

DATA ANALYTICS

USING INFORMATION FOR MEANINGFUL IMPROVEMENT

SWBA 30th Annual Benefits Compliance Conference

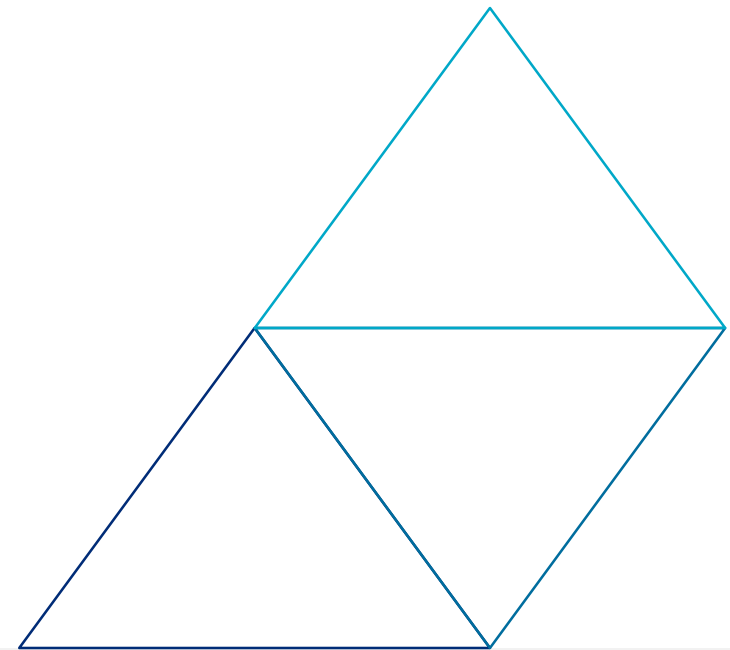
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DISCUSSION GUIDE

- Brief Introduction
- Data Analytics– What It Is vs. What It Isn't!
- How Data Analytics Fits Into Benefits
- A Day In The Life Of ~~Data Scientist~~ An Analytics Expert
- Measurement Strategy - Responsible Reporting
- Examples
- How Does This Lead To Solutions?
- Wrap-up and Questions

INTRODUCTION

WHO AM I?

- Currently a Principal at Mercer (13 years)
- CIGNA & UHC in HEDIS/quality, financial analysis and contracting/network development roles (6 years)
- Spent a year supporting the HCAHPS survey development & scoring, which looks at patient satisfaction after hospital stays
- Core Competencies: What does my job really require?
 - Unstoppable Curiosity – there’s always more to unravel!
 - Skeptical – but un-biased!
 - Very “Can-Do” attitude: If you can ask the question, I can figure it out!
 - We love to teach people about whatever we found!

DATA ANALYTICS

WHAT IT IS VS. WHAT IT ISN'T

- Data analytics is about:
 - Finding answers & solutions
 - Solving the “What-if’s”
 - Find root causes to issues
 - **Finding & bringing good, actionable information to the table!**
- Data analytics ISN'T:
 - A whole bunch of expensive software and tools
 - The most exciting adrenalin-filled job ever... (though it has its moments!!)
 - Just about big words like Artificial Intelligence and Machine Learning
 - These have their place... but not as part of the core work we do!

REPORTING DATA WHAT IT USED TO (AND SHOULDN'T) LOOK LIKE!

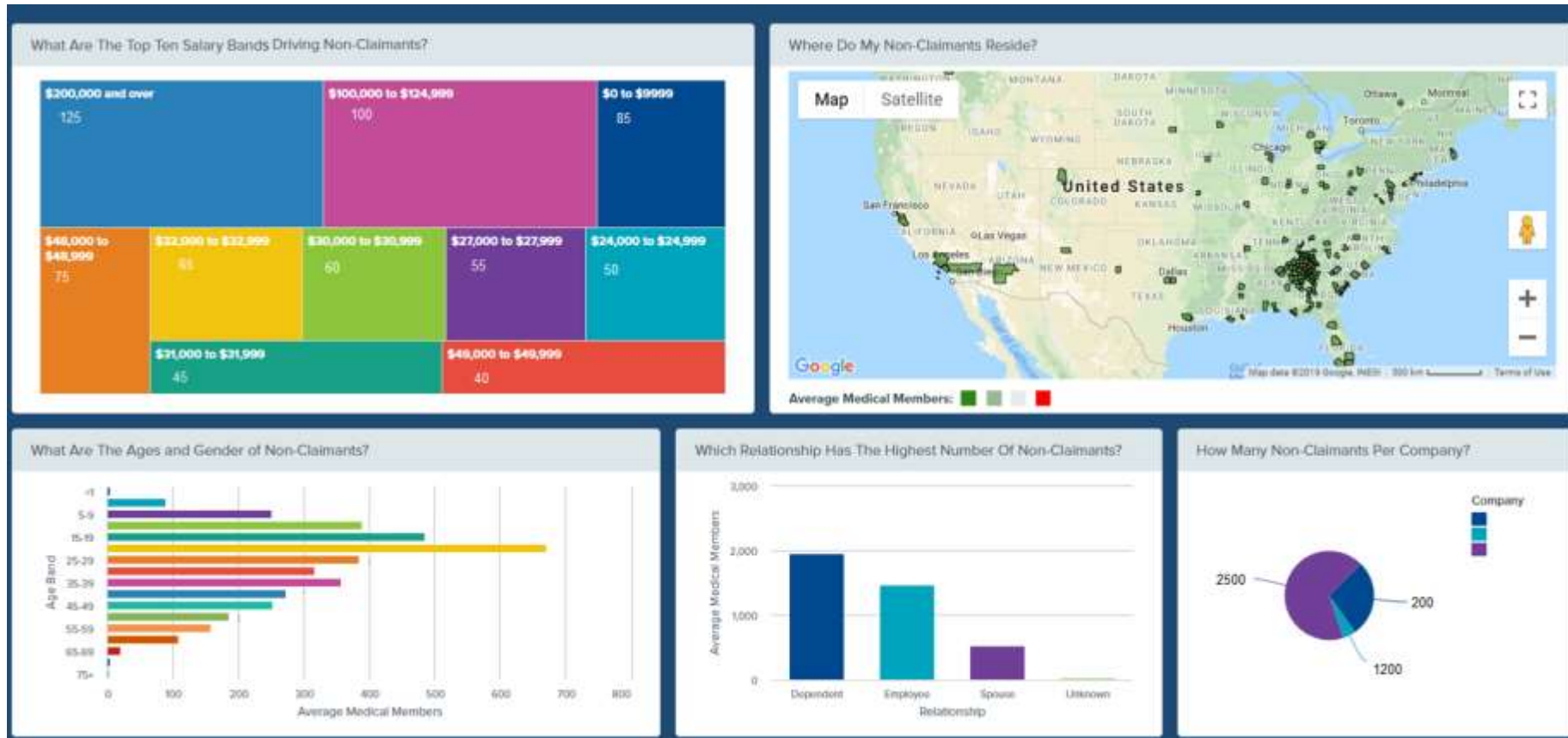
	Jan 2012 - Dec 2012 (TP1)	Jan 2013 - Dec 2013 (TP2)	Jan 2014 - Dec 2014 (TP3)	% Change (TP1 - TP2)	% Change (TP2 - TP3)
# High Cost Claimants (HCCs)	91	107	116	17.6%	8.4%
HCCs as % of Members	1.08%	1.13%	1.12%	5.0%	-1.3%
Allowed Amount for HCCs	\$10,000,000	\$12,766,638	\$13,034,970	25.2%	2.1%
Average Allowed Amount	\$110,000	\$119,312	\$112,370	8.5%	-5.8%

	Admits / 1000	Days / 1000	US	Allowed / Day	PMPY	Use*	Pvt	Trend ALOS	Trend PMPY (%)	Trend PMPY (\$)
Total	57	10	4.25	\$4,754	\$1,146	-3.2%	0.2%	-4.7%	-3.0%	-\$35
+ Medical	64	4.70	\$5,291	\$340	6.2%	23.3%	19.1%	30.9%	\$80	
+ Surgical	13	87	5.31	\$7,979	\$534	-1.6%	-14.8%	6.4%	-15.9%	-\$101
+ Maternity / Newborn	24	71	2.92	\$3,384	\$238	-0.7%	6.2%	-8.3%	5.5%	\$12
+ MHA	6	39	6.44	\$828	\$32	-20.7%	-3.1%	-41.9%	-45.4%	-\$27
+ OB / GYN	0.3	0.3	0.2	0.3	\$987	\$928	100%	-6.9%	-\$68	
+ All Other	2.5	1.9	2.2	2.1	2.2	\$387	\$382	42%	-3.8%	-\$15
Pharmacy Carve-Out (Allowed PMPY)	\$704	\$779	\$874	\$708	\$708	\$8	\$9	1%	9.0%	\$1
Pharmacy Carve-Out (per member)	7.2	8.3	8.9	7.3	7.3	\$69	\$56	6%	-18.6%	-\$13
+ Retail	5.8	7.3	6.8	6.4	6.6	\$70	\$26	3%	31.1%	\$8
+ Mail Order	1.4	1.0	1.1	0.9	1.1	\$89	\$62	7%	9.8%	\$4
Pharmacy Carve-Out Rx	\$342	\$229	25%	-8.3%	-\$13					

Reports photo - royalty-free stock image; courtesy of DepositPhotos.com

REPORTING INFORMATION WHAT IT SHOULD LOOK LIKE!

- When your analytics team brings you information... it looks like this.
- Otherwise, are they doing the analysis, or are YOU??



HOW DATA ANALYTICS FITS INTO BENEFITS

- Plan design
- Point solution programs:
 - Suitability
 - ROI/VOI, once program/solution is implemented
 - Do you have the right data to support?
- Understanding issues like:
 - ER Frequent fliers
 - Are UM/DM programs working?
 - Targeting education campaigns

A DAY IN THE LIFE...

(KEEPING THE ANALYTICS TEAM ENTERTAINED!)

A data analytics consultant never knows what their day will look like... Topics touched in a recent one week period:

- CFO considering point solutions- Should we? Can we? Real ROI expectations?
- Finalized an in-depth Expert Medical Opinion ROI analysis
- Significant fraud issue reported, then tracking across over 100 clients in 3 different databases, and figuring out who was most at risk for the NEXT round, and helping support efforts to curtail the exposure
- New infusion drugs in the pharmacy pipeline... and a client facing costs for three new Spinal Muscular Atrophy patients (\$1.7M Annually, estimated, each)- Good thing they took the high cost claimant reporting seriously last summer and bought stoploss!
- How do we educate about ER to the highest users (n=500) without sending out info to >50K employees?
- Un-official HIPAA training, enough to keep C-Suite leader from being dangerous!
- And about 30 more ad hoc/smaller requests that were ALL important.

MEASUREMENT STRATEGY RESPONSIBLE REPORTING

- Similar to a physician, “And first, do no harm...” – must be fair!
- Analytics approaches should be planned and unbiased
 - “How to Lie with Statistics” – it’s a real book!
 - To avoid bias- plan measurement strategy before a program even starts!
 - Leave egos & pre-conceived ideas at the door– or turn them into hypotheses, and test!
 - When the answer is not what you expect, figure out why!

Let the data tell the story,
DON'T make the data support the story!

MEASUREMENT STRATEGY

KEY QUESTIONS

How is success defined?

What metrics will answer our questions?

What data do we have, and what do we need, and where will we get it?

What questions do we want the data to answer?

Who is or are the recipient(s) of the information?

What format will tell the story best to each recipient?

What frequency is needed?

What actions do you expect the audience(s) to take based on the data?

SO WHERE DOES “INFORMATION” LEAD YOU?

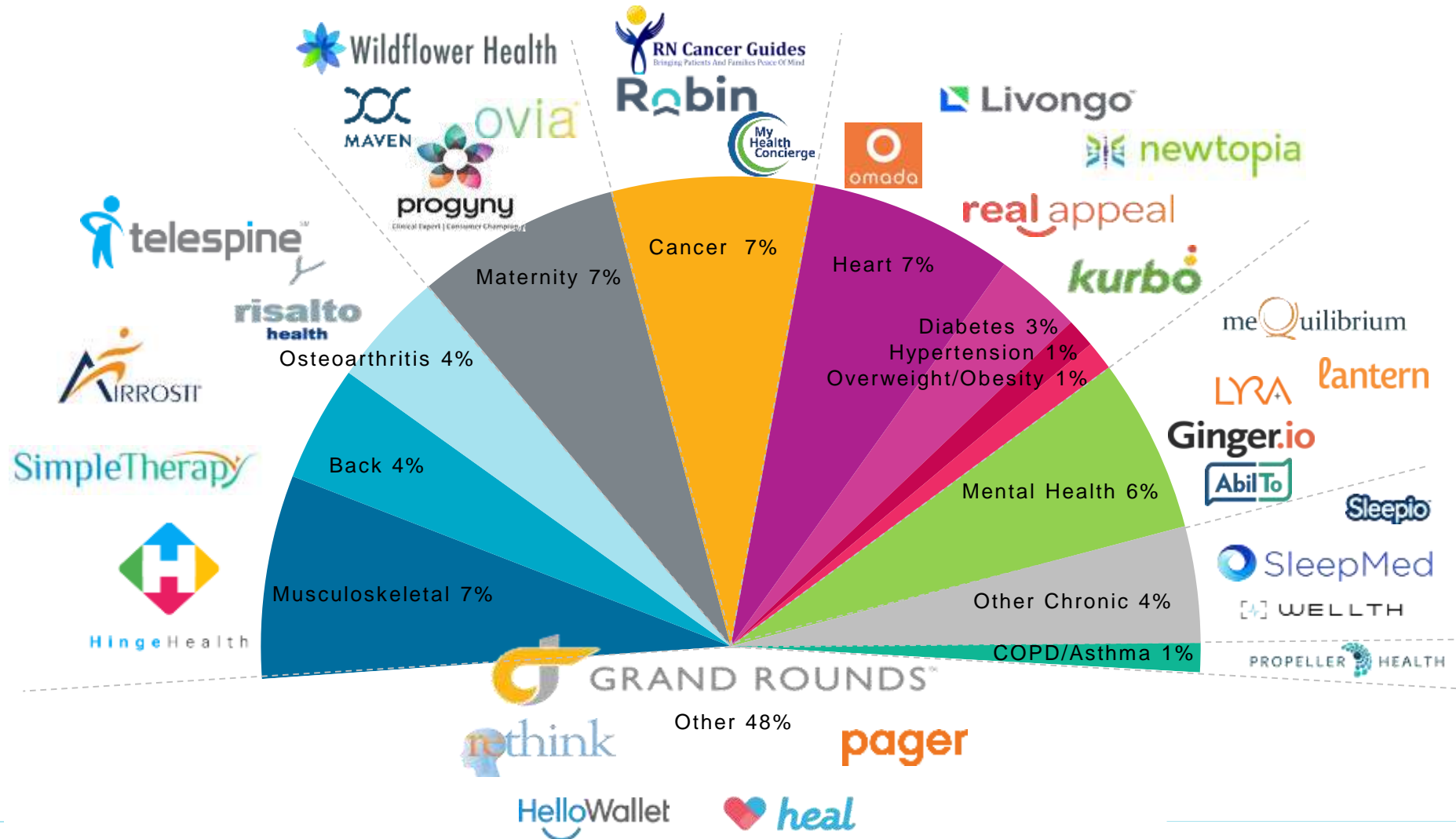
In the benefits realm, good information probably answers your questions– but that doesn't mean you have a solution or action!

Where does good information most often lead:

- Point solutions
 - That eventually need ROI measurement, to decide if they should continue!
 - MUCH easier if you plan early and contract with PGs!
- Education campaigns (and I don't mean postcards...)
 - Well targeted, but non-discriminatory campaigns!
- Very specific benefit design changes
 - Close loopholes
 - Avoid inappropriate OON leakage

TURNING DATA INTO OPPORTUNITIES

AN ABRIDGED GUIDE TO POINT SOLUTIONS



CLIENT FAVORITES

HIGH VALUE PROJECTS

- Emergency Room Reporting (across multiple datasets)
 - Nice to Know vs. Actionable
 - Frequent Fliers & Root Cause
 - Family Analysis
- Wellness program that had a very significant impact on ER use
 - Also huge impact on preventive screenings and Gaps-in-Care

SAMPLE DATA - ER ANALYSIS

WHAT DOES NICE TO KNOW LOOK LIKE?

NYU ER Classification			
	Visits	Allowed Amt Total	Avg Allowed / Visit
Alcohol/Drug	19	\$25,456	\$1,340
Emergent	179	\$269,101	\$1,503
Injury	448	\$548,762	\$1,225
Intermediate	599	\$930,347	\$1,553
Mental Health	41	\$65,614	\$1,600
Non-Emergent	660	\$837,123	\$1,268
Unclassified	357	\$488,709	\$1,369
TOTAL	2,303	\$3,165,113	\$1,374

Top 5 Diagnoses by Visit Count								
	Emergent				Injury			
	Dx	Visits	Allowed	Avg/Vst	Dx	Visits	Allowed	Avg/Vst
Diagnosis 1	Kidney stones	50	\$94,650	\$1,893	Open wound face/head, except eye	46	\$60,878	\$1,323
Diagnosis 2	Unspecified asthma	15	\$15,907	\$1,060	Injury/wound to fingers	28	\$25,065	\$864
Diagnosis 3	Acute appendicitis w/o peritonitis	10	\$11,411	\$1,141	Head injury NOS	20	\$20,693	\$1,035
Diagnosis 4	Intestinal obstruction NOS	8	\$13,390	\$1,674	Open wound hand except fingers alone w/o comp	11	\$16,334	\$1,485
Diagnosis 5	Acute pancreatitis	7	\$5,353	\$765	Neck sprain	10	\$8,437	\$844

SAMPLE DATA – ER FREQUENT FLIERS WHERE ARE THE PROBLEM AREAS?

ER Visits Per 1000 Comparison by State	Actives Only								
	Avg Members	Avg Allowed / Visit	All Visit Categories	Emergent	Injury	Intermediate	Non-Emergent	Unclassified	
TX	7,556	\$1,145	126.0	10.2	25.3	34.5	32.4	19.7	
NV	2,995	\$1,615	193.3	12.4	40.4	50.1	58.1	30.1	
CA	1,079	\$1,398	176.9	12.0	21.3	48.2	63.0	23.2	
CO	1,364	\$1,365	134.9	7.3	22.0	33.7	49.1	19.1	
AZ	1,503	\$1,779	113.1	14.0	18.6	27.3	30.6	20.6	
UT	969	\$1,712	142.4	13.4	29.9	27.9	42.3	23.7	
ID	688	\$900	95.9	7.3					
Aggregate:	16,155	\$1,378	141.13	MH and Drug ER					



ER Visits/Mbr	Members
12	1
11	1
9	4
8	1
6	7
5	62
4	135
3	568
2	1005
1	1752



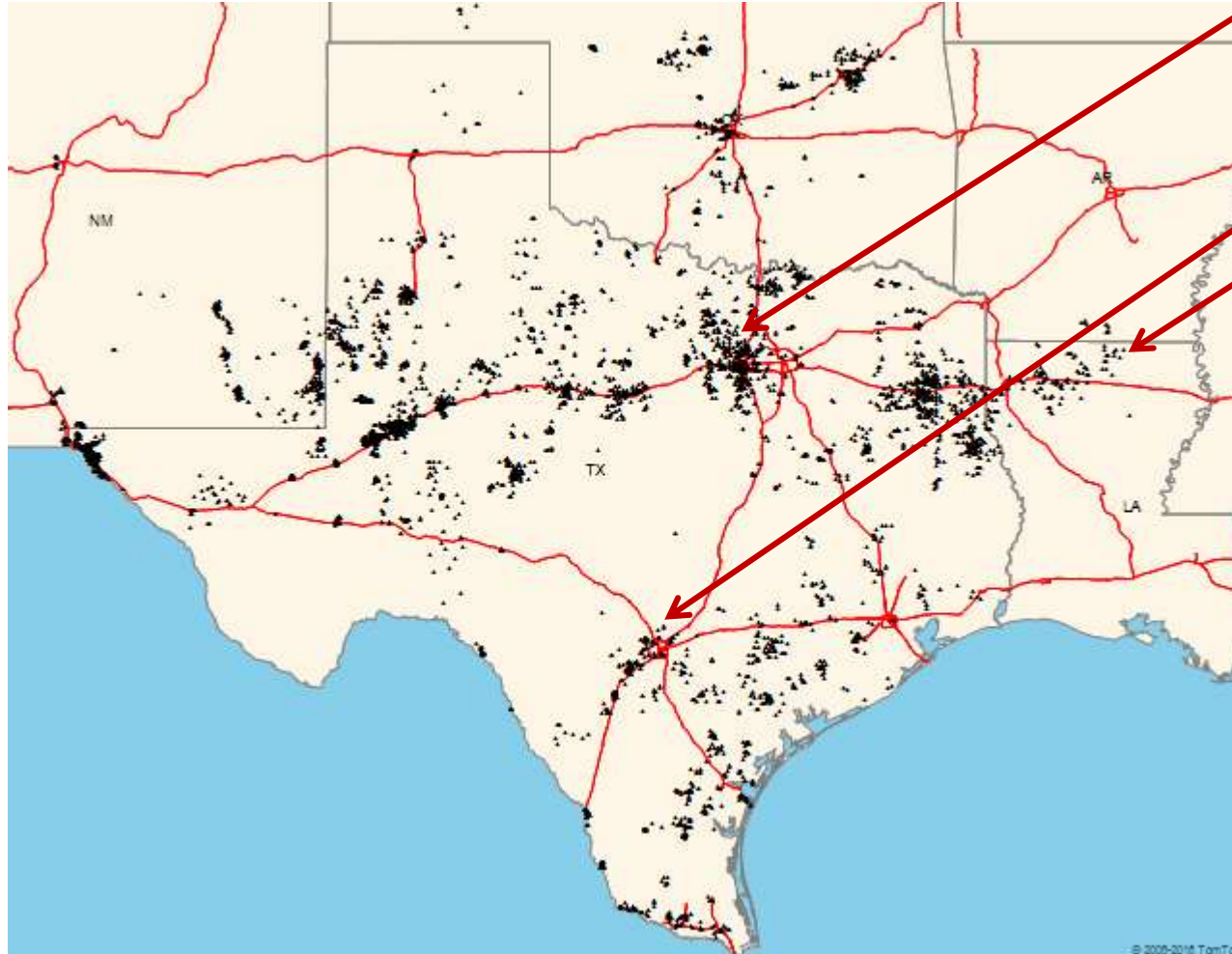
ER Frequent Fliers with ≥ 6 Visits	Emergent	Injury	Intermediate	Non-Emergent	Unclassified	Mental Health	Alcohol/Drug	TOTAL		
	Visits							Visits	Allowed	Avg/Vst
Member 1	1	1	3	5	2			12	\$30,925	\$2,577
Member 2			5	2	2			11	\$17,114	\$1,556
Member 3			5	3	1			9	\$18,236	\$2,026
Member 4	1		7	1				9	\$17,334	\$1,926
Member 5	1		6	1			1	9	\$9,932	\$1,104
Member 6				1	8			9	\$8,880	\$987
Member 7		2		2		3	1	8	\$20,036	\$2,504
Member 8	2		2	2				6	\$14,447	\$2,408
Member 9		1	2		2		1	6	\$11,744	\$1,957
Member 10			2	3			1	6	\$9,230	\$1,538
Member 11			1			3	2	6	\$6,920	\$1,153
Member 12							6	6	\$6,739	\$1,123
Member 13		3		1			2	6	\$6,591	\$1,099
Member 14		1		3		1	1	6	\$4,958	\$826

SAMPLE DATA – ER CASES

TOP 2 FREQUENT FLIERS – DEEP DIVE

Member Details	Service Month (Date blinded)	Diagnosis Description (5 Digit)	NYU ER Category	Allowed Amount Med	Net Pay Med
Member 1 (12 Separate ER Visits)	March	Disorder of biliary tract NEC	Unclassified	\$3,591	\$787
	March	Right upper quadrant abdominal pain	Intermediate	\$3,780	\$2,835
	April	Backache NOS	Non-Emergent	\$2,039	\$2,039
	April	Acute pain NEC	Unclassified	\$2,307	\$2,307
	April	Limb swelling	Non-Emergent	\$1,620	\$1,620
	May	Acute pain NEC	Non-Emergent	\$6,052	\$6,052
	May	Open wound hand except fingers alone w/o comp	Injury	\$2,297	\$2,297
	June	Renal colic	Emergent	\$1,687	\$1,687
	June	Symptoms associated w female genital organs NOS	Non-Emergent	\$2,328	\$2,328
	September	Abdominal painNOS	Intermediate	\$1,871	\$1,871
	October	Right upper quadrant pain	Intermediate	\$2,262	\$2,262
	October	Acute upper respiratory infection, unspecified	Non-Emergent	\$1,091	\$1,091
Member 2 (11 Separate ER Visits)	January	Abdominal painNOS	Intermediate	\$1,757	\$1,659
	February	Sciatica	Intermediate	\$2,398	\$0
	February	Type II/NOS diabetes mellitus w/o comp NSU	Intermediate	\$1,551	\$427
	March	Acute pancreatitis	Emergent	\$310	\$0
	July	Lumbago	Non-Emergent	\$1,975	\$1,771
	July	Type II/NOS diabetes mellitus w ketoacidosis NSU	Emergent	\$398	\$398
	September	Dehydration	Unclassified	\$606	\$606
	September	Lumbago	Non-Emergent	\$2,904	\$2,904
	October	Left upper quadrant pain	Intermediate	\$1,771	\$1,771
	October	Dehydration	Unclassified	\$1,818	\$1,818
	October	Left upper quadrant pain	Intermediate	\$1,627	\$1,627

SAMPLE DATA – ER CASES IS RURAL USE THE ROOT CAUSE?



ER Visits / Mbr	Members
18	1
14	1
13	1
9	4
8	1
7	5
6	13
5	21
4	48
3	151
2	434
1	2,018
Members with ER Visits:	2,698

SAMPLE DATA – ER CASES ALL IN THE FAMILY?

- After an initial look at the ER Frequent Flier population, it was very apparent that the frequent flier population is clustered within family units– as evidenced below.
- It appears that the majority of these visits (with one exception) for the most serious frequent fliers are *mostly* non-emergent in nature, and conditions that could be handled in a typical primary care setting– except that by the time the member is in the ER, it is too late.
- We have no way to look at the time of day on claims in the data warehouse. (Day of week was not significant– it rarely is.)

ER Visits (per Member)	Members	Total Allowed for ER Visits	Total Plan Paid for ER Visits
12	1	\$ 26,130	\$ 19,976
11	3	\$ 59,772	\$ 47,814
10	3	\$ 56,357	\$ 31,587
9	2	\$ 30,699	\$ 24,629
8	8	\$ 114,464	\$ 94,105
7	12	\$ 154,125	\$ 116,554
6	16	\$ 212,501	\$ 152,352
5	37	\$ 365,545	\$ 264,293
1-4 Visits	\$ 5,084	\$ 12,695,584	\$ 6,418,679
Grand Total	5,166	\$ 13,715,176	\$ 7,169,988



ER Visits (per FAMILY)	Families/ Subscribers	Total Allowed for ER Visits	Total Plan Paid for ER Visits	Visits Per Family Member
20	1	\$ 30,619	\$ 28,331	(9,5,3,2,1)
15	1	\$ 27,550	\$ 23,255	(11,4)
14	1	\$ 31,727	\$ 25,280	(7,5,2)
13	2	\$ 38,372	\$ 28,514	(8,3,2) (5,4,2,2)
12	2	\$ 45,119	\$ 32,943	(12) (11,1)
11	4	\$ 90,045	\$ 67,334	
10	6	\$ 96,162	\$ 68,591	
9	7	\$ 96,687	\$ 61,068	
1-8	4,388	\$ 13,258,896	\$ 6,834,673	
Grand Total	4,412	\$ 13,715,176	\$ 7,169,988	

Considerations

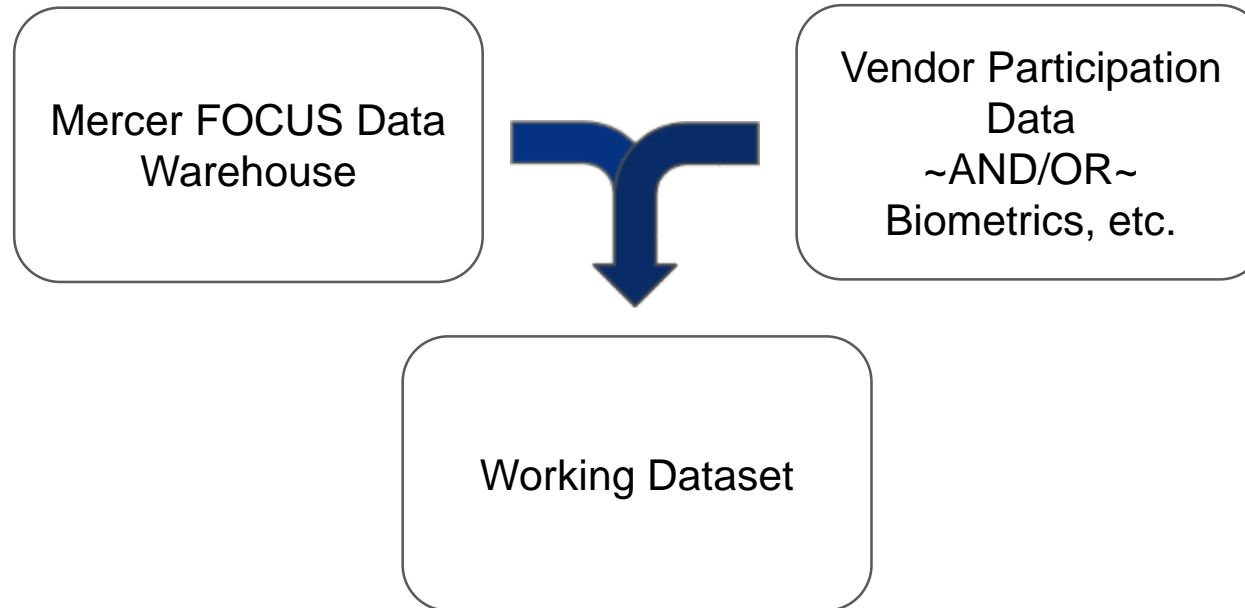
Benefit changes (i.e. higher copayments, etc. are not likely to make much of a difference to members like these, they are used to meeting their out-of-pocket maximum

Opting to stop paying ER claims for non-emergent diagnoses* is an option for many clients– but in this case, there are business (i.e. bad debt increase) considerations that preclude this option.

*Definition of “non-emergent” is often overly complex and problematic for this purpose.

ROI PROJECT APPROACH

Data was handled via cohort method:



Once this is accomplished, and participant/non-participant definitions are established, the working dataset can be used to report in various ways. (Note- multiple time periods/years are necessary)

This can be used with program participation information, HRA responses, biometrics, etc.

The figures on the following pages represent the year-over-year/concurrent control methodology.

PROGRAM IMPACT: EMERGENCY ROOM

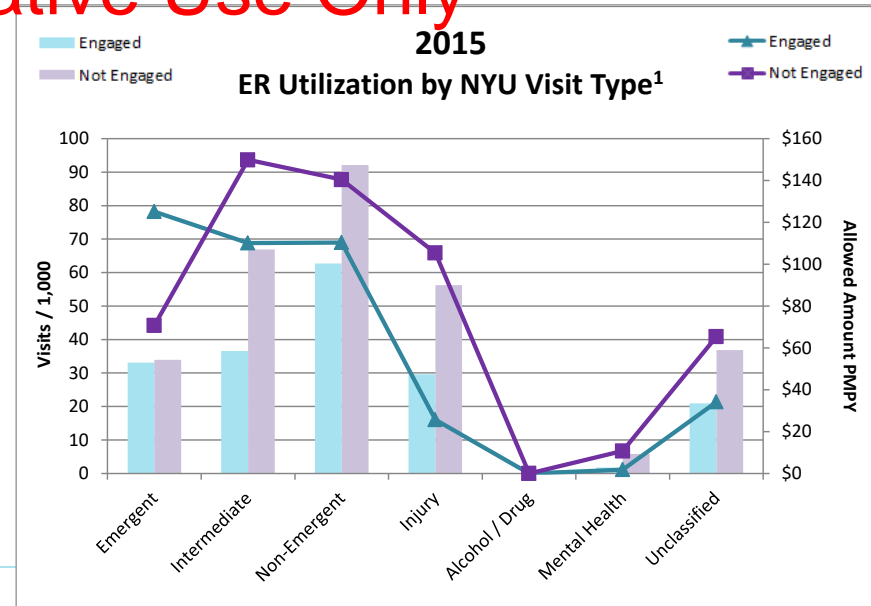
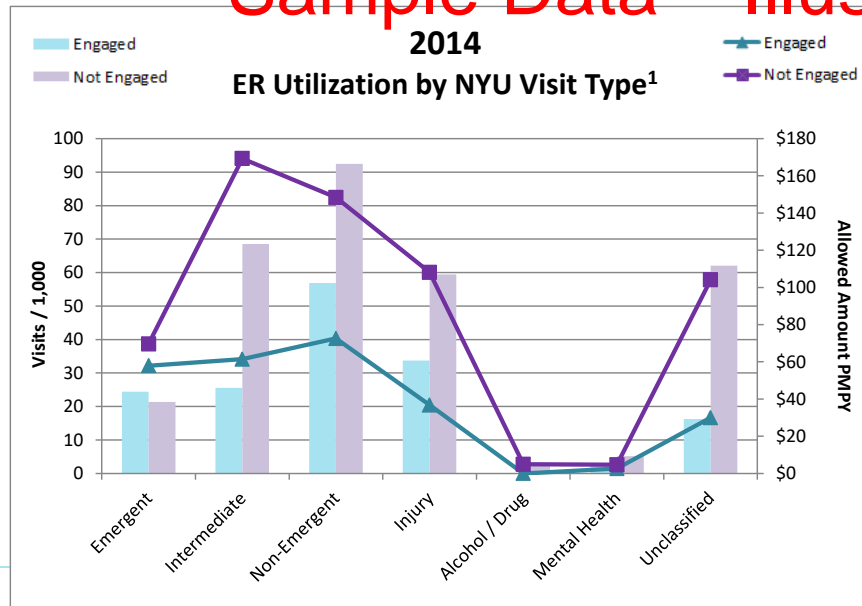
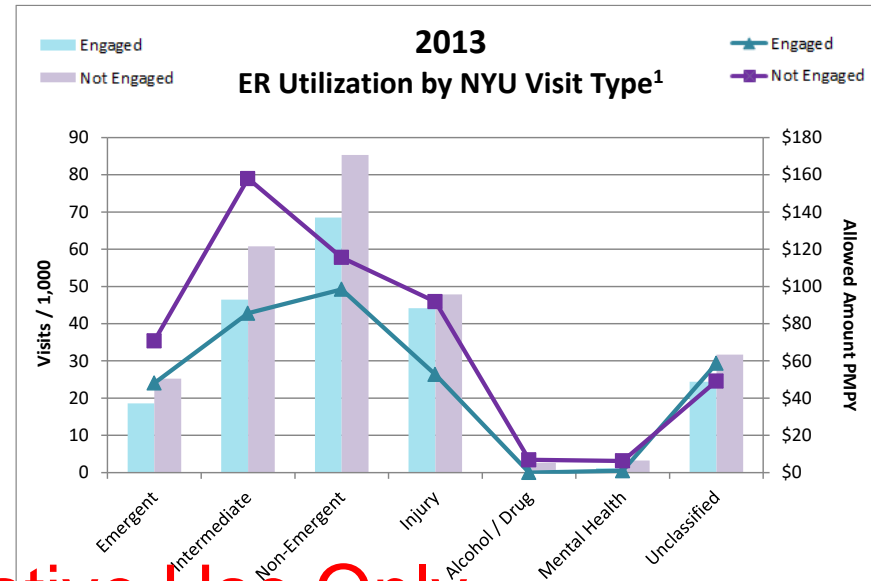
Very clear difference in ER use & cost by program participants:

- ER categories defined by NYU logic
- For example, in 2014 & 2015, the lower use of ER resulted in \$XXM lower ER spend for program participants
- This is presumably due to relationships with primary care physicians, and increased preventive care

*Participation required HA, Biometrics, and XXX+ points earned

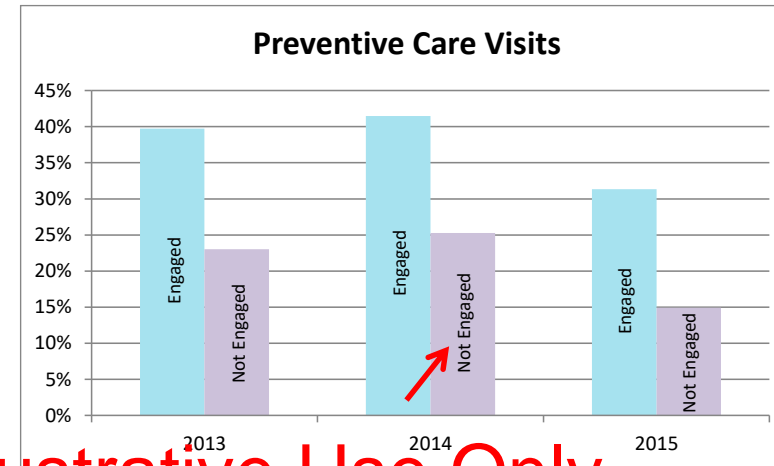
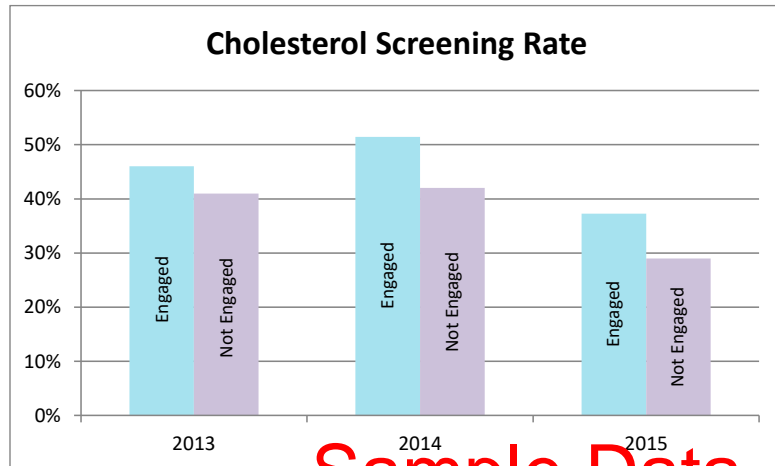
*Participants with \$100K+ allowed have been removed

Sample Data – Illustrative Use Only

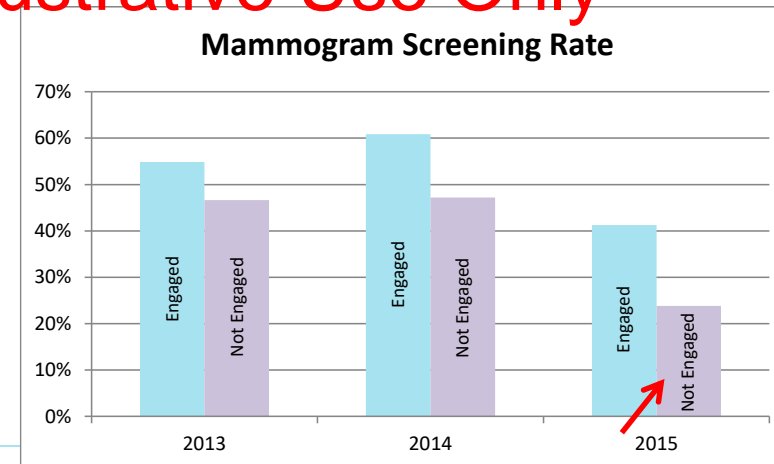
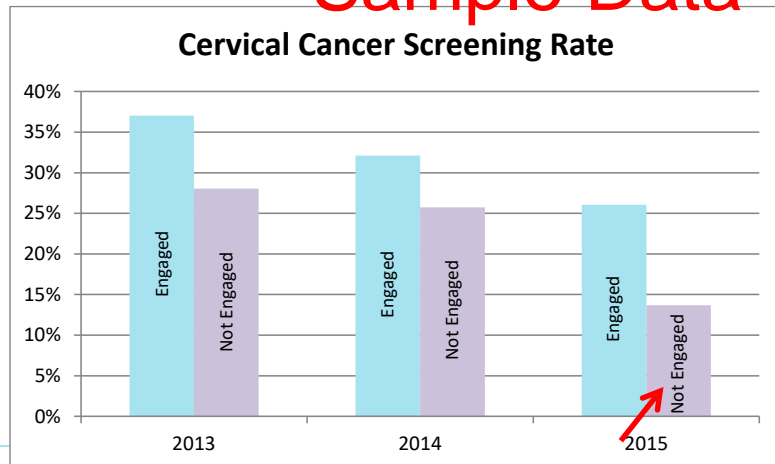


PROGRAM IMPACT ON PREVENTIVE SCREENING

- 2015 reflects YTD incurred- ratio is more important than the actual percentage
- Cannot extrapolate due to seasonal variation



Sample Data – Illustrative Use Only



RISK STRATIFICATION- ANOTHER APPROACH

		Low to Moderate Illness Burden		Moderate to High Illness Burden		High to Catastrophic Illness Burden							
		Wellness Program - Engaged & Continuously Enrolled		Employee & Spouse Only		Wellness Program - Engaged & Continuously Enrolled		Employee & Spouse Only					
July 2014 - June 2015													
How do these populations compare on basic demographics?													
Employees													
Average Contract Size		1.4	1.4	Low to Moderate Illness Burden		Moderate to High Illness Burden		High to Catastrophic Illness Burden					
Average Age (Members)		45.1	43.1	Wellness Program - Engaged & Continuously Enrolled		Employee & Spouse Only		Wellness Program - Engaged & Continuously Enrolled		Employee & Spouse Only			
% Male		60%	64%	Wellness Program - Engaged & Continuously Enrolled		Employee & Spouse Only		Wellness Program - Engaged & Continuously Enrolled		Employee & Spouse Only			
How do these populations differ in terms of illness and disease prevalence?													
Total FMPY (Allowed)		July 2014 - June 2015		Low to Moderate Illness Burden				Moderate to High Illness Burden					
* Medical	Average Illness Burden			Wellness Program - Engaged & Continuously Enrolled		Employee & Spouse Only		Wellness Program - Engaged & Continuously Enrolled		Employee & Spouse Only			
* Pharmacy				Wellness Program - Engaged & Continuously Enrolled		Employee & Spouse Only		Wellness Program - Engaged & Continuously Enrolled		Employee & Spouse Only			
How do these populations differ in how they use services?													
IP Admissions (per 1,000)		July 2014 - June 2015		Low to Moderate Illness Burden				Moderate to High Illness Burden					
* Medical	Top 5 Episodes of Care (Ranked by Total Allowed)	Mental Health (per 1,000)		Wellness Program - Engaged & Continuously Enrolled				Employee & Spouse Only		Wellness Program - Engaged & Continuously Enrolled		Employee & Spouse Only	
* Surgical		Anxiety					30.9	16.4	14.2				
* Maternity / Newborn		Depression						32.4	18.5	73.9			
* MHBA	Are there varying levels of compliance?	Cardiovascular / Metabolic (per 1,000)		Wellness Program - Engaged & Continuously Enrolled				Employee & Spouse Only		Wellness Program - Engaged & Continuously Enrolled		Employee & Spouse Only	
ER Visits (per 1,000)		Preventive Visit						116.2	89.0	193.2			
		Mammogram						0.0	1.1	25.6			
		Cervical Cancer Screening						0.0	0.0	0.0			
		Cholesterol						41.2	35.2	139.2			
		Colon Cancer											
Musculoskeletal (per 1,000)													
	Osteoarthritis						19.1	15.3	161.9				
	Rheumatoid Arthritis						1.5	0.4	14.2				
	Low Back Disorder						86.8	70.5	173.3				

Sample Data – Illustrative Use Only

QUESTIONS & CONTACT INFORMATION

Ask away... there are NO dumb questions when it comes to data analytics!!!

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MERCER

MAKE TOMORROW, TODAY