



Advancing High Performance Health

AMGA Foundation

Adult Immunization (AI)
Best Practices Learning
Collaborative, Group 3:
Case Study

*Intermountain
Healthcare
Salt Lake City, UT*



Organizational Profile

Based in Utah, Intermountain Healthcare is an integrated healthcare system of not-for-profit hospitals, clinics, physicians (employed and affiliated), health services, and health insurance plans. Intermountain provides services to populations ranging from urban to frontier communities throughout the state of Utah and southern Idaho. It was founded in 1975 when The Church of Jesus Christ of Latter-day Saints donated its 15-hospital system to the community under Intermountain Healthcare's management.

The system includes 22 hospitals, 2,683 licensed beds, ~185 freestanding clinics (including 78 primary care sites), 40 urgent care sites, 16 occupational health clinics, 26 retail pharmacies, and approximately 39,000 employees. It provides Connect Care, TeleHealth services, and an electronic patient portal as part of its ehealth strategies to patients. Its health insurance arm, SelectHealth, serves 870,000 members in Utah and Idaho.

There are 1,367 employed physicians in the Intermountain Medical Group (established in 1994), including 367 primary care physicians in addition to another 461 advanced practice clinicians. Intermountain also works with ~5,000 affiliated physicians not directly employed by the organization. The study population consisted of patients served by the Intermountain Medical Group, which hosts 3.1 million clinic visits annually. Of the services provided by the medical group in the first half of 2017, 61% were to unique primary care patients, 5% to unique secondary care patients, and 33% to unique urgent care patients.

The organization has long been recognized nationally and internationally as a leader in demonstrating that excellent clinical quality leads to lower costs.

Executive Summary

Intermountain Healthcare focused on increasing the immunization rate of Intermountain Medical Group adult patients and increasing the influenza vaccine Star measure rate for the SelectHealth population. To do so, initiatives were developed targeting immunization education and engagement, information technology, and vaccine access.

Among the most significant actions taken by the system were those affecting patient reminder protocols and IT clinical support. Intermountain Healthcare created electronic

Acronym Legend

AI Collaborative: AMGA's Adult Immunization Best Practices Collaborative

CDC: Centers for Disease Control and Prevention

EMR: Electronic Medical Record

HP2020: Healthy People 2020

PCV13: Pneumococcal Conjugate Vaccine

PPSV23: Pneumococcal Polysaccharide Vaccine

USIIS: Utah State Immunization Information System

reminders through its patient portal for adult patients of Intermountain Medical Group clinics who were not up to date with recommended influenza and pneumococcal vaccines. The intervention population was identified using the EMR provider alert system to specify which patients needed the services. Immunization records in the EMR were verified for accuracy by querying the state immunization registry. At the outset of the AMGA Adult Immunization Best Practices Collaborative (AI Collaborative), EMR alerts were already built for influenza vaccine (all adults) and for pneumococcal vaccines for patients age 65 years and older. Using OPTUM ICD10 codes, SNOMED codes, and Rx codes, the Intermountain team built three EMR provider alerts for high-risk patients needing pneumococcal vaccines: a pneumococcal conjugate vaccine (PCV13) alert, a pneumococcal polysaccharide vaccine (PPSV23) dose 1 alert, and a PPSV23 dose 2 alert. Functionality allowing patients to respond to the reminder through the portal was created. Clinics increased access to vaccine services by streamlining registration and EMR workflows to allow for walk-in vaccine visits.

Influenza vaccination rates for patients 19 years and older had an absolute increase of 10.4% from the first year to the second year of the project (39.5% to 49.9%), resulting in an influenza vaccine Star measure increase from two to three stars. Pneumococcal vaccination rates also steadily increased through the time of the AI Collaborative with 28.4% of patients age 65 years seen during the first quarter of the Collaborative having received both PCV13 and PPSV23 vaccines and 43.8% of patients age 65 years and older seen in the corresponding quarter one year later having receiving both pneumococcal vaccines.

Program Goals and Measures of Success

AI Collaborative Goals

Collaborative goals were set for the AI Collaborative (Groups 2 and 3 participants). The collaborative goals were set based on reviewing the Healthy People 2020 goals from the federal office of Disease Prevention and Health Promotion (HP2020)¹, baseline data for each group, and with input from the AI Collaborative advisors (see Appendix).

Intermountain Goals

Intermountain Healthcare's goals for the AI Collaborative focused on increasing the immunization rate of Intermountain Medical Group adult patients and increasing the influenza vaccine Star measure rate for the SelectHealth population. To achieve this, process goals were developed in the areas of patient reminders, provider point-of-care alerts, and increased access to vaccine services in clinics.

Electronic patient reminders were to be developed to inform Intermountain Medical Group patients of needed services such as influenza and pneumococcal vaccines through a patient portal (MyHealth). Success would be determined by identifying how many patients would access such a message in their portal account, creating a channel where patients could inform their providers of services completed in a bidirectional manner through the portal, and then measuring how many patients received the service that was recommended by the message.

The EMR alert function reminded providers at the point-of-care of the need to provide influenza vaccines to adults from October through March each year, and to remind providers that patients age 65 years and older need a PCV13 and PPSV23 vaccine. Additionally, a goal for the AI Collaborative was to develop an EMR alert for pneumococcal vaccines needed by high-risk adults age 19 to 64 years.

Intermountain Medical Group clinics were also given the goal to improve access to vaccination services for adults in their clinics.

Data Documentation and Standardization

Intermountain Healthcare used Optum One to monitor and report their selected measures. Optum One creates variables using underlying data from a variety of data sources including Rx tables, Rx history/patient reports, immunization tables, CPT/G codes, Health Maintenance tables, and ICD codes. Custom denominator lists were created by the Optum Analytics data team and uploaded into the application for each reporting period. These lists, along with reporting templates in the Optum One application, were used to retrieve data needed for AMGA reporting for Intermountain Healthcare interventions.

Intermountain Healthcare's EMR also identifies patients with high-risk diagnoses using SNOMED codes. Those codes were added when identifying the pneumococcal high-risk patient group targeted for the intervention. ICD codes of conditions where the condition is not immunocompromising but the medications used to treat the condition can be removed, and the pharmacy (Rx) codes for immunomodulating medications were added to identify pneumococcal high-risk patients. ICD codes indicating that conditions were in remission were also removed.

Population Identification

The target population was identified through three sources:

- First, patients ages 19 years and older (for influenza) and 65 years and older (for pneumococcal) who have an electronic portal account were identified.
- Second, providers are alerted in the EMR concerning patients who need a preventive service (in this case, an influenza vaccine or a pneumococcal vaccine). Those alerts are called "Advisories." Only those patients with an influenza or pneumococcal vaccine EMR advisory and a portal account were targeted.
- Third, in order to validate the accuracy of the advisory group still needing the reminder, the cohort was cross-matched to those who had the vaccine recorded in Utah's state immunization registry, which filtered out those who had a record of receiving a vaccine but documentation of the vaccine was not present in the EMR.

At the beginning of the AI Collaborative, there was no advisory in the EMR for high-risk patients aged 19-64 years. The advisory has now been created using Optum codes, SNOMED codes, and Rx codes to identify those patients who would be at high risk. The portal reminder message for that cohort is currently in the process of being designed.

Intervention

Interventions at Intermountain Medical Group included patient reminders and education powered by information technology, clinical support logic through the EMR to advise providers of needed immunizations for point-of-service care, and provider and staff education about the process of working with patients through portal communication and finding ways to improve accessibility to immunization services at clinic sites.

Patient Education and Information Technology

Prior to the AI Collaborative, in October of 2016, a general message was sent to patients through the MyHealth patient portal informing them to receive an influenza vaccine. The patient list was generated by the state vaccine registry. In September 2017, the first influenza message was sent through the MyHealth portal, which had data fields allowing patients to indicate if they already received a vaccine, the date of their vaccine, and which provider they would like that information to be directed to. This was the first message that used an advisory function to create the pool of patients receiving the communication. Clinics where the replies were directed inputted the data into their patient's vaccine records in the EMR. A central team entered the data of those generic records into the EMR where no provider was identified.

The first message was sent to Utah- and Idaho-based adult patients of the Intermountain Medical Group and of affiliated providers (n=344,729). Subsequent messages were only sent to patients residing in Utah. The first message was opened by 108,610 (31.5%) patients. Of those that opened the message, 9,853 (9.1%) replied that they had already received a vaccine that season.

In November 2017, a second influenza reminder was sent to those Intermountain Medical Group patients who had not yet received an influenza vaccine (n=97,820). It was opened by 29,768 (30.4%) patients.

In May 2018, a pneumococcal vaccine reminder was sent to Intermountain Medical Group patients aged 65+ years residing

in Utah who had an advisory that they were missing either the PPSV23, the PCV13, or both (n=20,426). It was opened by 4,522 (22%) patients.

In October 2018, influenza vaccine reminders were sent to adult Intermountain Medical Group patients residing in Utah who had an advisory that they had not yet received an influenza vaccine that season (n=139,758). It was opened by 28,692 patients.

In November 2018, a second influenza vaccine reminder was sent to those adult Intermountain Medical Group patients residing in Utah who continued to have an advisory that they had not yet received an influenza vaccine (n=76,861). As of this report, 1,400 (18%) have opened the message.

For each message cohort, patient records that revealed the need for a vaccine through the provider advisory function were also filtered by the Utah State Immunization Information System (USIIS) registry, identifying those who had a record of the vaccine that was not present in the patient's EMR record.

Clinical Support

Patient advisories were created and implemented within the EMR. The patient advisories component in the iCentra EMR is used to document receipt of or need for preventive care. Advisories remind providers to order/document appropriate preventive care services and also provide decision support to promote quality and safety initiatives. Advisories prior to the AI Collaborative included influenza vaccine for adults, Pevnar13 for patients >65 years, and Pneumovax for patients >65 years. The pneumococcal advisory for high-risk patients aged 19-64 years was developed during the AI Collaborative. Providers are advised of patients who need a Pevnar 13, a first dose of Pneumovax 23, or a second dose of Pneumovax 23.

Provider and Staff Education

Training was provided for clinical teams through the Primary Care Clinical Program Guidance Council on the new flow process leveraging information technology via the patient portal and through advisories within the EMR (see Appendix). Providers were also educated at regional Clinical Learning Days about the need to increase access to vaccines at the clinic level. The same educational initiative was presented to clinic staff at Immunization Summits. Additionally, a new process for influenza vaccine patient registration and documentation was developed, programmed in the EMR, and distributed to staff.

Outcomes and Results

GOAL	BASELINE	OUTCOME
Increase rate of Intermountain Medical Group adult receiving recommended immunizations:		
Measure 1 any Pneumococcal vaccine age 65+ (AMGA goal: 90%)	67.6%	Q5, 76.2%
Measure 1 both PPSV and PCV vaccines age 65+(AMGA goal: 60%)	27.0%	Q5, 43.8%
Measure 2 pneumococcal vaccine age 19-64 High-risk (AMGA goal: 45%)	27.6%	Q5, 31.7%
Measure 3 Influenza vaccine age 19+ (AMGA goal 45%)	39.5%	Annual, 49.9%
Increase influenza vaccine Stars measure rate for the SelectHealth population	2017 – 2 Stars	2018 – 3 Stars
Develop an electronic method to inform Medical Group patients of needed services	One previous influenza reminder had been sent to portal patients in 2016 but did not use the advisory function to identify the target population	Messages to patients: Flu Message #1 2017 – 344,729 messages 2018 – 139,758 messages Flu Reminder #2 2017 – 97,820 messages 2018 – 76,861 messages Pneumococcal 65+ 2018 – 20,246 messages
Identify how many patients accessed the portal message	None	Of the 344,729 influenza vaccine message #1 sent in 2017, 108,610 (31.5%) were opened
Create a channel where patients can inform providers of services completed in bidirectional manner through the MyHealth patient portal	None	Of the 108,610 influenza vaccine messages sent in 2017, 9,853 (9.1%) replied saying they had already received the vaccine. Of those replies, 4,126 (42%) were connected to a specific provider, and 5,727 (58%) went to a generic reply pool
Measure how many patients received recommended service		Vaccination rate of the entire population was able to be determined, but the team was not able to identify the rate of those who had opened the portal message compared to those who did not
Increase access to vaccine visits at Intermountain Medical Group clinics		<ul style="list-style-type: none"> • Clinical Learning Days lectures to physicians • Immunization Summit presentations to clinic staff • Visits to family practice clinics to request workflow changes to facilitate access • Development of abbreviated influenza vaccine process for registering patient and documenting vaccines in EMR

Lessons Learned and Ongoing Activities

Lessons learned from the AI Collaborative include:

- In order to do population reminders driven by EMR alerts, real-time, accurate clinical data must reside in the EMR record. The most accurate repository of immunization administration data by any provider resides in the state immunization registry; so, a daily feed of data from the state immunization registry needs to be obtained by the EMR for all Intermountain Health patients in order to keep the EMR immunization record up to date and allow for automated portal reminders for a large population of patients.
- When sending a message through the electronic patient portal, send it early in the week and resource the help line sufficiently with staff in order to ensure that patients who wish to log on to the portal and see the message have help with that process, since many patients may not have accessed their portal accounts since they signed up for the service.
- When sending a message through the patient portal, create an appropriate heading to the e-mail sending patients to the portal in order to open and read their message. The email message cannot divulge any protected health information in an unsecured format and must therefore be general in nature. Informing patients that they had a message from their provider alarmed some who thought the message could be serious in nature. Intermountain Health found that an appropriate message that balanced these two concerns was to indicate in the e-mail that the patient had a “preventive care” message from their provider in the portal.
- When allowing patients to reply to the reminder through the portal with data that needed to be entered into the patient’s EMR record, too much staff time was needed to field the messages and enter the data. The process of entering the data into the EMR needs to be automated.
- The EMR patient registration process is time intensive and cumbersome and needed to be streamlined for a walk-in vaccine visit.
- Quality measures can have unintended consequences on access to services. Because providers are rated on consistently providing services such as falls prevention, depression screening, and blood pressure management to their assigned patients, they do not want walk-in vaccine visit patients to be assigned to them and have limited providing vaccines to established patients only. Processes needed to be developed to allow for a walk-in vaccine visit only patient not to be assigned to a provider.
- In order to identify patients at high risk for pneumococcal vaccine, the EMR system uses more than just ICD10 codes, and Intermountain Health needed to find the appropriate SNOMED codes as well. Intermountain Health was assisted in this by another participant of the AI Collaborative who had the same concern. It was also found that some of the ICD10 codes provided were for conditions that in and of themselves do not create compromised immunity, but the patient’s immunocompromised status is caused by medications that may or may not be used to treat that condition. Those diagnoses were removed and Intermountain Health instead added pharmacy (Rx) codes to identify those patients on immune modulating medications.

Next steps for Intermountain Healthcare include working with the EMR vendor to program a daily interface of immunization data for the entire patient population from the state immunization registry to the EMR system; sending out the portal reminder message to pneumococcal high-risk adults; investigating ways to automate the portal process; examining ways to automate the data input of patient portal responses; and creating EMR-supported workflows for patient walk-in vaccine visits.

References

1. Office of Disease Prevention and Health Promotion (ODPHP). Healthy People 2020. [healthypeople.gov](https://www.healthypeople.gov).

Collaborative Goals

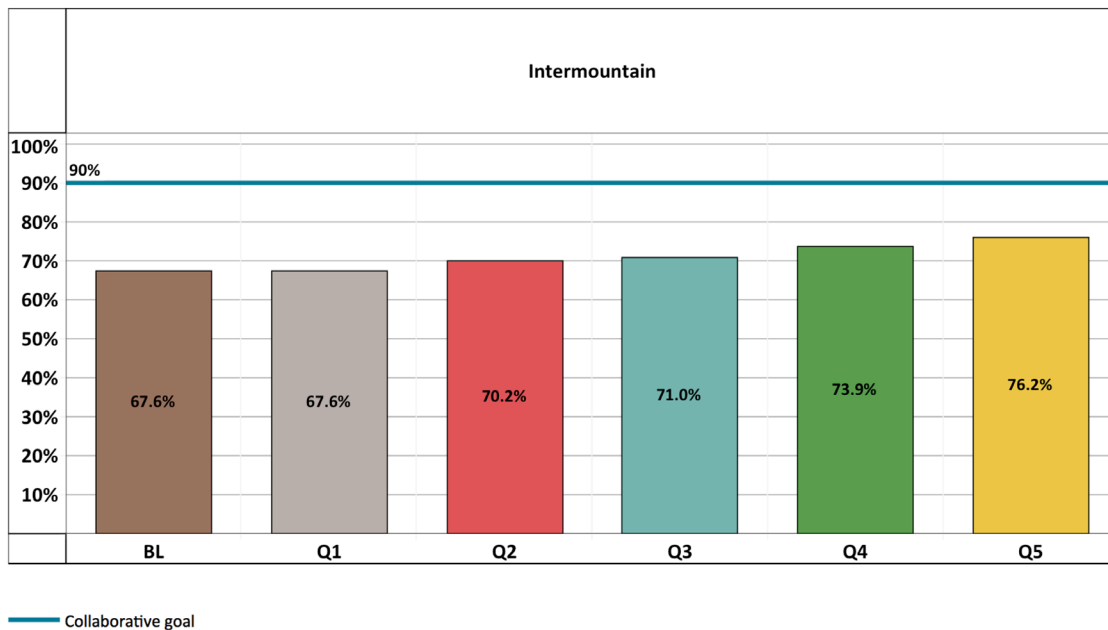
Measure	Healthy People 2020	Collaborative Goal
Measure 1 (65+) Any	90%	90%
Measure 1 (65+) Both PPSV and PCV*	90%	60%
Measure 2 (High-Risk)	60%	45%
Optional Measure 2a (At-Risk)**		
Measure 3 (Flu)	70%/90%***	45%

* Increasing “Both” is a good goal for Groups which are already doing well on “Any”

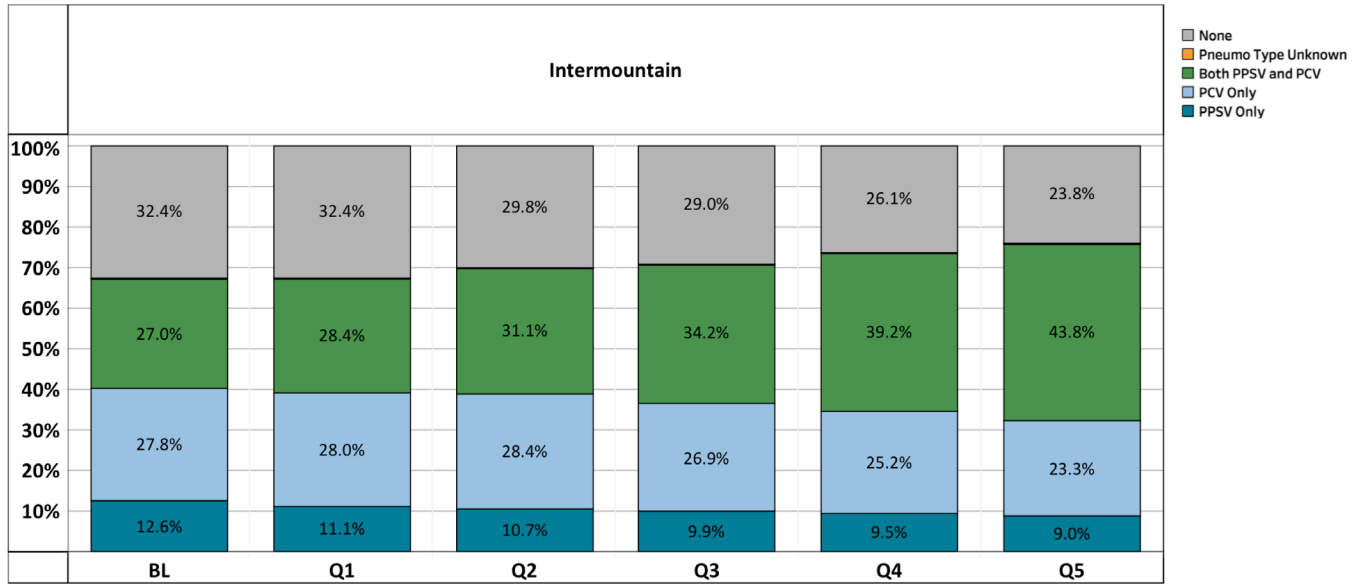
** According to CDC guidelines, it is not currently recommended that the at-risk population receive PCV. Therefore, “PPSV” or “Unknown pneumococcal vaccination” are numerator options for Measure 2a.

*** 70% for all patients, 90% for Medicare patients

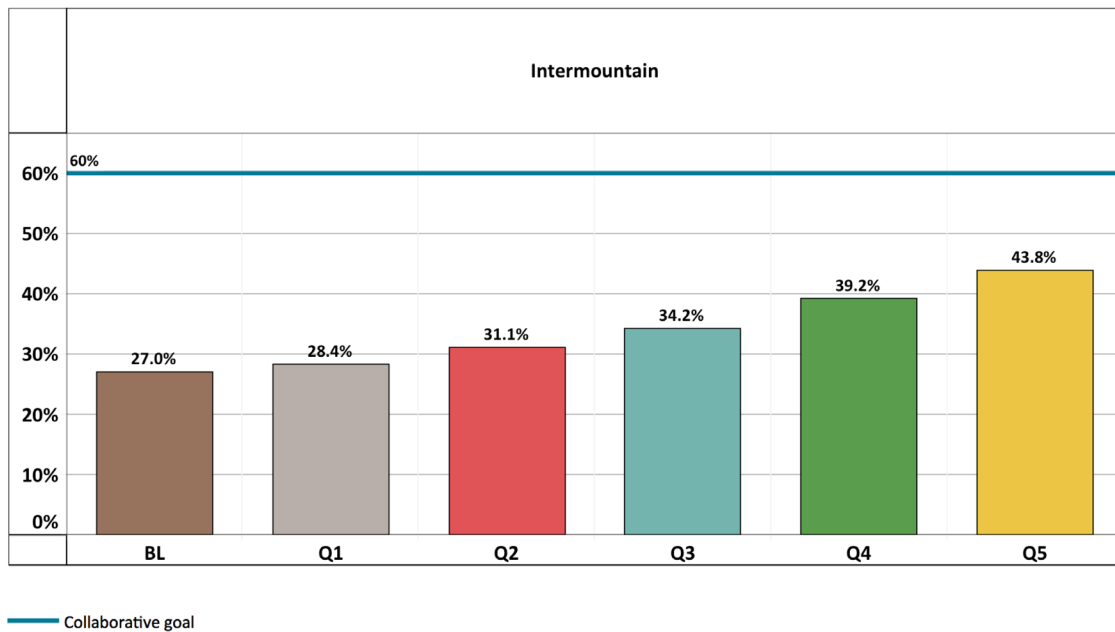
Measure 1 – Pneumococcal (Any) Immunization for Adults Ages ≥ 65



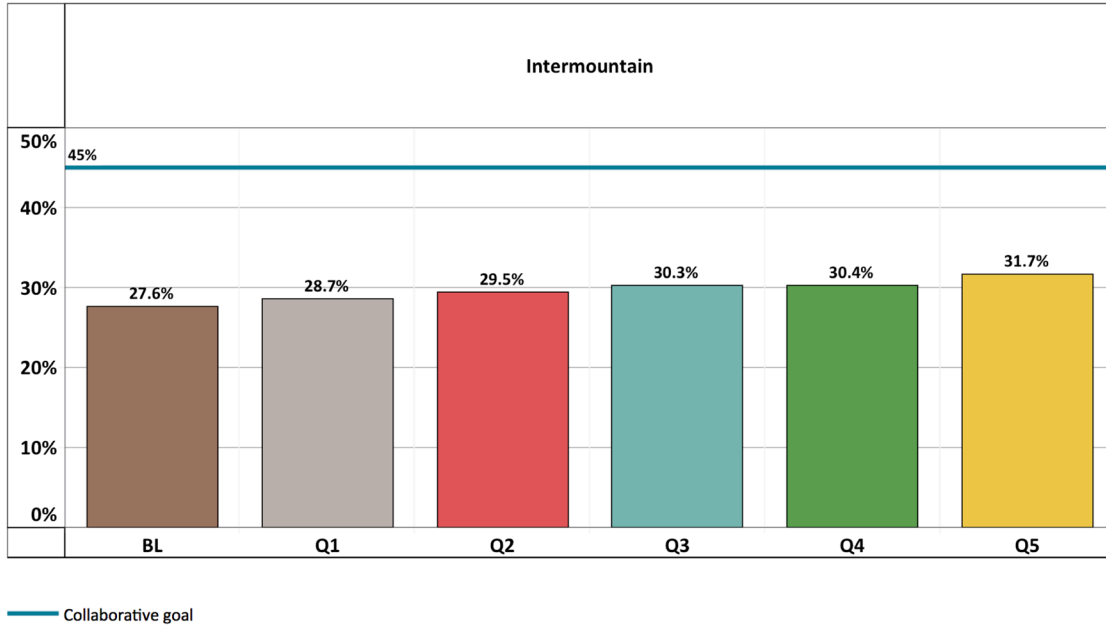
Measure 1 – Pneumococcal (Any) Immunization for Adults Ages ≥ 65



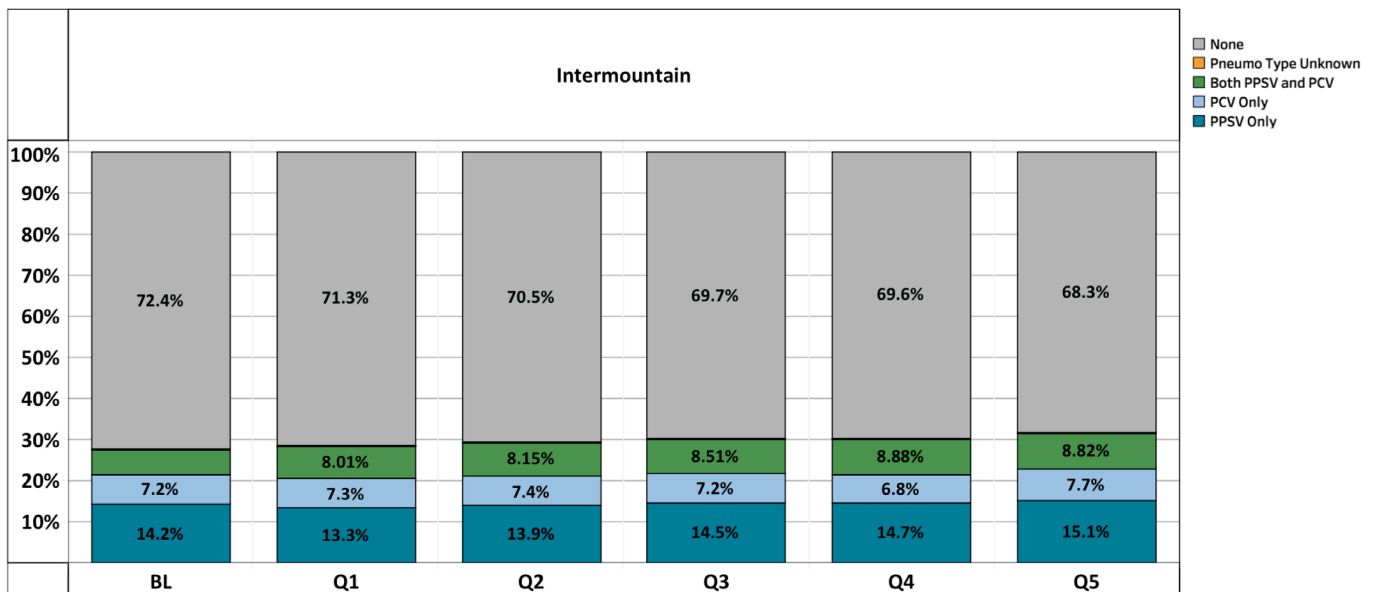
Measure 1 – Both PPSV and PCV Immunization for Adults Ages ≥ 65



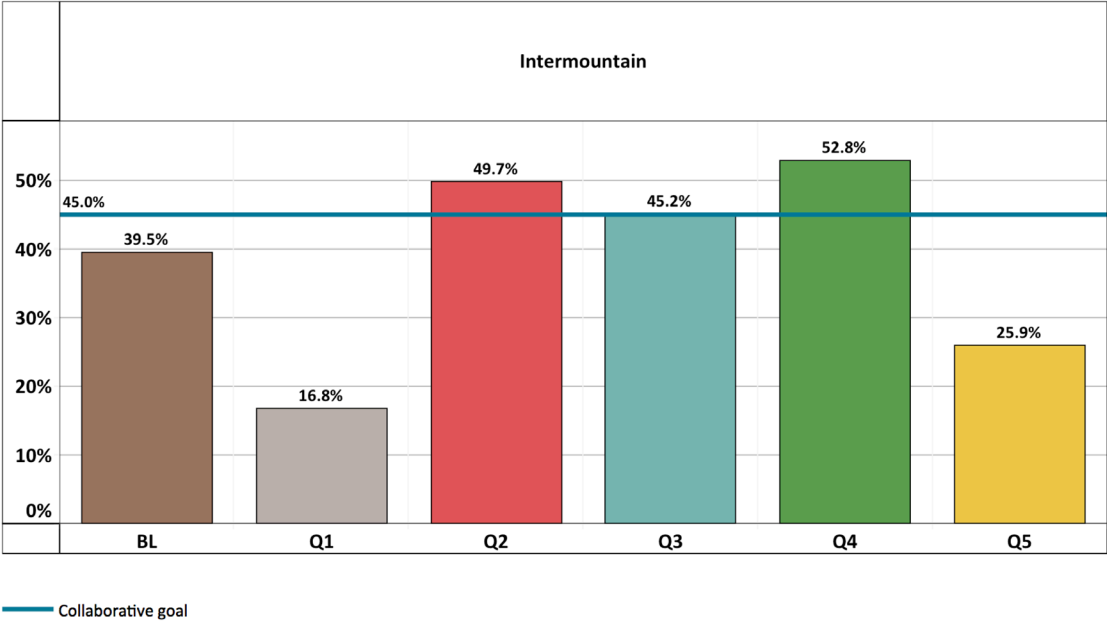
Measure 2 – Pneumococcal (Any) Immunization for Adults Ages 19–64 with High-Risk Conditions



Measure 2 – Pneumococcal (Any) Immunization for Adults Ages 19–64 with High-Risk Conditions



Measure 3 – Influenza Immunization, Age ≥ 18

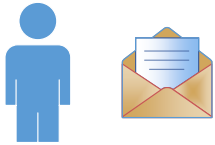


Immunization Portal Process



IMMUNIZATION PORTAL PROCESS

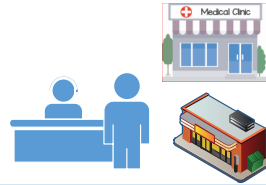
MID SEPTEMBER



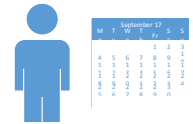
Patient receives email, indicating they have a message in the Portal.



Patient goes into Portal, and views message from provider. Message will indicate patient is due for influenza vaccine.



Message will indicate patient can make appointment with their provider, go to a community pharmacy, or health department.

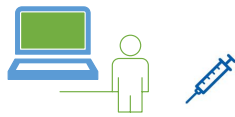


Patient is asked to confirm if already received a vaccine and provide date received, and choose preferred provider and submit to that message pool.



MA or PSR of Patient's Provider receives message with date immunization received. Staff opens an iCentra "Clinic" visit or "Clinical Support" visit (CSWIV).

Do not use historical FIN



Staff verifies whether vaccination data is in Immunization Schedule. If not, staff clicks on "Registry Import" to see if record of immunization is in USIIS.

If record is in USIIS, staff downloads immunization from USIIS into patient chart.

If record of immunization is NOT in USIIS, then staff records vaccine under Historical Immunization record in iCentra.

Advisory is satisfied.

MID NOVEMBER

For patients that did not receive an influenza vaccine, a second invite with a similar message will be sent to the Portal. The process will remain the same.

IMPACT TO CLINICS – ASSUMPTIONS
500,000 adult patients who have Primary Care Provider in MG, have a Portal account.

Based on history, only 5% of messages sent are opened by patients. With 25,000 patients, stretched between 85 Primary Care Clinics (PCCs), we are estimating an average 300 patients per clinic.



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AMGA's Distinguished Data and
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