



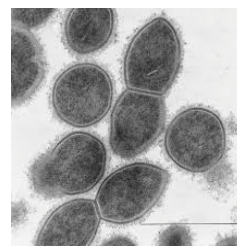
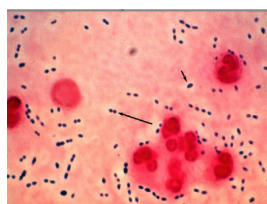
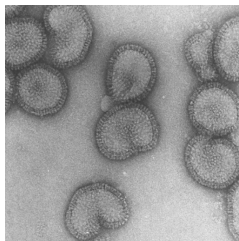
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Successful Use of Population Analytics to Increase Immunization in a Learning Collaborative

Carl Johnson, MD, EdM, MSc
Senior Physician Director Optum Analytics

The Real Enemies



Agenda



- CDC/ACIP population information for pneumococcal vaccine and influenza
- Getting the data right
 - The Optum One platform (101)
 - Mapping
 - Normalizing to platform-wide common variables
- Defining what to measure
 - Who is a patient
 - Who is a provider
 - Goals
- Results
 - Pneumococcal 65 and older
 - Pneumococcal “Risk Conditions”
 - Influenza
- Speed Bumps
- Next Steps

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Post-September 2014

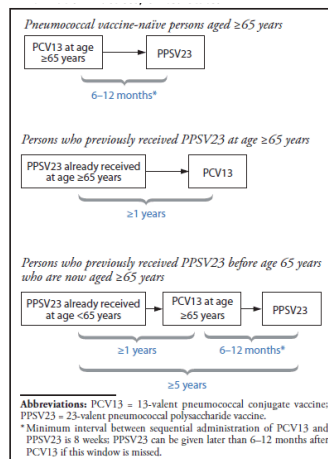


TABLE. Medical conditions or other indications for administration of 13-valent pneumococcal conjugate vaccine (PCV13), and indications for 23-valent pneumococcal polysaccharide vaccine (PPSV23) administration and revaccination for adults aged ≥18 years,* by risk group – Advisory Committee on Immunization Practices, United States, 2012

Risk group	Underlying medical condition	PCV13 Recommended	PPSV23 Recommended	Revaccination 5 yrs after first dose
Immunocompetent persons	Chronic heart disease [†]		✓	
	Chronic lung disease [‡]		✓	
	Diabetes mellitus		✓	
	Cerebrospinal fluid leak	✓	✓	
	Cochlear implant	✓	✓	
	Alcoholism		✓	
	Chronic liver disease, cirrhosis		✓	
	Cigarette smoking		✓	
Persons with functional or anatomic asplenia	Sickle cell disease/other hemoglobinopathy	✓	✓	✓
	Congenital or acquired asplenia	✓	✓	✓
Immunocompromised persons	Congenital or acquired immunodeficiency [§]	✓	✓	✓
	Human immunodeficiency virus infection	✓	✓	✓
	Chronic renal failure	✓	✓	✓
	Nephrotic syndrome	✓	✓	✓
	Leukemia	✓	✓	✓
	Lymphoma	✓	✓	✓
	Multiple myeloma	✓	✓	✓
	Generalized malignancy	✓	✓	✓
	Iatrogenic immunosuppression**	✓	✓	✓
	Solid organ transplant	✓	✓	✓
	Multiple myeloma	✓	✓	✓

* All adults aged ≥65 years should receive a dose of PPSV23, regardless of previous history of vaccination with pneumococcal vaccine.
[†] Including congestive heart failure and cardiomyopathies, including hypertension.
[‡] Including chronic obstructive pulmonary disease, emphysema, and asthma.
[§] Excludes B-lymphoid or T-lymphocyte deficiency, complement deficiencies (particularly C1, C2, C3, and C4 deficiencies), and phagocytic disorders (excluding chronic granulomatous disease).
^{**} Diseases requiring treatment with immunosuppressive drugs, including long-term systemic corticosteroids and radiation therapy.

<http://www.cdc.gov/mmwr/previe w/mm wr ht ml/m m633 7a4. ht m>

<http://www.cdc.gov/mmwr/previe w/mm wr ht ml/m m614 0a4. ht m>

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Targeting Pneumococcal Vaccine Populations



- Adults 65 and older
- “High Risk”
 - **PCV 13 High Risk (19 years and older)**
 - Functional or Anatomic Asplenia (including sickle cell)
 - Immunocompromising Conditions (eg, HIV infection)
 - Cochlear Implant
 - Cerebral Spinal Fluid (CSF) Leaks
 - **PPSV High Risk-Immunocompetent Persons (19 years and older)**
 - Chronic Heart Disease
 - Pulmonary Disease (Including Asthma)
 - Liver Disease
 - Alcoholism
 - CSF Leaks
 - Cochlear Implants
 - Those who Smoke Cigarettes
 - **PPSV Highest-Risk Persons**
 - Functional or Anatomic Asplenia
 - Immunosuppression
 - Transplant
 - Chronic Renal Failure
 - Nephrotic Syndrome

Table 1: Pneumococcal vaccination recommendations: US adults age 19 to 64 years by risk group

Two pneumococcal vaccines are recommended by CDC for use in adults: a 13-valent pneumococcal conjugate vaccine (PCV13) and a 23-valent pneumococcal polysaccharide vaccine (PPSV23)

Risk Group	Underlying Medical Condition	PCV13	PPSV23	PPSV23 Revaccination
Immunocompromised persons*	Congenital or acquired immunodeficiency*	✓	✓	✓
	HIV	✓	✓	✓
	Chronic renal failure	✓	✓	✓
	Nephrotic syndrome	✓	✓	✓
	Leukemia	✓	✓	✓
	Lymphoma	✓	✓	✓
	Hodgkin disease	✓	✓	✓
	Generalized malignancy	✓	✓	✓
	Iatrogenic immunosuppression**	✓	✓	✓
	Solid organ transplant	✓	✓	✓
	Multiple myeloma	✓	✓	✓
	Sickle cell disease/other hemoglobinopathy	✓	✓	✓
Persons with functional or anatomic asplenia*	Congenital or acquired asplenia	✓	✓	✓
	Cerebrospinal fluid leak	✓	✓	
Immunocompetent persons*	Cochlear implant	✓	✓	
	Chronic heart disease†		✓	
Immunocompetent persons	Chronic lung disease‡		✓	
	Diabetes mellitus		✓	
	Alcoholism		✓	
	Chronic liver disease, cirrhosis		✓	
	Cigarette smoking		✓	

<http://www.cdc.gov/vaccines/pubs/pinkbook/pneumo.html>

<http://www.adultvaccination.org/professional-resources/pneumo/cta-chronic-conditions.pdf>

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Influenza Vaccination Recommendations.



Routine annual influenza vaccination is recommended for all persons aged ≥ 6 months who do not have contraindications.

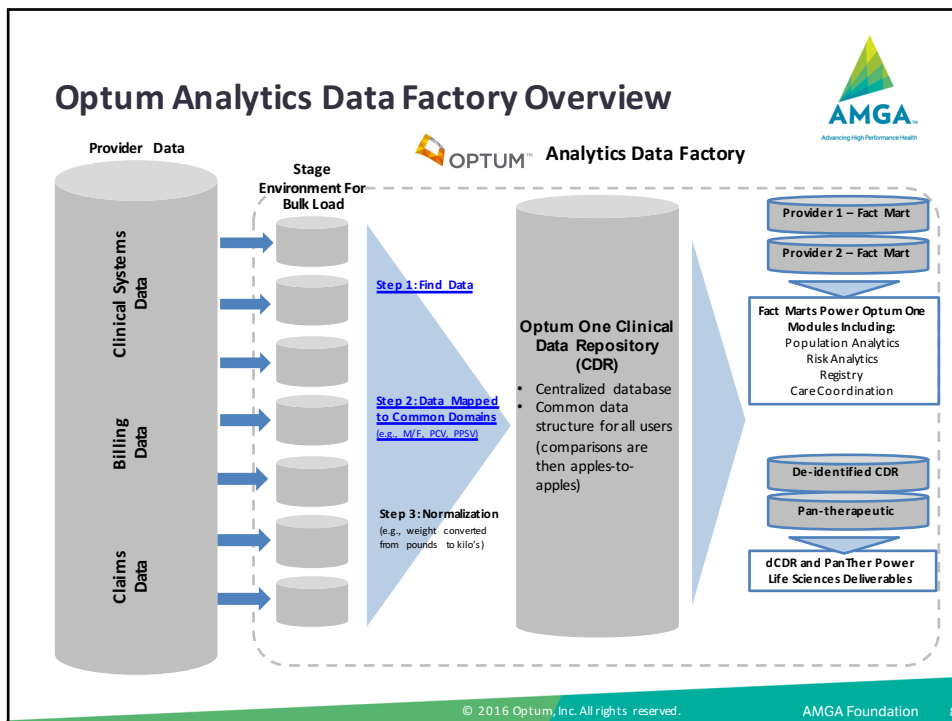
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Getting the Data Right

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Immunizations Data Sources Used to find Immunizations data in EHRs



- Immunization Tables
- Health Maintenance Tables
- CPT/G Codes
- ICD 9 Codes

Marked variation in where data was documented at the onset of the collaborative. OptumOne™ identifies and aggregates from all!

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Pneumococcal Vaccine Variables



- | | |
|---|---|
| • Pt Received Pneumococcal Vaccine (Any), Age 65+ | • Pt Received Pneumococcal Vaccine (Any), Age 19-64 |
| • Pt Received Pneumococcal Vaccine (Both PCV & PPSV), Age 65+ | • Pt Received Pneumococcal Vaccine (Both PCV & PPSV), Age 19-64 |
| • Pt Received Pneumococcal Vaccine (PPSV), Age 65+ | • Pt Received Pneumococcal Vaccine (PPSV), Age 19-64 |
| • Pt Received Pneumococcal Vaccine (PCV), Age 65+ | • Pt Received Pneumococcal Vaccine (PCV), Age 19-64 |
| • Pt Received Pneumococcal Vaccine (Unspecified), Age 65+ | • Pt Received Pneumococcal Vaccine (Unspecified), Age 19-64 |

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The Influenza Variables



- Pt Received Influenza Vaccine During the Current Flu Season, Age 18+
- Pt Received Influenza Vaccine During the Previous Flu Season, Age 18+

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CDC/ACIP Recommendations—Consolidation of 1330 ICD-9 Codes (linked to ICD-10) to 9 Risk Condition Variables



Optum One Risk Condition Variable	At Least 1 PPSV	At Least 1 PCV	Both PPSV and PCV
Immunology	✓	✓	✓
Nephrology/Renal	✓	✓	✓
Oncology	✓	✓	✓
Surgical/Transplant	✓	✓	✓
Chronic Heart Conditions	✓		
Chronic Liver Conditions	✓		
Diabetes Mellitus	✓		
Lifestyle (e.g. Smoking)	✓		
Lung Disease	✓		

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Measure Calculation Definitions



Measure	Denominator	Numerator
Pneumo Age 65+	All patients in study, age 65+ ➤ <i>AI Collaborative total: 334,674</i>	All patients denominator with any evidence of pneumococcal vaccine, from age 65+
Pneumo Age 19-64 High Risk	All patients in study, age 19-64, With any evidence of 1+ HR condition ➤ <i>AI Collaborative total: 441,690</i>	All patients denominator with any evidence of pneumococcal vaccine, from age 19+
Influenza age 18+	All patients in study, age 18+ ➤ <i>AI Collaborative total: 1,266,768</i>	All patients denominator with any evidence of influenza vaccine from 7/1 – 6/30 of a given flu year

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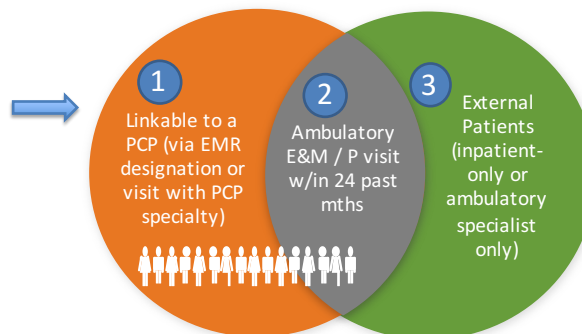
Measure Definitions

Inclusion Criteria: Patients who meet both of the following:

1. Be linkable to a PCP via one of the following:
 - a) Linked to a PCP either via designation in EMR, OR
 - b) Seen by a PCP-eligible provider (FM, IM, GP, NP, PA) in the trailing 24 months, AND
2. Have had at least one ambulatory evaluation and management, and/or procedure claim during the last 24 months

Inclusion Criteria:
Patients that meet criteria 1 and 2

Exclusion Criteria:
Patients with relevant allergies (i.e. Egg)



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Goals



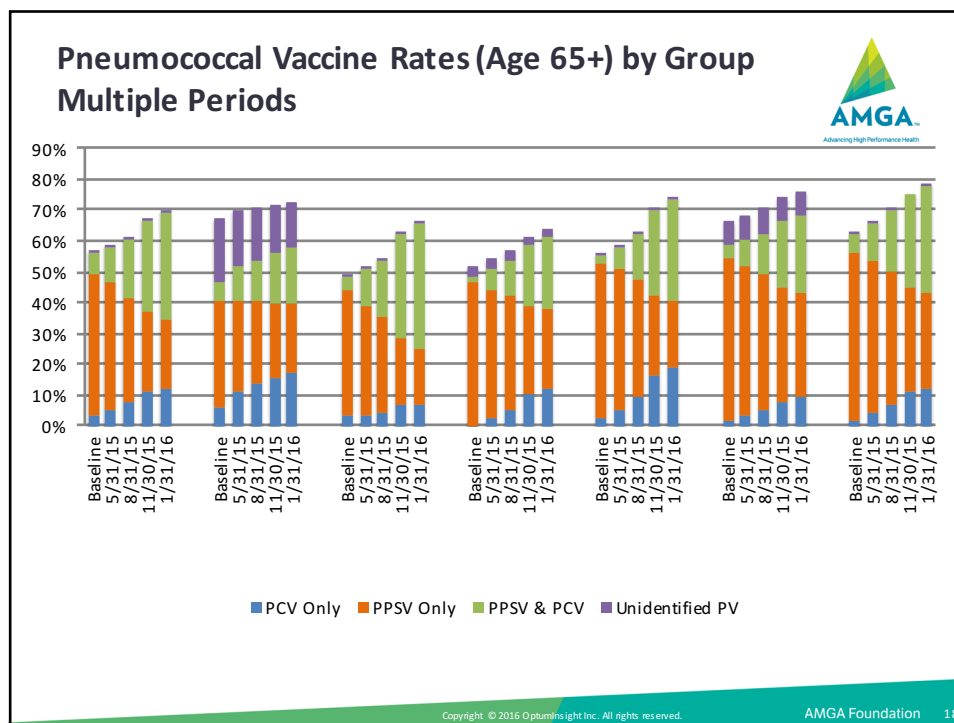
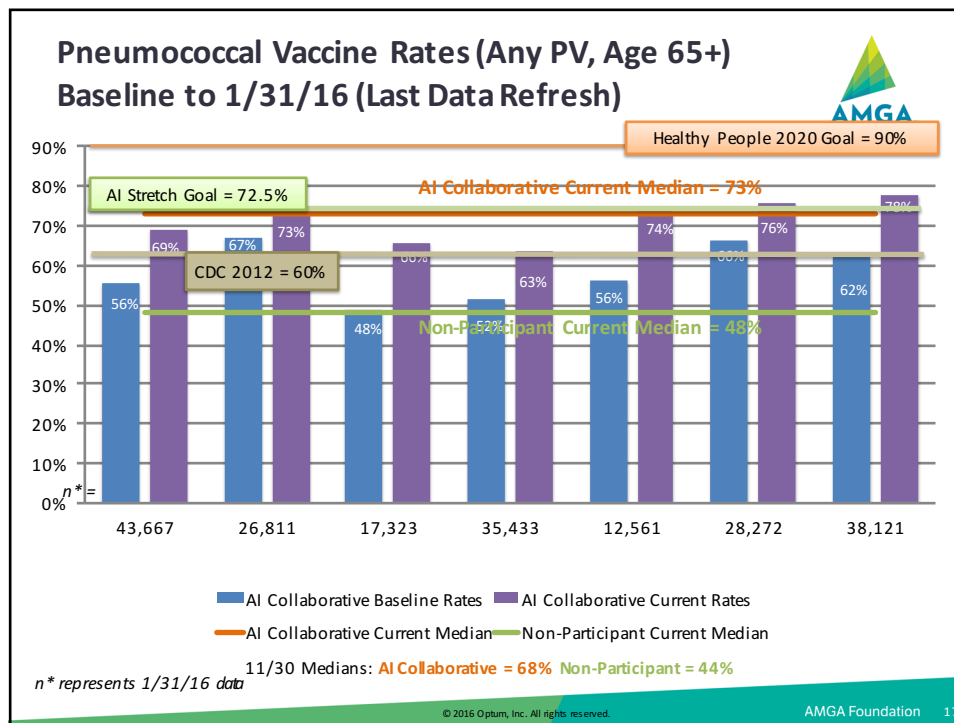
- **Healthy People 2020**
- **AI Collaborative “Stretch”**
- **CDC NHIS 2012**

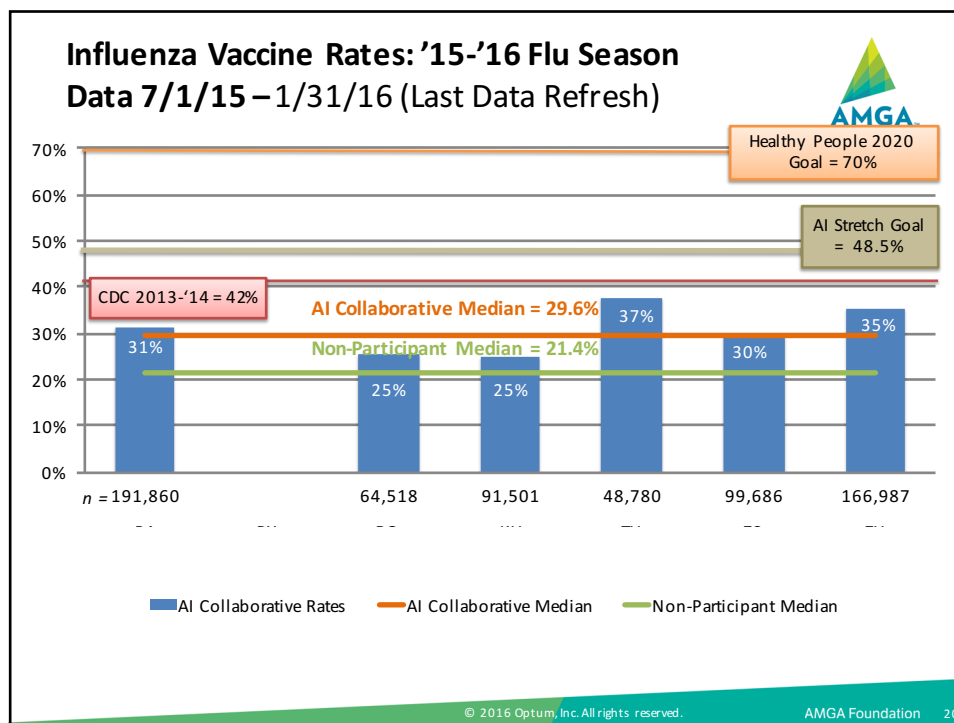
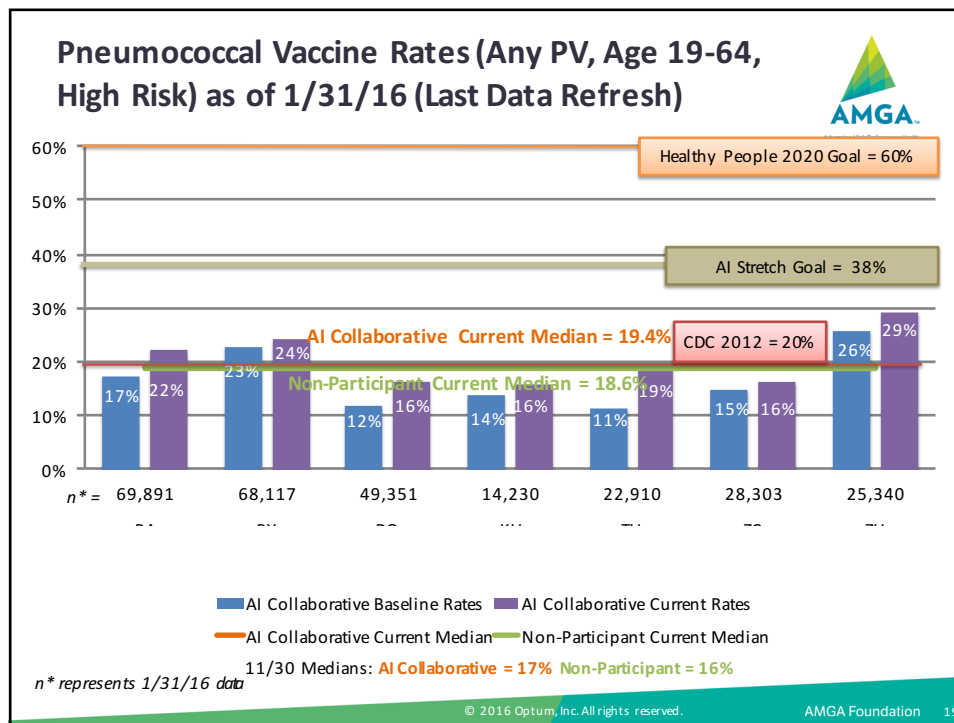
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RESULTS

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Change from Baseline (%) 1/31/16 (Last Data Refresh)



65 and Older			19-64 (Risk Groups Combined)		
Pneumococcal Vaccine Profile	AI Collaborative	Non-Participants	Pneumococcal Vaccine Profile	AI Collaborative	Non-Participants
Any Pneumococcal	12.9	8.2	Any Pneumococcal	3.8	1.5%
PCV	37.3	26	PPSV	2.8	1.6
Pneumo Naïve (PCV)	28	11	PCV	3.5	2.4
Both PPSV/PCV	25	13	Pneumo Naïve (PCV)	2.0	1.4
			Both PPSV/PCV	1.9	1.4

During the 2015-16 Flu Season to date: AI Collaborative Influenza Vaccine rate **24.4%** vs. Non-Participant Influenza Vaccine rate **18.9%**

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Speed Bumps



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Speed Bumps



- Skin Cancer
- Chronic Liver Disease/Fatty Liver
- Smoking (Lifestyle)
- Alcoholism (limits legally in mining this data)

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Next Steps with Analytics



- Risk Stacking (Pelton, et.al., Open Forum Infect Dis (Winter 2015) 2 (1):doi: 10.1093/ofid/ofv020) <http://ofid.oxfordjournals.org/content/2/1/ofv020.full>
- Next Vaccine Due Date
- Improved efficiency in providing reports to providers, office managers
- State Registry Data, Pharmacy Data
- Invasive Pneumococcal Disease Rates

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