following section discusses potentially avoidable readmissions based on information based on data provided by OHCA.

Potentially Avoidable/Preventable

OHCA provided the results of performing an analysis on potentially preventable readmissions (PPRs) for the hospital inpatient admissions across the SoonerCare population in calendar years 2013 and 2014. Based on the identified claims, it was estimated that approximately 4-5% of all admissions are readmissions.

A PPR is a claim for an inpatient readmission that may be related to a gap in care from the initial admission. PPR logic assesses clinical reasons for the readmission and attempt to see if the reason for readmission is associated with a prior admission within a particular time span. If it is determined to be clinically related, then it is potentially preventable. The possibility of a PPR is dependent upon a number of characteristics including severity of illness, demographic of the patient, and even presence of a behavioral health issue.

Due to the limited amount of Medicaid data available, we were not able to evaluate potentially avoidable initial admissions and avoidable emergency department visits. Based on experience in other state Medicaid programs, however, we would anticipate that the percentage of facility claims at could be avoided or prevented is slightly higher than observed in the commercial and Medicare populations.

VII. COMMERCIAL

The commercially insured population comprises lives whose health insurance is covered by insurance corporations that receive premiums from members, or member sponsors. The premiums received by the insurance companies are used to fund the costs of their enrollees' healthcare along with company administrative costs all while trying to provide sufficient profit margins. Commercial insurance is often employer-sponsored for large and small groups with individually insured lives spanning approximately 25% of the commercially insured population in the State of Oklahoma in calendar year 2015 to date. In order to provide insurance coverage and remain solvent, commercial insurers attempt to manage risk by identifying the cost of their targeted population and developing premiums adequate to cover the costs previously indicated. Typically, provider reimbursement levels under commercial coverage are higher than those offered by Medicaid and Medicare across all categories of service. Therefore, it is important to review the delivery of high-cost services and the related conditions specific to the commercially insured population.

Prevalence

Figure 12 provides a summary of the prevalence rates of the OSIM-identified conditions for the commercially insured lives in the State of Oklahoma.

Figure 12 State of Oklahoma OSIM Condition Prevalence Rates-Commercial	
Obesity (based on published research)	29.9%[32,a]
Diabetes	5.2%[b]
Hypertension	14.2%[b]
Tobacco Usage	21.1%[33,a]
Behavioral Health Conditions	9.2%

Notes: a. Obesity and tobacco rates are based upon publicly reported information, specific to Oklahoma.
b. Diabetes, hypertension, and behavioral health condition prevalence rates for the commercial market are based on claims information.

The obesity prevalence rate illustrated in Figure 12 was based on the State of Obesity report and was calculated utilizing obesity rates by age included in the report against the actual ages noted in the sample claims information. Based on the discussion of the 80/20 rule previously mentioned, we have performed additional analysis on those individuals that comprised the top 20% most expensive aggregate healthcare spend of the sample claims information.

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[32] Retrieved on September 21, 2015 from The State of Obesity report http://stateofobesity.org/states/ok/ -
[33] Retrieved on November 6, 2015 utilizing CY 2014 BRFSS data accessed at http://www.ok.gov/health/Data_and_Statistics/Center_For_Health_Statistics/Health_Care_Information/Behavioral_Risk_Factor_Surveillance_System/BRFSS_Data/index.html

While this population does include some of the members noted in the OSIM-identified conditions, our intent is to treat this portion of the population separate from those conditions in order to identify what other areas may be of focus for OSIM stakeholders. Figure 13 provides a summary of the most prevalent conditions identified in the top 20% population outside of the OSIM-identified conditions.

Figure 13 State of Oklahoma Top 20% Other Conditions-Commercial	
	Percent of Expenditures
Neoplasms	11%
Diseases of the heart	9%
Spondylosis and other back problems	5%
Non-traumatic joint disorders	4%
Diseases of the urinary system	4%
Mental Illness	2%

The categorization of these claims is based on Clinical Classifications Software (CCS) for ICD-9-CM. This software was developed as part of the Healthcare Cost and Utilization Project (HCUP), a Federal-State-Industry partnership sponsored by the Agency for Healthcare Research and Quality. The percentages noted in Figure 13 represent the portion of claims within the top 20% most expensive individuals that were associated with a person categorized into one of the conditions. Based on these additional conditions, cancers and heart disease are two prevalent conditions among the highest cost individuals that could be considered in Oklahoma's healthcare innovations.

Although the conditions highlighted by the study of the most expensive 20% patients in the sample commercial data would serve to expand the focus of OSIM beyond the four prescribed conditions, it is quite possible that some of the conditions identified in the highest cost 20% are a result of the OSIM identified conditions. This could be observed through lung cancer caused by tobacco use or heart disease stemming from associated obesity or hypertension. That is not to indicate causality, but looking at these conditions in a silo may distort the true impact of a particular condition.

Based on the State of Obesity report, the State of Oklahoma has the 6th highest obesity rate across the United States. Analyzing the opportunities to lower healthcare related costs associated with obese patients is a key study to be performed with this population. Unfortunately, this is also a condition that is not routinely coded through diagnosis information.

Demographics

The prevalence of these conditions in the commercial population is heavily influenced by the demographics of the individuals covered by commercial insurers. As previously indicated, the portion of the population typically covered through commercial insurance will be younger to middle aged adults as well as related dependents.

Figure 14 provides a breakdown of the age and gender statistics across the sample claims information we utilized for the population in total, the OSIM-identified conditions, and the top 20% most expensive grouping. We have also reflected the average per member per year cost for the patients included within the particular population groupings. It is important to note that information is based on the sample claims database. For purposes of this information, we have limited the obesity and tobacco usage demographics to those identified in the claims data. Therefore, this may not reflect the true distribution of lives within these conditions, as the population without applicable diagnosis codes may have different demographics.

| Figure 14 State of Oklahoma Demographic Information-Commercial			
	Average Age	**Percentage of Population - Female**	**Per Member per Year**
Obesity (population based on coding)	43.7	63%	$17,136
Diabetes	51.8	46%	$17,429
Hypertension	51.6	47%	$14,129
Tobacco Usage (Population based on coding)	43.5	49%	$17,216
Behavioral Health Conditions	41.4	61%	$15,596
Top 20%	42.4	59%	$24,446
Composite Population	33.7	50%	$4,993

The information illustrated in Figure 14 indicates that while the average commercially insured individual in our sample claims information is younger than 35, the average age of those diagnosed with either an OSIM-identified condition or included in our top 20% is 10-20 years older than the average age of the covered population and at a cost of at least 3 times that of the composite average. Given the size of the commercial population, the large cost variance between these high-needs patients serves to provide incentive to reduce related healthcare expenditures to potentially provide a larger impact on savings.

Reviewing external sources of information would indicate that both obesity and tobacco use prevalence is slightly lower in females than in males. A review of the demographics of these populations provides OSIM stakeholders with information on what portion of the population can be targeted by changes in the system. Taking this information into consideration may alter which approaches may be construed as best for reaching the goals of the innovation plan.

Total cost of care

Figure 15 illustrates the variance in annual cost of care on members diagnosed with diabetes or hypertension and the top 20% population collected from our sample claims information. We have highlighted the spread between the 25th and 75th percentiles. The 75th percentile number represents the amount at which 75 percent of the individuals for a given condition are at or below in terms of annual cost. Interpreted a different way, the amounts above the 75th percentile are the most expensive quartile identified in our sample claims information.

Figure 15
Commercial Population
25th-75th Percentile Cost
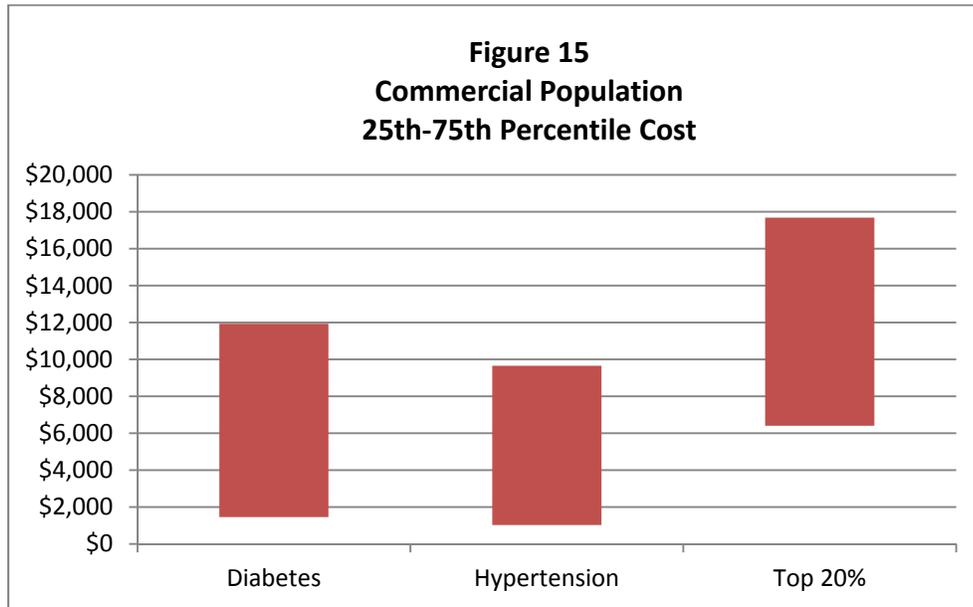
The variance between the 25th and 75th percentiles for certain conditions helps to identify conditions that can produce the widest disparity in total cost. For example, patients diagnosed with hypertension vary in costs from around $1,000 up to $9,500, whereas those in the top 20% population have a change of over $11,000 between the 25th and 75th percentiles. Finding ways to shift these bars down or even compress the top portion of the bar is the key behind reducing healthcare expenditures.

Provided Services

Consistent with our methodology of identifying high-cost hospital inpatient admissions in the Medicaid population, we summarized the DRGs present in our sample commercial claims information. These inpatient admissions were specific to the high-cost conditions previously summarized. Figure 16 provides a summary of the highest expenditure-producing DRGs identified across the high-cost patient populations in the commercial claims information. Cost per admit is illustrated on an allowed amount basis consistent with costs reported on all populations with the exception of the billed charges information from the state discharge database.

DRG and Description	Figure 16 State of Oklahoma Most Prevalent DRGs in High-Cost Conditions - Commercial		
	Percent of Inpatient Expenditures	Percent of Admits	Allowed Amount per Admit
237 – Major cardiovascular procedures	6.5%	2.1%	$42,074
470 – Major joint replacement	4.4%	2.5%	$7,146
003 – ECMO or Tracheostomy with mechanical ventilation greater than 96 hours	3.6%	1.1%	$22,638
219 – Cardiac valve & other major cardiothoracic procedure	2.8%	0.6%	$38,878
775 – Vaginal delivery	2.1%	3.0%	$2,738
460 – Spinal fusion except cervical	2.1%	1.2%	$14,445
014 – Allogeneic bone marrow transplant	2.0%	0.9%	$21,070
958 – Other OR procedures for trauma	1.7%	0.4%	$30,271

The types of admissions for the reported DRGs illustrated in Figure 16 covers conditions related to neoplasms, cardiovascular issues, and similar DRGs summarized from the Medicaid information. Given that the information reflected for this summary is from a sample of claims information, a complete review of the commercial population may result in a different set of DRGs. However, there are a few key services that were collected in our analysis which may be prime target for payment reform initiatives.

In particular, these would be cardiovascular procedures, joint replacements, and maternity deliveries.

Cardiovascular procedures Although the definition of for DRG (237) is vague and could include a number of different procedures, the focus should be placed on the fact that these are major cardiovascular procedures. As these could result in lengthy stays, and high per admit costs, case managers would be ideal candidates for being able to control costs in these situations and avoid potential pitfalls. Though not all hypertension and heart disease cases may result in this type of service, case managers assigned to the more complicated and highest cost beneficiaries can help facilitate the pre- and post-admission time periods and ensure that quality and coordination of care is being performed adequately.

Joint replacements and maternity deliveries Similar to the proposed approaches in the Medicaid population discussion, payment reform initiatives can be employed in the commercial market to help limit the spending associated with these conditions.

Figure 17 provides a summary of the highest cost CPT-4/HCPCS codes identified across the high-cost patient population in the commercial claims information, excluding evaluation and management code that are typically included in physician office visits.

We have excluded the office visit codes from the analysis as these would be services that are recommended to be occurring in the normal course of care or treatment.

As patients, and in particular those with high-cost conditions, routinely make visits to their primary care physicians, they are more apt to avoid trips to the emergency department or inpatient admissions.

Figure 17 State of Oklahoma Most Prevalent CPT-4/HCPCS in High-Cost Conditions (non-E&M)			
Procedure Code and Description	**Percent of CPT-4 Reported Claims**	**Percent of Utilization**	**Allowed Amount per Service**
90999 – Dialysis procedure	2.5%	0.4%	$1,483
74177 – CT abdominal & pelvis w/ contrast	1.8%	0.3%	$1,319
97110 – Therapeutic exercises	1.6%	3.9%	$101
78452– HT muscle image	1.3%	0.3%	$1,081
74176 – CT abdominal & pelvis	1.2%	0.2%	$1,271
93458– Left heart artery ventricle angiography	1.2%	0.1%	$3,048
J1745– Infliximab injection	1.0%	0.1%	$4,691

Based on the services listed above, treatments are related to a number of different conditions. Proper care management techniques would ensure that patients diagnosed with specific conditions are getting proper care which can be facilitated through a case manager or primary care physician. In light of the DRGs and procedural codes summarized for the commercial population, a few initiatives to implement within the payer market are as follows:

- Expanding the patient-centered medical home initiative across the state and including care managers to better coordinate the care of the high-cost individuals
- Establishing provider risk-sharing arrangements that can ensure that providers are taking part in the overall insurance risk of the population
- Creating additional outreach programs that can help target specific conditions and assist patients in identifying healthy behaviors to foster non-medical solutions for better health

Beyond the realm of physical health conditions, we must also consider the impact of behavioral health conditions and related services. While the coverage of certain services is mandatory, the amount of healthcare dollars spent under commercial insurance for these conditions is far less than the impact these conditions may have on an individual's total cost of care. Based on information summarized for the top 20% population, mental illness appeared as a diagnosed condition on 2% of hospital inpatient expenditures. In addition to hospital inpatient admissions, we also analyzed information on the therapeutic drug classification of the prescription drugs included.

Based on the AHFS therapeutic classification, medications to help treat behavioral health issues constitute 10-15% of all prescription drugs.

The prevalence of behavioral health conditions serves to understand the percentage of the population impacted by these conditions, but it should be noted that the impact of a behavioral condition on expenditures may be reflected in increased physical health services.

Potentially Avoidable/Preventable

Different analyses were performed on hospital inpatient and hospital outpatient claims to estimate the percentage of claims that could be potentially avoidable or preventable. For hospital inpatient admissions, we applied the Prevention Quality Indicators (PQIs) to assess the portion of hospital admissions that could have been prevented with appropriate care[34]. The PQIs are a set of measures that can be used with hospital inpatient discharge data to identify quality of care for "ambulatory care sensitive conditions," or conditions for which appropriate outpatient care can potentially prevent the need for hospitalization or for which early intervention can prevent complications or more severe disease. Figure 18 provides a summary of the percentage of inpatient admissions that could be potentially avoided according to these PQIs for each of the OSIM-identified conditions as well as those summarized from the top 20% population.

The New York University ED algorithm was applied to emergency department visits to categorize those cases into ones that could have been avoided completely or been treated in a non-emergent setting versus those that required an emergency room visit. Based on the sample claims information utilized in our analysis, Figure 18 provides a summary of the ED visits that were identified for each of the condition groupings.

Figure 18 State of Oklahoma Potentially Avoidable/Preventable Facility Claims-Commercial		
	Percent of Inpatient Expenditures	**Percent of Outpatient Expenditures**
Obesity (population based on coding)	8.2%	6.1%
Diabetes	14.2%	5.3%
Hypertension	9.7%	5.6%
Tobacco Usage (population based on coding)	6.1%	11.3%
Behavioral Health Conditions	5.2%	9.7%
Top 20%	5.9%	6.2%

[34] http://www.qualityindicators.ahrq.gov/modules/pqi_overview.aspx

The facility claims noted as potentially avoidable for both obesity and tobacco use are specific to the limited summarized claims information. The potentially avoidable facility claims on these populations in total will vary from the percentages noted on the sample portion.

It is important to note that preventing or avoiding both inpatient admissions and visits to the emergency department will not result in direct removal of all costs associated with these occurrences but will rather most likely be replaced with other, lower-cost alternatives. These may be reflected in more visits to a primary care physician or better adherence to prescribed medications.

VIII. MEDICARE

Medicare provides health insurance coverage to nearly 50 million individuals in the United States, with enrollment continuing to increase as the "baby boomer" generation approaches age 65. Historically, coverage under Medicare has been viewed as medical coverage for individuals over the age of 65. It is important to note that age is not the only determining factor in obtaining Medicare coverage. Individuals meeting certain disability requirements may also meet Medicare eligibility at an age younger than 65. This population, in comparison to the commercial population, is less healthy due to older age and higher risk of having a chronic condition. Member cost-sharing can vary significantly depending on the patient need and whether an individual has purchased supplemental coverage. Based on the database that was available for use in our analysis, expenditures related to Medicare Part D prescription drug claims is not included.

Prevalence

Figure 19 provides a summary of the prevalence rates of the OSIM-identified conditions for the lives covered by Medicare in the State of Oklahoma.

Figure 19 State of Oklahoma OSIM Condition Prevalence Rates-Medicare	
Obesity (based on published research)	28.9%[35,a]
Diabetes	25.9%[b]
Hypertension	70.6%[b]
Tobacco Usage (based on published research)	9.9%[36,a]
Behavioral Health Conditions	22.5%[b]

Notes: a. Obesity and tobacco rates are based upon publicly reported information, specific to Oklahoma.
b. Diabetes, hypertension and behavioral health condition prevalence rates for the Medicare market is based on claims information.

The key observation with regard to Figure 19 is that diabetes and hypertension are diagnosed in a significantly higher portion of the Medicare population than what was observed in the Medicaid and commercial markets. With over 70% of the Medicare population (based on sample claims information) being diagnosed with hypertension, developing a payment or delivery mechanism to aid in care coordination is extremely important within this market. Although Medicare is funded by the federal government, the spending that occurs within the Medicare market has importance on the Oklahoma healthcare system. In particular, higher utilization by Medicare patients may place added strain on the healthcare system. The obesity rate reported by the State of Obesity 2014 report indicates that for those over the age of 65, the obesity rate in the State of Oklahoma is 28.9%.

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[35] Retrieved on September 21, 2015 from The State of Obesity report http://stateofobesity.org/states/ok/ - Based on over 65 obesity rate
[36] Retrieved on September 21, 2015 from http://www.americashealthrankings.org/senior/OK

Although not all Medicare lives are over the age of 65, this metric provides a reasonable estimate for the slightly lower prevalence of obese patients in the Medicare population than what is observed in the commercial population. Additionally, the tobacco use rate is significantly lower in the Medicare population.

Consistent with the approach taken in the commercial population, we have analyzed the top 20% most expensive patients based on aggregate healthcare spend of the sample Medicare claims information. This population includes a number of the members noted in the OSIM-identified conditions, but our intent is to treat this portion of the population separate from those conditions in order to identify what other areas may be of focus for OSIM stakeholders. Figure 20 provides a summary of the most prevalent conditions identified in the top 20% population outside of the OSIM identified conditions.

Figure 20 State of Oklahoma Top 20% Other Conditions-Medicare	
	Percent of Expenditures
Diseases of the heart	14%
Neoplasms	12%
Non-traumatic joint disorders	5%
Diseases of the urinary system	3%
Cerebrovascular disease	3%
Mental Illness	3%

The categorization of these claims is based on the CCS for ICD-9-CM. Once again, the percentages noted in Figure 20 represent the portion of claims within the top 20% most expensive individuals that were associated with a person categorized into one of the conditions within the Medicare population. Although the conditions are similar to those identified in the commercial population, the percentage that these conditions comprise of total admits is higher. Additionally, the joint disorders could be candidates for the CMS hip and knee replacement bundled payment.

The lower obesity and tobacco use rates within the Medicare population coupled with the extremely high percentage of hypertensive patients shifts focus to conditions which are of highest importance and can provide larger areas of potential savings. In addition to the increased hypertension prevalence the increase in the diabetes prevalence from the commercial population is nearly 500%.

Demographics

Due to the older age of members enrolled in Medicare, the prevalence of these conditions within Medicare coverage is highly linked to the age of the individuals covered under this program. As previously indicated, the portion of the population typically covered through Medicare insurance will be older, post-retirement adults.

Figure 21 provides a breakdown of the age and gender statistics across the sample claims information we utilized for the population in total, the OSIM identified conditions, and the top 20% most expensive grouping. We have also reflected the average per member per year cost for the patients included within the particular population groupings. It is important to note that information is based on the sample claims database. For purposes of this information, we have limited the obesity and tobacco usage demographics to those identified in the claims data.

Therefore, this may not reflect the true distribution of lives within these conditions, as the population without applicable diagnosis codes may have different demographics.

Figure 21 State of Oklahoma Demographic Information-Medicare			
	Average Age	**Percentage of Population – Female**	**Per Member per Year**
Obesity (population based on coding)	72.2	54%	$22,617
Diabetes	74.1	48%	$15,520
Hypertension	74.9	56%	$12,481
Tobacco Usage (population based on coding)	71.6	47%	$21,050
Behavioral Health Conditions	75.3	60%	$22,057
Top 20%	76.7	55%	$40,759
Composite Population	74.2	55%	$9,865

The information shown in Figure 21 illustrates the lack of variance in age as a majority of the individuals covered under Medicare are post-65. Additionally, the large increase on the per member per year amount for the top 20% highlights the large variance in cost of care we could observe from patients under this insurance coverage. One item to note is that the PMPY values illustrated in this table do not include pharmacy costs related to Medicare Part D claims due to lack of available information.

Total cost of care

Figure 22 illustrates the variance in annual cost of care for members diagnosed with diabetes or hypertension and the top 20% population collected from our sample claims information. We have highlighted the spread between the 25th and 75th percentiles. The 75th percentile number represents the amount at which 75 percent of the individuals for a given condition are at or below in terms of annual cost. In the Medicare population, the top 20% group has a significantly higher average annual cost than the other noted conditions.

Figure 22
Medicare Population
25th-75th Percentile Cost
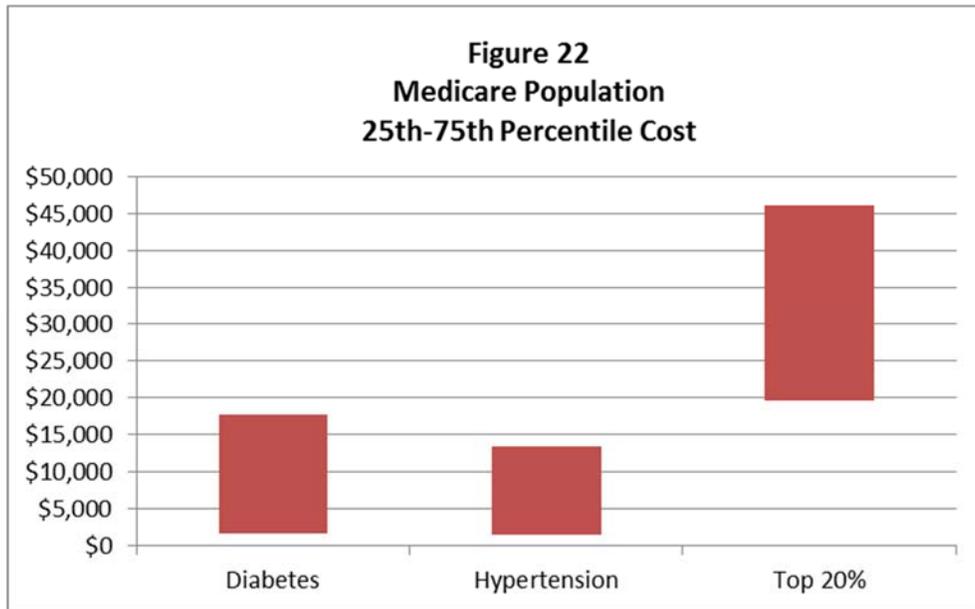
Provided Services

The following provides a summary of the different services that were provided to Medicare beneficiaries in our sample claims information for hospital inpatient admissions.

Figure 23 State of Oklahoma Most Prevalent DRGs in High-Cost Conditions – Medicare			
DRG and Description	**Percent of Inpatient Expenditures**	**Percent of Admits**	**Allowed Amount per Admit**
945 – Rehabilitation with complications or comorbidities	5.8%	4.2%	$16,745
470 – Major joint replacement	5.3%	5.1%	$12,501
871 – Septicemia or severe sepsis without mechanical ventilation, greater than 96 hours	3.2%	3.2%	$12,341
853 – Infectious and parasitic diseases	1.4%	0.4%	$38,540
207 – Respiratory system diagnosis with ventilator support	1.4%	0.4%	$44,021
003 – ECMO or Tracheostomy with mechanical ventilation greater than 96 hours	1.3%	0.1%	$170,360
460 – Spinal fusion except cervical without major complications	1.2%	0.7%	$22,337
193 – Simple pneumonia& pleurisy	1.1%	1.4%	$9,806

The DRGs illustrated in Figure 23 contain several infection-related conditions, but we also see the high utilization of joint replacements as was observed in the commercial data. Once again, these cases would be ideal for implementing bundled payments around an episode of care.

There are currently three accountable care organizations (ACOs) currently operating in the State of Oklahoma with Medicare enrollment. Expanding the number and size of these ACOs to handle more of the Medicare coverage may help limit or reduce current spending. As we have observed on higher needs patients that may have dual coverage in both Medicaid and Medicare, coordination of services and treatment are keys to helping eliminate unwanted costs.

Figure 24 provides a summary of the highest cost CPT-4/HCPCS codes identified across the high-cost patient population in the Medicare claims information, excluding evaluation and management codes which are typically included in physician office visits. We have excluded the office visit codes from the analysis as these would be services that are recommended to be occurring in the normal course of care or treatment. As patients, and in particular those with high-cost conditions, routinely make visits to their primary care physicians, they are more apt to avoid trips to the emergency department or inpatient admissions.

Figure 24 State of Oklahoma Most Prevalent CPT-4/HCPCS in High-Cost Conditions (non-E&M)			
Procedure Code and Description	**Percent of CPT-4 Reported Claims**	**Percent of Utilization**	**Allowed Amount per Service**
G0154 – Direct skilled nursing by licensed nurse	5.8%	7.6%	$134
Q5001 – Hospice in patient home	5.0%	0.5%	$1,909
G0164 – Services of skilled nurse for training family member	3.1%	3.4%	$157
Q5003– Hospice in LT/non-skilled NF	2.9%	0.3%	$1,782
G0151 – Services performed by qualified physical therapist	2.7%	2.9%	$164
G0157– Services performed by qualified physical therapist assistant	2.3%	2.5%	$156
G0156– Services of home health/hospice aide	2.0%	6.1%	$58

The resulting list of services is specific to patients requiring extensive nursing care and long-term care support across different settings. Because of the limited Medicare liability associated with long-term care services, as well as the anticipated short-term nature of hospice care, these types of services are typically difficult to identify for areas of potential savings.

Potentially Avoidable/Preventable

Consistent with the methodologies applied to the commercial experience, we performed an analysis of hospital inpatient and hospital outpatient claims to estimate the percentage of claims that could be potentially avoidable or preventable. Figure 25 provides a summary of the percentage of inpatient admissions that could be potentially avoided according to the PQIs and ED visits that could be prevented or moved to a lower cost setting for each of the OSIM-identified conditions as well as those summarized from the top 20% population.

Figure 25 State of Oklahoma Potentially Avoidable/Preventable Facility Claims-Medicare		
	Percent of Inpatient Expenditures	**Percent of Outpatient Expenditures**
Obesity (population based on coding)	15.8%	4.0%
Diabetes	13.2%	4.0%
Hypertension	11.6%	3.9%
Tobacco Usage (population based on coding)	14.0%	5.2%
Behavioral Health Conditions	9.7%	5.2%
Top 20%	11.2%	3.5%

The facility claims noted as potentially avoidable for both obesity and tobacco use are specific to the limited summarized claims information. The potentially avoidable facility claims on these populations in total will vary from the percentages noted on the sample portion. It is important to note that preventing or avoiding both inpatient admissions and visits to the emergency department will not result in direct removal of all costs associated with these occurrences, but will rather most likely be replaced with other, lower-cost alternatives. These may be reflected in more visits to a primary care physician or better adherence to prescribed medications.

IX. EGID

The Oklahoma EGID population encompasses individuals employed by state agencies, school districts, and other governmental units of the State of Oklahoma. EGID provides statewide health, dental, life, and disability insurance plans for Oklahoma's public sector employees. The plans are referred to as HealthChoice. HealthChoice offers seven different plan options with various levels of premiums and member cost sharing. State employees may also elect coverage through a federally qualified HMO; however, these are not actively managed by EGID and instead are overseen by the Employees Benefit Department. Figure 26 provides a summary of the members and dependents covered by the EGID program within the HealthChoice plans.

Figure 26 State of Oklahoma EGID HealthChoice Population Distribution			
Employee Type	**Members**	**Dependents**	**Total**
State Employee	39,139	35,916	75,055
Education Employees	77,692	21,236	98,928
Local Government Employees	8,557	1,923	10,480
Total	125,388	59,075	184,463

Note: Based on census of health insurance census for EGID as of June 03, 2015.

The expectation is that individuals receiving health insurance coverage through the EGID program would resemble the population distribution within the commercial payer market. As these individuals are typically of working age with dependents, the average EGID participant would have similar characteristics to the demographic profile presented under the commercial market. State employees enrolled in a federally qualified HMO are believed to be included in the sample commercial claims summarized in that section. Due to the masking of individuals and groups in the database, we are unable to know exactly which of those members are directly from the EGID population.

Detailed claims information for the EGID population was not available for purposes of our analysis. Therefore, we have relied on reports and data summaries provided by the administrator for EGID healthcare claims. The reported information was limited to individuals enrolled in HealthChoice and does not include experience related to those in a federally qualified HMO. An additional caveat for the EGID population is that expenditure and prevalence information noted in this section of the report are in relation to the EGID HealthChoice population in total. The provided reports and data summaries did not separately identify the populations by condition as was done for the other payer markets. For example, costs related to diabetes care is only for the services performed to treat the diabetic conditions and not related to the total cost of care for EGID members with diabetes.

Prevalence

Figure 27 provides a summary of the prevalence rates for some of the OSIM identified conditions within the EGID population as sourced by Truven Health Analytics.

Figure 27 State of Oklahoma OSIM Condition Prevalence Rates-EGID	
Obesity (based on coding)	1.2%
Diabetes	11.5%'
Hypertension	21.0%
Behavioral Health	8.2%

Notes: a. Obesity, diabetes, and hypertension rates are based upon Truven Health Analytics summarized information for June 2014 to May 2015 enrollment.
b. The behavioral health prevalence rate is the sum of anxiety disorder, bipolar disorder, and depression prevalence as reported by Truven Health Analytics.

The prevalence rates illustrated in Figure 27 were sourced by Truven Health Analytics based upon claims experience specific to the EGID population. The prevalence rates cited for the EGID population with regard to diabetes and hypertension are higher than prevalence rates for the commercial population. Some of this difference may be due to the methodology utilized to identify the individuals within the populations.

Data provided for the development of Figure 27 did not include information to develop a prevalence rate for tobacco usage.   Additionally, the actual prevalence rate of obesity is estimated to be significantly higher than the rate identified in the data.

Other highly prevalent conditions noted within the EGID population included joint disorders, infections, lipid disorders, and osteoarthritis. Based on limited data, we were not able to provide deeper analysis on these conditions and potential cost impact across the healthcare system.

Demographics

According to a report on enrollment of the members for the EGID population, the average age of a member is 37.1, with the average age of the employee at approximately 46 years of age. This suggests that the average EGID enrollee is older than the population identified for the commercial market analysis. Based on information analyzed in the Medicare market, the older age may be a contributing factor to higher prevalence rates for diabetes and hypertension in the EGID population than observed in commercial.

Figure 28 provides a summary of the average per member cost for specific OSIM conditions summarized by Truven. The reported expenditures are based on allowed amount from reports summarized by Truven Health Analytics and the composite costs may not be a direct comparison to costs included in tables for other payers. The information in Figure 28 is intended to illustrate the cost relativity of the noted conditions within the EGID population.

Figure 28 State of Oklahoma EGID High-Cost Condition Claims Summary		
	Average Cost Per Member	**Relative Cost to Composite**
Obesity (population based on coding)	$8,788	208%
Diabetes	$9,808	233%
Hypertension	$7,452	177%
EGID Composite	$4,216	100%

The relative costs for these conditions within the EGID population align better with those of the Medicare market and continue to highlight the increase in cost of care on the diagnosed individuals.

Provided Services

Figure 29 provides a summary of the most prevalent DRGs producing hospital inpatient admissions across the EGID population. As previously mentioned, this information reflects utilization for the entire EGID population and not just those in high-cost conditions identified by OSIM.

Figure 29 State of Oklahoma Most Prevalent DRGs– EGID		
DRG and Description	**Percent of Admits**	**Allowed amount per Admit**
470 – Major joint replacement or reattachment of lower extremity	6.3%	$12,083
795 – Normal Newborn	5.2%	$1,862
775 Vaginal delivery without complicating diagnosis	4.43%	$8,894
945 – Rehabilitation with complications	3.2%	$4,578
871 – Septicemia or severe sepsis	2.8%	$6,745
885 - Pyschoses	2.2%	$6,357

The DRGs illustrated in Figure 29 are consistent with the admissions that were identified in other populations. Based on proposed approaches discussed in prior sections, methods to combat costs on joint replacements, maternity deliveries, and behavioral health admissions would be applicable to the EGID population. .

The top professional services provided to EGID enrollees by number of services was predominantly for professional office visits. However, the listing of top codes by expenditures included those related to professional charges on major procedures.

Potentially Avoidable/Preventable

Truven Health Analytics provided information regarding the potentially avoidable inpatient admissions utilizing the AHRQ preventable quality indicators utilized in the commercial and Medicare sections of this report. The information was provided for the condition associated with the avoidable admissions. Based on findings for calendar year 2014 reported claims, the largest percentage of avoidable admissions were for the following conditions:

- Bacterial pneumonia
- Urinary tract infections
- COPD
- Hypertension, and
- Diabetes

Although costs associated with these admissions was not provided, two of the OSIM identified conditions (diabetes and hypertension) directly appear in the most prevalent avoidable admissions. Another OSIM identified condition, tobacco use, is present in regards to linking long-term tobacco use with COPD. This speaks to the notion that identifying approaches to better manage the care for individuals with these conditions is critical to reducing expenditures across the healthcare system in Oklahoma.

X.   OKLAHOMA UNINSURED

With the understanding that information on the uninsured population is limited, we have focused on publicly available information to gain insight on the types of services this population utilizes and what may be causing them to have these services performed.

The current estimate of uninsured lives in the State of Oklahoma is over 540,000 as of calendar year 2015. Based on information reported by OHCA for calendar year 2013, the uninsured population was previously over 650,000.[37] Thus, the uninsured rate has decreased over the past few years. The composition of the uninsured population is predominantly adults that are at or below 300% FPL. According to information reported in the Behavioral Risk Factor Surveillance System (BRFSS) for 2014, the non-elderly portion of the population has seen steady decreases across the state but at varying levels of change across the different ages.[38]

BRFSS is a collection of health-related telephone surveys that collect state data about United States residents regarding their health-related risk behaviors, chronic health conditions, and use of preventive services. With a lack of available claims information, the identification of conditions manifested by the uninsured population is a difficult task. Consequently, we must rely on the reported health status of the individuals from the BRFSS data. The following provides information available from the 2014 BRFSS data regarding different elements of one's health status:

- Those without healthcare coverage tend to indicate that they are in fair or poor condition at a higher percentage than those enrolled with some form of insurance coverage;
- The uninsured population is more likely to use tobacco and not perform leisure time physical activity;
- There was little variance in the reporting of certain chronic conditions discussed in this report between the insured and uninsured respondents with the exception of hypertension; and,
- Hospital discharges for mental disorders contributed almost $30 million in total charges from the hospitals.

The expectation is that the large group of adults that are part of this uninsured group would be similar in demographics to the adults enrolled in the Medicaid program (similar ages and income levels). Despite not having any form of insurance coverage, these individuals still utilize the healthcare system to meet their healthcare needs. As the utilization of healthcare services for this population emerges, one of the goals for the State of Oklahoma is to help identify methods to provide insurance coverage for these individuals.

Unfortunately, this population does not provide an easy route to obtain health claims data which can be used to assess current treatment and services.

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[37] Accessed from http://www.okhca.org/research.aspx?id=87 on September 22, 2015 for Uninsured Fast Facts
[38] Population Health Needs Assessment Supplement: Those without health care coverage, produced by OSDH dated September 21, 2015

Although all claims information for the uninsured lives is not available, we did perform a summary on the hospital inpatient discharge data that incorporates hospital inpatient admission related data for all discharges within a state, regardless of insurance coverage. Figure 30 provides a summary of the most prevalent DRGs identified in the hospital discharge data for the OSIM conditions. This information is based on calendar year 2011 claims and includes amounts as billed charges.

| Figure 30 State of Oklahoma Most Prevalent DRGs - Uninsured			
DRG and Description	**Percent of Inpatient Expenditures**	**Percent of Admits**	**Billed Charge per Admit**
249 - Perc cardiovasc proc w non-drug-eluting stent	2.9%	1.4%	$62,322
247 - Perc cardiovasc proc w drug-eluting stent	2.5%	1.3%	$58,085
287 - Circulatory disorders except AMI, w card cath	2.3%	2.2%	$31,872
603 – Cellulitis without complications	2.2%	4.0%	$16,984
392 - Esophagitis, gastroent & misc digest disorders	1.9%	3.6%	$16,105
871 - Septicemia or severe sepsis without mechanical ventilation, greater than 96 hours	1.7%	1.3%	$40,903
313 – Chest Pain	1.3%	3.4%	$12,405

In addition to the DRGs summarized from the state discharge data, it is also important to note the emergency department usage by uninsured individuals. Based on observation of utilization patterns, it is assumed that the absence of medical coverage can result in the reliance of uninsured individuals on the emergency department for medical needs, whether urgent or nonurgent. In a study presented by the Oklahoma Hospital Association, and produced by the CDC and National Center for Health Statistics, uninsured individuals have the highest percent of nonurgent use of the emergency department. [39]

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[39] Emergency Department Visitors and Visits: Who Used the Emergency Room in 2007?, NCHS Data Brief No. 38, May 2010

XI. DISCUSSION OF RESULTS

Discussion of high-cost individuals and conditions throughout this report has centered on identifying the target populations across the different payers in the State of Oklahoma and providing details regarding cost of care and prevalence. The details gathered from this portion of our work helps set the stage for determining where potential inefficiencies exist in the current healthcare system. Pinpointing these areas of inefficiency will help provide a path for success as we set out with the ultimate goal of reducing healthcare expenditures

Degree of healthcare management (DoHM) indicates the portion of care that is being well managed, and ranges from a loosely managed plan (0% DoHM) to a well-managed plan (100% DoHM). The figure below illustrates how the DoHM spectrum is indicative of plan performance.
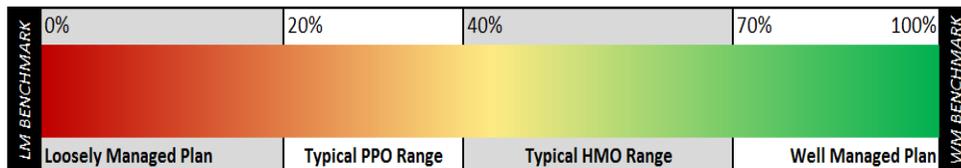
The loosely managed benchmark within the Milliman Health Cost Guidelines represents the high end of the spectrum in terms of healthcare costs. A loosely managed health plan is one that does little to manage cost and utilization of healthcare services, and is typically characterized by the following:

- Limited use of evidence-based best practices;
- Minimal incentives to manage both costs and utilization;
- Limited use of low cost treatment alternatives;
- Potentially excessive use of high tech services; and,
- An environment that does little to promote change.

A typical loosely managed healthcare delivery system will have:

- Some inpatient utilization review;
- Pre-authorization for some procedures; and,
- Case management that has little impact.

The well-managed benchmark represents the low end of the spectrum in terms of healthcare costs. A well-managed health plan is one with comprehensive utilization management programs, and is typically characterized by the following:

- Active use of evidence-based treatment guidelines;
- Programs to educate physicians on ways to provide care more efficiently;
- Financial incentives that reward providers for efficient utilization;
- On-site utilization management of inpatient services;
- Availability and coordinated use of appropriate alternative levels of care;
- The use of a primary care manager;

- Active use of physician assistance, nurse practitioners, and other physician extenders;
- Demand management programs that teach members when to seek medical assistance;

Generally speaking, a shift from a loosely managed care network to a well-managed care network should produce savings by eliminating unnecessary services without harming the consumer or lowering the quality of care being provided. While many may correctly say that finding the way to move the needle from loosely to well-managed is a challenge, understanding how far that needle can move or how far it needs to be moved comes first and can sometimes be the more difficult task. Thus, it is important to understand where the current system lies on that spectrum. A major step in understanding this concept is to identify the populations and/or services that are producing the highest amount of healthcare spending. This task was illustrated in earlier sections of the report.

Another step involves assessing the system's current level of care against industry standards for care management. We previously showed that the largest portion of medical claims cost for high-cost patients in the commercial and Medicare populations were incurred for services provided in a hospital setting. While hospital admissions will always occur, the focus may be to lessen the number of overall admissions and maintain a length of stay that is medically necessary for those that cannot be avoided. Once again, it is important to differentiate between avoiding admissions and reducing lengths of stay where it makes clinical sense versus doing so simply to reduce the amount of medical claims cost. Another important tool that can help lower the overall expenditures is to shift delivery of care to a professional or ambulatory setting, where possible. As we have observed in the payer-specific sections, a percentage of emergency room visits can be categorized as non-emergent or sometimes altogether avoidable. Often times, the discussion of identifying savings in the healthcare system is to transition services to a lower cost, and more efficient setting.

Utilizing a Milliman internal listing of loosely managed and well managed DRG benchmarks, we estimated the impact of going from a loosely managed utilization to a well-managed utilization to be a 30% reduction on inpatient spending. The 30% savings from a loosely managed to a well-managed plan is reflected on a composite basis on both utilization and cost. Identifying areas or cases that can help reduce expenditures must also focus on maintaining quality of care.

The following tables provide an estimate of the potential savings that can be achieved by taking steps towards better care management. It should be noted that shifting to a fully, well-managed network may not be feasible. Based on the estimated percentages of potentially avoidable facility claims illustrated in this report, we have applied a 1% reduction to hospital inpatient expenditures to illustrate a potential expectation for savings. The prevalence rates and PMPY values specific to hospital inpatient services provide the basis for calculating these estimates. Figure 31 illustrates the estimated savings for the commercial population based on summarized inpatient per member per year values associated with the identified condition populations. The inpatient costs for obesity and tobacco use populations for the commercial population is based on reported cost information specific to the inpatient setting from published research.

Figure 31 State of Oklahoma Sample Commercial Database Calculated Savings for Hospital Inpatient						
Condition	**Hospital Inpatient PMPY**	**Reduction Factor**	**Inpatient PMPY Savings**	**Claims Identified Condition Prevalence**	**Commercial Population**	**Estimated Savings**
Obesity (based on coding)	$7,448	1.0%	$74	3.8%	800,000	$2.2 million
Diabetes	6,841	1.0%	$68	5.2%	800,000	$2.8 million
Hypertension	5,664	1.0%	$57	14.2%	800,000	$6.5 million
Tobacco Usage (based on coding)	6,777	1.0%	$68	3.2%	800,000	$1.7 million
Behavioral Health	6,518	1.0%	$65	9.2%	800,000	$4.8 million
Top 20%	10,082	1.0%	$108	20%	800,000	$17.3 million

Notes: 1. 1% reduction is based on achievable shift of potentially avoidable admissions.
2. Condition prevalence is based on information reported in Figure 1 with the exception of obesity and tobacco usage which is based on prevalence of population identified in claims information.

Applying similar reductions on the Medicare population is provided in Figure 32.

Figure 32 State of Oklahoma Sample Medicare Database Calculated Savings for Hospital Inpatient						
Condition	**Hospital Inpatient PMPY**	**Reduction Factor**	**Inpatient PMPY Savings**	**Claims Identified Condition Prevalence**	**Medicare Population**	**Estimated Savings**
Obesity (based on coding)	$11,685	1.0%	$117	7.0%	625,000	$5.8 million
Diabetes	7,040	1.0%	$70	25.9%	625,000	$11.3 million
Hypertension	5,222	1.0%	$52	70.6%	625,000	$23.0 million
Tobacco Usage (based on coding)	10,864	1.0%	$109	5.8%	625,000	$3.9 million
Behavioral Health	10,838	1.0%	$108	22.5%	625,000	$15.2 million
Top 20%	20,558	1.0%	$206	20%	625,000	$25.7 million

Notes: 1. 1% reduction is based on achievable shift of potentially avoidable admissions.
2. Condition prevalence is based on information reported in Figure 1 with the exception of obesity and tobacco usage which is based on prevalence of population identified in claims information.

Applying similar reductions on the Medicaid population is provided in Figure 33.

	Figure 33 **State of Oklahoma** **Sample Medicaid Information** **Calculated Savings for Hospital Inpatient**					
Condition	**Hospital Inpatient PMPY**	**Reduction Factor**	**Inpatient PMPY Savings**	**Claims Identified Condition Prevalence**	**Medicaid Population**	**Estimated Savings**
Obesity	N/A	1.0%	N/A	N/A	789,000	N/A
Diabetes	2,216	1.0%	$22	4.5%	789,000	$790,000
Hypertension	1,947	1.0%	$19	9.8%	789,000	$1.5 million
Tobacco Usage	N/A	1.0%	N/A	N/A	789,000	N/A
Behavioral Health	N/A	1.0%	N/A	N/A	789,000	N/A

Notes: 1. 1% reduction is based on achievable shift of potentially avoidable admissions.
2. Condition prevalence is based on information reported in Figure 1.

Based on the results illustrated above, there is potential for significant healthcare savings just within hospital inpatient services. After ascertaining where the current system lies on the care management spectrum, we can begin to estimate the amount of overall spend that may be avoidable in the system. While any shift away from the loosely managed program toward the well-managed end of the spectrum would be expected to produce savings in the long run, one must always consider the administrative burden this shift would take, as well as financial investment in better care management practices (for example: higher utilization of preventive care services, etc.). Therefore, the incremental savings produced by applying these changes should outweigh the incremental cost of performing such a move in order for the initiative to be considered a financial success.

BEST PRACTICES

An additional step in establishing the shift is to find the best practices for performing the care coordination and management. As with any complex problem, there is not a simple, nor is there a single, answer. What may work in helping to reduce the cost of care and improve health outcomes across one population may not provide for improvement in others.

A thorough review of the care delivery models currently in use by the State of Oklahoma and nationwide is provided in a separate portion of our work with OSDH and OSIM.

The key to a successful care management program is to allow for customization to the targeted population. In dealing with high-risk patients, a one-size fits all mentality will not produce the best outcomes. Building relationships among the different parties is key in getting stakeholder buy-in for achieving the same goal. Because those patients at the highest risk will benefit greatly from planned care management, it is important to have an approach that is both quantitative and qualitative. Identifying patients through risk scoring or other criteria is an oft-used quantitative approach. Focusing enrollment into particular care management programs around acute care events (i.e., ED visits) helps identify the target opportunities and engage the patient.

A critical role, which if left undone could erase the positives, is to constantly be monitoring the results of these approaches and updating or adapting as new beneficiaries are identified. Routinely performing conditional and patient analysis can help steer the program in the right direction to ensure that focus is being applied to current and future high-cost patients along with working to keep those already identified from backtracking.

ROLE OF STAKEHOLDERS

In relation to the topic of developing a care management plan, a stakeholder is any individual who has a vested interest in the care and clinical decisions being made. In order to achieve the identified goals, it will take active participation from all stakeholders to get the process moving. This process should be a collaborative effort with stakeholders working together towards the target and will include payers, providers, and even beneficiaries. While a lot of focus is directed towards incentivizing providers to deliver more cost-efficient and better quality of care, if the beneficiary is not motivated to improve along with the rest of the healthcare system, then any approach may prove fruitless. Payers must learn to build networks not just with providers to obtain good business relationships, but also gaining the trust of patients and letting them understand that the focus is not strictly on the bottom line.

Stakeholders must also learn to come together and interact with one another. Much of today's healthcare industry inefficiencies are due to misaligned objectives in the delivery of healthcare. While that strategy may not prove too costly on the larger swath of patients, high utilizers of a bifurcated system can result in higher medical expenses than necessary throughout a network. The Agency for Healthcare Research and Quality (AHRQ) believes that involving stakeholders during all phases of a care management program from design to implementation can lead to a more successful program and better buy-in from all participants. [40]

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[40] AHRQ on engaging stakeholders http://www.ahrq.gov/professionals/systems/long-term-care/resources/hcbs/medicaidmgmt/medicaidmgmt2.html

XII. OVERVIEW OF ANALYSIS AND ASSUMPTIONS

As part of Oklahoma's State Innovation Model we were requested to evaluate and categorize the delivery of high-cost services across the multiple payers in the State of Oklahoma. The focus of our analysis was the evaluation of high-cost condition populations and their incurred services to provide context for care optimization of the identified population groups. Information on the identified populations was then summarized on demographics, cost of care, and utilization of services. The various treatments provided to the targeted populations were compared to the general population within these payer databases to assess the impact the diagnosed patients have on the healthcare system. While the terminology used throughout this report is in reference to high-cost patients and conditions, another key attribute of these populations is that they are generally also high **risk**. Thus, while it is vital to understand where the dollars are being spent, it also important to recognize these high risk patients will likely always be utilizers of the healthcare system.

HIGH-COST SERVICES

An analysis of high-cost services incurred by individuals in the Oklahoma healthcare system entailed a review of experience across all major insurance groups: Medicare, Medicaid, and commercial payers as well as the EGID and uninsured populations. Studying the costs from the different payers allows for insight into the conditions or services that may be driving expenditures throughout the state while at the same time pinpointing areas that may be specific to one or more of the payers. Although statewide programs designed to reduce healthcare expenditures may not be applicable to all payer systems, understanding the high-cost individuals and services within the healthcare landscape is crucial for the system as a whole. The latter part of this report focuses on identifying areas of potential savings and proposed methodologies to optimize the care being delivered to these patients.

OSIM GOALS

Identifying and analyzing the high-cost individuals in the State of Oklahoma healthcare market helps foster development along the path for each of the three OSIM defined goals to improve health, provide better care, and reduce health expenditures for Oklahomans. As this analysis focuses on the cost and prevalence of specific conditions and the individuals consuming large amounts of healthcare services, the most direct impact is on reducing healthcare expenditures through more efficient care delivery. Throughout this report we discuss the populations categorized in certain disease states and illustrate the level of healthcare dollars that are spent on treatment. While the cost of direct medical treatment alone can be expensive, one must consider that most of these conditions carry with them co-morbidities that serve to magnify the total cost of care for an individual. By working to identify these populations along with other high-cost patients that may not be associated with the pre-defined conditions, we can highlight the areas where care coordination and management can be steered to decrease the amount of claims cost outlay for affected patients. Ideally, the targeted reductions will provide savings as the State of Oklahoma looks into the future of care delivery across its healthcare landscape.

Concurrent with the cost reduction goal, a shift in care management and delivery to the target population is expected to support an improvement in health outcomes and better quality of care for the individuals. Meeting these goals would be dependent upon finding treatment and care plans that will better coordinate the care of the beneficiaries that are the focus of this analysis. In order to meet these initiatives, it is apparent that an improvement must be made in provider efficiencies. It can be stated that the current healthcare system includes a large amount of waste, or spending that could be eliminated without harming consumers or reducing the quality of care.[41]   Although the elimination of medical waste was not a directly identified goal by OSIM, helping to lower healthcare expenditures through reduced utilization and better coordination on high-risk, high-cost patients is helping to achieve that purpose.

Improved health outcomes and better quality of care, the other goals of OSIM, can be viewed as a result of the discussion on care optimization and operational benchmarks. By establishing a guideline for identifying areas of high concern, the anticipated outcome will be more efficient use of healthcare resources and better care management of the affected population while also improving their overall health.

OTHER CONSIDERATIONS

While the goal of this analysis was to identify and summarize costs currently being spent on healthcare, one way to help contain spending is to prevent participants from becoming part of these high-risk groups. As previously stated, once a member is diagnosed with a particular chronic condition it is possible that the participant will begin to utilize more services and become a larger burden on the delivery system. Appropriate management and putting in to place programs to identify potentially risky cases can result in a reduction of expenditures. This concept is not studied at length in this report, but it is important to note. Identifying methods to keep costs down is important, but not having them occur is far better.

The four conditions identified by OSIM provide great examples of being able to recognize a condition in its early stages. According to the American Diabetes Association, while 29.1 million Americans have diabetes, 86 million have prediabetes[42]. Although these individuals do not have full onset diabetes, they are at higher risk of developing this condition based on elevated blood sugar levels. If programs can be put in place to help keep patients from shifting from prediabetes to diabetes, healthcare expenditures can be saved by avoiding the condition altogether. Similar considerations can be made for those who are overweight, but not clinically obese or those with higher than normal blood pressure, but not clinically diagnosed with hypertension.

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[41] http://www.healthaffairs.org/healthpolicybriefs/brief.php?brief_id=82
[42] Retrieved on September 13, 2015 from http://www.diabetes.org/diabetes-basics/statistics/

DATA SOURCES

Commercial Market
2013 Milliman Consolidated Health Cost Guidelines Sources Database (CHSD) Data – This internal Milliman database is used to develop the Milliman Health Cost Guidelines (HCGs), which is nationally accepted as an industry standard. The 2013 CHSD data contains detailed claims and eligibility records for over 17 million commercially insured lives nationwide. For use in this report, we limited our analysis of the CHSD data to only include Oklahoma; however, we reviewed surrounding states to ensure reasonability.

Medicare Market
2013 CMS Medicare 5% Sample Data – CMS has publicly released information including Medicare beneficiaries, Medicare claims, Medicare providers, and clinical data. For the use in this analysis, the Medicare 5% sample was utilized which is created based on selecting records with 05, 20, 45, 70 or 95 in positions 8 and 9 of the HIC number (HICN), which represents beneficiary's Medicare identification number. Similarly to the commercial data used, the 5% sample data was limited to Oklahoma insured lives, but considered data from other states for reasonability checking.

Medicaid Market
The Oklahoma Health Care Authority oversees the Medicaid program in the State of Oklahoma. For purposes of our analysis, OHCA provided conditional studies that encompassed many of the high-cost conditions analyzed under this portion of the OSIM project. In addition to the use of these reports, we also utilized the SFY 2014 SoonerCare annual report. Publically available information produced by OHCA can be found on OHCA's website www.okhca.org under the Research tab.

IDENTIFICATION METHODS

Condition Identification
When developing cost relativities and prevalence rate estimates by condition, members were identified as having a condition using all the International Statistical Classification of Disease, 9th Revision, Clinical Modification (ICD-9) codes listed on the claims within the sample databases. To improve credibility and help lower the risk of false positives (reporting error where presence of a condition is incorrectly indicated), radiology and pathology claims were excluded for the purposes of member's condition identification. For use in this analysis, radiology and pathology claims were identified as institutional claims with a revenue code with first three digits of *"030", "031", "032", or "033"* or professional claims with a CPT code with first digit of 7 or 8. Once a member was identified as having a condition, the entire experience period for that member was retroactively given weight towards that chronic condition. This methodology was utilized because of the limited time span over which the base period of analytics covered (only used calendar year 2013 experience).

The identification of conditions in the Medicaid system was based on the methodology utilized by the OHCA group performing the analysis. Based on a review of the methodology stated in each of the disease specific reports, the focus was consistent with our logic by attempting to use ICD-9 diagnosis code information against a claims and enrollment database.

XIII.   DATA RELIANCE

In performing our analysis, we relied on the following data sources for specific values referenced in this report:

- Oklahoma Health Care Authority conditional studies;
- Oklahoma Health Care Authority SFY 2014 SoonerCare annual report;
- Oklahoma Health Care Authority SoonerCare Management Report;
- Oklahoma EGID population data provided by EGID;
- Oklahoma EGID analyses performed by Truven Health Analytics;
- Oklahoma State Discharge data for calendar year 2011;
- Behavioral Risk Factor Surveillance System (BRFSS) 2014 statistics; and,
- CMS Medicare 5% sample.

We have not audited or verified this data and other information. If the underlying data or information is inaccurate or incomplete, the results of our analysis may likewise be inaccurate or incomplete. We performed a limited review of the data used directly in our analysis for reasonableness and consistency and have not found material defects in the data. If there are material defects in the data, it is possible that they would be uncovered by a detailed, systematic review and comparison of the data to search for data values that are questionable or for relationships that are materially inconsistent. Such a review was beyond the scope of the report.

XIV. LIMITATIONS AND QUALIFICATIONS

This report is intended to analyze the delivery of high-cost services in the State of Oklahoma insurance market. It is our understanding that the State will use this report to help key decision makers plan and implement a health innovation plan for the State in compliance with the Federal SIM grant awarded to Oklahoma in December of 2014. The report may not be suitable for other purposes.

This report has been prepared solely for the internal use of, and is only to be relied upon by, the Oklahoma State Department of Health (OSDH). Milliman makes no representations or warranties regarding the contents of this correspondence to third parties. Likewise, third parties are instructed that they are to place no reliance upon this correspondence prepared for OSDH by Milliman that would result in the creation of any duty or liability under any theory of law by Milliman or its employees to third parties. If this report is distributed to third parties, it should be distributed only in its entirety.

The results in this report are technical in nature and dependent upon specific assumptions and methods. No party should rely upon this report without a thorough understanding of those assumptions and methods.

Milliman's consultants are not attorneys and are not qualified to give legal advice. We recommend that users of this report consult with their own legal counsel regarding interpretation of legislation and administrative rules, possible implications of specific ACA-required features, or other legal issues related to implementation of an ACA-compliant entity.

Differences between our projections and actual amounts depend on the extent to which future experience conforms to the assumptions made for this analysis. It is certain that actual experience will not conform exactly to the assumptions used in this analysis. Actual amounts will differ from projected amounts to the extent that actual experience deviates from expected experience.

The services provided for this project were performed under the signed Contract between Milliman, Inc. (Milliman) and the Oklahoma State Department of Health (OSDH) signed March 27, 2015.

Guidelines issued by the American Academy of Actuaries require actuaries to include their professional qualifications in all actuarial communications. The authors of this report are members of the American Academy of Actuaries and meet the qualification standards for performing the analyses contained herein.

APPENDIX A

Serious Mental Illness Diagnosis Codes

Diagnosis Code	Description of Diagnosis
290	Dementias
293	Transient mental disorders due to conditions classified elsewhere
294	Persistent mental disorders due to conditions classified elsewhere
295	Schizophrenic disorders
296	Episodic mood disorders
297	Delusional disorders
298	Other nonorganic psychoses
300.01	Panic disorder without agoraphobia
300.11	Conversion disorder
300.21	Agoraphobia with panic disorder
300.22	Agoraphobia without mention of panic attacks
300.3	Obsessive-compulsive disorders
300.7	Hypochondriasis
300.81	Somatization disorder
300.89	Other somatoform disorders
301.13	Cyclothymic disorder
301.7	Antisocial personality disorder
301.83	Borderline personality disorder
307.80	Psychogenic pain, site unspecified
307.81	Tension headache
307.89	Pain disorders related to psychological factors; other
309.81	Posttraumatic stress disorder
311	Depressive disorder, not elsewhere classified
312.34	Intermittent explosive disorder

Alcohol and Drug Abuse Diagnosis Codes

Diagnosis Code	Description of Diagnosis
291	Alcohol-induced mental disorders
292	Drug-induced mental disorders
303	Alcohol dependence syndrome
304	Drug dependence
305.0	Nondependent alcohol abuse
305.1	Tobacco use disorder
305.2	Nondependent cannabis abuse
305.3	Nondependent hallucinogen abuse
305.4	Nondependent sedative, hypnotic, or anxiolytic abuse
305.5	Nondependent opioid abuse
305.6	Nondependent cocaine abuse
305.7	Nondependent amphetamine or related acting sympathomimetic abuse
305.8	Nondependent antidepressant type abuse
305.9	Nondependent other mixed or unspecified drug abuse