May 13, 2016

Using Big Data & Analytics to Understand Population Health in South Dakota

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Chief Medical Officer

Avera Health Plans

Agenda

- Healthcare Reform
- Shift from Fee-for-service to Value Based Care
- State of South Dakota
- State of Health in South Dakota
- Population Health Management

Bob

- 45 y/o male
- Hx of diabetes, HTN
- Smoker 3 cigarettes per day
- Occasional ETOH
- 2 medications

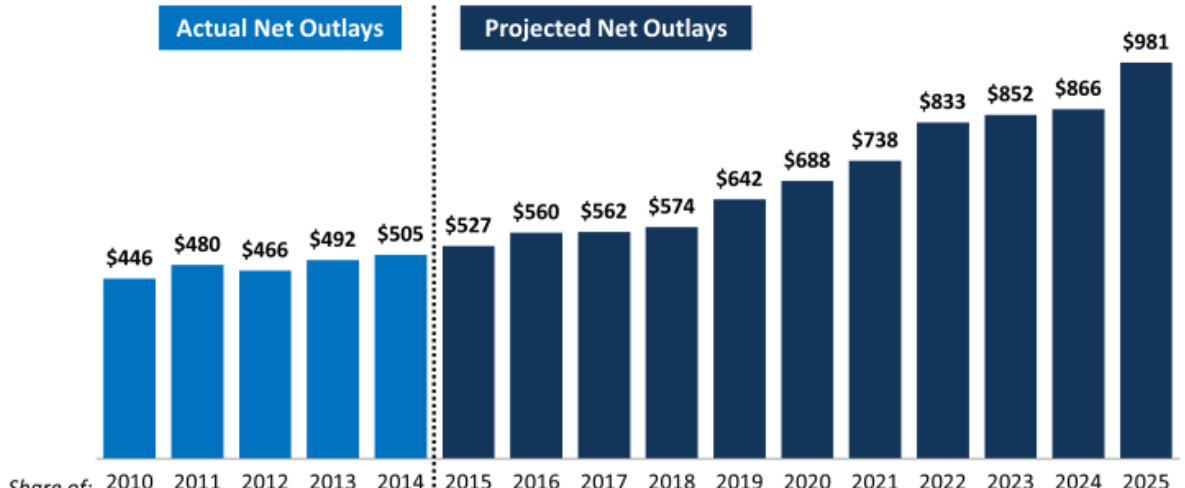
Robert

- 50 y/o male
- Hx of GERD, obesity, sleep apnea
- Non-smoker
- No ETOH
- 2 medications

Medicare spending is projected to nearly double from $527 billion in 2015 to $981 billion in 2025, according to CBO.

Figure 27

Medicare Spending and Percent of Federal Outlays and GDP, 2010-2025



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Share of: Federal Outlays	*12.9%*	*13.3%*	*13.2%*	*14.2%*	*14.4%*	*14.3%*	*14.3%*	*13.9%*	*13.6%*	*14.3%*	*14.5%*	*14.8%*	*15.8%*	*15.8%*	*15.2%*	*16.2%*
GDP	*3.0%*	*3.1%*	*2.9%*	*3.0%*	*2.9%*	*2.9%*	*3.0%*	*2.9%*	*2.8%*	*3.0%*	*3.1%*	*3.2%*	*3.4%*	*3.4%*	*3.3%*	*3.6%*

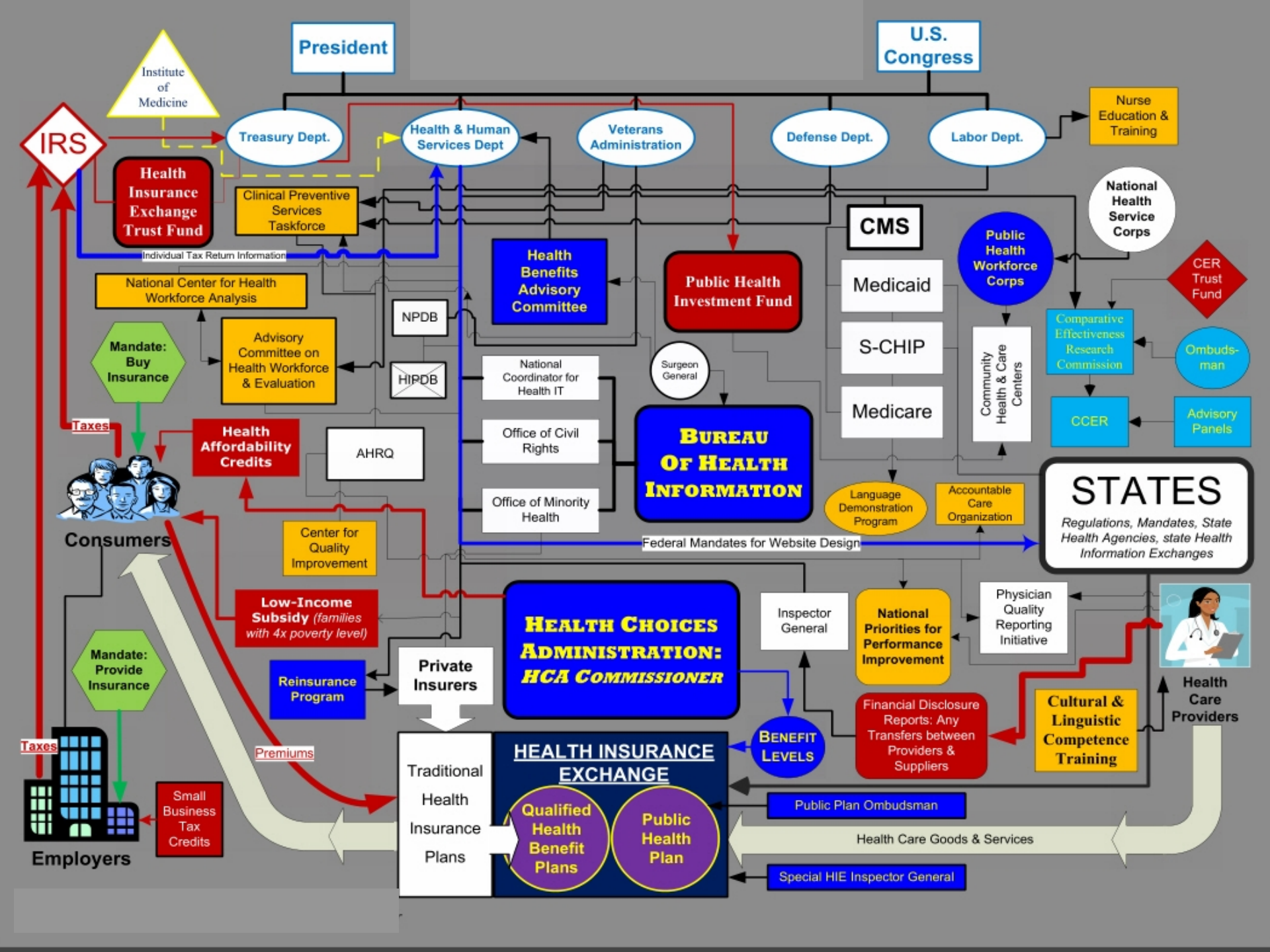
NOTE: All amounts are for federal fiscal years; amounts are in billions and consist of Medicare spending minus income from premiums and other offsetting receipts.
SOURCE: Kaiser Family Foundation based on data from Congressional Budget Office, Updated Budget Projections: 2015 to 2025 (March 2015); The 2014 Long-Term Budget Outlook (July 2014).

THE HENRY J. KAISER FAMILY FOUNDATION

Figure 27: Medicare Spending and Percent of Federal Outlays and GDP, 2010-2025

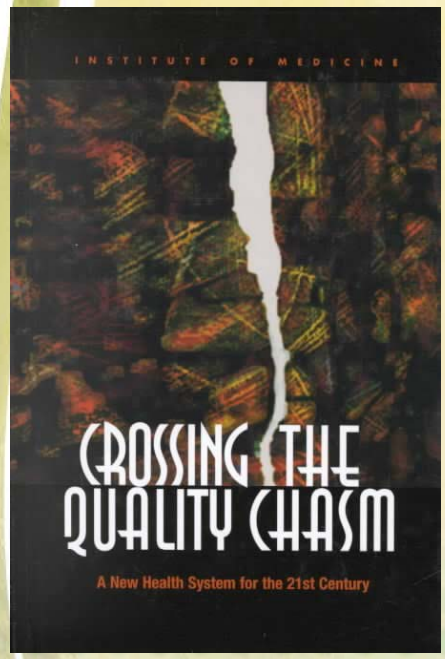
Current U.S. Health Care System

- A non-system
- Uncoordinated
- Fragmented care
- Emphasizes intervention, rather than prevention and comprehensive management of health
- Unsustainable costs that are rapidly increasing
- Access is declining
- Quality is far from ideal


President
U.S. Congress
Institute of Medicine
IRS
Treasury Dept.
Health & Human Services Dept
Veterans Administration
Defense Dept.
Labor Dept.
Nurse Education & Training
Health Insurance Exchange Trust Fund
Clinical Preventive Services Taskforce
Individual Tax Return Information
National Health Service Corps
CMS
Public Health Workforce Corps
CER Trust Fund
Health Benefits Advisory Committee
Public Health Investment Fund
Medicaid
S-CHIP
Medicare
National Center for Health Workforce Analysis
NPDB
HIPDB
Advisory Committee on Health Workforce & Evaluation
Mandate: Buy Insurance
Taxes
Surgeon General
National Coordinator for Health IT
Office of Civil Rights
Office of Minority Health
Bureau Of Health Information
Community Health & Care Centers
Comparative Effectiveness Research Commission
Ombuds-man
CCER
Advisory Panels
Health Affordability Credits
AHRQ
Consumers
Language Demonstration Program
Accountable Care Organization
STATES
Regulations, Mandates, State Health Agencies, state Health Information Exchanges
Federal Mandates for Website Design
Center for Quality Improvement
Low-Income Subsidy (families with 4x poverty level)
Health Choices Administration: HCA Commissioner
Inspector General
National Priorities for Performance Improvement
Physician Quality Reporting Initiative
Mandate: Provide Insurance
Reinsurance Program
Private Insurers
Financial Disclosure Reports: Any Transfers between Providers & Suppliers
Cultural & Linguistic Competence Training
Health Care Providers
Taxes
Premiums
Benefit Levels
Traditional Health Insurance Plans
HEALTH INSURANCE EXCHANGE
Qualified Health Benefit Plans
Public Health Plan
Public Plan Ombudsman
Health Care Goods & Services
Special HIE Inspector General
Small Business Tax Credits
Employers

Triple Aim

- Better patient experience of care
- Better health outcomes
- Lower Cost



Health Insurance Coverage

+

Access to Usual Source of Care =

Improved Health Outcomes

What Are the Insurance Marketplaces (Exchanges)?

- Federally run, state-run, or partnership exchanges.
- Composed of private insurance plans and federal plans, including Medicaid and the Children's Health Insurance Program.
- Allow Americans to compare, find, and enroll for health insurance coverage in one place, with one application.

Options for Saving

- Based on income level and family size, patients can qualify for:
  - Reduced premiums or co-pays through a plan in the Marketplace
  - Expanded Medicaid programs for people who make up to 133% of the federal poverty level

The ACA & Market Forces

Cost Imperative

- Aging population, Medicaid expansion, subsidies = government budget strain
- Provider payment cuts
- Insurer competition and consolidation will reduce private plan rates
- Increased efficiency measures and cost transparency

Increased Consumerism

- Consumer annual choice on public and private exchanges
- High deductible plans
- Technology apps and 'wearables"
- Transparency in costs and quality
- More "retail" health options

Payment Model Evolution

- Providers accountable for quality and costs
- Alignment of payment models with patient care episodes, not providers
- Focus on "triple aim" measurement
- Incentives to align private and public payment models and measures

THE WALL STREET JOURNAL.

Number of Uninsured in U.S. Dropped Below 10% for First Time in 2015

School Once Run by Jane Sanders Plans to Close After Expansion Fails

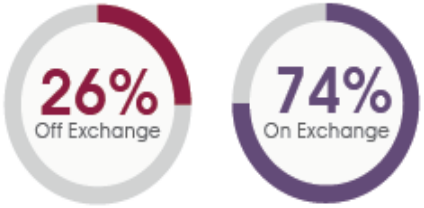
ELECTION 2016
In Battleground State, Republicans Are Split on Trump

POLITICS | HEALTH POLICY

Number of Uninsured in U.S. Dropped Below 10% for First Time in 2015

Affordable Care Act lowers number of uninsured, but critics contend it cost too much to do too little

21,520 Total Members
PLANS EFFECTIVE JANUARY 1



ACA Individual Premium PMPM
JANUARY 2016

ACA Individual Premium PMPM between 2014 and 2015 was influenced by a larger percentage of Off-Exchange members who purchased lower value metal plans. In 2016, there will be a continued migration to lower valued metal tier plans both on/off the Exchange.

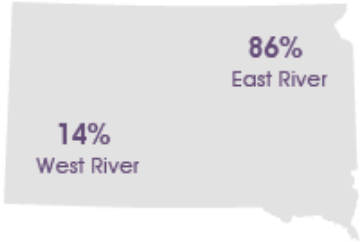
FEBRUARY / MARCH ADDITIONAL APPLICANTS (EST.):

2,330 On Exchange

609 Off Exchange

2,422 Total

Members by Region



POSSIBLE GRAND TOTAL
23,942

DECREASING AVERAGE AGE
INDIVIDUAL PRODUCT LINE

This factor influencing premium may however have a positive impact on risk.

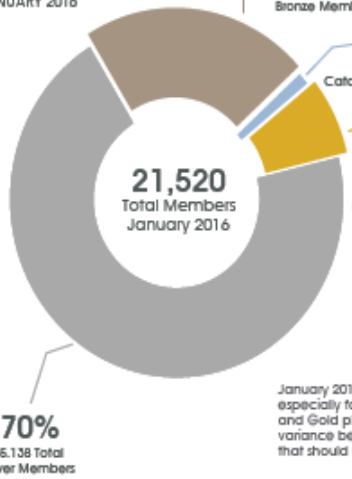
December 2014
40.2

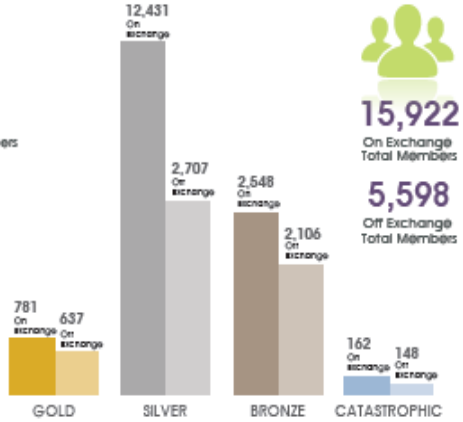
December 2015
38.6

January 2016
37.7

2016 Open Enrollment Results

Membership Numbers
JANUARY 2016





15,922 On Exchange Total Members

5,598 Off Exchange Total Members

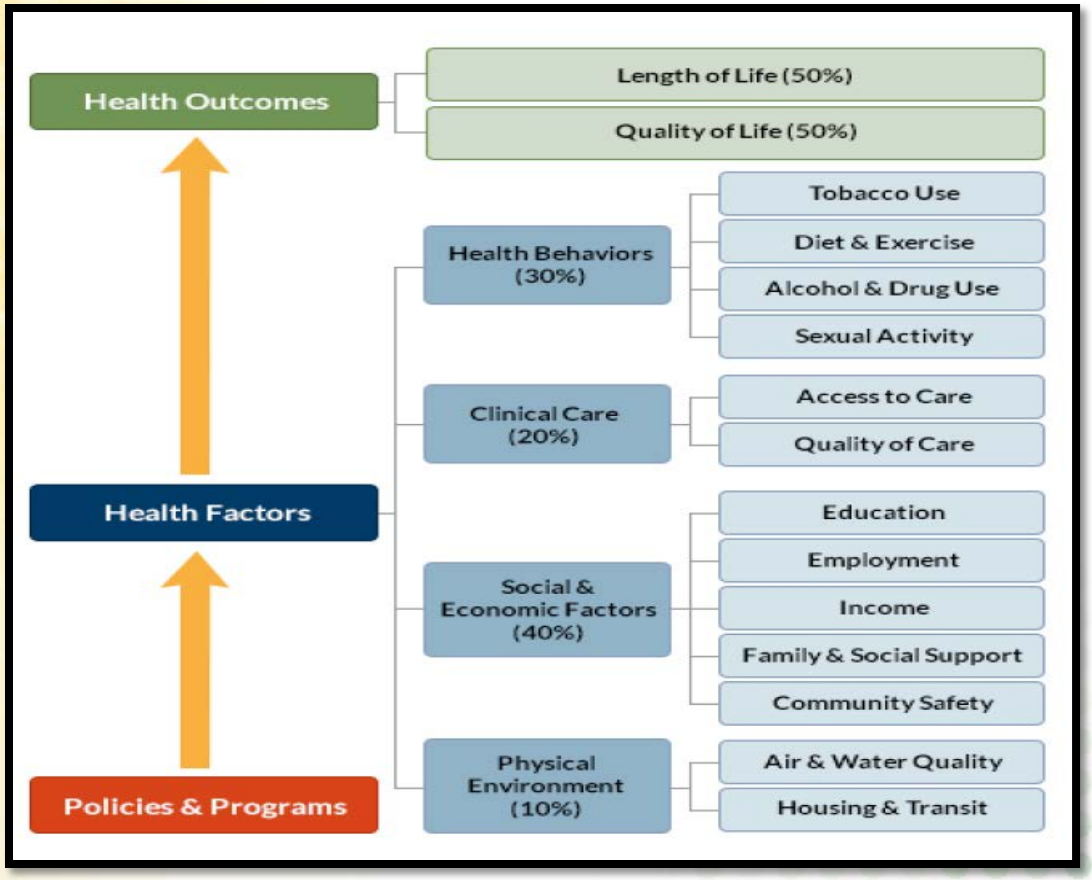
January 2016 membership numbers continue the metal tier mix migration to bronze plans especially for off-exchange membership. In 2015, 84% of members were enrolled in Silver and Gold plans, this percentage dropped in January 2016 to 77%. This will create a variance between actual 2016 PMPM premium and budgeted 2016 PMPM premium that should be recast to adjust for open enrollment.

Federal Subsidies On Exchange Only

Members with Advanced Premium Tax Credit

Members with Cost Sharing Reduction

- It takes everyone
- Move from data to evidence-informed action
- Focus across the health factors—including social and economic factors
- Policy, systems, and environmental change

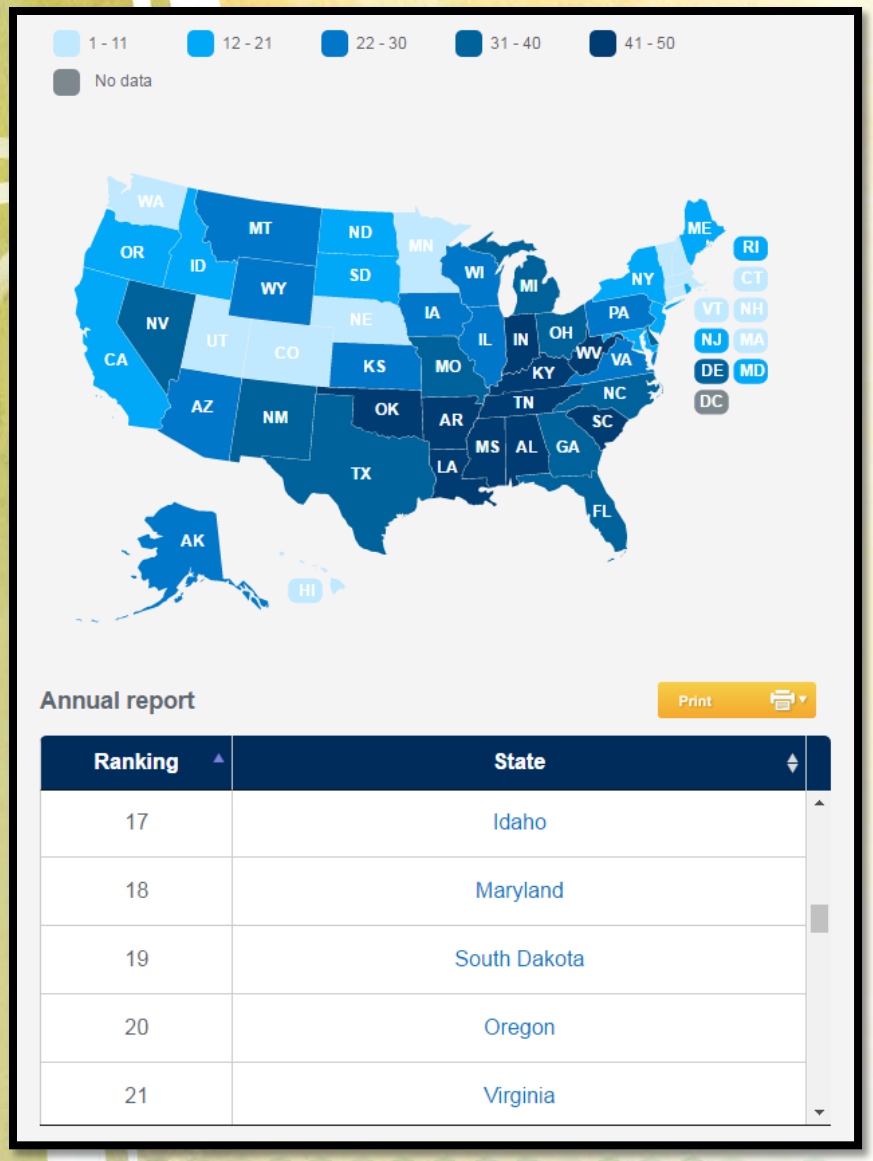


Variation In Health Outcomes: The Role Of Spending On Social Services, Public Health, And Health Care, 2000–09

Although spending rates on health care and social services vary substantially across the states, little is known about the possible association between variation in state-level health outcomes and the allocation of state spending between health care and social services. To estimate that association, we used state-level repeated measures multivariable modeling for the period 2000–09, with region and time fixed effects adjusted for total spending and state demographic and economic characteristics and with one- and two-year lags. We found that states with a higher ratio of social to health spending (calculated as the sum of social service spending and public health spending divided by the sum of Medicare spending and Medicaid spending) had significantly better subsequent health outcomes for the following seven measures: adult obesity; asthma; mentally unhealthy days; days with activity limitations; and mortality rates for lung cancer, acute myocardial infarction, and type 2 diabetes. Our study suggests that broadening the debate beyond what should be spent on health care to include what should be invested in health—not only in health care but also in social services and public health—is warranted.

Health Affairs, May 2016

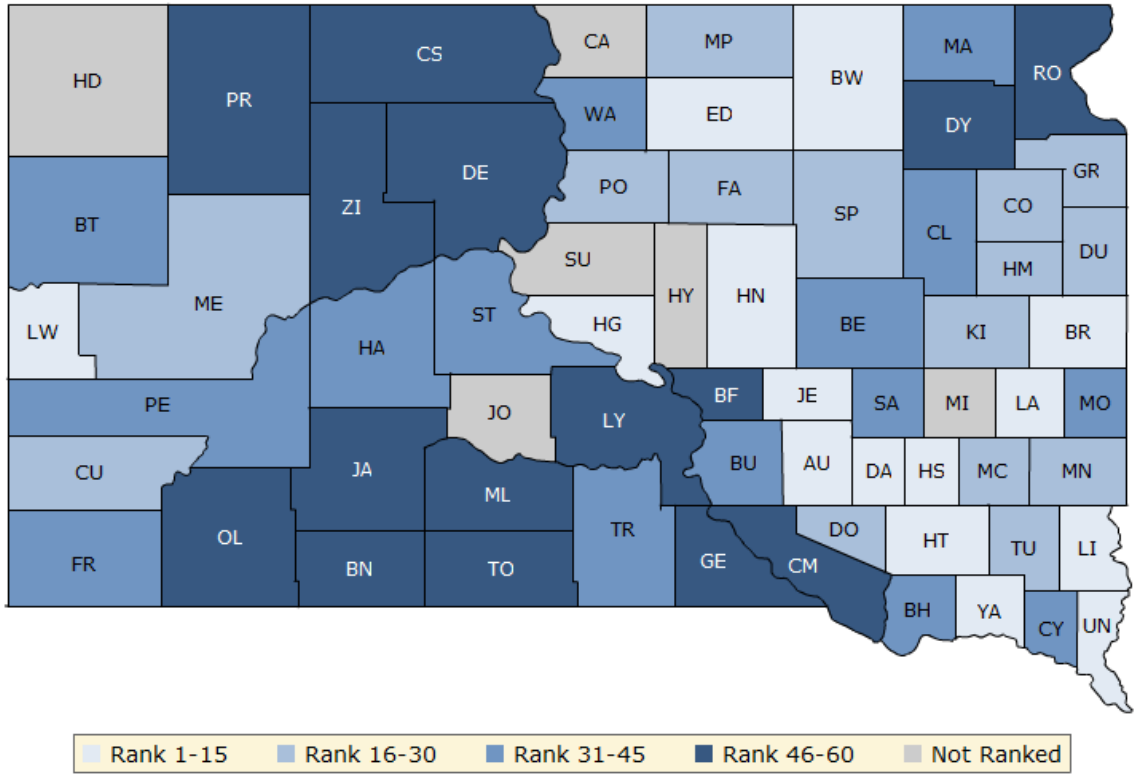
America's Health Rankings



Annual report

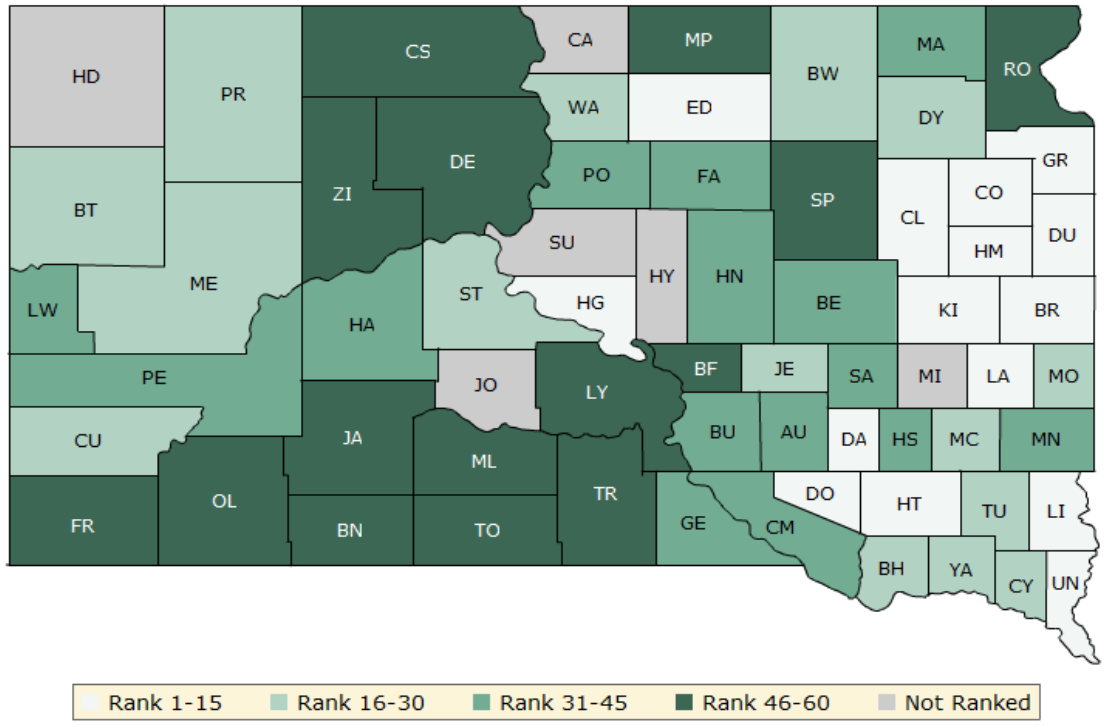
Print

Ranking	State
17	Idaho
18	Maryland
19	South Dakota
20	Oregon
21	Virginia



Overall Health Factors

County	Rank	County	Rank	County	Rank	County	Rank
Aurora	12	Day	46	Jackson	52	Pennington	39
Beadle	40	Deuel	30	Jerauld	11	Perkins	48
Bennett	54	Dewey	56	Jones	NR	Potter	16
Bon Homme	41	Douglas	21	Kingsbury	27	Roberts	50
Brookings	9	Edmunds	2	Lake	7	Sanborn	35
Brown	5	Fall River	42	Lawrence	14	Spink	24
Brule	31	Faulk	29	Lincoln	1	Stanley	37
Buffalo	58	Grant	25	Lyman	51	Sully	NR
Butte	32	Gregory	47	Marshall	44	Todd	59
Campbell	NR	Haakon	34	McCook	17	Tripp	43
Charles Mix	49	Hamlin	22	McPherson	20	Turner	28
Clark	36	Hand	8	Meade	26	Union	3
Clay	33	Hanson	6	Mellette	53	Walworth	38
Codington	23	Harding	NR	Miner	NR	Yankton	15
Corson	57	Hughes	4	Minnehaha	18	Ziebach	55
Custer	19	Hutchinson	13	Moody	45		
Davison	10	Hyde	NR	Oglala Lakota	60		



County	Rank	County	Rank	County	Rank	County	Rank
Aurora	40	Day	22	Jackson	55	Pennington	39
Beadle	44	Deuel	5	Jerauld	27	Perkins	23
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Bon Homme	17	Douglas	10	Kingsbury	12	Roberts	51
Brookings	7	Edmunds	11	Lake	8	Sanborn	36
Brown	20	Fall River	46	Lawrence	33	Spink	48
Brule	35	Faulk	42	Lincoln	4	Stanley	25
Buffalo	57	Grant	2	Lyman	47	Sully	NR
Butte	19	Gregory	45	Marshall	41	Todd	60
Campbell	NR	Haakon	38	McCook	26	Tripp	50
Charles Mix	37	Hamlin	3	McPherson	49	Turner	16
Clark	1	Hand	31	Meade	30	Union	14
Clay	28	Hanson	43	Mellette	52	Walworth	18
Codington	13	Harding	NR	Miner	NR	Yankton	21
Corson	58	Hughes	9	Minnehaha	34	Ziebach	53
Custer	24	Hutchinson	6	Moody	29		
Davison	15	Hyde	NR	Oglala Lakota	59		

Overall Health Outcomes

Clark (CL)

☐ Show areas to explore ☐ Show areas of strength

County Demographics +

	Clark County	Trend	Error Margin	Top U.S. Performers^	South Dakota	Rank (of 60)
Health Outcomes						**1**
Length of Life						20
Premature death	5,800		4,200-7,900	5,200	6,800	
Quality of Life						2
Poor or fair health**	10%		10-11%	12%	13%	
Poor physical health days**	2.7		2.5-2.8	2.9	3.1	
Poor mental health days**	2.4		2.3-2.5	2.8	2.7	
Low birthweight	4%			6%	6%	
Additional Health Outcomes (not included in overall ranking) +						
Health Factors						**36**
Health Behaviors						29
Adult smoking**	15%		14-15%	14%	19%	
Adult obesity	34%		27-41%	25%	30%	
Food environment index	7.3			8.3	7.3	
Physical inactivity	27%		20-34%	20%	24%	
Access to exercise opportunities	41%			91%	67%	
Excessive drinking**	18%		17-19%	12%	18%	
Alcohol-impaired driving deaths	40%		15-62%	14%	35%	
Sexually transmitted infections	139.5			134.1	471.2	
Teen births	15			19	36	

Lincoln (LI)

☐ Show areas to explore ☐ Show areas of strength

County Demographics +

	Lincoln County	Trend	Error Margin	Top U.S. Performers^	South Dakota	Rank (of 60)
Health Outcomes						**4**
Length of Life						1
Premature death	3,400		2,800-3,900	5,200	6,800	
Quality of Life						13
Poor or fair health**	9%		9-9%	12%	13%	
Poor physical health days**	2.2		2.1-2.4	2.9	3.1	
Poor mental health days**	2.2		2.1-2.3	2.8	2.7	
Low birthweight	6%		5-7%	6%	6%	
Additional Health Outcomes (not included in overall ranking) +						
Health Factors						**1**
Health Behaviors						5
Adult smoking**	15%		14-15%	14%	19%	
Adult obesity	28%		26-31%	25%	30%	
Food environment index	9.0			8.3	7.3	
Physical inactivity	22%		20-24%	20%	24%	
Access to exercise opportunities	78%			91%	67%	
Excessive drinking**	20%		19-21%	12%	18%	
Alcohol-impaired driving deaths	44%		35-53%	14%	35%	
Sexually transmitted infections	209.1			134.1	471.2	
Teen births	16		13-19	19	36	

Todd (TO)

☐ Show areas to explore ☐ Show areas of strength

County Demographics +

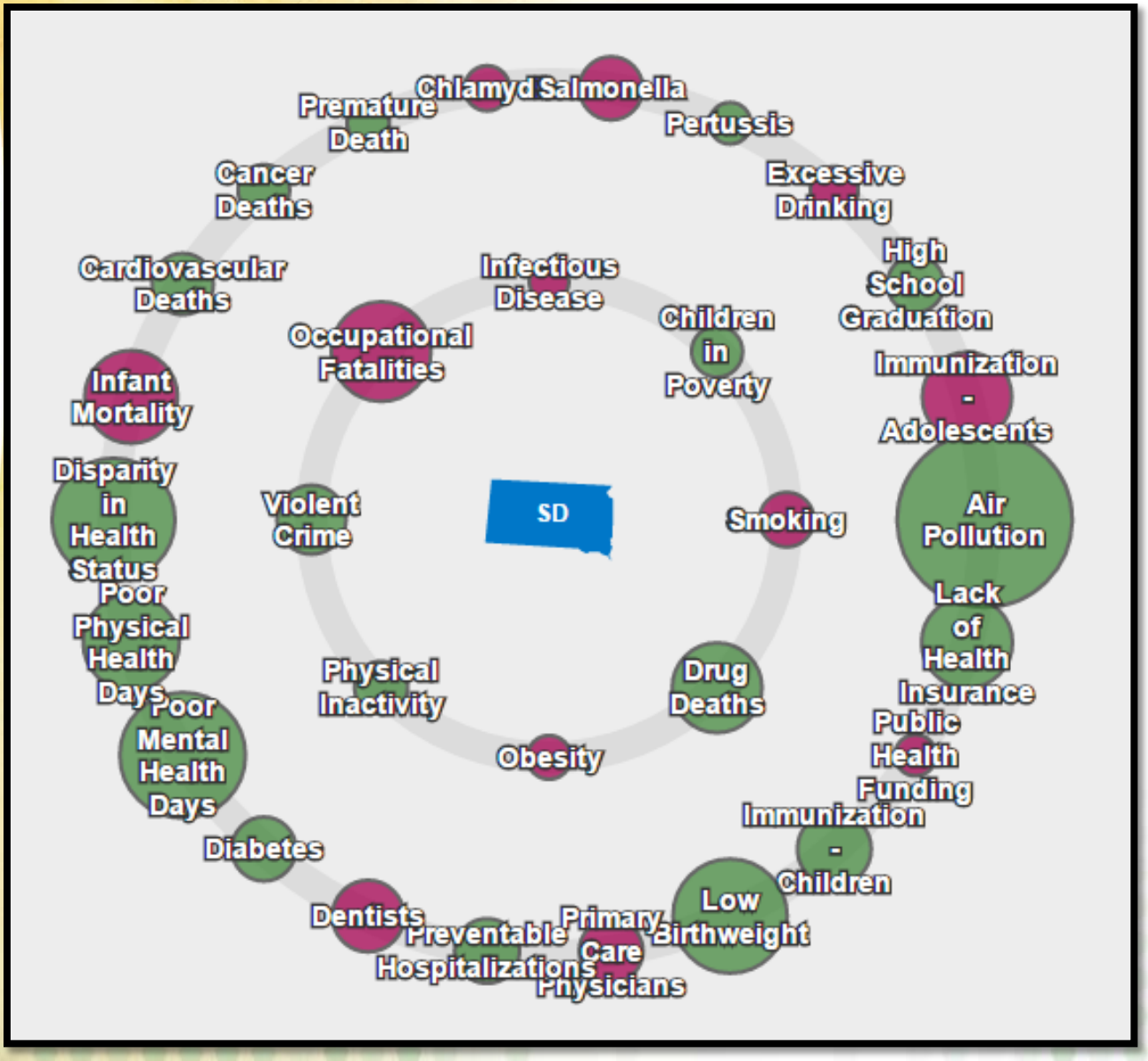
	Todd County	Trend	Error Margin	Top U.S. Performers^	South Dakota	Rank (of 60)
Health Outcomes						**60**
Length of Life						58
Premature death	22,200		18,700-25,600	5,200	6,800	
Quality of Life						60
Poor or fair health**	30%		29-31%	12%	13%	
Poor physical health days**	5.7		5.4-5.9	2.9	3.1	
Poor mental health days**	4.6		4.4-4.8	2.8	2.7	
Low birthweight	8%		7-9%	6%	6%	
Additional Health Outcomes (not included in overall ranking) +						
Health Factors						**59**
Health Behaviors						58
Adult smoking**	38%		37-39%	14%	19%	
Adult obesity	38%		33-42%	25%	30%	
Food environment index	4.8			8.3	7.3	
Physical inactivity	29%		25-32%	20%	24%	
Access to exercise opportunities	1%			91%	67%	
Excessive drinking**	17%		16-18%	12%	18%	
Alcohol-impaired driving deaths	20%		2-48%	14%	35%	
Sexually transmitted infections	1,951.3			134.1	471.2	
Teen births	123		110-136	19	36	

Minnehaha (MN)

☐ Show areas to explore ☐ Show areas of strength

County Demographics +

	Minnehaha County	Trend	Error Margin	Top U.S. Performers^	South Dakota	Rank (of 60)
Health Outcomes						**34**
Length of Life						23
Premature death	6,300		5,900-6,700	5,200	6,800	
Quality of Life						41
Poor or fair health**	12%		11-12%	12%	13%	
Poor physical health days**	2.7		2.6-2.8	2.9	3.1	
Poor mental health days**	2.6		2.5-2.7	2.8	2.7	
Low birthweight	7%		7-7%	6%	6%	
Additional Health Outcomes (not included in overall ranking) +						
Health Factors						**18**
Health Behaviors						14
Adult smoking**	17%		16-17%	14%	19%	
Adult obesity	28%		26-30%	25%	30%	
Food environment index	8.0			8.3	7.3	
Physical inactivity	23%		21-25%	20%	24%	
Access to exercise opportunities	88%			91%	67%	
Excessive drinking**	19%		19-20%	12%	18%	
Alcohol-impaired driving deaths	25%		18-32%	14%	35%	
Sexually transmitted infections	532.5			134.1	471.2	
Teen births	34		33-36	19	36	


Chlamyd
Salmonella
Premature Death
Pertussis
Cancer Deaths
Excessive Drinking
Cardiovascular Deaths
Infectious Disease
High School Graduation
Occupational Fatalities
Children in Poverty
Infant Mortality
Immunization - Adolescents
Disparity in Health Status
Violent Crime
SD
Smoking
Air Pollution
Poor Physical Health Days
Lack of Health Insurance
Physical Inactivity
Drug Deaths
Poor Mental Health Days
Public Health Funding
Obesity
Immunization - Children
Diabetes
Low Birthweight
Dentists
Primary Care Physicians
Preventable Hospitalizations

2016 *COUNTY HEALTH RANKINGS*: MEASURES AND NATIONAL/STATE RESULTS

Measure	Description	US Median	State Overall	State Minimum	State Maximum
HEALTH OUTCOMES					
Premature death	Years of potential life lost before age 75 per 100,000 population	7,700	6,800	3,400	23,900
Poor or fair health	% of adults reporting fair or poor health	16%	13%	8%	33%
Poor physical health days	Average # of physically unhealthy days reported in past 30 days	3.7	3.1	2.2	5.9
Poor mental health days	Average # of mentally unhealthy days reported in past 30 days	3.7	2.7	2.1	4.7
Low birthweight	% of live births with low birthweight (< 2500 grams)	8%	6%	3%	9%
HEALTH FACTORS					
HEALTH BEHAVIORS					
Adult smoking	% of adults who are current smokers	18%	19%	13%	41%
Adult obesity	% of adults that report a BMI ≥ 30	31%	30%	25%	45%
Food environment index	Index of factors that contribute to a healthy food environment, (0-10)	7.2	7.3	0.0	9.0
Physical inactivity	% of adults aged 20 and over reporting no leisure-time physical activity	28%	24%	20%	34%
Access to exercise opportunities	% of population with adequate access to locations for physical activity	62%	67%	1%	92%
Excessive drinking	% of adults reporting binge or heavy drinking	17%	18%	15%	23%
Alcohol-impaired driving deaths	% of driving deaths with alcohol involvement	31%	35%	0%	100%
Sexually transmitted infections	# of newly diagnosed chlamydia cases per 100,000 population	287.7	471.2	48.1	2,653.1
Teen births	# of births per 1,000 female population ages 15-19	40	36	9	123
CLINICAL CARE					
Uninsured	% of population under age 65 without health insurance	17%	13%	7%	22%
Primary care physicians	Ratio of population to primary care physicians	1,990:1	1,310:1	5,960:1	600:1
Dentists	Ratio of population to dentists	2,590:1	1,770:1	3,980:0	400:1
Mental health providers	Ratio of population to mental health providers	1,060:1	630:1	8,270:1	210:1
Preventable hospital stays	# of hospital stays for ambulatory-care sensitive conditions per 1,000 Medicare enrollees	60	52	29	161
Diabetic monitoring	% of diabetic Medicare enrollees ages 65-75 that receive HbA1c monitoring	85%	83%	19%	96%
Mammography screening	% of female Medicare enrollees ages 67-69 that receive mammography screening	61%	66%	26%	86%

2016 *COUNTY HEALTH RANKINGS*: MEASURES AND NATIONAL/STATE RESULTS

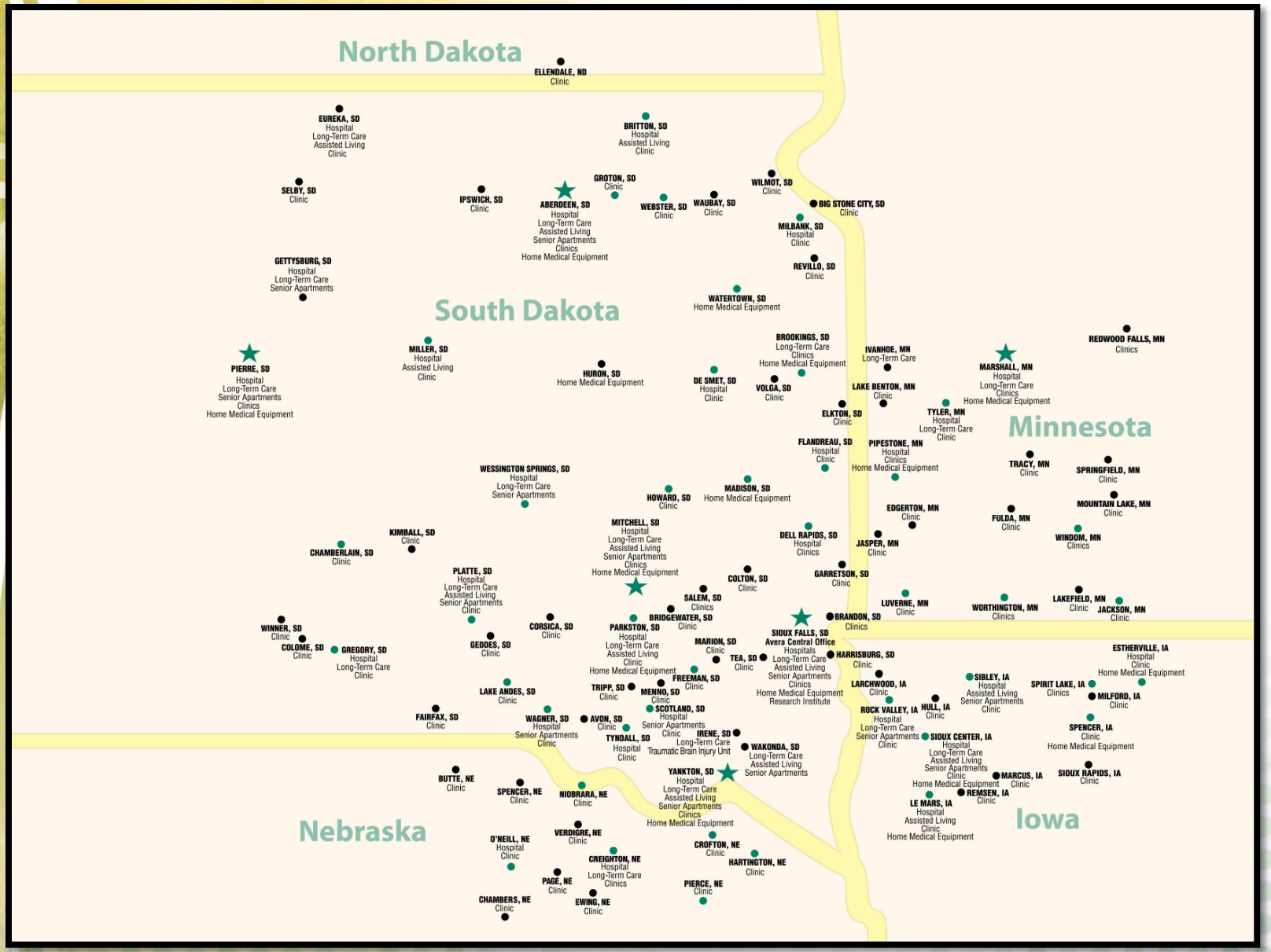
Measure	Description	US Median	State Overall	State Minimum	State Maximum
SOCIAL AND ECONOMIC FACTORS					
High school graduation	% of ninth-grade cohort that graduates in four years	86%	83%	3%	97%
Some college	% of adults ages 25-44 with some post-secondary education	56%	67%	43%	83%
Unemployment	% of population aged 16 and older unemployed but seeking work	6.0%	3.4%	2.4%	14.5%
Children in poverty	% of children under age 18 in poverty	23%	18%	5%	54%
Income inequality	Ratio of household income at the 80th percentile to income at the 20th percentile	4.4	4.2	3.3	6.9
Children in single-parent households	% of children that live in a household headed by a single parent	32%	32%	5%	70%
Social associations	# of membership associations per 10,000 population	13.0	17.0	0.0	33.9
Violent crime	# of reported violent crime offenses per 100,000 population	199	282	0	493
Injury deaths	# of deaths due to injury per 100,000 population	74	70	35	251
PHYSICAL ENVIRONMENT					
Air pollution – particulate matter	Average daily density of fine particulate matter in micrograms per cubic meter (PM2.5)	11.9	10.8	9.5	12.3
Drinking water violations	Indicator of the presence of health-related drinking water violations. Yes - indicates the presence of a violation, No - indicates no violation.	NA	NA	No	Yes
Severe housing problems	% of households with overcrowding, high housing costs, or lack of kitchen or plumbing facilities	14%	12%	6%	44%
Driving alone to work	% of workforce that drives alone to work	80%	79%	49%	88%
Long commute – driving alone	Among workers who commute in their car alone, % commuting > 30 minutes	29%	14%	3%	49%

2016 COUNTY HEALTH RANKINGS: DATA SOURCES AND YEARS OF DATA

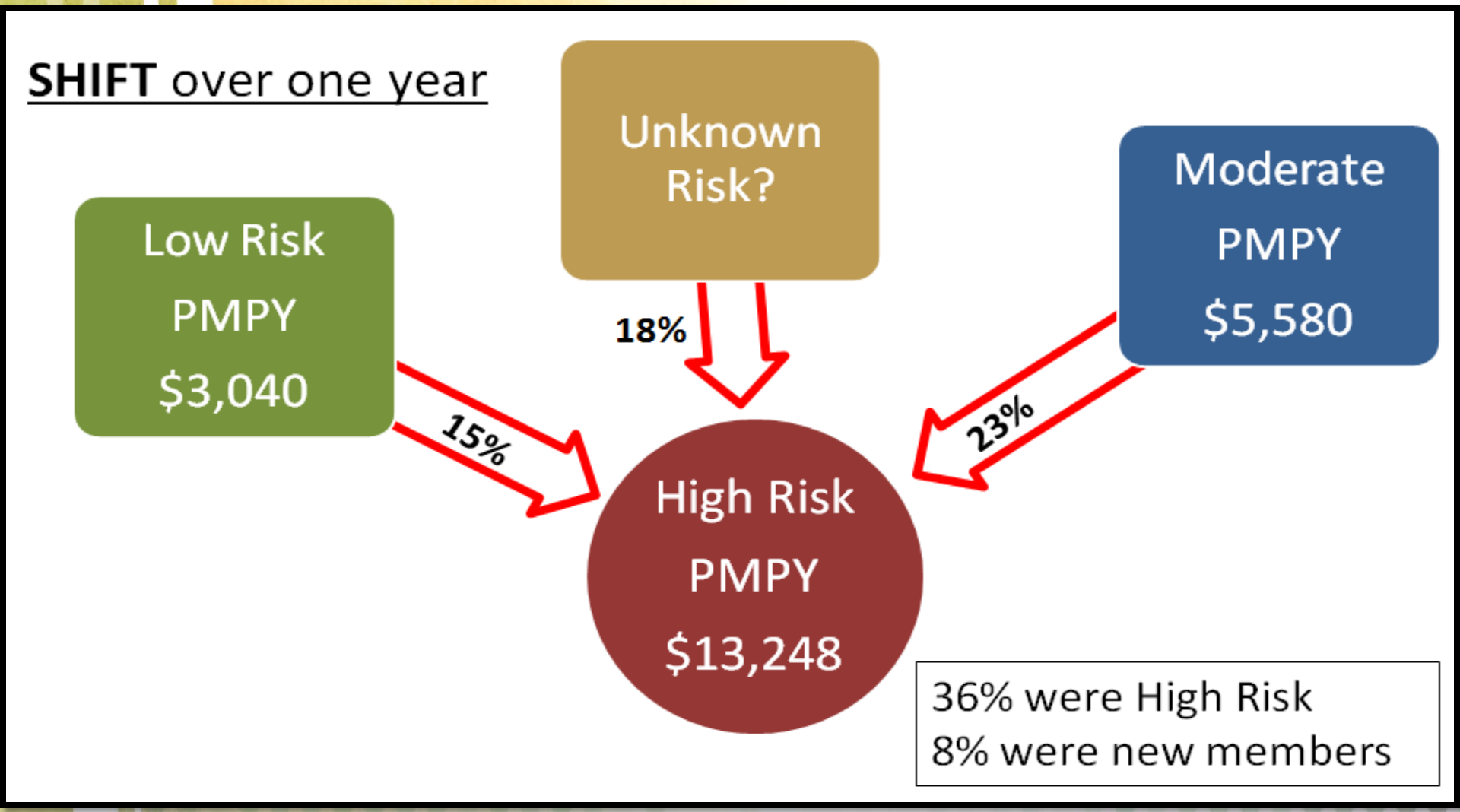
	Measure	Data Source	Years of Data
HEALTH OUTCOMES			
Length of Life	Premature death	National Center for Health Statistics – Mortality files	2011-2013
Quality of Life	Poor or fair health	Behavioral Risk Factor Surveillance System	2014
	Poor physical health days	Behavioral Risk Factor Surveillance System	2014
	Poor mental health days	Behavioral Risk Factor Surveillance System	2014
	Low birthweight	National Center for Health Statistics – Natality files	2007-2013
HEALTH FACTORS			
HEALTH BEHAVIORS			
Tobacco Use	Adult smoking	Behavioral Risk Factor Surveillance System	2014
Diet and Exercise	Adult obesity	CDC Diabetes Interactive Atlas	2012
	Food environment index	USDA Food Environment Atlas, Map the Meal Gap	2013
	Physical inactivity	CDC Diabetes Interactive Atlas	2012
	Access to exercise opportunities	Business Analyst, Delorme map data, ESRI, & US Census Tigerline Files	2010 & 2014
Alcohol and Drug Use	Excessive drinking	Behavioral Risk Factor Surveillance System	2014
	Alcohol-impaired driving deaths	Fatality Analysis Reporting System	2010-2014
Sexual Activity	Sexually transmitted infections	National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention	2013
	Teen births	National Center for Health Statistics - Natality files	2007-2013
CLINICAL CARE			
Access to Care	Uninsured	Small Area Health Insurance Estimates	2013
	Primary care physicians	Area Health Resource File/American Medical Association	2013
	Dentists	Area Health Resource File/National Provider Identification file	2014
	Mental health providers	CMS, National Provider Identification file	2015
Quality of Care	Preventable hospital stays	Dartmouth Atlas of Health Care	2013
	Diabetic monitoring	Dartmouth Atlas of Health Care	2013

2016 COUNTY HEALTH RANKINGS: DATA SOURCES AND YEARS OF DATA

	Measure	Data Source	Years of Data
SOCIAL AND ECONOMIC FACTORS			
Education	High school graduation	EDFacts	2012-2013
	Some college	American Community Survey	2010-2014
Employment	Unemployment	Bureau of Labor Statistics	2014
Income	Children in poverty	Small Area Income and Poverty Estimates	2014
	Income inequality	American Community Survey	2010-2014
Family and Social Support	Children in single-parent households	American Community Survey	2010-2014
	Social associations	County Business Patterns	2013
Community Safety	Violent crime	Uniform Crime Reporting – FBI	2010-2012
	Injury deaths	CDC WONDER mortality data	2009-2013
PHYSICAL ENVIRONMENT			
Air and Water Quality	Air pollution - particulate matter [1]	CDC WONDER environmental data	2011
	Drinking water violations	Safe Drinking Water Information System	FY2013-14
Housing and Transit	Severe housing problems	Comprehensive Housing Affordability Strategy (CHAS) data	2008-2012
	Driving alone to work	American Community Survey	2010-2014
	Long commute – driving alone	American Community Survey	2010-2014


North Dakota
ELLENDALE, ND
Clinic
EUREKA, SD
Hospital
Long-Term Care
Assisted Living
Clinic
BRITTON, SD
Hospital
Assisted Living
Clinic
SELBY, SD
Clinic
IPSWICH, SD
Clinic
ABERDEEN, SD
Hospital
Long-Term Care
Assisted Living
Senior Apartments
Clinics
Home Medical Equipment
GROTON, SD
Clinic
WEBSTER, SD
Clinic
WAUBAY, SD
Clinic
WILMOT, SD
Clinic
BIG STONE CITY, SD
Clinic
MILBANK, SD
Hospital
Clinic
REVILLO, SD
Clinic
GETTYSBURG, SD
Hospital
Long-Term Care
Senior Apartments
WATERTOWN, SD
Home Medical Equipment
South Dakota
REDWOOD FALLS, MN
Clinics
BROOKINGS, SD
Long-Term Care
Clinics
Home Medical Equipment
IVANHOE, MN
Long-Term Care
MARSHALL, MN
Hospital
Long-Term Care
Clinics
Home Medical Equipment
MILLER, SD
Hospital
Assisted Living
Clinic
PIERRE, SD
Hospital
Long-Term Care
Senior Apartments
Clinics
Home Medical Equipment
HURON, SD
Home Medical Equipment
DE SMET, SD
Hospital
Clinic
VOLGA, SD
Clinic
LAKE BENTON, MN
Clinic
TYLER, MN
Hospital
Long-Term Care
Clinic
ELKTON, SD
Clinic
Minnesota
FLANDREAU, SD
Hospital
Clinic
PIPESTONE, MN
Hospital
Clinics
Home Medical Equipment
TRACY, MN
Clinic
SPRINGFIELD, MN
Clinic
WESSINGTON SPRINGS, SD
Hospital
Long-Term Care
Senior Apartments
HOWARD, SD
Clinic
MADISON, SD
Home Medical Equipment
MOUNTAIN LAKE, MN
Clinic
EDGERTON, MN
Clinic
FULDA, MN
Clinic
WINDOM, MN
Clinics
MITCHELL, SD
Hospital
Long-Term Care
Assisted Living
Senior Apartments
Clinics
Home Medical Equipment
KIMBALL, SD
Clinic
CHAMBERLAIN, SD
Clinic
DELL RAPIDS, SD
Hospital
Clinics
JASPER, MN
Clinic
PLATTE, SD
Hospital
Long-Term Care
Assisted Living
Senior Apartments
Clinic
COLTON, SD
Clinic
GARRETSON, SD
Clinic
LUVERNE, MN
Clinic
WORTHINGTON, MN
Clinics
LAKEFIELD, MN
Clinic
JACKSON, MN
Clinic
SALEM, SD
Clinics
BRIDGEWATER, SD
Clinic
BRANDON, SD
Clinics
WINNER, SD
Clinic
COLOME, SD
Clinic
GREGORY, SD
Hospital
Long-Term Care
Clinic
CORSICA, SD
Clinic
GEDDES, SD
Clinic
PARKSTON, SD
Hospital
Long-Term Care
Assisted Living
Clinic
Home Medical Equipment
SIOUX FALLS, SD
Avera Central Office
Hospitals
Long-Term Care
Assisted Living
Senior Apartments
Clinics
Home Medical Equipment
Research Institute
MARION, SD
Clinic
TEA, SD
Clinic
HARRISBURG, SD
Clinic
ESTHERVILLE, IA
Hospital
Clinic
Home Medical Equipment
FREEMAN, SD
Clinic
LARCHWOOD, IA
Clinic
SIBLEY, IA
Hospital
Assisted Living
Senior Apartments
Clinic
SPIRIT LAKE, IA
Clinics
MILFORD, IA
Clinic
LAKE ANDES, SD
Clinic
TRIPP, SD
Clinic
MENNO, SD
Clinic
ROCK VALLEY, IA
Hospital
Long-Term Care
Senior Apartments
HULL, IA
Clinic
FAIRFAX, SD
Clinic
SCOTLAND, SD
Hospital
Senior Apartments
Clinic
WAGNER, SD
Hospital
Senior Apartments
Clinic
AVON, SD
Clinic
TYNDALL, SD
Hospital
Clinic
IRENE, SD
Long-Term Care
Traumatic Brain Injury Unit
WAKONDA, SD
Long-Term Care
Assisted Living
Senior Apartments
SIOUX CENTER, IA
Hospital
Long-Term Care
Assisted Living
Senior Apartments
Clinic
Home Medical Equipment
SPENCER, IA
Clinic
Home Medical Equipment
BUTTE, NE
Clinic
YANKTON, SD
Hospital
Long-Term Care
Assisted Living
Senior Apartments
Clinics
Home Medical Equipment
MARCUS, IA
Clinic
SIOUX RAPIDS, IA
Clinic
REMSEN, IA
Clinic
SPENCER, NE
Clinic
NIOBRARA, NE
Clinic
LE MARS, IA
Hospital
Assisted Living
Clinic
Home Medical Equipment
Nebraska
Iowa
VERDIGRE, NE
Clinic
O'NEILL, NE
Hospital
Clinic
CROFTON, NE
Clinic
CREIGHTON, NE
Hospital
Long-Term Care
Clinics
HARTINGTON, NE
Clinic
PAGE, NE
Clinic
PIERCE, NE
Clinic
CHAMBERS, NE
Clinic
EWING, NE
Clinic

ONLY Managing High Costs

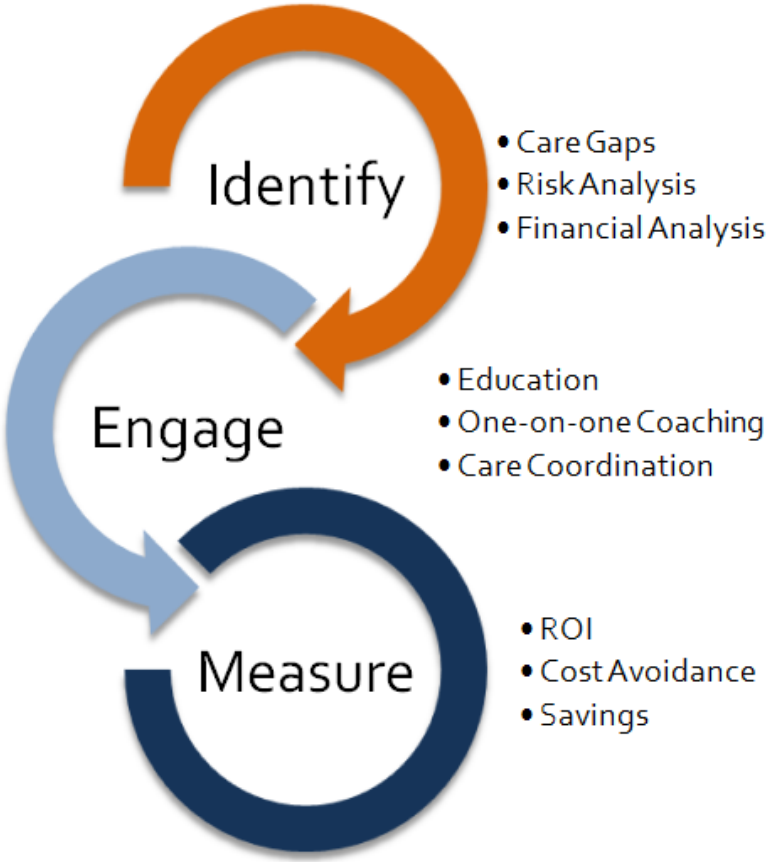


The Standard Approach

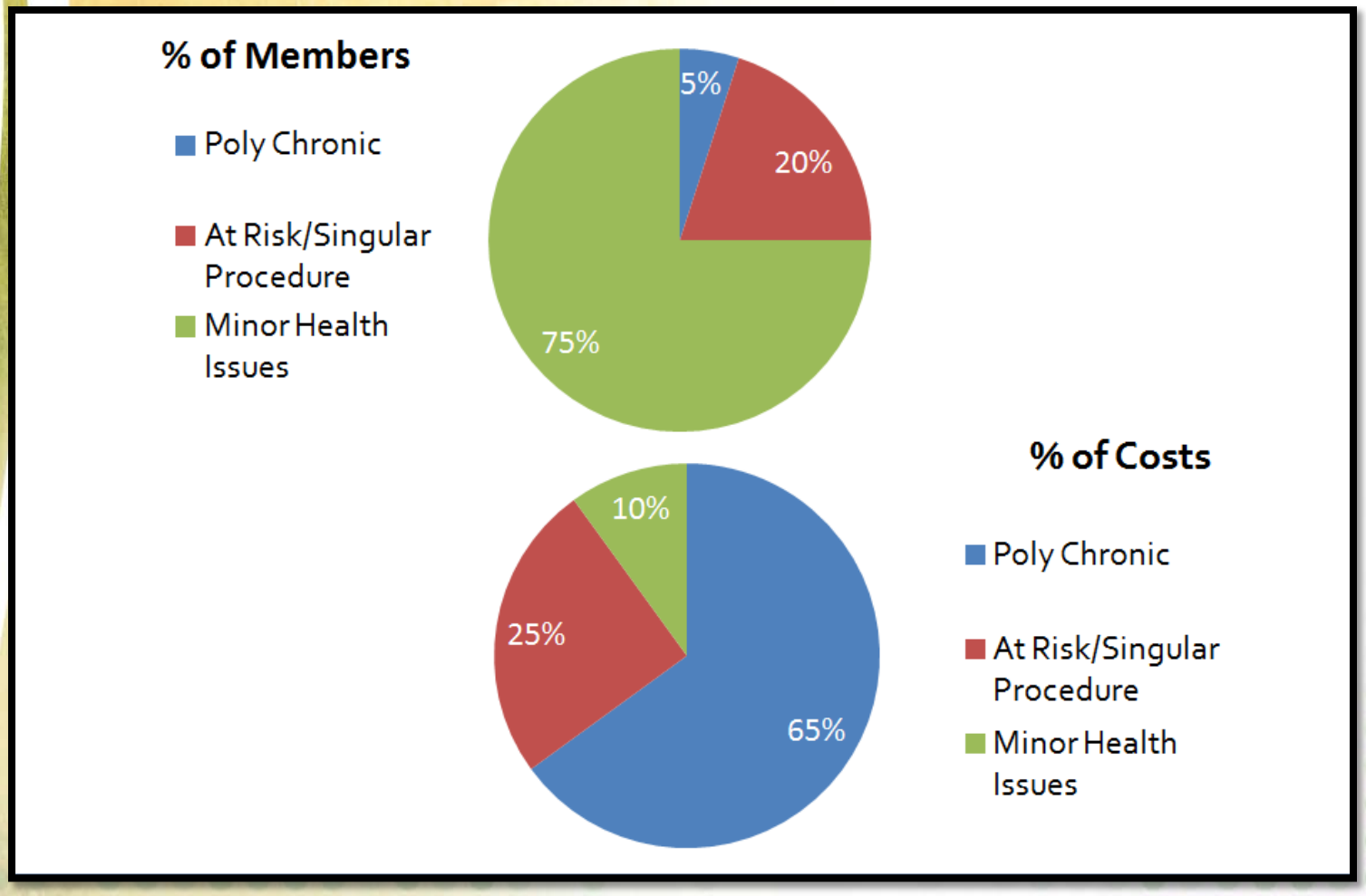
Targeted Population
Health Management

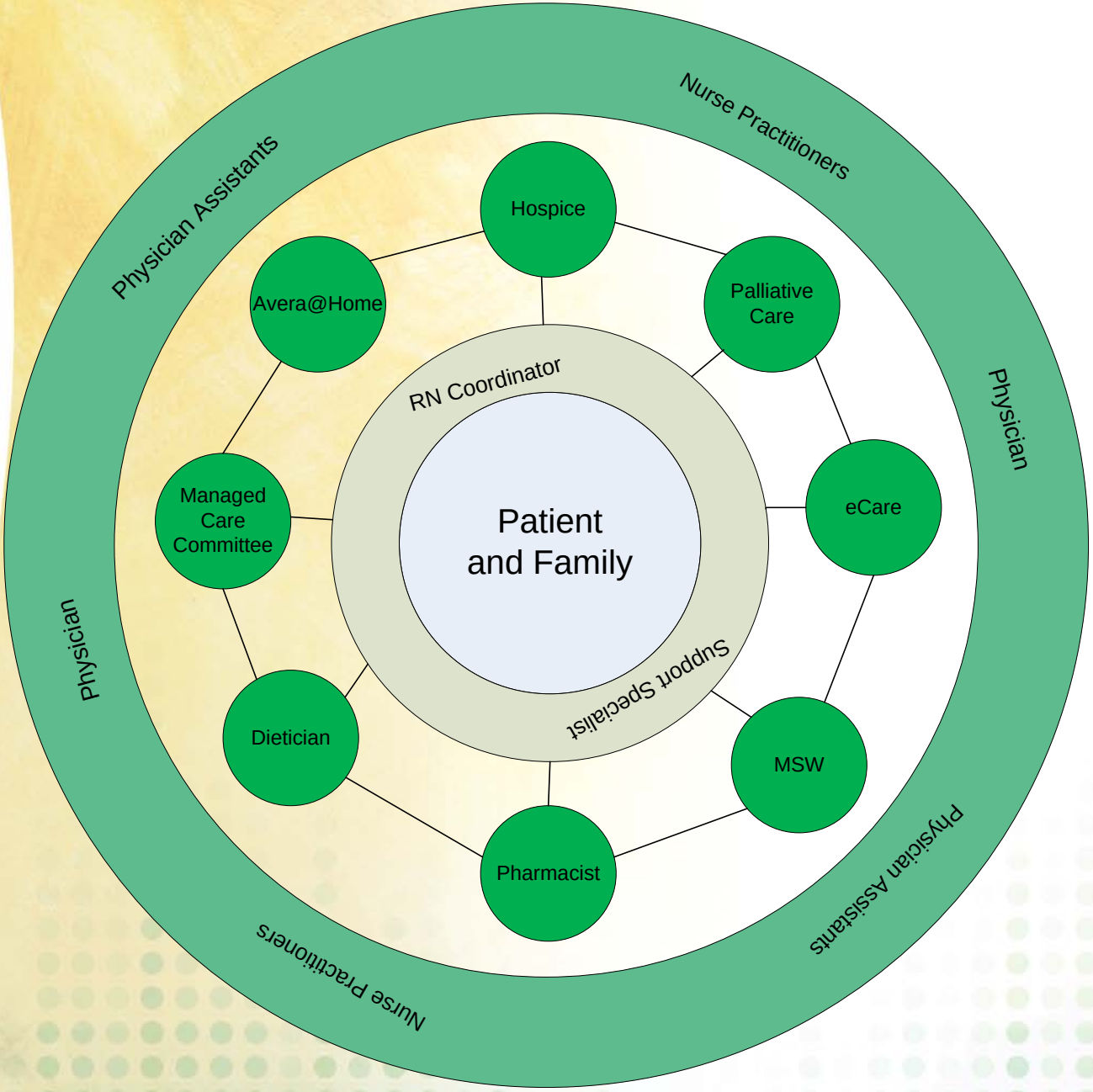
Changing the Approach

Population Health Management Process



Targeting the Right Members



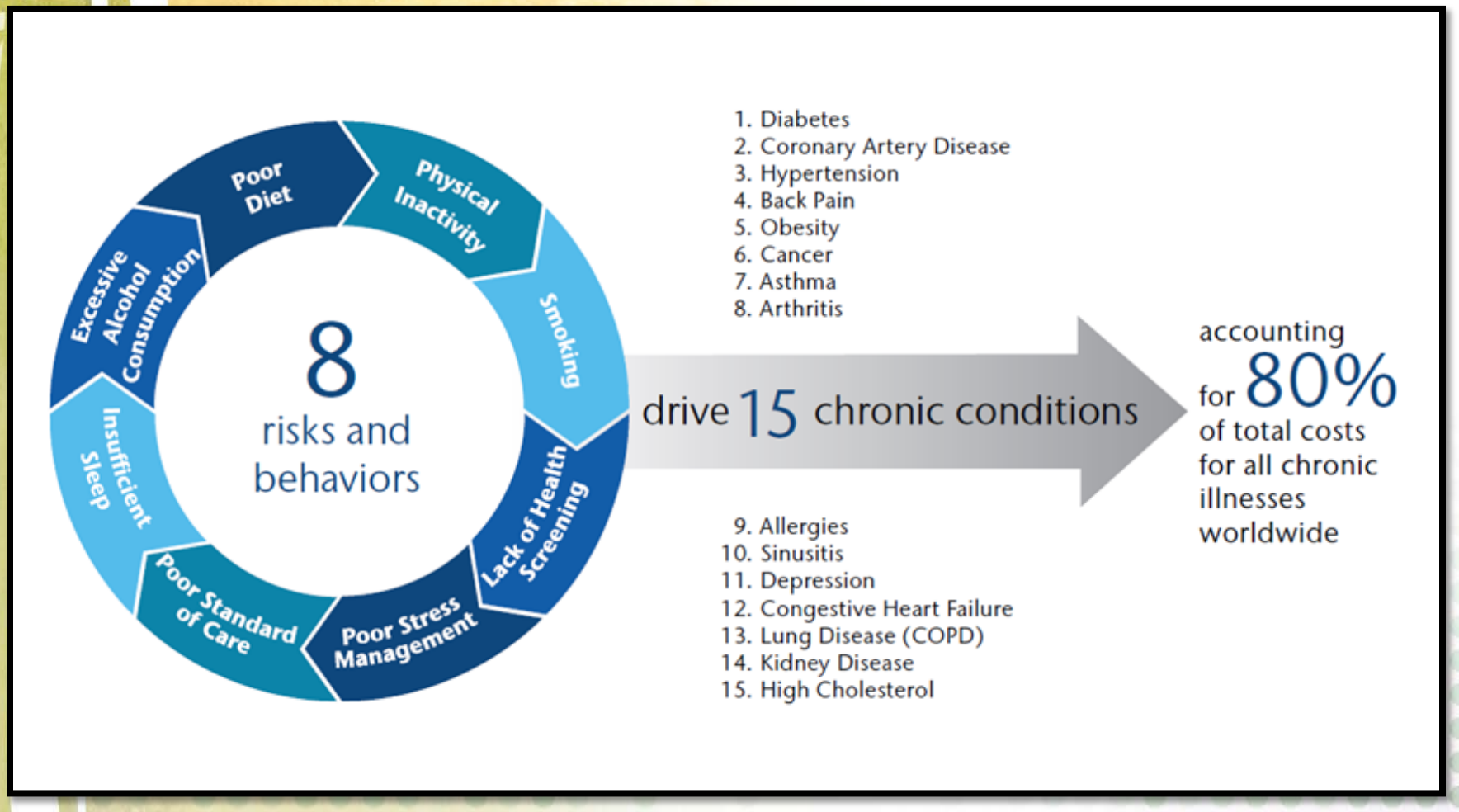

Nurse Practitioners
Physician
Physician Assistants
Nurse Practitioners
Physician
Physician Assistants
Hospice
Avera@Home
Palliative Care
RN Coordinator
Managed Care Committee
eCare
Patient and Family
Support Specialist
Dietician
MSW
Pharmacist

Identify

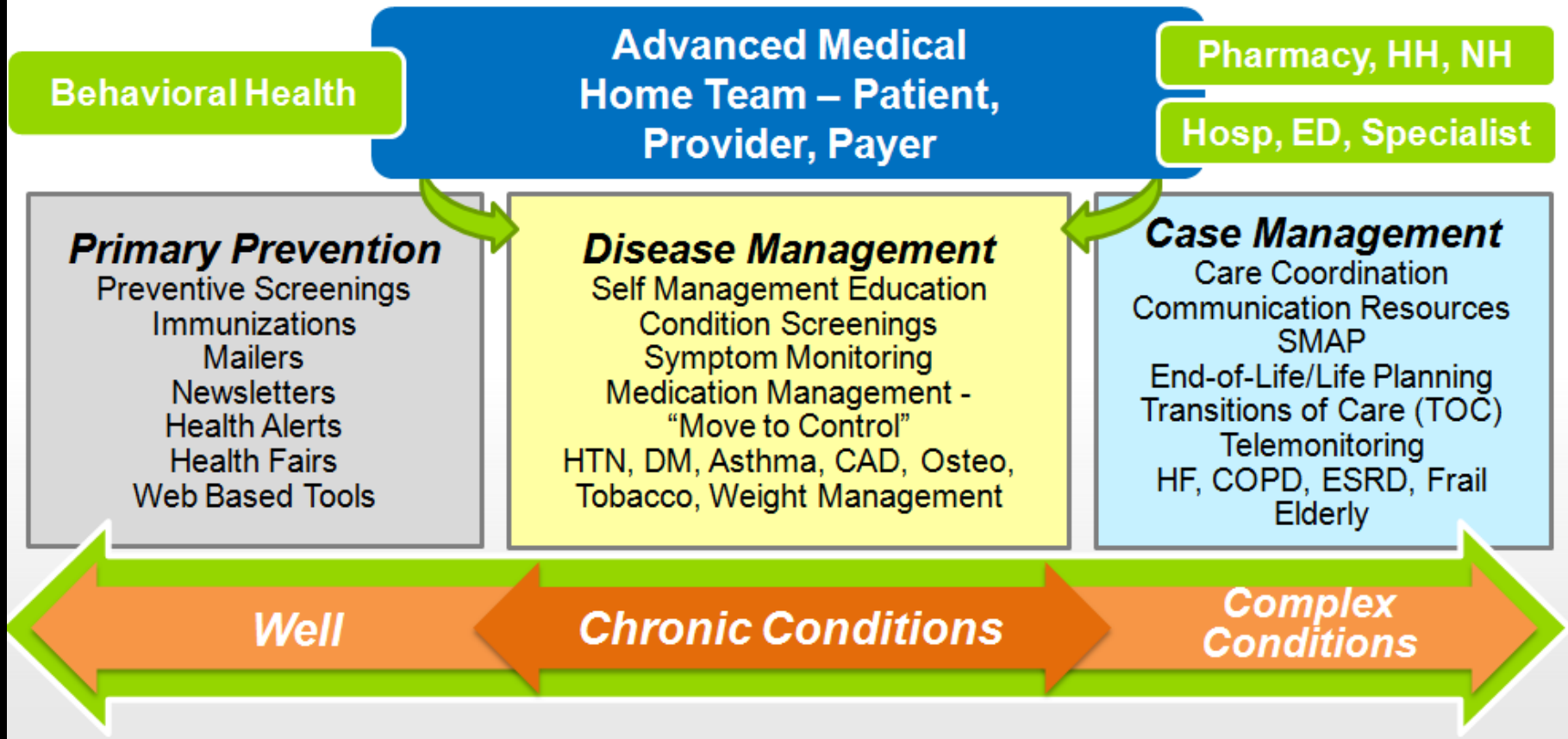
- High and Moderate Risk Members are identified through a multi-point Risk Analysis covering a wide range of medical and pharmacy based triggers and benchmarks, including:

  - Utilization Patterns
  - Historical Medical and Pharmacy Spend
  - Diagnostic Indicators (Hypertension, Diabetes, ..
  - Care Gap Analysis
  - Medication Adherence
  - Behavior Patterns
  - …And More

Narrowing the Focus



Data Analytics as Core Foundation for Population Management

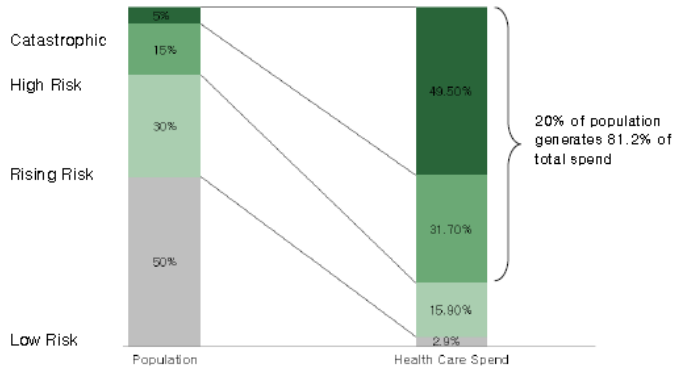


Data Analytics: PM; Gaps in Care; Provider Profiling

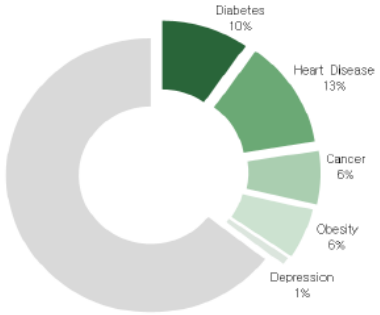
Population Health Management – Risk Stratification

Avera

Health Care Spending by Population[1]



Health Care Spending By Disease[2]



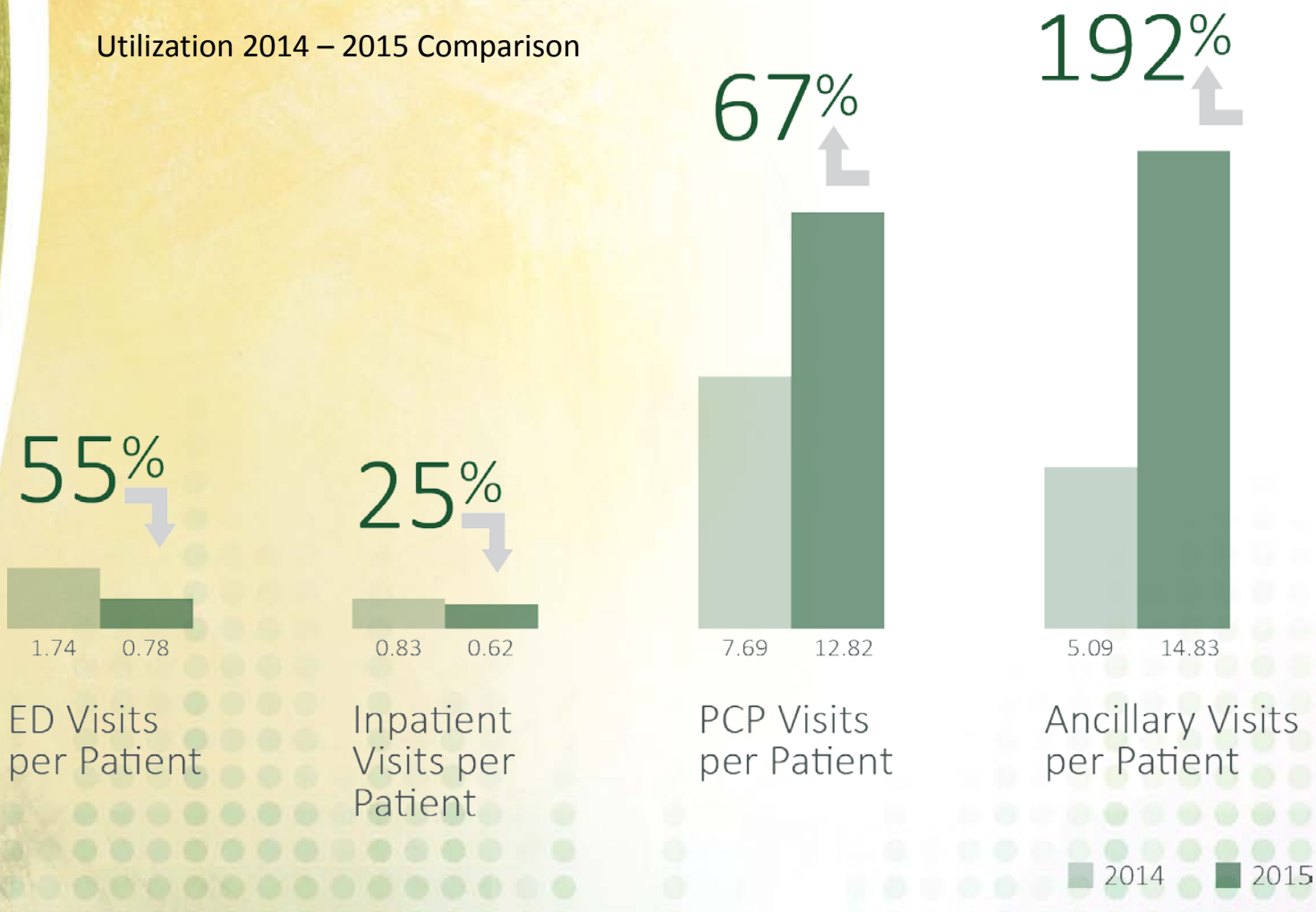
Population	Characteristics	Strategy	Tactics
Catastrophic	– Extraordinary life threatening illness or trauma – Extreme demand on health care resources – Examples: terminal cancer, major trauma	– Provide high cost care in lowest cost setting appropriate – Avoid expensive non-EBM therapies – Avoid duplication	– Case management / steerage – Advance care planning / palliative / hospice – Specialty navigation – Partner with payors
High Risk	– Multiple chronic conditions – Uncontrolled chronic condition(s) – High utilizer of healthcare resources – Lower socioeconomic status – Poor social support	– Prevent catastrophic complications – Bring chronic disease(s) into control – Pay attention to social & behavioral determinants of care	– Enroll in coordinated care – Motivational interviewing & shared longitudinal care plans – Disease Management programs – Transitions of care management – Aggressively treat serious mental illness
Rising Risk	– Borderline uncontrolled chronic condition(s) – Poor engagement in healthcare – History of illness	– Prevent disease & risk progression – Improve patient engagement & self-management support	– +/– coordinated care – +/– disease management programs – EBM care protocols (service lines) – Enhance communication through multiple modalities (portal, text, e-mail, etc.)
Low Risk	– General population – Controlled chronic condition(s)	– Build brand loyalty – Enhance access to care – Prevention – Eliminate health disparities	– Regular age related health screenings – Health risk assessment – Convert clinics to FQHCs in underserved locations – Expand AveraNow & eCare – Build facilities in peripheral communities – Wellness programs – Targeted marketing

Sources:

1. Kaiser Family Foundation calculations using data from U.S. DHHS, AHRQ, and MEPS, 2009.
2. Centers for Disease Control & Prevention calculations using data from AHA, NCI, ADA, 2013-2014.

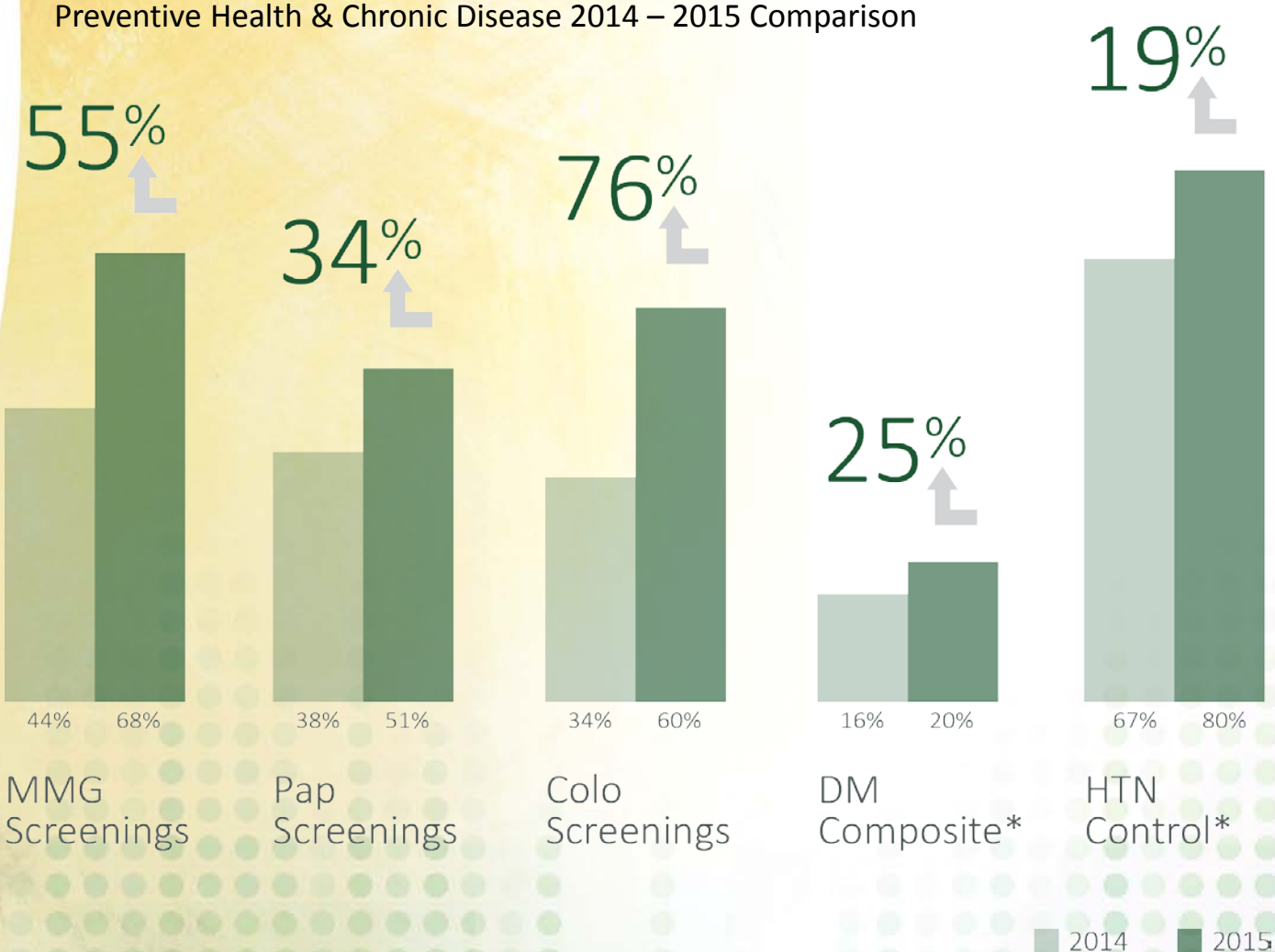
AMG Coordinated Care Performance

Utilization 2014 – 2015 Comparison



AMG Coordinated Care Performance

Preventive Health & Chronic Disease 2014 – 2015 Comparison



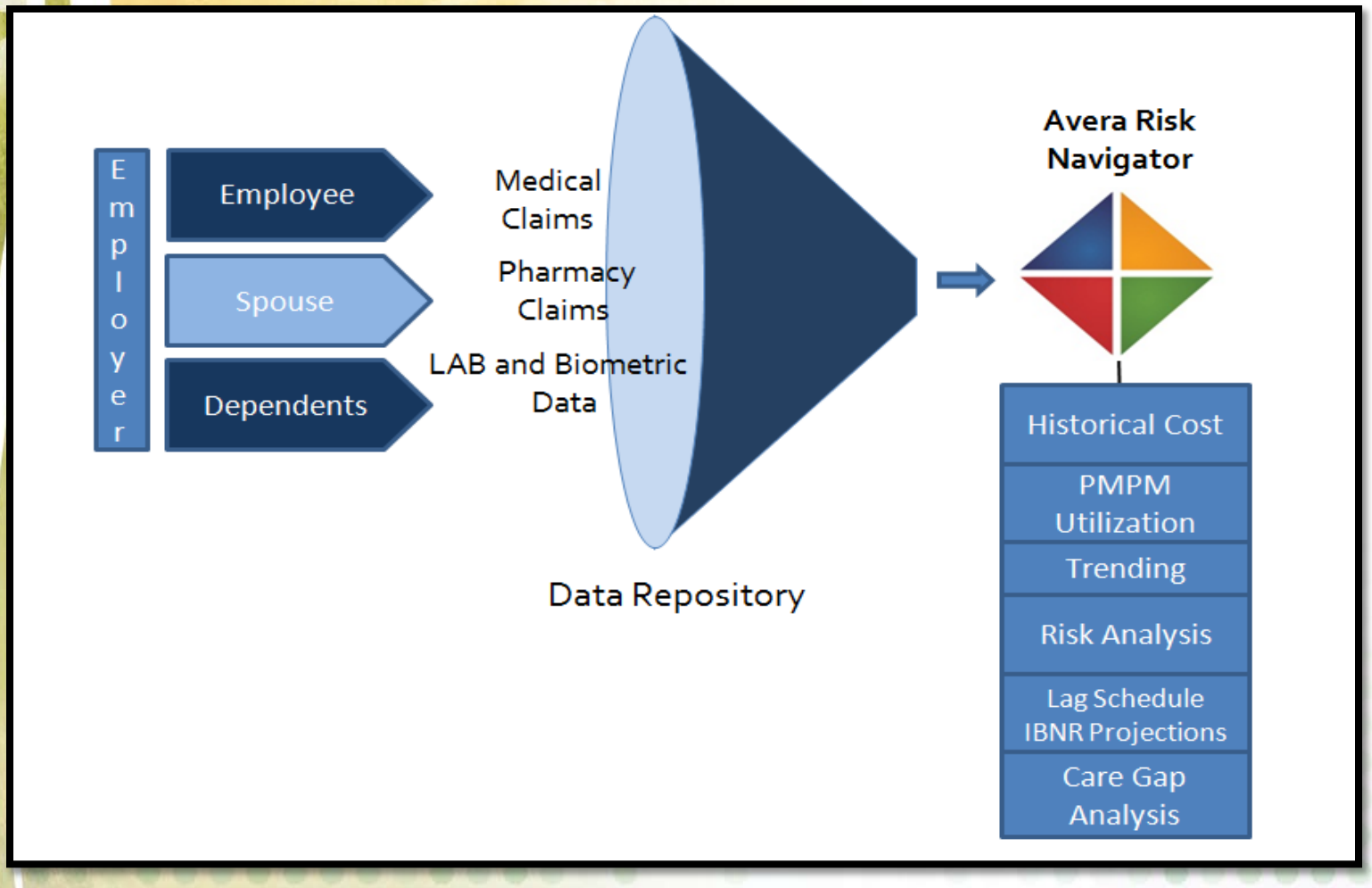
Engage

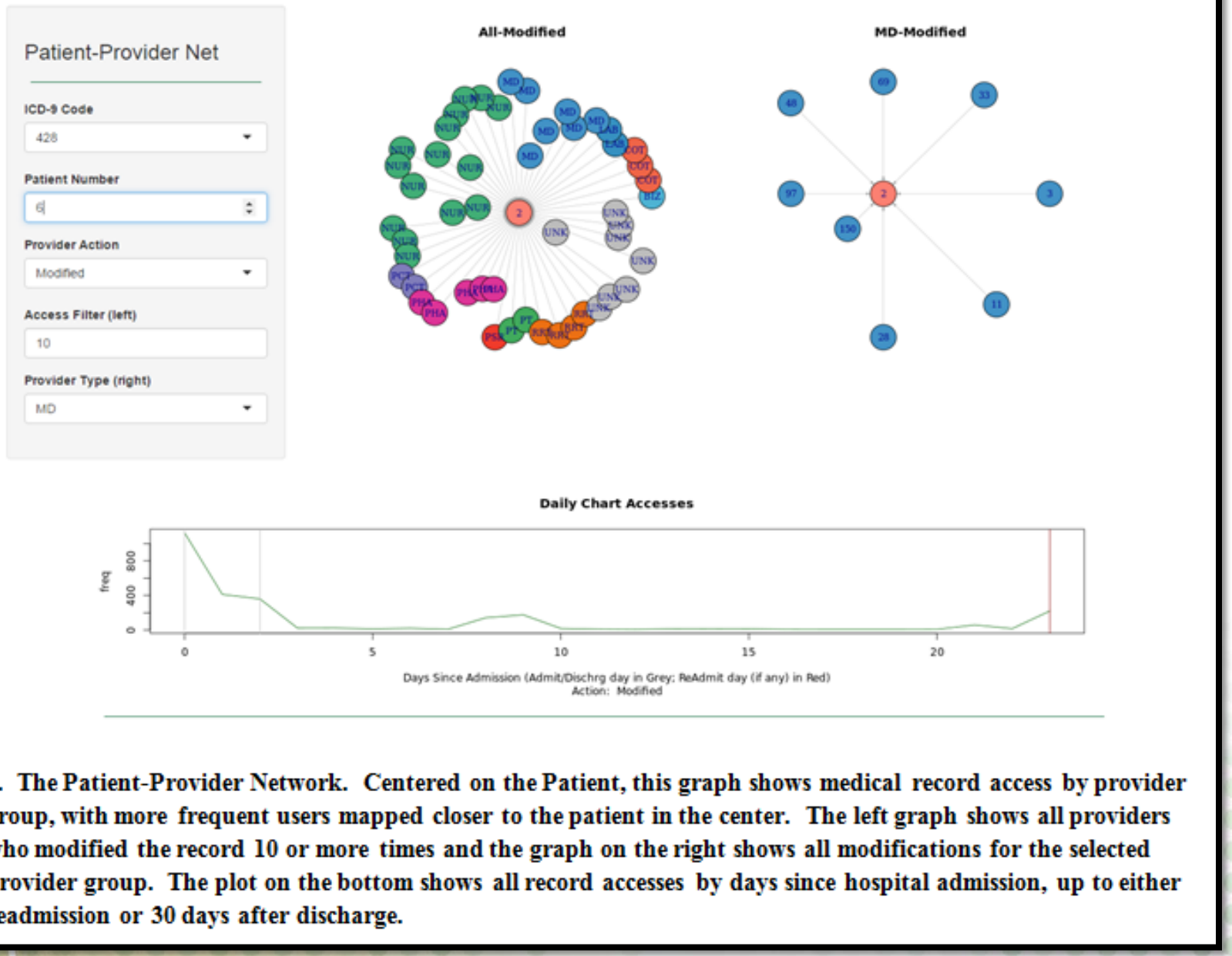
- Look to your community
  - Occupational Health Clinics
  - On-site Coaching
  - Local Hospital Resources
    - Blood pressure screenings
    - Diabetes education and support groups
    - Cancer support groups
    - Fitness classes
    - Etc…
  - Primary Care Physicians

But is there more?

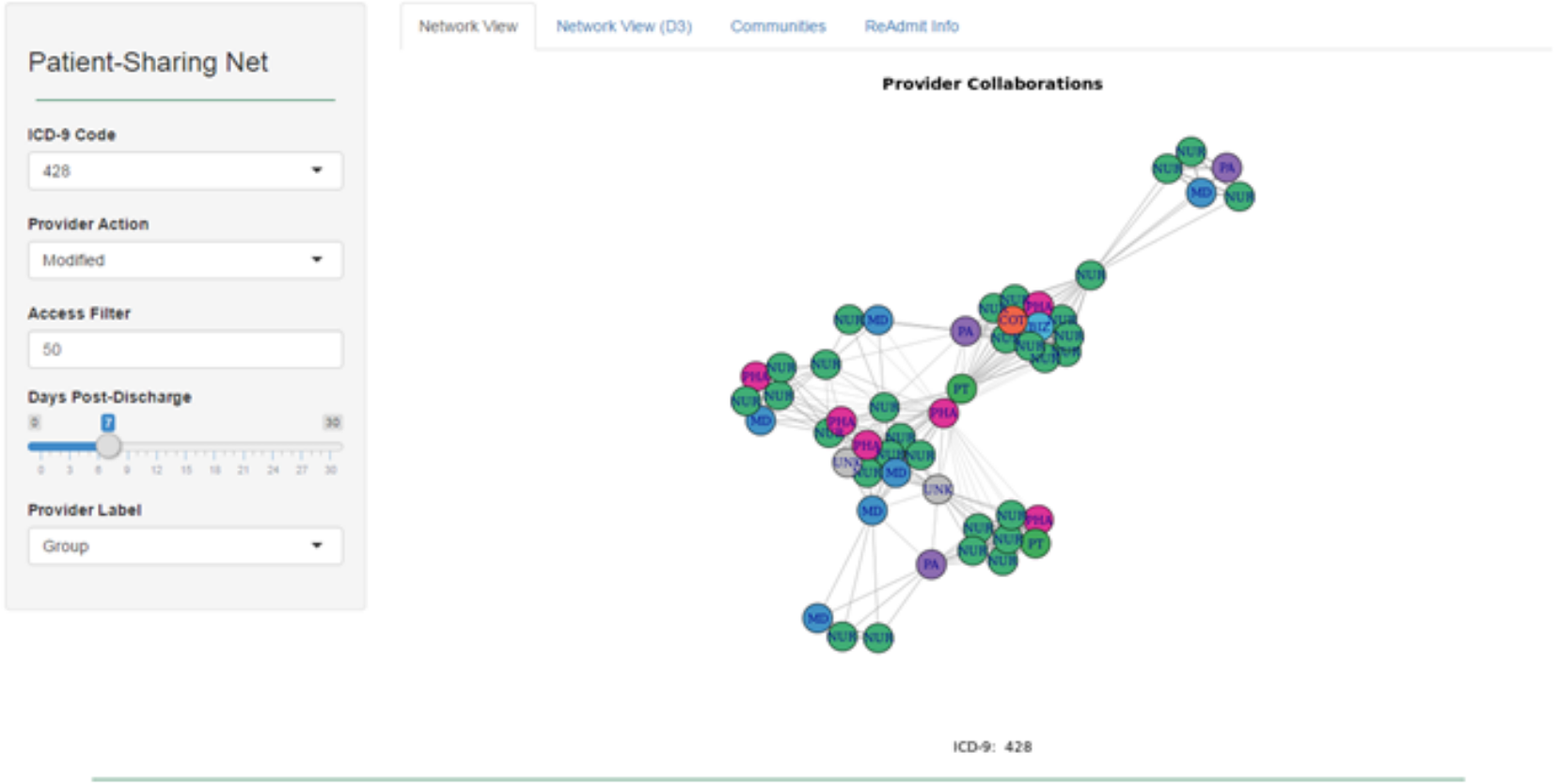
What are we missing?

Data Analytics



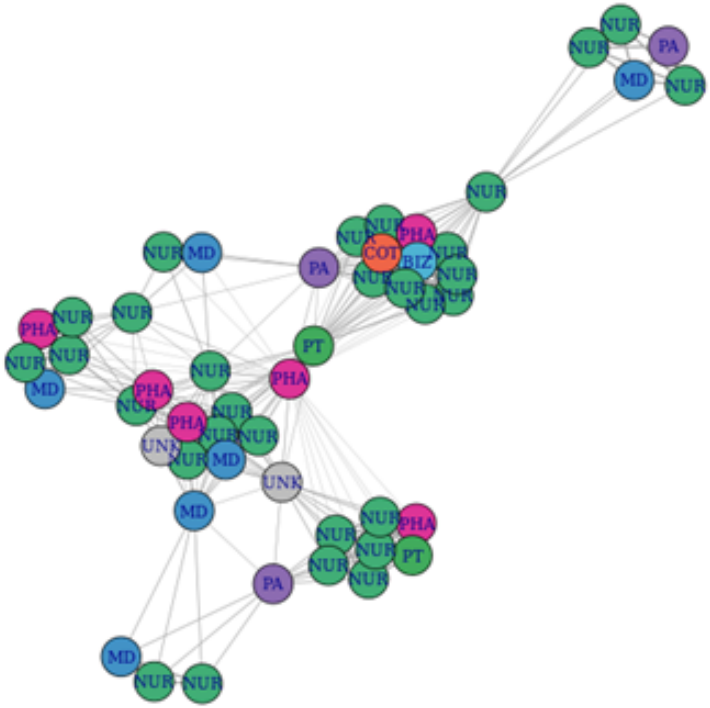


1. The Patient-Provider Network. Centered on the Patient, this graph shows medical record access by provider group, with more frequent users mapped closer to the patient in the center. The left graph shows all providers who modified the record 10 or more times and the graph on the right shows all modifications for the selected provider group. The plot on the bottom shows all record accesses by days since hospital admission, up to either readmission or 30 days after discharge.



2. The Provider Collaboration Network. This graph illustrates frequent collaboration between care providers, using counts of common medical record access as an indicator of collaboration strength.

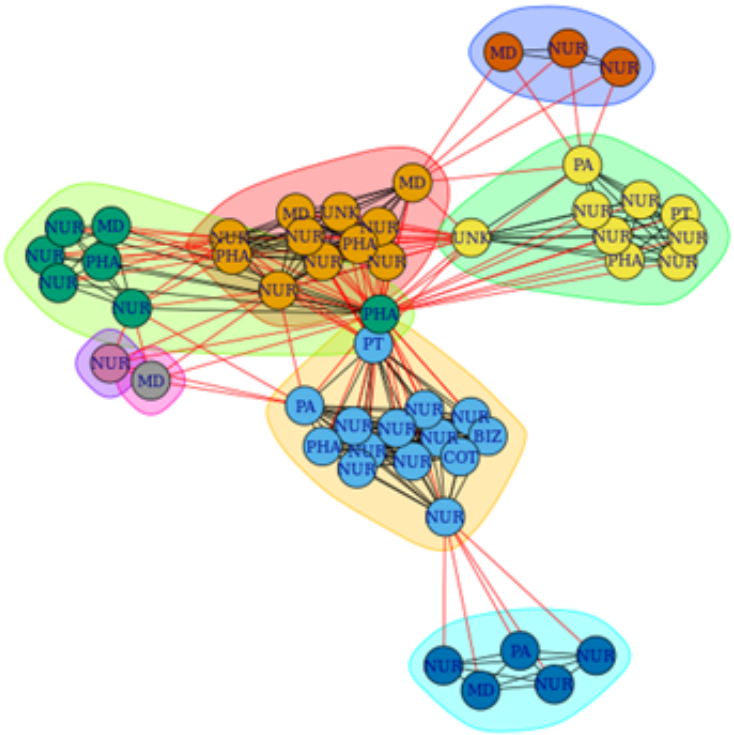
Provider Collaborations



ICD-9: 428

3. A closer view of the Provider Collaboration network. Groups of providers that share common interaction with patient medical records have stronger connections to one another which resultsin the clustered groupings shown in this Fruchterman-Reingold force directed layout.

Collaboration Communities



ICD-9: 428

5. A closer view of the Provider Collaboration network, with graph communities highlighted. Groups of providers that share common interaction with patient medical records have stronger connections to one another and therefore the clustered groupings shown in this graph layout. Communities were calculated with the Edge Betweenness method in the iGraph software package.

Key Insights

Don't confuse more data with more insight.

- Without having the proper technology framework in place, with context and metadata for meaningful use, new technology is really not very useful.
- Prediction focused on a specific clinical setting or patient need will always trump a generic predictor in terms of accuracy and utility.
- The full power of prediction is best realized when specific variables are gathered, a targeted clinical need is met and participants are willing to act.

Don’t confuse insight with value.

- Data plus context equals knowledge.
- A significant key to success is obtaining all of the necessary data.
- Assessing only part of a picture often yields an incorrect view.

Don’t overestimate the ability to interpret the data.

- Comprehensive outcomes data is often missing in our current healthcare system.
- This is hard work. Find the right partners.
- Test and retest the datasets.

Don't underestimate the challenge of implementation.

- Clinical event prediction and subsequent intervention should be both content driven and clinician driven.
- Prediction should link carefully to clinical priorities and measurable events such as cost effectiveness, clinical protocols or patient outcomes.

Bob

- 45 y/o male
- Recently unemployed
- Hx of diabetes, HTN
- Smoker 3 cigarettes per day – purchase hx 1 pk/day
- Occasional ETOH
- 2 medications – refilled every other month
- Not checking sugars more than 3 times per month

Robert

- 50 y/o male
- Hx of GERD, obesity, sleep apnea
- Non-compliance with CPAP
- Non-smoker
- No ETOH – purchase hx six pack per week
- Eats out 4 times per week for fast food
- 2 medications – actually taking chronic pain medication from alternative provider as well as antidepressant

Questions?