![ADFM — Association of Departments of Family Medicine | VISION, VOICE, LEADERSHIP]
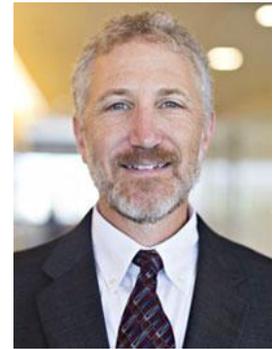
APPLIED INFORMATICS: VISIT FREQUENCY AND PREDICTIVE RISK

August 28, 2018

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Applied Informatics: Predictive Risk

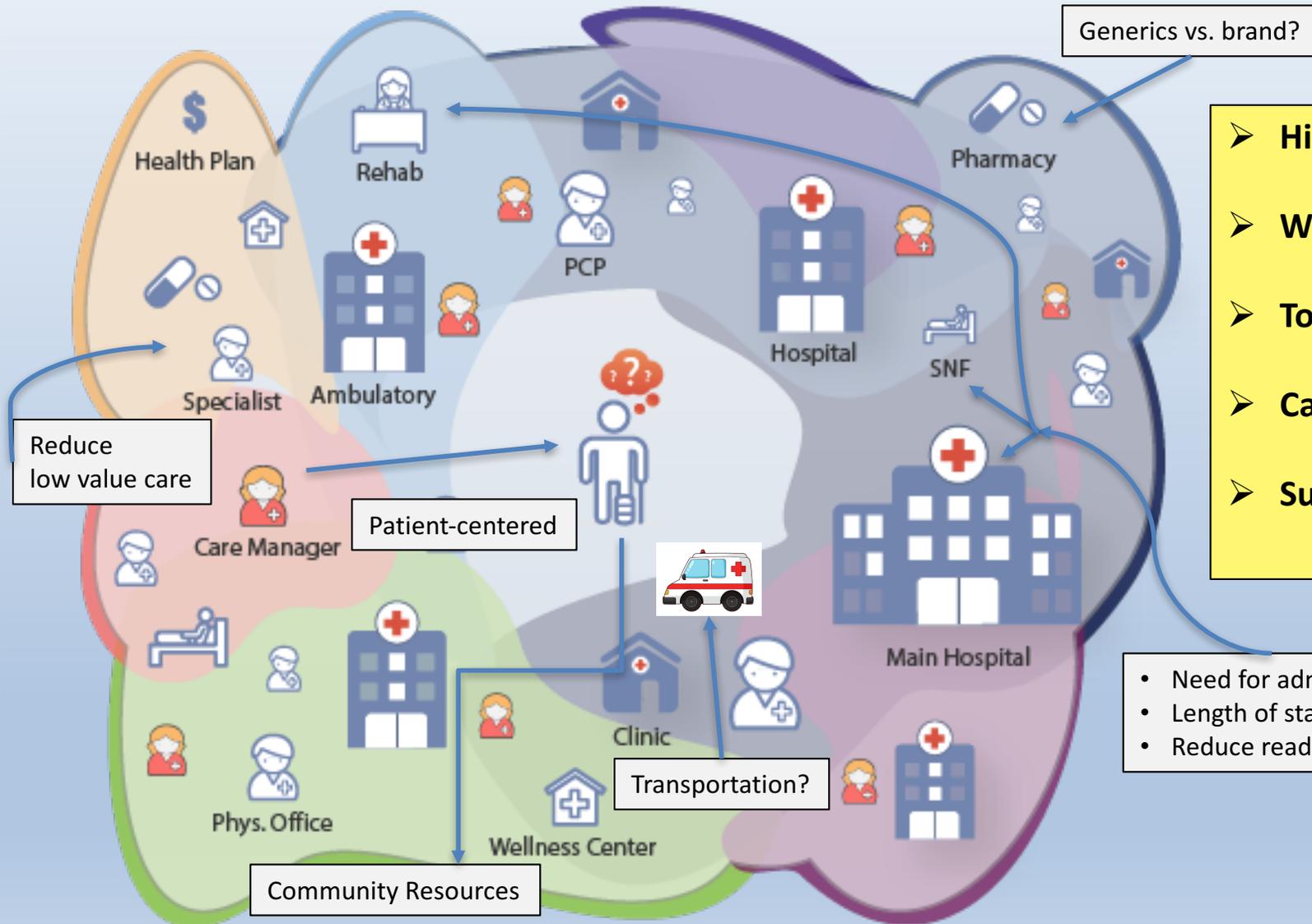ADFM Webinar

Michael Jeremiah, MD

August 2018

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Health Care Ecosystem
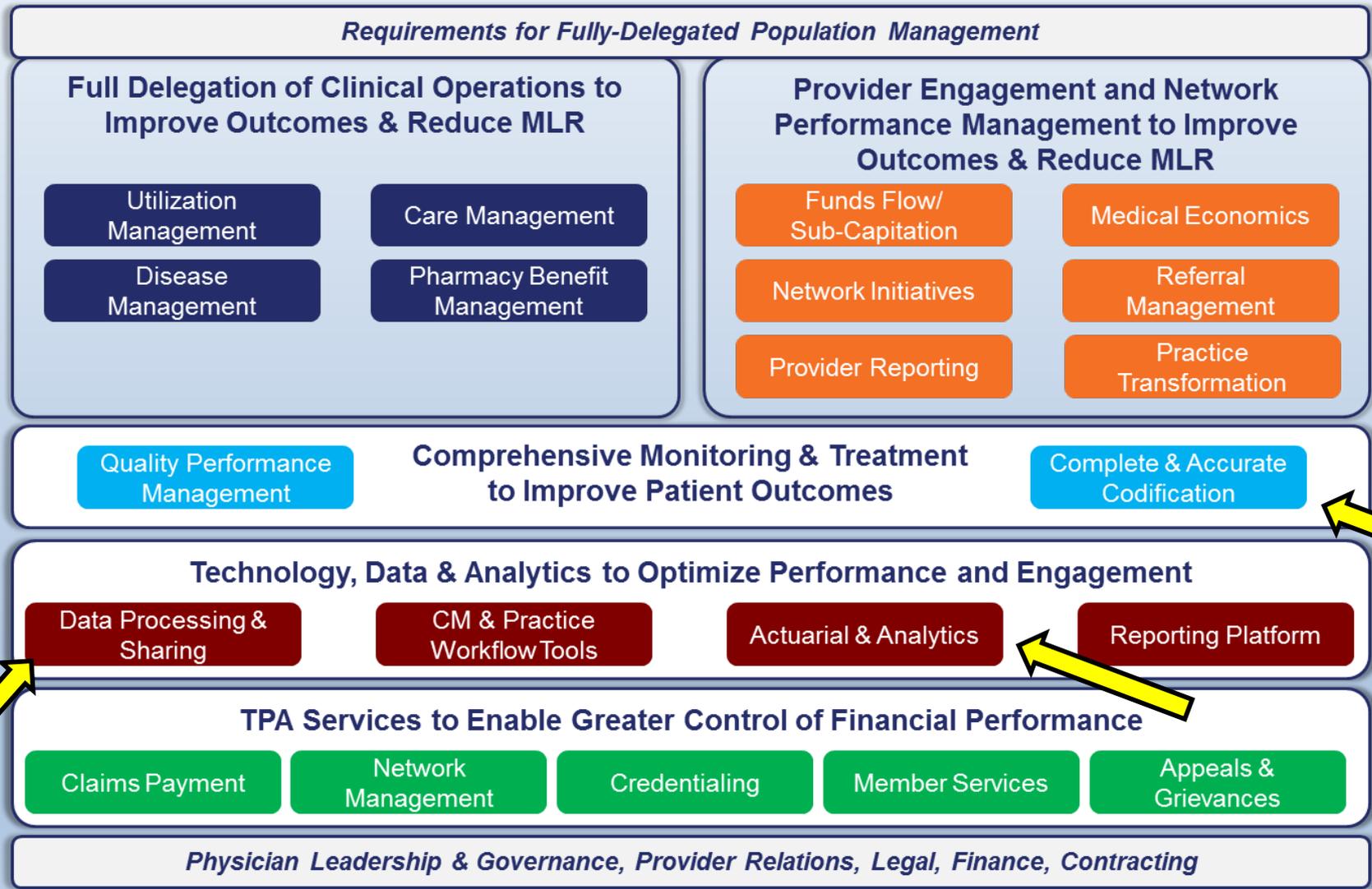
"The only constant is change…"

$$V_{(VALUE)} = \frac{Q_{(QUALITY)} + S_{(SERVICE)}}{\$_{(COST)}}$$

Generics vs. brand?

Health Plan

Rehab

PCP

Pharmacy

Specialist

Ambulatory

Hospital

SNF

Reduce low value care

Patient-centered

Care Manager

Main Hospital

Clinic

Transportation?

Phys. Office

Wellness Center

Community Resources

Need for admission?
- Length of stay
- Reduce readmissions
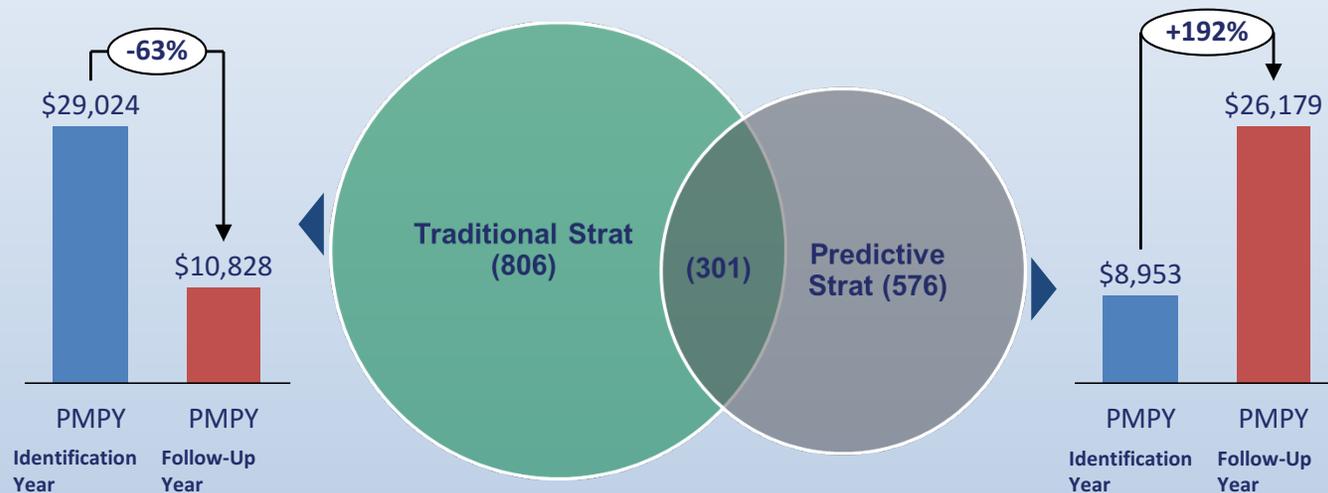
- **High risk focus**

- **Where are the drivers?**

- **Tools: Identifi & Jvion**

- **Can we show Impact?**

- **Sustainability**

Core Capabilities Required to Succeed in Responding to Market Forces

Requirements for Fully-Delegated Population Management

Full Delegation of Clinical Operations to Improve Outcomes & Reduce MLR

- Utilization Management
- Care Management
- Disease Management
- Pharmacy Benefit Management

Provider Engagement and Network Performance Management to Improve Outcomes & Reduce MLR

- Funds Flow/Sub-Capitation
- Medical Economics
- Network Initiatives
- Referral Management
- Provider Reporting
- Practice Transformation

Comprehensive Monitoring & Treatment to Improve Patient Outcomes

- Quality Performance Management
- Complete & Accurate Codification

Technology, Data & Analytics to Optimize Performance and Engagement

- Data Processing & Sharing
- CM & Practice Workflow Tools
- Actuarial & Analytics
- Reporting Platform

TPA Services to Enable Greater Control of Financial Performance

- Claims Payment
- Network Management
- Credentialing
- Member Services
- Appeals & Grievances

Physician Leadership & Governance, Provider Relations, Legal, Finance, Contracting

Comparison of Traditional vs Predictive Stratification on Future Medical Expense

$29,024 -63%

$10,828

PMPY
Identification Year

PMPY
Follow-Up Year

Traditional Strat (806)

(301)

Predictive Strat (576)

+192%

$26,179

$8,953

PMPY
Identification Year

PMPY
Follow-Up Year

CLINICAL PROFILE COMPARISON

TRADITIONAL STRATIFICATION	PREDICTIVE STRATIFICATION
75-year old female with diabetes and COPD. Incurred 2 inpatient admissions and 1 ED visit in the prior 12 months, with no PCP visit in the prior 6 months	66-year old female with diabetes and CAD. No inpatient admissions in prior 12 months; 3rd percentile in median income; lives in a food desert; 9 unique medications, including anxiety medication that was never filled

Predictive Model's c-stat > 0.8 Indicates Stronger Performance Compared to Industry Standards

Models with more focused outcomes performed twice as well as those that attempted to predict general outcomes

Total Cost of Care

Any Acute Event

Impactable Acute Event

Increasing predictive model performance
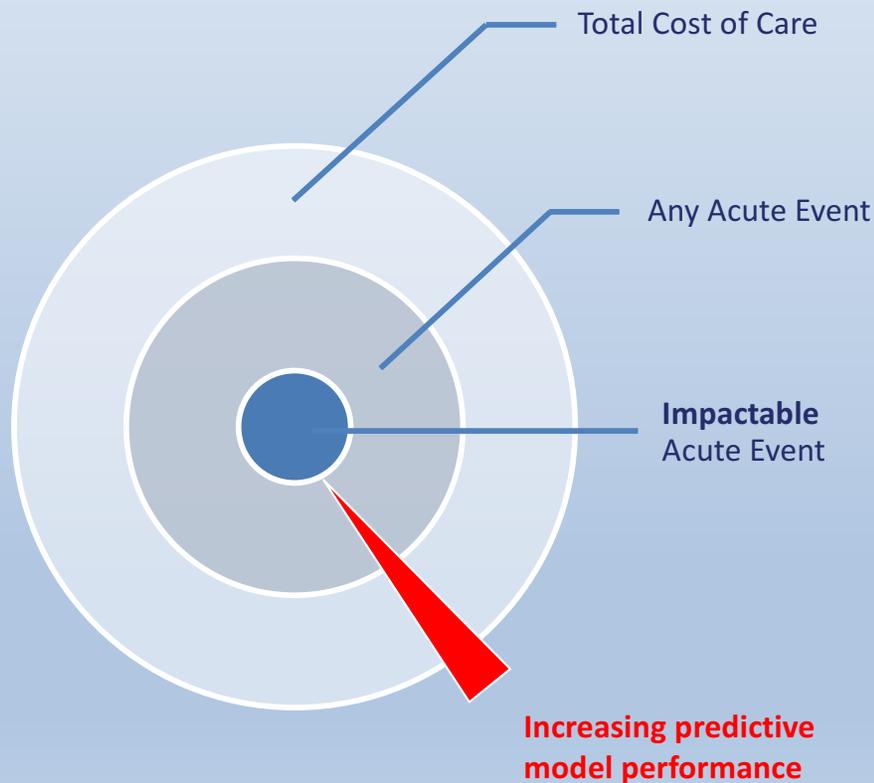
Predictive Model Performance[1]		
Model	ED Visits c-statistic	Hospitalization c-statistic
Johns Hopkins Adjusted Clinical Groups (ACG)	.67	.73
Chronic Comorbidity Counts (CCC)	.61	.69
MN Tiering	.66	.71
Charlson Comorbidity Measure	.59	.68
Evolent Complex Care Predictive Model	**.81**	**.86**
	.82	

Flip a coin?

- The c-stat ranged from 0.50 for case managers, 0.56 for physicians to 0.59 for interns indicating only a slightly better probability than chance*

- physicians overestimate the number of patients that will be readmitted, they also miss almost 40% of patients who are readmitted within 30 days." **

*Allaudeen N, Schnipper JL, Orav EJ, *et al*. Inability of providers to predict unplanned readmissions. *J Gen Intern Med* 2011;26:771–6.
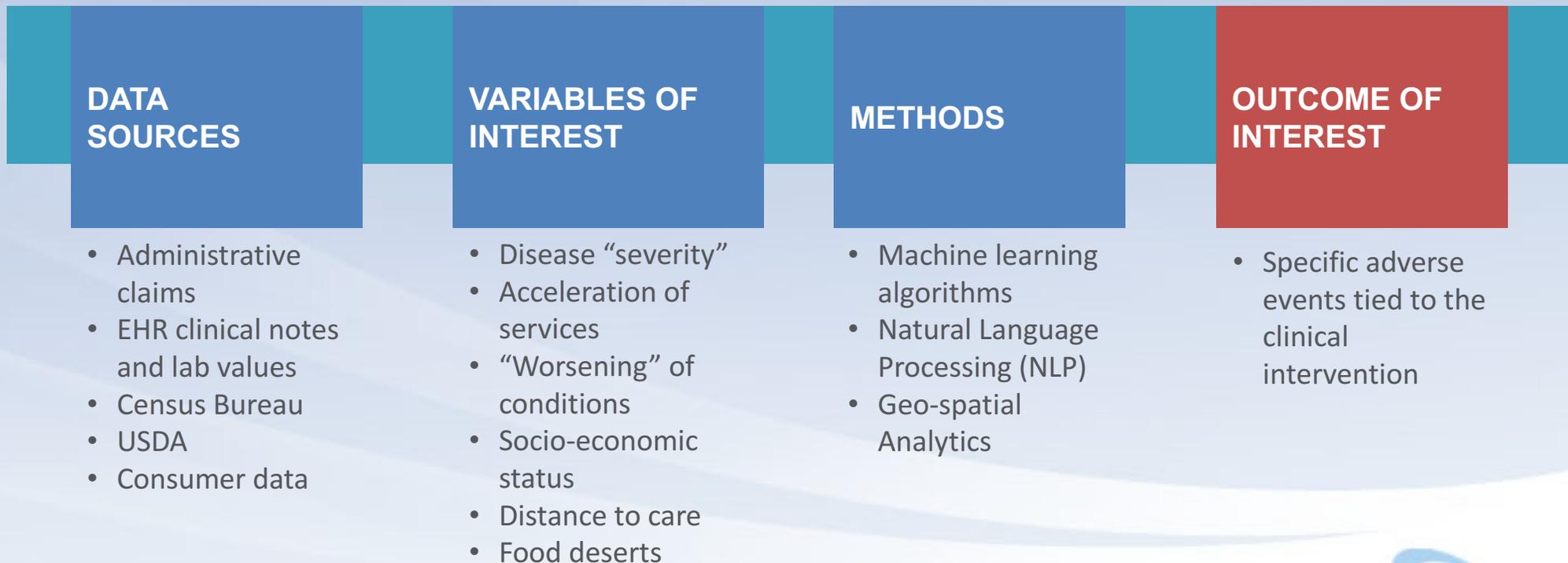** Schwartz et al Readmission Intuition: Can Physicians Accurately Predict Readmissions at the Time of Initial Admission? http://www.shmabstracts.com/abstract/readmission-intuition-can-physicians-accurately-predict-readmissions-at-the-time-of-initial-admission/

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How does stratification predict risk?

How do we find patients who are at risk of increased medical spend and impending events?

DATA SOURCES

- Administrative claims
- EHR clinical notes and lab values
- Census Bureau
- USDA
- Consumer data

VARIABLES OF INTEREST

- Disease "severity"
- Acceleration of services
- "Worsening" of conditions
- Socio-economic status
- Distance to care
- Food deserts

METHODS
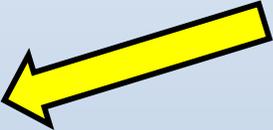
- Machine learning algorithms
- Natural Language Processing (NLP)
- Geo-spatial Analytics

OUTCOME OF INTEREST

- Specific adverse events tied to the clinical intervention

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Clinical Recommendations:

Top Recommendations for All-Cause Readmissions
Focus on disease process education including recognition of symptoms, treatment goals and recognition of deterioration/progression/complications
Encourage daily exercise focusing on weight management goals and path to rehabilitation
Focus on follow-up appointment coordination with the PCP
Focus attention on accessibility of prescribed medications and address any obstacles
Provide patient/caregiver with detailed respiratory teaching, including: symptomatology, rehabilitation, exercise, and nutrition goals. Review prescribed medications and their adverse effects
Focus particular attention on medication plan, including timing, dosage, route, potential adverse effects and interactions
Focus on coordination of needed equipment such as walkers, wheelchairs, bedside commodes, and other aids at time of discharge
Review prescribed diet and nutrition goals including diet logging, if required
Focus on patient's understanding of the need to complete prescribed antibiotic schedule
Provide patient/caregiver with contact information in case of need/change in condition
Focus on education about disease process, recognition of deterioration/progression/complications, procedures done and treatment and rehabilitation goals
Focus on patient's understanding of discharge instructions
Provide patient/caregiver with printed instructions and confirm understanding prior to discharge
Focus attention on establishing disease specific diet and nutrition goals
Focus attention on receipt and understanding of written and oral discharge instructions

"Focus attention on accessibility of prescribed medications and address obstacles."

Appendix

- Care Management Descriptions:
    - Complex Care
    - Transition Care
    - Advanced Ilness Care

Complex Care

Your Patient's experience

Stratification

➢ More than one diagnosis of chronic disease (COPD, Asthma, CAD, Diabetes, CHF, HTN)
➢ Additional data sources for variables like socio-economic status, med changes, etc.

Program

➢ Takes approximately 4 months
➢ May include social, behavioral, and pharmD interventions
➢ Remove barriers to care

Engage

❑ Work with nurse for in-depth assessment
❑ Participate in phone calls with nurse every other week
❑ Can call nurse as needed
❑ Nurse may meet patient for doctor's visit

Graduation criteria

✓ Active role in self-management
✓ Medication adherence
✓ Engaged in treatment plan
✓ Engaged in symptom management
✓ Seeks care appropriately
✓ Advanced directives

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Transition Care

Your Patient's experience

Stratification

➢ Patient is transitioning from the acute care setting to home
➢ High risk for readmission

Program

➢ Approximately 30 days, starting 1-2 days post-discharge
➢ Ensure PCP visit for hospital follow up
➢ Remove barriers to care

Engage

❑ Work with nurse for in-depth assessment and medication reconciliation
❑ Participate in phone calls with nurse each week
❑ Can call nurse as needed

Graduation criteria

✓ Active role in self-management
✓ Medication adherence
✓ Completed all necessary post- discharge appointments and testing
✓ Engaged in treatment plan and symptom management
✓ No readmission in 30 days

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13

Advanced Illness Care

Stratification

- Chronic, life-limiting conditions
- Not yet in hospice or palliative care

Program

- Approximately 3 – 4 months
- Weekly, bi-weekly calls
- May continue to monitor longer, with at least monthly contacts
- May do a home visit, facility visit, or attend an office visit with the patient when appropriate.

Your Patient's experience

Engage

- ☐ Work with nurse for in-depth assessment
- ☐ Participate in phone calls with nurse every week or bi-weekly
- ☐ Can call nurse as needed
- ☐ Nurse may meet patient at home and for medical visit

Graduation criteria

- ✓ Understands how to manage a change in symptoms
- ✓ POST and Advanced Directive in place
- ✓ Care plan to address patient / caregiver needs and goals
- ✓ Patient/caregiver verbalize fears, tradeoffs, preferences, and goals of care

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Using Informatics To Drive Access
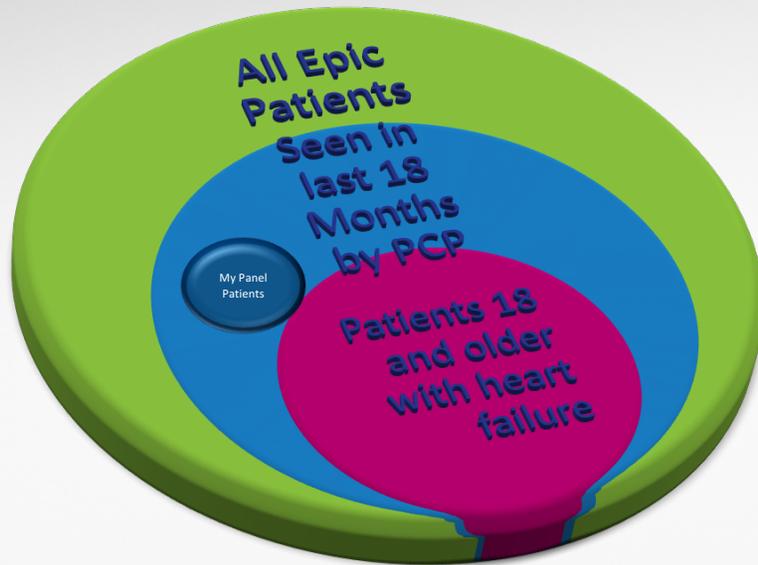
Through attributed Panel Size

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Lehigh Valley Health Network

Step 1: Calculate Attributed Panel Size

All Epic Patients

Seen in last 18 Months by PCP

Patients 18 and older with heart failure

My Panel Patients

Direct Patient Care begins with a designated PCP. Individualized care teams are built around the patient-practitioner relationship.

Population Management begins with attributing patients into groups that are assigned to an accountable care arrangement.

Empanelment enables interpersonal continuity and panel management to achieve the triple aim.

Patient attribution is essential to measure cost and quality and cost of care for any payor organization.

Benchmark Family Medicine Panel Size (Sullivan Kotter): 1786 Physician, 708 APC

*panel size is risk adjusted by age and gender

Row Labels	Sum of 18 Month Clinical FTE	Sum of Panel Size	Sum of Benchmark Based on FTE	Sum of Panel Size as a % of Benchmark	Sum of Panel Size/clinical FTE
⊟ Family Medicine	76.74	133523	116925.58	114.2%	1740
⊞ LVPG ███████	5.35	5953	7522.42	79.1%	1113
⊞ LVPG Family Medicine - ███	4.01	7701	6083.86	126.6%	1920
⊞ LVPG Family Medicine - ███	2.79	6557	4982.94	131.6%	2350
⊞ LVPG Family Medicine - ███	1.39	2967	2040.56	145.4%	2135
⊞ LVPG Family Medicine - ███	2.09	2687	1479.72	181.6%	1286
⊞ LVPG Family Medicine - ███	1.47	2073	1379.32	150.3%	1410
⊞ LVPG Family Medicine - ███	2.66	4289	3812.1	112.5%	1612
⊟ LVPG Family Medicine - ███	3.04	3367	4804.2	70.1%	1108
███ Family Medicine	0.98	1408	1750.28	80.4%	1437
███, Family Medicine	0.99	912	1768.14	51.6%	921
███, Family Medicine	0.49	744	875.14	85.0%	1518
███, Mid Level Provider	0.58	303	410.64	73.8%	522
⊞ LVPG Family Medicine - ███	5.44	8923	8810.32	101.3%	1640
⊞ LVPG Family Medicine - ███	1.12	1305	1215	107.4%	1165
⊞ LVPG Family Medicine - ███	3.94	4928	6466.92	76.2%	1251
⊞ LVPG Family Medicine - ███	5.32	7634	7356.3	103.8%	1435
⊞ LVPG Family Medicine - ███	5.45	7963	9270.16	85.9%	1461
⊞ LVPG Family Medicine - ███	2.99	5813	4887.38	118.9%	1944
⊞ LVPG Family Medicine - ███	1.8	4366	3214.8	135.8%	2426
⊞ LVPG Family Medicine - ███	5.18	8705	8173.48	106.5%	1681
⊞ LVPG Family Medicine - ███	2.23	5878	3982.78	147.6%	2636
⊞ LVPG Family Medicine - ███	1.8	3950	2406.3	164.2%	2194
⊞ LVPG Family Medicine - ███	2.58	4221	3790.86	111.3%	1636
⊞ LVPG Family Medicine - ███	2	4555	3572	127.5%	2278
⊞ LVPG Family Medicine - ███	2.26	5456	3314.02	164.6%	2414
⊞ LVPG Family Medicine - ███	6.31	13700	10696.56	128.1%	2171
⊞ LVPG Family Medicine - ███	4.52	9530	5877.58	162.1%	2108
⊞ LVPG Internal Medicine ███	1	1002	1786	56.1%	1002

Programmed Scheduling by Panel Size

New Patient holds per session

Panel > 115% median: 1

Panel 95-114% median: 1-2

Panel < 95% median: 2-3

Acute Visit holds per session

Panel > 115% median: 2-4

Panel 95-114% median: 2-4

Panel < 95% median: 0-1

Potential Additional Steps

- Staffing, Recruiting, Growth Strategy (started)
- Continuity by Attributed Panel
- Visit frequency by diagnosis by panel
    - Example: Stable HTN patient seen 1-5x annually
        - Higher frequency by those with smaller panels (?)
- Embark into predictive analytics: evaluate which patient has better outcomes (visits, demographic, etc)

Questions?

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Wake Forest®
Baptist Medical Center

Where is everybody

Population Health/Value Based Care Unique Structure

Value Contracts with United MA, Humana MA, Cigna, ect

Population Health Team Wake Forest

Operationalize Contracts

Identify populations outside of contracts to focus on

Partner with community groups and organizations to impact population health

NextGen ACO with Wake and Catawba

Supporting our 19 county region

Wholly owned subsidiary

CHESS

Value Based Contracting

ACO Creation

Population Management services for patients in contracts

Health Systems/Physician Groups

Groups joining contracts or MSSP ACO

Informatics Needs data

- We get our attribution list from CHESS
- These need to be entered into registries
- We can pull data from the clinical record
- This only tells part of the story
- Need data from claims

Claims data

- Our data comes through CHESS from the different contracts we are
- We then use this data identify patients who need more touches from our Navigation team and their primary care physicians

Cross-Payer Utilization by Provider

ED Visits per 1,000, Top 20 Providers
Wake Forest Baptist Health
(YTD 2017 through Sept; MSSP, United MA, Humana MA)
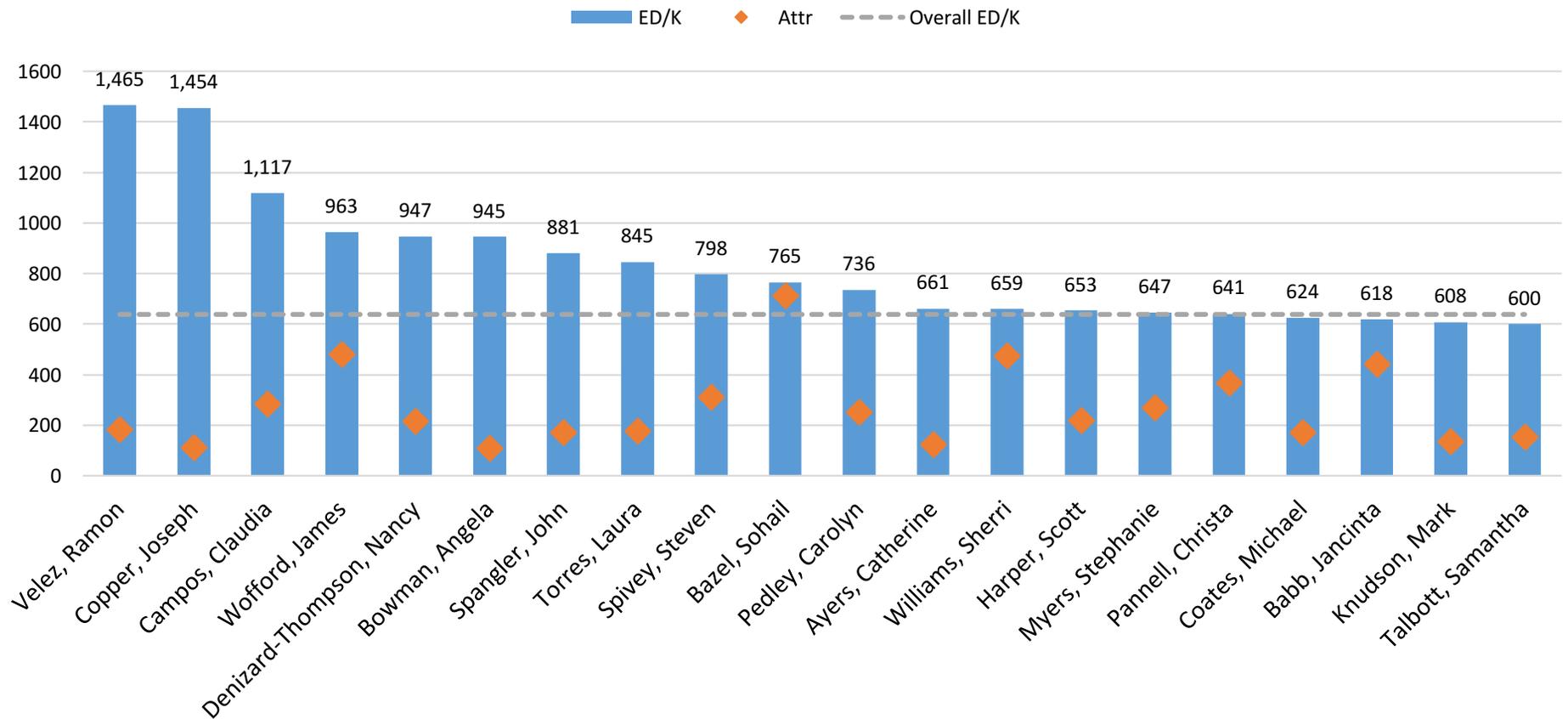
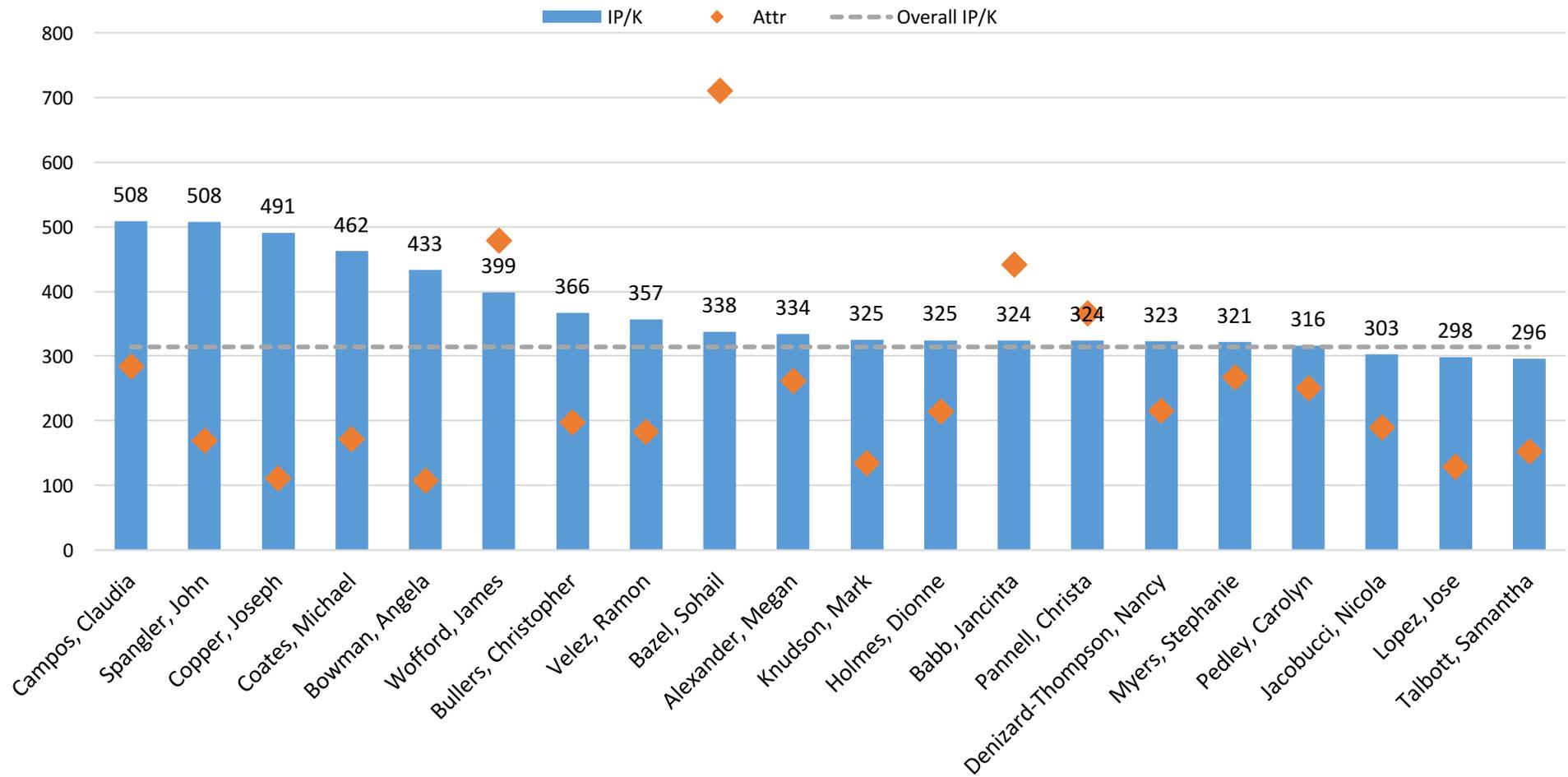# Cross-Payer Utilization by Provider

Inpatient Admissions per 1,000, Top 20 Providers

Wake Forest Baptist Health

(2017 YTD through Sept; MSSP, United MA, Humana MA)

Legend: ■ IP/K   ◆ Attr   - - - Overall IP/K

Values (IP/K):
- Campos, Claudia: 508
- Spangler, John: 508
- Copper, Joseph: 491
- Coates, Michael: 462
- Bowman, Angela: 433
- Wofford, James: 399
- Bullers, Christopher: 366
- Velez, Ramon: 357
- Bazel, Sohail: 338
- Alexander, Megan: 334
- Knudson, Mark: 325
- Holmes, Dionne: 325
- Babb, Jancinta: 324
- Pannell, Christa: 324
- Denizard-Thompson, Nancy: 323
- Myers, Stephanie: 321
- Pedley, Carolyn: 316
- Jacobucci, Nicola: 303
- Lopez, Jose: 298
- Talbott, Samantha: 296

SNF Analysis
MSSP ACO

| SNF Facility	SNF Count	SNF %
Silas Creek Rehabilitation Center, Winston-Salem (2 Stars)	69	7.5%
Wilkes Senior Village Care Concepts, North Wilkesboro	58	6.3%
Bermuda Village, Bermuda Run (2 Stars)	42	4.6%
Winston Salem Rehabilitation Operations, Winston-Salem (1 Star)	42	4.6%
Bermuda Commons, Advance (1 Star)	41	4.4%
Oak Forest Health and Rehabilitation Company, Winston-Salem* (4 Stars)	40	4.3%
Lutheran Home Trinity Glen, Winston-Salem* (2 Stars)	34	3.7%
Abernethy Laurels, Newton* (5 Stars)	33	3.6%
Regency Care of Clemmons, Clemmons	31	3.4%
Surry Community Health and Rehabilitation Center (2 Stars)	27	2.9%

*Preferred Provider 2017
** Potential Preferred Provider 2018

- Current data presents from 1/1/17 through 8/31/17.
- Facility list contains top 10 SNF facilities.
- Star Ratings as of 10.20.17

MSSP ACO
SNF Utilization

SNF Admissions per 1,000
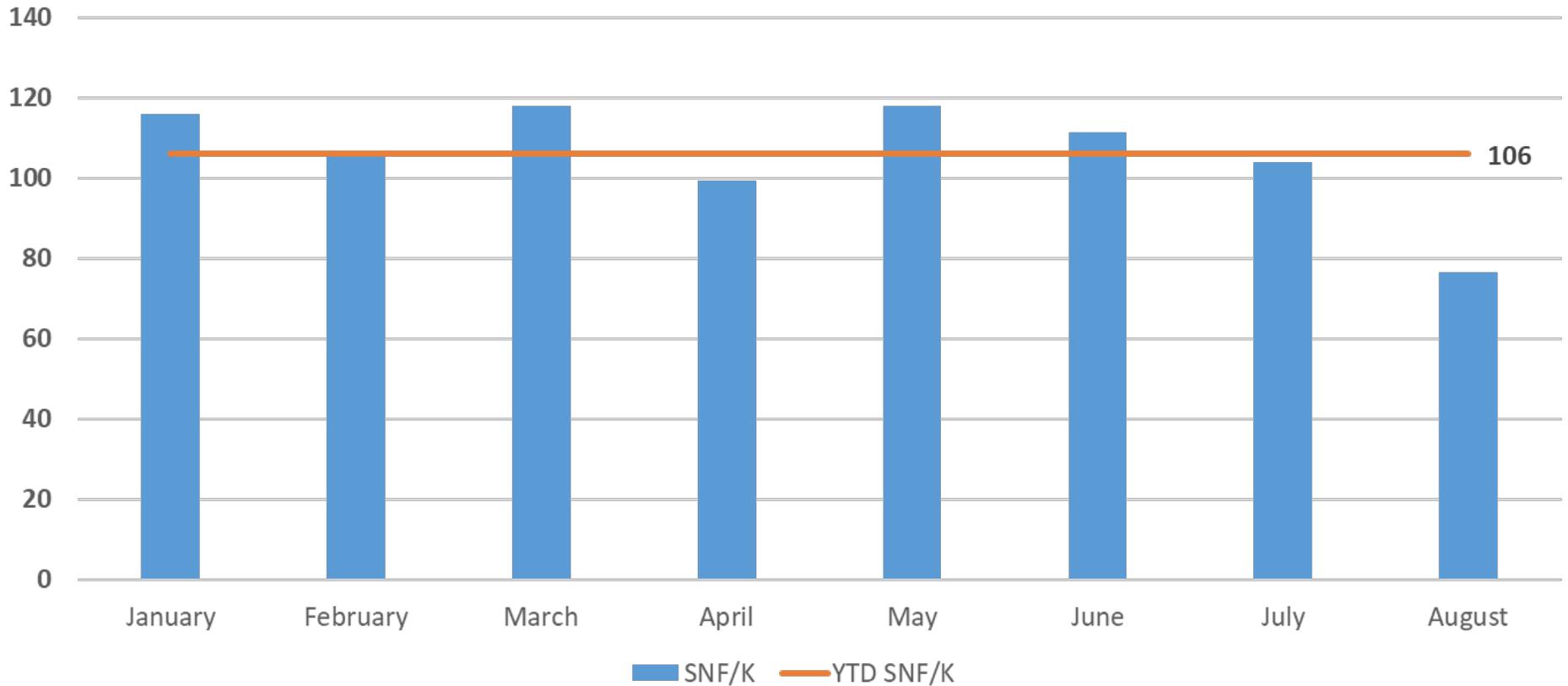
- Current data presents from 1/1/17 through 8/31/17.

Quality

	QBC Points	Target	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Gaps to Target
Eligibility (Core) Measures: "Gateway" to Shared Savings or Risk										
DM HbA1c Test		80%	23.6%	38.3%	50.4%	58.1%	68.4%	80.3%	85.3%	0
DM Nephropathy Screening		85%	36.1%	41.3%	47.8%	50.4%	55.6%	65.2%	70.4%	205
CMP, BMP, or Renal Panel		65%	31.5%	52.9%	64.7%	71.5%	79.3%	87.0%	90.2%	0
PCP Visit		75%	1.7%	23.6%	44.0%	56.9%	63.3%	72.2%	76.6%	0
QBC HEDIS Measures: Target goals = Increased MLR (see table 1 below)										
Breast Cancer Screening	1	74%	71.0%	73.0%	74.0%	75.0%	76.0%	79.0%	79.0%	0
Colorectal Cancer Screening	1	76%	69.0%	70.0%	71.0%	72.0%	73.0%	75.0%	76.0%	0
Adult BMI Assessment	1	91%	74.0%	72.0%	72.0%	72.0%	76.0%	78.0%	79.0%	256
DM HbA1c < 9%	2	80%	8.0%	12.0%	13.0%	15.0%	15.0%	22.0%	25.0%	597
Diabetic Eye Exam	1	77%	35.0%	36.0%	39.0%	43.0%	48.0%	58.0%	63.0%	148
Diabetic Kidney Disease Monitoring	1	96%	74.0%	84.0%	87.0%	90.0%	91.0%	94.0%	95.0%	10
Osteoporosis Mgmt (women) with a Fracture	1	58%	25.0%	30.0%	43.0%	36.0%	37.0%	55.0%	59.0%	0
Rheumatoid Arthritis Mgmt	1	83%	100.0%	74.0%	81.0%	82.0%	80.0%	80.0%	78.0%	3
QBC Medication Adherence Measures: Target goals = Increased PMPM										
Medication Adherence for Diabetes Medications		83%	93.0%	82.0%	85.0%	86.0%	87.0%	90.0%	81.0%	-
Medication Adherence for Hypertension (RAS)		83%	85.0%	85.0%	86.0%	86.0%	89.0%	91.0%	82.0%	-
Medication Adherence for Cholesterol (statins)		79%	85.0%	85.0%	85.0%	86.0%	86.0%	89.0%	80.0%	-
Contracted Bonus Utilization Measures (EBC Program)										
Acute Admits per 1000		<194.7	288.9	274.8	270.7	268.8	266.2			n/a
SNF Admits per 1000		<47.8								n/a
Readmissions per 1000		<21.9								n/a
ER visits per 1000		<462.6	494.0	547.5	572.0					n/a
Specialist Encounters per 1000		<4910.3								n/a

▪ **Data reflects quality reporting as of 8/31/17**

Our Success with using EHR and Claims data

- Have had shared savings in MSSP for 2 out of the 3 years we were in MSSP
- Have had MLR with MA contract of 73% down from 94% when we started
- Can have success without having to spend millions on data solutions
- Need the solutions for predictive analytics

Power of Texting: Tool for Care Gap Closure

July-Oct YoY Fy'17 vs 18: Patient Access and Financial Shortfall was the necessity of innovation

2.62%
Reduction in Patient Vol

6%
wRVU shortfall due to OutPt volume reduction & Med/Hospitalist Svc admitting FM Pts

10%
Reduced Residents productivity translating into lower patient volume

Outreach Basis:

1. CareGap closure was targeted for Primary Care Disease States with largest target population

2. Patient data was gathered & extracted from PPRNET Data Warehouse

3. Payor Focus outreach was included in the effort

4. Follow-up was for patients not seen in the last 90 days **and** w/o Future Appts

Over 12K text messages in 102 days has yielded 28% success rate with no-show rate lower by 2% compared to avg of 16%

Outreach Date	Description	# pts in file	# appts made	Rate of conversion to appt.	arrivals	no-shows	NS rate
2/20/18	Pneumonia Shots Pilot I	100	56	56%	45	8	15%
2/28/18	Pneumonia Shots Pilot II	400	171	43%	122	31	20%
3/5/18	High Risk Pneumonia Shots Pilot	332	126	38%	83	18	18%
3/7/18	Diabetes Follow-Up	402	272	68%	186	26	12%
3/12/18	No Follow-Up Patients seen in Jan & CHF	839	435	52%	288	49	15%
3/19/18	HyperTension Patients	1385	617	45%	430	69	14%
4/6/18	Patients with Multiple Medical Conditions (CCM)	255	81	32%	48	8	14%
4/16/18	No Follow-Up Patients seen in Feb & March + Diabetes & /Or Hypertension	1562	341	22%	119	24	17%
4/26/18	Depression Follow-Up	1871	369	20%	185	32	15%
5/9/18	Blue Cross Blue Shields Diabetes Care Gaps	68	28	41%	12	2	14%
5/10/18	Cardiac Care Follow-up	470	205	44%	111	12	10%
5/23/18	Departed Faculty Patient Panel I	279	59	21%	37	2	5%
5/31/18	Departed Faculty Patient Panel II	1292	211	16%	82	6	7%
7/5/18	Departed Faculty III & Residents Patient Panel	2778	453	16%	130	24	16%
	Total	12033	3424	28%	1878	311	14%

Key Learnings

1. Care Gap Closure
   - Diabetes Patient Population has highest conversion rate with lowest no-show rate
   - Depression Patient Panel has lowest conversion rate with decent no-show rate

2. Follow-Up Appts
   - Patients who leave w/o appts have limited response to text messages for subsequent appts
   - No-Show rate seems to be at average