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Improving Health Outcomes for Children (IHOC) First STEPS Phase I Initiative: Improving Immunizations for Children and Adolescents

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Improving Health Outcomes for Children (IHOC)

First STEPS Phase I Initiative:

Improving Immunizations for Children and Adolescents

Final Evaluation Report

UNIVERSITY OF SOUTHERN MAINE
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About this Study

This report was written by Kimberley Fox and Carolyn Gray at the Cutler Institute of Health and Social Policy, Muskie School of Public Service at the University of Southern Maine. This is the final report of a series produced to inform the Phase I Improving Immunizations for Children and Adolescents learning initiative as it was being implemented. Previous reports summarized participant satisfaction with learning sessions and interim outcomes at six months. This final report assesses immunization rates in participating practices a full year after the initiative began and at 15 months. It also summarizes lessons learned in implementing changes in practices and challenges in using CHIPRA and IHOC immunization measures at the practice-level to inform quality improvement.

We would like to thank the following individuals and practices for their time and effort to make this evaluation and final report possible. In particular, we would like to thank Dr. Amy Belisle, Director of Quality Counts for Kids, and Sue Butts-Dion, Program Manager for First STEPS, for their support of the evaluation as an integral part of the learning sessions and assistance in collecting office system survey data from practices. We also thank our colleagues at the Muskie School of Public Service, Stuart Bratesman and Catherine Gunn who provided data collection support and monthly reports of immunization measures to practices as well as assisting the evaluation team in aggregate data analysis and interpretation of the data. We also would like to thank Sherrie Winton for leading data collection activities for Phase I and writing interim evaluation reports, Kyra Chamberlain for her insight into policy implications and coordination with stakeholders, and Pamela Ford-Taylor for providing administrative support. Finally, we want to thank the 24 practices that participated in First STEPS, who gave their time and effort to make this evaluation possible.

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The views expressed are those of the authors and do not necessarily represent the views of either the Department or the School. For further information regarding this report, or the broader evaluation of the local IHOC initiative, please contact Kim Fox at kfox@usm.maine.edu.

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Executive Summary

In February 2010, Maine and Vermont were awarded a five-year demonstration grant from the Centers for Medicare and Medicaid Services (CMS) to improve the quality of health care for children insured by Medicaid and the Children's Health Insurance Program (CHIP).[1] Maine's Department of Health and Human Services' (DHHS) Office of MaineCare Services (OMS) received the Improving Health Outcomes for Children (IHOC) grant in partnership with the Maine Center for Disease Control, the Muskie School of Public Service at the University of Southern Maine (MSPS), Vermont's Medicaid Program, and the University of Vermont. In Maine, IHOC brings together public and private health stakeholders to standardize the delivery of preventive and follow up care for children and to meet quality improvement goals of the Office of MaineCare Services.

Through IHOC, Maine Quality Counts is leading the First STEPS (Strengthening Together Early Prevention Services) Learning Initiative to support Maine's primary care practices in improving preventive and screening processes for children and building medical homes. The First STEPS Learning Initiative is being implemented in phases. The first phase focused on improving immunizations and began in September of 2011 and ended in April 2012. Twenty-four pediatric and family practices that serve a high volume of children insured by MaineCare agreed to participate. As part of the initiative, IHOC identified specific immunization measures to be improved.[2] Maine Quality Counts offered monthly coaching calls, two all-day learning sessions, and tools for practices to track their immunization rates and report on change efforts such as the Plan-Do-Study-Act (PDSA) cycles. The goal of Phase I was to improve immunization rates in participating practices by at least 4 percentage points within one year of project initiation by implementing changes in office procedures advocated by the American Academy of Pediatrics' Bright Futures curriculum.

This final report assesses the percentage point change in immunization rates in participating practices a full year after the initiative began and at 15 months. It also summarizes lessons learned in implementing changes in practices and challenges in using CHIPRA and IHOC immunization measures at the practice-level to inform quality improvement. Key findings include:

Increases in overall immunization rates exceeded target goal

First STEPS exceeded its target goal of raising overall immunization rates by at least 4 percentage points after twelve months in the 21 practices that reported data in the state's immunization registry (known as ImmPact) *and* participating practices continued to improve their rates over time.

- Twelve months after the beginning of learning initiative (**Sept 2012**), overall immunization rates in participating practices **increased 5.1 percentage points** (+5.1%) from baseline.

1 CHIPRA quality demonstration grants are authorized by Section 401(d) of the Child Health Insurance Program Reauthorization Act (CHIPRA).

2 Immunization measures tracked at the practice-level were drawn from ME IHOC's measures list that includes CHIPRA Initial Core Set of Children's Health Care Quality individual and combination immunization measures for 2 and 13 year olds (#5, #6) as well as Human Papillomavirus (girls only) for 13 year olds and individual vaccine and one combination measure for 6 year olds.

- Fifteen months after the beginning of the learning initiative (**Dec 2012**), overall immunization rates in participating practices **increased 7.1 percentage points** (+7.1%) from baseline.

Nearly all participating practices increased overall immunization rates in their practice

- Eighteen (86%) out of 21 practices participating in First STEPS Phase I and reporting data in ImmPact increased overall immunization rates after 12 months (Sept 2012).
- More than half of participating practices (11 practices or 52%) increased their overall immunization rates by 4 percentage points or more after one year.
- Rates of improvement from baseline within participating practices ranged from 0.2 to 21 percentage points improvement.

Individual vaccine rates increased in First STEPS practices for all but one measured vaccine

While nearly all rates increased, increases were statistically significant for two combination rates and four individual vaccines including:

- Overall Up To Date status for 2 year olds (+11.3%) and 13 year olds (+14.9%);
- Hepatitis A vaccine rate for 2 year olds (+11.6%);
- Measles, mumps, and rubella (MMR) vaccine rate for 6 year olds (+5.5%);
- Tetanus and diphtheria (TD) vaccine rate for 13 year olds (+13.5%); and
- Meningococcal vaccine rate for 13 year olds (+14.9%).

Practices reported increased use of several recommended immunization-related office procedures after First STEPS participation

Practices increased the frequency of using 22 out of 31 recommended immunization-related office procedures after their First STEPS participation. These changes were statistically significant for:

- Training staff in how to discuss importance of vaccinations with hesitant patients/parents;
- Using recall and reminder systems for children due or past due for vaccinations;
- Routinely reviewing practice vaccination rates;
- Reviewing and updating dose data in the state immunization registry; and
- Reviewing data in the state immunization registry to identify vaccinations received at alternate sites.

Some changes were found to be particularly effective for improving immunization rates

Based on interviews with participating practices, the changes that were the most effective in raising immunization rates in their practices included:

- Using new or more consistent procedures for updating and reviewing records including data reported in the state immunization registry;
- Having data available to track their progress monthly;
- Sending reminder/recall letters; and
- Standardizing the immunization schedule used by providers throughout the practice.

First STEPS helped identify barriers and facilitate system-related changes to sustain and encourage immunization rate improvement after the learning session.

By convening providers in the First STEPS learning sessions and testing the use of IHOC immunization measures for quality improvement, the initiative found that:

- Producing practice-level reports of IHOC measures through the state immunization registry system was more difficult than expected;
- Introducing immunization quality metrics that differ from those that have historically been used requires extensive education to obtain provider participation and buy-in; and
- To the extent possible, quality measures should be aligned with clinical guidelines to reduce confusion and enhance participation.

First STEPS also contributed to system changes that will help support and encourage practice-level immunization quality improvement efforts going forward. In particular, First STEPS:

- Increased the use of the state immunization registry, improved accuracy of the data reported, and identified changes to make the registry more useful for practice-level improvement; and
- Helped gain support of payers, health systems, and quality organizations to use IHOC measures in pay-for-performance and public reporting efforts in the state.

Introduction

In February 2010, Maine and Vermont were awarded a five-year demonstration grant from the Centers for Medicare and Medicaid Services (CMS) to improve the quality of health care for children insured by Medicaid and the Children's Health Insurance Program (CHIP).[3] Maine's Department of Health and Human Services' (DHHS) Office of MaineCare Services (OMS) received the Improving Health Outcomes for Children (IHOC) grant in partnership with the Maine Center for Disease Control, the Muskie School of Public Service at the University of Southern Maine (MSPS), Vermont's Medicaid Program, and the University of Vermont. In Maine, IHOC brings together public and private health stakeholders to standardize the delivery of preventive and follow up care for children and to meet quality improvement goals of the Office of MaineCare Services.

Through IHOC, Maine Quality Counts is leading the First STEPS (Strengthening Together Early Prevention Services) Learning Initiative to support Maine's primary care practices in improving preventive and screening processes for children and building medical homes. First STEPS provides wide-ranging and in-depth quality improvement, coaching, data monitoring of standardized quality measures and educational support to pediatric and family medicine practices as they continue to enhance health outcomes for children.

The purpose of the First STEPS Learning Initiative is to increase the rate of Early, Periodic, Screening, Diagnosis, and Treatment (EPSDT) services for children receiving MaineCare benefits by providing tools and data monitoring, offering comprehensive educational support, and engaging primary care practices in multiple change interventions to build patient centered medical homes for children. It is expected that improving rates of preventive services and proactively identifying children's unique needs, will result in children and families accessing necessary medical and developmental services earlier, thereby reducing disease. As a result of these positive changes, it is anticipated that health outcomes for children and families in Maine will be improved.

The First STEPS Learning Initiative is being implemented in phases. The first phase focused on improving immunizations and began in September of 2011 and ended in April 2012. Twenty-four pediatric and family practices that serve a high volume of children insured by MaineCare agreed to participate. As part of the initiative, IHOC identified specific immunization measures to be improved,[4] and Maine Quality Counts offered monthly coaching calls, two all-day learning sessions, and tools for practices to track their immunization rates and report on change efforts such as the Plan-Do-Study-Act (PDSA) cycles. The goal of Phase I was to improve immunization rates in participating practices by at least 4 percentage points within one year of project initiation by implementing changes in office systems advocated by the American Academy of Pediatrics' Bright Futures curriculum.[5]

3 CHIPRA quality demonstration grants are authorized by Section 401(d) of the Child Health Insurance Program Reauthorization Act (CHIPRA).

4 Immunization measures tracked at the practice-level were drawn from Maine IHOC's measures list that includes CHIPRA Initial Core Set of Children's Health Care Quality individual and combination immunization measures for 2 and 13 year olds (#5, #6) as well as Human Papillomavirus (girls only) for 13 year olds, four individual vaccines, and one combination measure for 6 year olds.

5 In addition to the overall target improvement rate, Quality Counts also set targeted improvement rates for individual immunizations based on statewide Maine Immunization Survey baseline estimates. Measures estimated to be at or above 80% at baseline were targeted to increase by at least 4 percentage points. Measures below 80% at baseline were targeted to increase by at least 10 percentage points. See Appendix A for a detailed list of targeted rates of improvement for individual immunizations.

In September 2012, an interim report was released on the evaluation findings from the first phase of the First STEPS initiative based on six months of data. This final report analyzes immunization rates in participating practices a full year after the initiative began and after 15 months. It also summarizes lessons learned in implementing practice changes and the benefits and challenges of using CHIPRA and IHOC immunization measures at the practice-level to inform quality improvement. The report includes:

- An analysis of immunization rates a full year and at 15 months after Phase I began, including the influenza vaccine for two year olds, which had been excluded from the interim report since the complete flu season data were not available at that time. We also assess whether changes in rates are statistically significant.
- An analysis of statistically significant changes in practices' immunization-related office procedures before and after participation in the First STEPS learning sessions, based on self-reported pre/post office surveys.[6]
- A summary of qualitative interviews with practices including their experiences with implementing changes in their practice workflow, best practices for raising immunization rates, feedback on participation in the learning collaborative as well as recommendations for other providers and future learning collaboratives.
- A summary of barriers identified and other system changes resulting from the initiative.

Evaluation Methods

Immunization Rates

We analyzed data from ImmPact, Maine's state immunization registry, to measure changes in immunization rates in participating practices before and after participation in the learning sessions from August 2011 to December 2012. Twenty one of the twenty four practices participating in First STEPS Phase I submitted patient-level data through ImmPact for all patients in the target age groups. These data were then extracted from ImmPact and aggregated into monthly reports using the Comprehensive Clinic Assessment Software Application (CoCASA), which is open-source software from the US Centers for Disease Control and Prevention designed to assess immunization rates. For these reports, the CoCASA tool was used to compare the practice's patient-level immunization data for their entire patient population to accepted immunization schedules to determine how many patients over the prior 12 months had been up-to-date on each type of immunization as of their 2nd, 6th, or 13th birthdays. Monthly data reports were shared with each of the practice sites using random, de-identified codes to allow them to compare their own 12 month rolling average rates with average rates for all participating practices and for each of the other practices also reporting in ImmPact.

6 In order to assess statistically significant change over time, the analyses in this final report only include practices that responded to both pre and post surveys (n=16). Results previously reported included all twenty-four practices that had completed at least one survey (16 completing both pre and post, 3 that only responded to the initial survey, and 5 that only responded to the final survey).

The remaining three practices submitted summary-level immunization rates based on a sample of 10 charts from each age group that had reached their birth date in the prior month. Due to differences in the data collection process between chart review and ImmPact and resulting differences in how rates were calculated, the evaluation excludes chart review data from this analysis.

Immunization measures tracked included the CHIPRA Initial Core Set of Children's Health Care Quality individual and combination immunization measures for 2 and 13 year olds (#5, #6) as well as Human Papillomavirus (girls only) for 13 year olds, four individual vaccines, and one combination measure for 6 year olds.

We analyzed rates of change for overall immunizations and each of the 16 individual immunizations and 3 combination rates for three different age groups (2 year olds, 6 year olds, and 13 year olds) from the first month that complete data in ImmPact were available[7] through September 2012. We compared rates of change to targeted rates of improvement set by Maine Quality Counts for the initiative (see Appendix A).

Immunization rates were analyzed to assess if there was a significant change comparing rates before and one year after the learning sessions (August 2011 to September 2012).[8] Rates were analyzed using the paired t-test, using $p<.05$ to determine statistical significance. The analyses accounted for multiple vaccine measures within each age group.

The influenza vaccine is not included in the overall immunization rates due to incomplete reporting by some practices (n=4). Influenza vaccine rate changes are summarized separately in the text for practices that did report.

Data on practice immunization rates are presented by:

1. The average immunization rates in each participating practice for all 16 individual immunization measures combined (excluding combination rates and influenza vaccine) from the starting month that practices reported complete data in ImmPact and after one year (September 2012).
2. The average immunization rate in age-specific composite and individual measures in First STEPS participating practices from the starting month that complete data was reported in ImmPact and after one year.
3. The average percentage point change for each composite and individual measure and for each practice during the study period.

Reported averages are not weighted by the number of patients served per practice. Change is measured by percentage point changes, not relative percent change. Percentage point changes measure the absolute percentage change while percent change measures relative change (e.g. interest rates rising from 5% to 6% would be a 1 percentage point change; but it would be a 20% increase in rates). The initiative's targeted goal was to improve the overall immunization rates in participating practices by 4 percentage points.

7 In the initial months of First STEPS Phase I, several practices had to back-enter immunization records into ImmPact so that their rates reflected all their patients. These initial months of data were excluded from our analysis since they did not accurately represent complete rates.

8 The study period for the influenza vaccination was September 2011 to September 2012.

Immunization-related Office Procedures

We evaluated changes in immunization office procedures before and after First STEPS participation based on *Immunization Office Systems Surveys* completed by participating practices at the beginning and end of the formal Phase I learning sessions. (September 2011, and April 2012). These surveys were completed by practice staff and assessed the frequency that practices were implementing certain office processes and procedures known to be effective in raising immunization rates and improving quality of care, as well as assessing the practices' perceived value or importance of each of these office practices. Survey domains of specific office processes and procedures included:

- Staff Training and Practice Processes
- Reminder/Recall Procedures
- Data and Registry
- At Patient Visit
- Patient Education

The office system survey responses were analyzed for the sixteen practices that had responded to both the pre and post survey. The pre/post responses for each practice were paired and analyzed for significant change using the Wilcoxon signed rank sum test. Significant change was determined using $p<.05$. In total, there were 24 practices that responded to the surveys. Three practices answered only the pre survey, and five surveys answered only the post survey. All analyses and charts are based on the 16 practices that responded to both the pre and post surveys, unless noted otherwise. For practices that reported more than one response, the last most complete survey during the survey time period was used for analysis. Due to rounding, some charts shown in this report do not total 100%.

Best Practices, Lessons Learned, Barriers and System-related Changes

To assess providers' experience and satisfaction with participating in First STEPS Phase I and how participation influenced practice change, we analyzed monthly reports completed by practices and provided to Quality Counts describing their Plan-Do-Study-Act (PDSAs) activities and also conducted semi-structured 20-25 minute interviews conducted with participating practices in June and July of 2012. All First STEPS Phase I practices were invited to participate in these interviews. Ten agreed to participate; 8 completed the interview and 2 cancelled. Semi-structured questions focused on practice changes and improvements made by providers since participating in Phase I, perceived effectiveness of these changes, lessons learned in implementing improvements, recommendations for other practices that try to make similar changes, and the perceived value of and satisfaction with tracking immunization data and participating in First STEPS generally.

Results from interviews and monthly reports were coded and analyzed for recurring concepts, themes, and patterns. Where possible, the evaluation team looked for patterns or differences in interview responses based on the practices' immunization rate improvements.

We gathered data on barriers identified and system-related changes resulting from the initiative based on interviews with the practices, observation of the learning sessions, participation in other IHOC and Maine

Child Health Improvement Partnership (ME CHIP) meetings at which First STEPS was discussed, as well as document review of IHOC program reports.

Evaluation Limitations

The evaluation uses a pre/post design and had no control group to measure factors other than the First STEPS learning sessions that may have contributed to immunization rate improvements. We also relied on self-reported changes in office procedures by the participating practices. The surveys were administered by Maine Quality Counts as part of the initiative which may have biased responses towards demonstrating improvement.

While registry data allowed us to capture changes in immunization rates for all children served by the practice, it also has some limitations. Firstly, the registry data is for all children served and we were not able to assess the effect on children covered by Medicaid and CHIP in particular. In addition, registry data is entered by the practices, and is only as accurate as the data entered and reported. Practices that were not entering immunization data into ImmPact prior to First STEPS needed to become familiar with the system and how to accurately report data. Some practices also needed to enter historical patient data into ImmPact so that their rates would be reflective of the immunization status of their entire patient panel which required a great deal of staff time. Depending on the practices' data entry capacity, there were lags in data completeness during some months. Monthly fluctuations in data suggest that practices had retroactively updated the ImmPact system at varying stages as they worked to make their immunization records current. To correct for these anomalies resulting from data entry lags, we excluded from the analysis incomplete or skewed data in months with large fluctuations in the number of children immunized from the analysis. Thus, baseline periods varied for some practices for one or more of the 16 immunization measures. Specifically, August 2011 baseline rates were used for 14 practices for all 16 measures. For the remaining seven practices, we used the baseline of Oct 2011 (3 practices), Nov 2011 (1 practice), or January 2012 (3 practices) for one or more measures. By using later baseline for some practices our estimates may underestimate the full effect of the initiative.

Data for the rotavirus vaccine should also be interpreted with caution due to limitations identified in how rates were calculated by the CoCASA software, which ultimately required that the first four months of data be excluded from the analysis. In addition, we discovered that a recall of the three-dose rotavirus vaccine series occurred during the measurement period which may have affected the rates for this vaccine. Most participating practices had been using the three-dose RotaTeq vaccine but temporarily switched to using the two-dose Rotarix vaccine as a result of the recall. Some practices remained with the two-dose series while others switched back to the three-dose series once it became available again. A limitation of the CoCASA software is that rates are calculated based on either the two-dose rotavirus series or the three-dose rotavirus series, and cannot accommodate for the use of both types of vaccines within one measurement period. As a result, some of the practices' rates for the Rotavirus vaccine may appear lower than they actually were.

There were other policy changes occurring in Maine that may have influenced immunization rates that we could not control for in this evaluation. Prior to the First STEPS Phase I learning sessions, the Maine Universal Childhood Immunization Program was signed into law in April 2010 (PL 595), and became fully functional in January 2012. This program provides all children from birth through age 19 with universal access to a uniform set of vaccines as they are determined by the Maine Vaccine Board (MVB). The law expanded availability of state supplied vaccines to all children in the state and made more combination vaccines available at no cost. To receive these vaccines for children in their practice, providers are required to use ImmPact for ordering vaccines and reporting doses administered on a per patient or aggregate basis. Before the law became effective, there

was also considerable outreach and education to providers to encourage participation, and the First STEPS Phase I learning sessions also included a session on benefits and requirements of the new law. This evaluation was not able to measure the separate effect of the universal childhood immunization program on increasing immunization rates in the state.

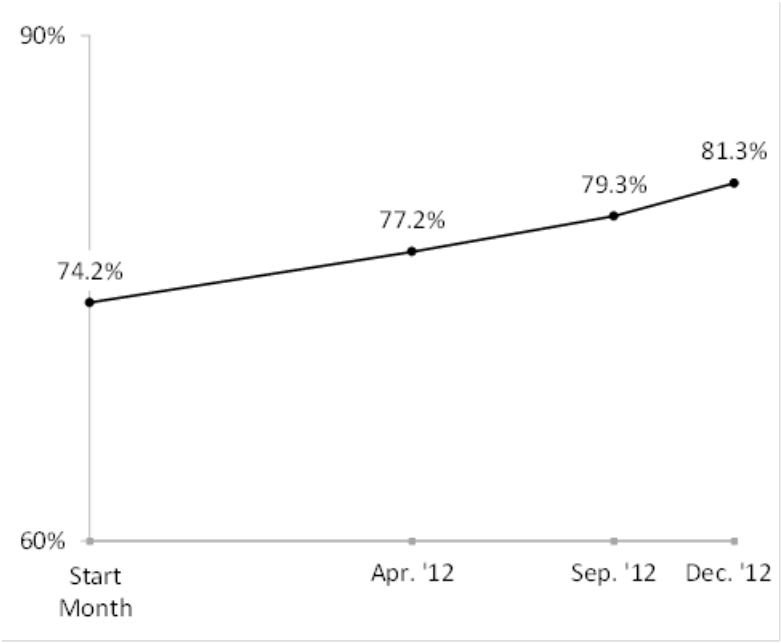
Findings

Changes in Immunization Rates

Average childhood immunization rates increased by 5.1 percentage points in participating practices after a year.

The goal of First STEPS Phase I was to increase overall immunization rates by at least 4 percentage points after one year of project initiation. As shown in Chart 1, the average rate of change for immunizations across all participating practices significantly increased by 5.1 percentage points after a year -- from 74.2% at baseline to 79.3% by September 2012. This overall change in immunization rates was statistically significant and exceeds the First STEPS target goal of improving overall immunization rates by 4 percentage points.

CHART 1: CHANGE IN OVERALL IMMUNIZATION RATES IN FIRST STEPS PHASE I PARTICIPATING PRACTICES FROM THE STARTING MONTH TO DECEMBER 2012.



Immunization rates continue to improve after 15 months, 7.1 percentage points higher than baseline.

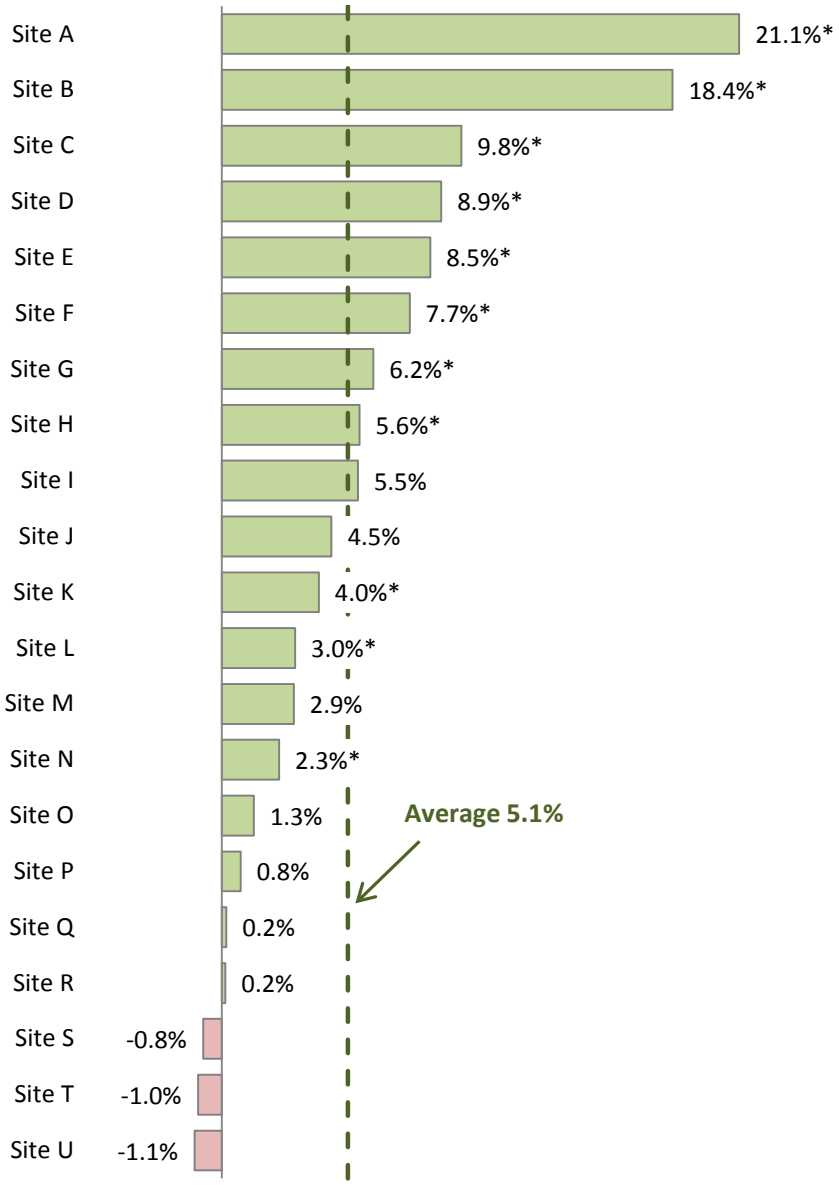
In addition to analyzing immunization rates after one year, we looked at rates after the targeted improvement period to assess if the rates continue to increase. Overall immunization rates increased steadily over the course of the initiative, from a 3 percentage point improvement half a year after the learning session began, increasing to a 5.1 percentage point improvement 12 months after beginning the learning session, and increasing to 7.1 percentage points above baseline 15 months after beginning the learning session.

Most practices improved their overall immunization rates.

Chart 2 reveals that eighteen out of 21 practices (86%) increased overall immunization rates between baseline and September 2012. Practice-level improvement rates ranged from 0.2 to 21.1 percentage points and were statistically significant in eleven practices. Eleven practices (52%) also met or exceeded the First STEPS Phase I overall target improvement rate of 4 percentage points.

These improvements reflect both improvements in reporting as well as immunization rates. Only three practices had a slight decline of 1 percentage point (-0.8 to -1.1) in their overall rates, which were not statistically significant. As shown in Table 1, most of these practices began with much higher immunization rates than other practices at the outset and although many continued to meet these high standards, it may have been difficult for these practices to raise rates above their already high starting rates.

CHART 2: PERCENTAGE POINT CHANGE IN IMMUNIZATION RATES BY PRACTICE SITE, BETWEEN THE STARTING MONTH AND AFTER ONE YEAR (SEPT 2012)



*Significant change in immunization rate comparing rate before and one year after First STEPS Phase I learning sessions, p<.05.

TABLE 1: OVERALL IMMUNIZATION RATE BY PRACTICE SITE, BETWEEN THE STARTING MONTH AND AFTER ONE YEAR (SEPT 2012)

Practice ID	Overall Immunization Rate		
	at Starting Month	After One Year (Sept 2012)	Change
Site A	58.7%	79.8%	21.1%*
Site B	56.1%	74.5%	18.4%*
Site C	68.2%	78.0%	9.8%*
Site D	74.2%	83.2%	8.9%*
Site E	66.7%	75.2%	8.5%*
Site F	76.8%	84.5%	7.7%*
Site G	76.3%	82.5%	6.2%*
Site H	74.7%	80.3%	5.6%*
Site I	71.3%	76.8%	5.5%
Site J	74.8%	79.3%	4.5%
Site K	72.0%	75.9%	4.0%*
Site L	77.2%	80.2%	3.0%*
Site M	77.9%	80.9%	2.9%
Site N	82.3%	84.6%	2.3%*
Site O	75.7%	77.1%	1.3%
Site P	85.4%	86.1%	0.8%
Site Q	90.0%	90.2%	0.2%
Site R	81.6%	81.8%	0.2%
Site S	74.8%	74.0%	-0.8%
Site T	87.3%	86.3%	-1.0%
Site U	55.2%	54.1%	-1.1%
Overall average	74.2%	79.3%	5.1%*

*Significant change in immunization rate comparing rate before and one year after First STEPS Phase I learning sessions, p<.05.

Immunization rates increased in all age groups, with the greatest increase for 13 year-olds.

As shown in Table 2, the percentage of children that were up-to-date on all vaccines increased in every age group

over the course of the learning initiative, ranging from 5 to 15 percentage point improvement depending on the age group. These increases in children who were up-to-date on vaccines were statistically significant for 13 year olds which rose from 53.6% to 68.5% (14.9 percentage points), and 2 year olds which rose from 28.7 to 39.9% (11.3 percentage points). Despite these improvements, immunization rates for 2 year olds remain low largely due to the inclusion of Hepatitis A, which has only recently been added to the immunization schedule.

Several individual vaccination rates also increased significantly.

As shown in Table 2 and Chart 3, immunization rates for nearly all individual vaccines increased during the study period with the exception of rotavirus, which declined by 4 percentage points. All other individual vaccines had improvement rates ranging from 2.2 to 14.9 percentage points.

As indicated above, the rotavirus vaccine rates may appear lower than the actual rates due to supply problems that occurred during the study period resulting in some practices switching from a three-dose to two-dose series that was not adjusted for in the CoCASA reports generated from ImmPact data. In addition, rotavirus is only recommended for the first 8 months of life and there is no catch up schedule to give children missed vaccines up to the age of 2; therefore, it may take a longer period to see the increase in rates resulting from this learning initiative.

Individual vaccine rates increased significantly for Meningococcal (MCV), and Tetanus Diphtheria (TD) vaccines, (increasing respectively from 59% to 73.9% and from 62.8% to 76.4% of 13 year olds vaccinated), Hepatitis A (from 31.2% to 42.9% of two year olds vaccinated), and Measles, Mumps and Rubella (MMR) vaccine (from 82.5% to 88% of six-year-olds vaccinated). As indicated above, even with significant increases in Hepatitis A rates, they are still lower than other two year old rates because this vaccine was only recently introduced to the vaccine schedule. Incorporation of new vaccines into the schedule takes time and some practices administer the Hepatitis A vaccine or the second dose after age two, which does not meet the recommended age limit and is not counted toward their overall rate.

Even with these improvements, many individual immunization rates were below the targeted improvement rates set by Quality Counts initially (see Appendix A). This may be due to the fact that targets were set using Maine's National Immunization Survey (NIS) data, before population registry data from ImmPact was available. In comparing actual rates reported in ImmPact with target NIS survey estimates, there were significant differences, with some significantly higher and others lower than baseline rates within the participating practices. This suggests that the target goals were not reflective of actual baseline. In addition, for many of the 2 year old and 6 year old immunization measures, many participating practices began with fairly high rates, so there was not a great deal of room for improvement. These practices maintained these high immunization levels throughout the initiative.

Rates of immunization for Human Papillomavirus (HPV) in girls increased but remained lower than national estimates. HPV is intended to prevent cervical cancer, but practices' have found that many families are resistant to vaccinating their daughters. Also the vaccine's administrative schedule requires that the vaccine be administered in 3 doses in rapid succession. Since most children of this age are accustomed to only visiting their doctor for one well-child visit annually, practices reported difficulty in getting adolescent girls to return for follow-up vaccines within a few months.

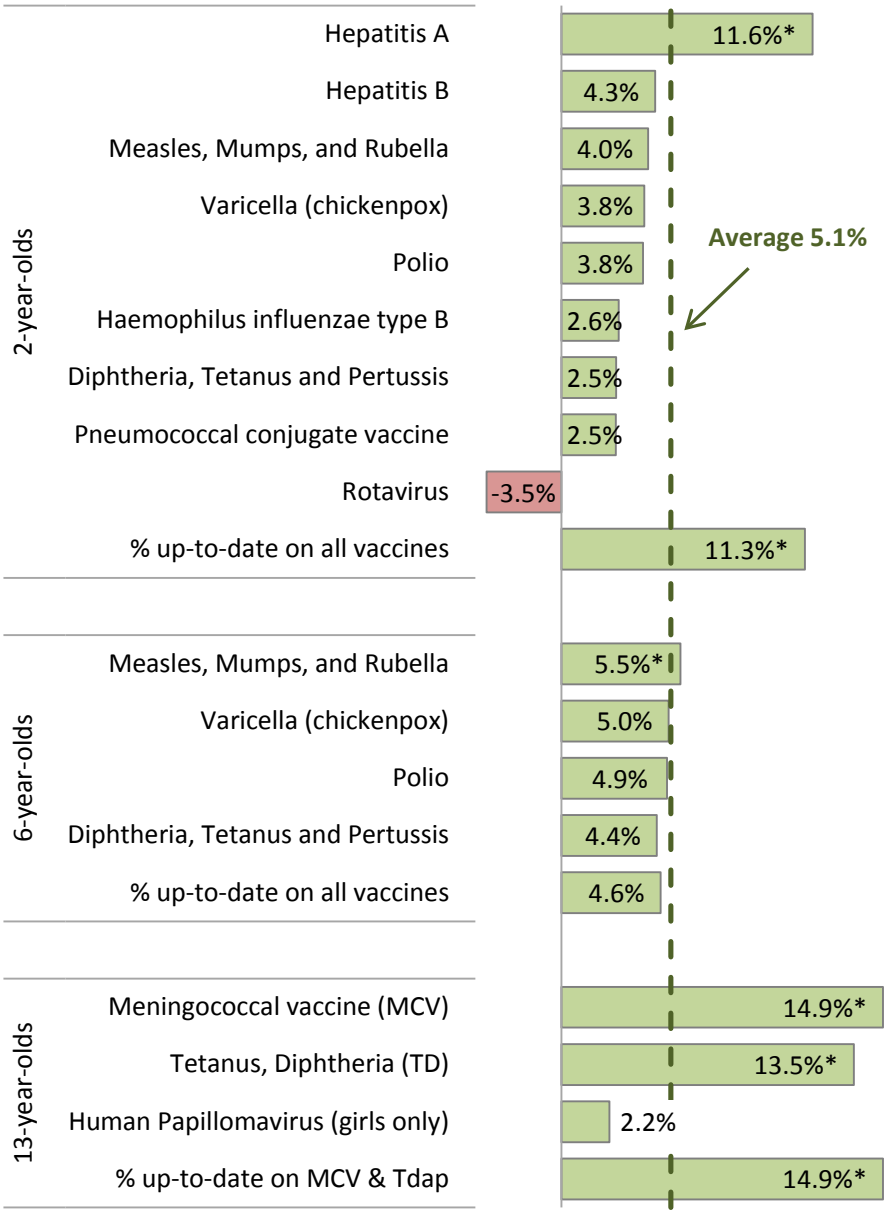
TABLE 2: AVERAGE IMMUNIZATION RATES FOR AGE-SPECIFIC COMBINATION RATES AND INDIVIDUAL VACCINES, BETWEEN THE STARTING MONTH AND AFTER ONE YEAR (SEPT 2012)

Type of vaccine by age group	Starting Month	After One Year (Sept 2012)	Change
2-year-olds			
Hepatitis A	31.2%	42.9%	11.6%*
Hepatitis B	86.5%	90.8%	4.3%
Measles, Mumps, and Rubella	88.9%	92.9%	4.0%
Varicella (chickenpox)	87.7%	91.6%	3.8%
Polio	92.7%	96.5%	3.8%
Haemophilus influenzae type B	95.1%	97.8%	2.6%
Diphtheria, Tetanus and Pertussis	86.1%	88.7%	2.5%
Pneumococcal conjugate vaccine	91.5%	94.0%	2.5%
Rotavirus	62.8%	59.3%	-3.5%
% of children up-to-date on all vaccines	28.7%	39.9%	11.3%*
6-year-olds			
Measles, Mumps, and Rubella	82.5%	88.0%	5.5%*
Varicella (chickenpox)	74.2%	79.1%	5.0%
Polio	82.4%	87.3%	4.9%
Diphtheria, Tetanus and Pertussis	84.1%	88.5%	4.4%
% of children up-to-date on all vaccines	68.7%	73.3%	4.6%
13-year-olds			
Meningococcal vaccine (MCV)	59.0%	73.9%	14.9%*
Tetanus, Diphtheria (TD)	62.8%	76.4%	13.5%*
Human Papillomavirus (girls only)	18.9%	21.1%	2.2%
% of children up-to-date on MCV & TD	53.6%	68.5%	14.9%*
All three age groups			
Average across all age groups	74.2%	79.3%	5.1%*

*Significant change in immunization rate comparing rate before and one year after First STEPS Phase I learning sessions, p<.05.

Combination rates for 2 year olds exclude rotavirus, which is based on a completion date of 8 months rather than 2 years.

CHART 3: PERCENTAGE POINT CHANGE IN CHILDHOOD IMMUNIZATION RATES BY VACCINE AND AGE GROUP, BETWEEN THE STARTING MONTH AND AFTER ONE YEAR (SEPT 2012)



*Significant change in immunization rate comparing rate before and one year after First STEPS Phase I learning sessions, p<.05.

As indicated in the methods section, influenza vaccination rates are not included in the overall immunization rates since data was not available for all practices. For the 17 practices that reported influenza vaccine data,

the rate improved from 62.3% to 66.4% after one year, an increase of 4.1 percentage points, which was not significant. Within individual practices, 10 practices saw an improvement in influenza rates and 7 showed a decline in the influenza rate.

Few practices exceeded targets on all combination and individual measures

While many practices showed significant improvement in overall immunization rates and more than half exceeded the initiative's target of a greater than 4 percentage point increase, few practices exceeded targets on all individual measures (see Appendix B). As noted previously, this may be an artifact of the targets for specific immunizations (see Appendix A) being set based on Maine Immunization Survey data, which were later found to overestimate baseline rates for participating practices as reported in the registry data. Fourteen participating practices showed improvement in the number of individual measures that met or exceeded the individual target rates; four practices did not change and three practices declined by one measure.

Changes in Immunization-related Office Procedures

In addition to standardizing immunization measures and providing timely data to monitor quality improvement, the First STEPS Phase I learning sessions raised awareness of and provided support to implement recommended office procedures for improving immunization rates. The learning sessions highlighted how practices could use the state immunization registry to track their practice's rates, as well as the importance of using the registry regularly to ensure that it accurately reflected actual immunizations given. To address parental hesitancy or resistance which providers had indicated was a barrier for achieving higher immunization rates, both learning sessions and coaching calls included speakers that described strategies they had implemented to engage parents and address their concerns. Other topics covered by the learning sessions or calls included using PDSA cycles, standardizing immunization schedules used by all providers within the practice, framing immunization quality improvement within the context of building patient centered medical homes, using Bright Futures at well-child visits, and building improvements into the practice workflow so that improvements could be sustained.

To assess perceived importance and frequency of use of these recommended office procedures, First STEPS practices completed an *Immunization Office System Survey* before and after the initiative. The survey include a list of 31 office procedures, such as routinely reviewing vaccination rates and having a recall system in place for when children become past due for vaccinations. Survey results reveal that First STEPS practices increasingly are using recommended office procedures for improving immunization rates in caring for their patients. By the end of Phase I, most participating practices (80% or more) reported that they were always or very often using 15 of the 31 recommended immunization-related office procedures. Between surveys, the frequency of use increased for 22 out of 31 recommended immunization office procedures. Appendix C shows responses of "always"/"very often" and "very important"/"important" for all questions in the survey. The number of respondents is 16 practices for the following charts, unless otherwise noted.

While the frequency of use increased, the level of perceived importance of these procedures by practice staff remained largely the same between surveys. Only 11 immunization procedures had increased in perceived importance (as measured by practices indicating it was important or very important) in the follow-up survey from what they had initially reported. This may be due to the fact that rates of perceived importance were high on the initial survey, while frequency of using these procedures tended to be lower which left more room for improvement. It could also be an indication that attitudes and beliefs of staff take longer to change than practice behaviors.

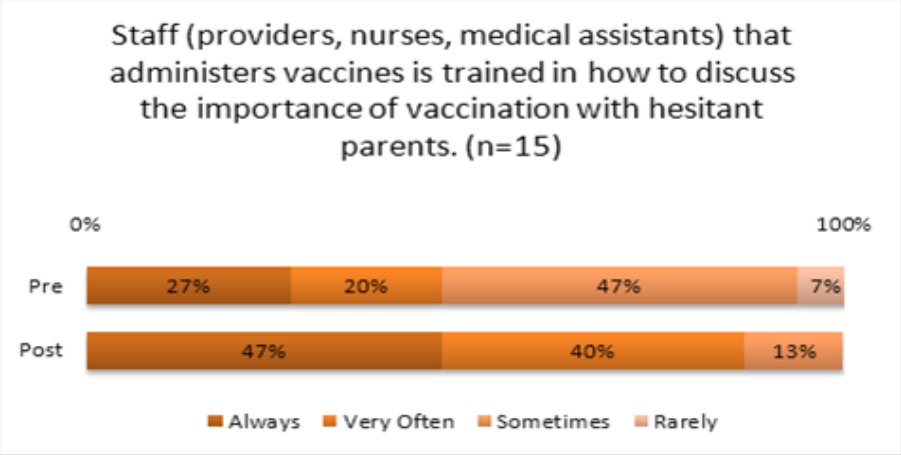
Frequency of use of Office Procedures

While frequency of use increased for the vast majority of recommended immunization-related office procedures, those that changed significantly in First STEPS practices are shown in Charts 4 through 8. After participating in the Phase I learning sessions, participating practices were significantly more likely to 1) train staff on how to discuss the importance of vaccinations with hesitant patients, 2) regularly use recall and reminder systems when children are past due for vaccinations, 3) routinely review vaccination rates in their practice 4) review registry (ImmPact) data prior to patient visits to determine if any vaccinations were received at alternate sites, and 5) update historical vaccination data in ImmPact.

Staff Training and Practice Processes

Prior to First STEPS Phase I, less than half of practices (47%) always or very often trained staff on how to discuss the importance of vaccination with hesitant parents. After First STEPS, the vast majority of practices (87%) always or very often trained staff in how to have this discussion with parents.

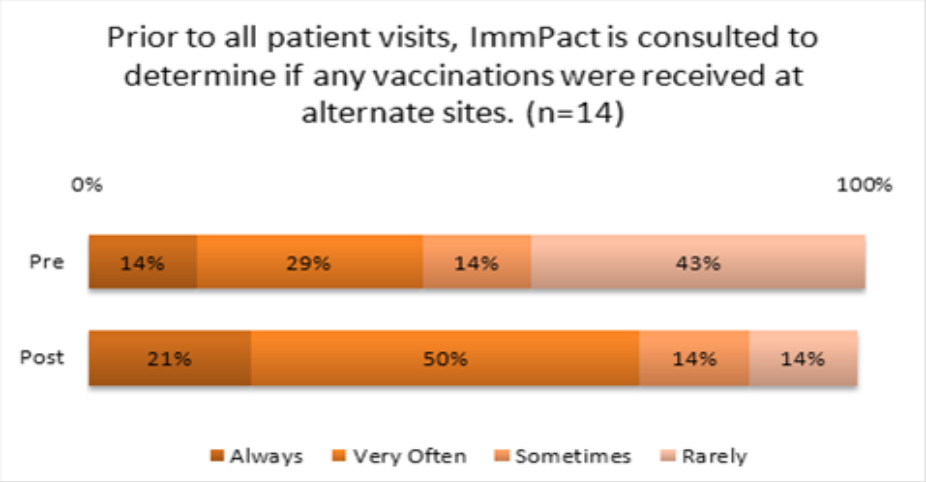
CHART 4



Reminder/Recall Procedures

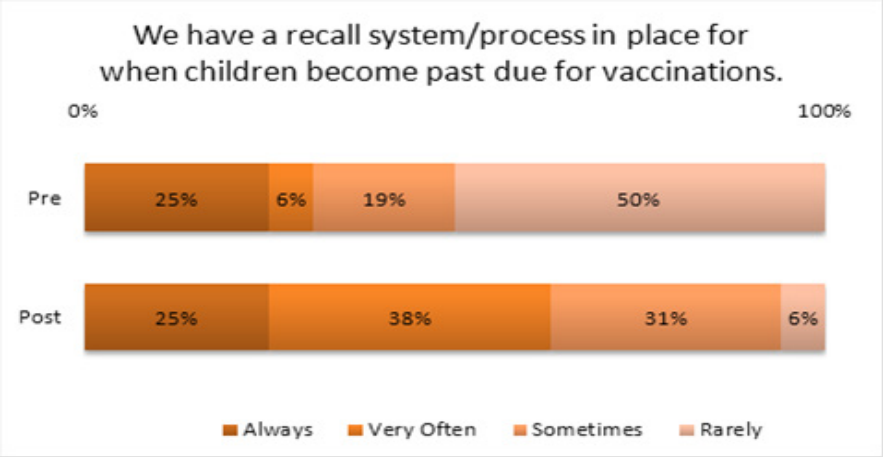
Prior to First STEPS Phase I, less than half of practices (43%) always or very often consulted the state immunization registry (ImmPact) prior to patient visits to determine if any vaccinations were received at alternate sites. After First STEPS, almost three quarters of practices (71%) had staff always or very often consulting ImmPact for vaccinations received at alternate sites.

CHART 5



Prior to First STEPS Phase I, half of practices (50%) rarely had a recall system/process in place for when children became past due for vaccinations. After First STEPS, almost two-thirds of practices (63%) reported always or very often having a recall system/process in place for tracking past due vaccinations.

CHART 6



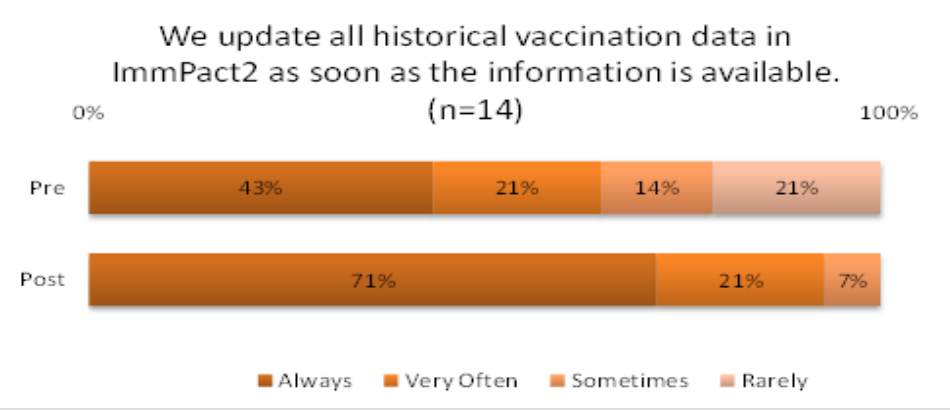
Data and Registry

Prior to First STEPS Phase I, just under half of practices (44%) always or very often routinely reviewed data on their vaccination rates, and shared this information with all staff to strategize on how to improve vaccination rates. After First STEPS, most practices (88%) always or very often reviewed their vaccination rates and worked on improving these rates.

CHART 7

Prior to First STEPS Phase I, 64% of practices always or very often updated historical vaccination data in ImmPact as soon as the information was available. After First STEPS, almost all practices (93%) updated historical vaccination data in ImmPact.

CHART 8



Perceived Importance of Office Procedures

Some of the office procedures that practices were using with greater frequency also showed an increase in perceived importance reported by practices, such as routinely reviewing vaccination rates, and staff receiving training on working with hesitant parents. Other office procedures that increased in perceived importance included allowing patient to walk-in during office hours for a 'nurse-only' vaccination visit, using all visits not just well-child visits to assess vaccination records and vaccinate if needed, and providing vaccinations during evening or weekends hours. Appendix C provides more details on changes in perceived importance on specific measures. However, none of the changes in perceived level of importance were statistically significant.

Best Practices and Feedback on Learning Sessions from Practices

In semi-structured interviews, eight First STEPS practices discussed changes that were the most effective in raising immunization rates in their practices. Many of these changes overlapped with those that showed improvement in the office survey data presented above. Some of these changes included using new or more consistent procedures for updating and reviewing records including data reported in the state immunization registry, sending reminder/recall letters, and standardizing the immunization schedule used by providers throughout the practice.

Improving Immunization Reporting and Using Data

Nearly all providers interviewed indicated that participation in First STEPS had increased their use of the state immunization registry to improve immunization rates. In addition to describing the role that ImmPact had in change efforts, many of the practices mentioned they updated patient charts or reviewed immunization records as part of their efforts to raise their rates. They discovered that some of the patients being reported as not being up-to-date in ImmPact had actually left the practice. To improve their registry data, a number of practices stated that they "cleaned up" their patient panel by identifying patients who had moved or gone elsewhere (MOGE) and documenting this within ImmPact so that those patients would not be counted in their practice rates.

Education/Worker Training

A number of participants reported that education and training were important aspects of practice improvements. Responses focused on education and training ranged from the importance of peers educating one another and learning about immunizations (e.g. who gets immunized, recommended ages for immunizations, etc.) to training the receptionist on printing the ImmPact statement every time a patient walked through the door.

Communication

Communicating with families, staff, and other primary care providers (PCPs) were highlighted as changes that practices made while striving to improve their immunization rates. Communication approaches included practices informing families that their children were not up-to-date on vaccinations through letters, phone calls, texts, and at visits; contacting primary care physicians to inform them that their patients were not up-to-date or when a vaccination had been administered, and flagging staff members on an immunization or record issue to which they should pay attention.

Most Effective Strategies

We printed the ImmPact2 statement as soon as anyone walked in the door.

Some practices thought all of the changes that they made were effective, and some practices reported that some changes were more effective than others in improving immunization rates. Practice changes that were perceived as effective were:

- Using and/or updating the ImmPact system
- Printing ImmPact reports at every visit
- Establishing shared goals and a standardized immunization schedule for all providers in the practice
- Informing families and PCPs about children who need updated immunizations
- Sending out recall letters to families (and sharing a clear message with families about immunizations due)
- Sending text reminders for upcoming appointments
- Changing the immunization schedule (e.g. administering the Hepatitis A vaccine to children at 18 months instead of at their second (24 month) birthday
- Reviewing children's charts at 18 months to identify those who needed immunizations before age 2
- Prepping charts the day before the patient's appointments/reviewing immunization history

Sustainability and Lessons Learned

It's ingrained... I'd like to look at every child coming through the door.

All practices identified at least one change that was sustainable and a permanent part of their system and most practices indicated they would continue most of these changes after the initiative ended.

Nearly every practice shared at least one learning lesson and most of them had gained a number of insights while in the process of implementing strategies to raise immunization rates and improve quality of care. Themes from learning lessons and recommendations to other practices who may want to implement similar changes included:

Accuracy

- Accuracy is important (from beginning to end in administering immunizations)
- It is important not to rely on only one data source to determine whether or not a child is up-to-date (also, the data source must be valid)

Accountability and Buy-in

- Staff must be accountable

- There must be buy-in and commitment from the staff; it's a collaborative effort

Work flow/Infrastructure

Practices need their change efforts to be a multi-disciplinary effort

- Change must be a permanent part of the [work] flow
- There needs to be an infrastructure to support change (for tracking data)
- One person should devote all of their time to making changes or a practice should devote a certain amount of time to focus on this priority each week

Leadership/Vision

- There needs to be strong leadership
- It's helpful when staff focus on the bigger picture (such as helping children get immunized and keeping them safe)

Communication

- It's important to share a clear message with parents; unclear messages can be confusing and create a sense of alarm (regarding the child's immunization record)
- Everyone must be trained and know the new process of implementing changes (even substitutes); communication between staff members is key

Realistic Changes

Take small steps when implementing change; test or pilot ideas

The quotes below provide some anecdotal examples of practices experience with implementing these changes and the importance of getting staff committed/ involved as well as parents:

- At first no one knew exactly who had entered data in ImmPact. With my clinical support, I made sure that every vaccine they (staff) touched, it was theirs to finish and record.
- When they (staff members) understood the process and knew it meant better numbers for getting kids immunized, there was no grumbling.
- We were surprised about the depth of commitment we needed (from a variety of staff) to make this work.
- You have to have something that's worthy – (it must) mean something to them…like improving immunization rates for kids and keeping them safe.
- The simpler you make it for the parents to understand – the easier it is.

Implementation Challenges

Time constraints were the most challenging aspect of implementing practice improvements. Other barriers include struggles implementing changes within their practice due to system delays in implementing ImmPact improvements, limited time for change efforts while facing staff shortages, and difficulties finding time to meet with staff frequently to communicate aspects of the new tasks or processes. Other challenges identified include:

- Double data entry - updating both the EMR and ImmPact system
- Errors in immunization records
- Limited resources to complete the work (e.g. meeting PDSA cycle requirements, making reminder calls)
- Difficulty understanding how to complete certain tasks (e.g. connecting ideas to practice)
- Internal system barriers (e.g. getting forms approved through committees)

Value of Practice-level data on immunization rates

Most providers indicated that it had been useful or motivating to have their own practice's data and immunization rates available as many were not previously tracking them internally. The following are different quotes from interviews that highlight the importance of data in the change process:

- We were not tracking our immunizations internally....having the numbers is really an incentive to keep up the good work we've done.
- When we started doing monthly data entry for First STEPS … each time I ran the data, when providers got their stats - we could look at where we had improved.
- Once we have all of our historical data in, we can run a report without too much work to see what our rates are (through ImmPact).
- Getting feedback about our immunization rates has been very helpful.
- Certainly the data collection capabilities, data crunching, the numbers given to us were very helpful. We got nice print outs with our own data and comparisons with other groups. We could see our own trends. That was very helpful. We do not have easily accessible, robust information like that here.
- We were tracking two year olds, but not on a regular basis as we are now. We had more direction with First STEPS. It was a lot of work but we're glad we participated and there were good outcomes. We learned a lot. We look at our own rates before. We didn't compare to other practices. You've got to look at your own home and how your own practice is doing. It was great to see it for what we were doing.

Satisfaction with First STEPS Phase I

Practices' experiences with the First STEPS Learning Collaborative (Phase I) were overwhelmingly positive. Nearly every practice shared a positive experience while reflecting on their participation in First STEPS Phase I learning activities. The following are some quotes about the value of First STEPS participation:

- I thought the learning sessions were helpful. They were well-done and well-coordinated. I always learned a lot.
- It made us do the work to raise immunization rates. (If we hadn't participated) we would have talked about it, hit a bump, and would not keep going or we would not have worked through it.
- (Through PDSAs), I learned the utility of asking a question and then coming up with a plan.
- It (First STEPS) helped for the education and the accountability; getting the data monthly.
- We wouldn't have done anything without them. It would have been status quo.
- For the most part, I really enjoy them (learning sessions). You get to see people, you learn. I like it to be educational and an efficient use of time.
- It (First STEPS) was helpful because it kept us on track.
- The learning sessions were informative.
- First STEPS helped pediatricians in getting ongoing credit for board certification. This is credit that you get for doing something meaningful for kids. This is a huge motivator for me and my colleagues.

Experience with Coaching Model

Some of the providers reported that coaches were a helpful resource for their practice. One practice shared the following positive comments about his or her coach:

We have a fabulous coach who was very helpful. She had connections to resources. If we needed to do something, she could help us….She was knowledgeable of what's out there, who could help us, or if she didn't know the answer, she would direct us to who we needed to speak with.

At least two providers shared that it may have been helpful if their practice and coach connected more often. One of these practices thought that they could have reached out to their coach more frequently and consulted with him/her when facing roadblocks. Another practice suggested that coaches and practices work together face-to-face. Having a solid understanding of pediatric practices was also shared by one practice as an essential competency for coaches.

Recommendations for future learning initiatives

Practices also shared some suggestions about reducing the time commitment of participating in First STEPS, strategies to keep up with communication efforts, and ways to structure the PDSAs.

Some suggestions included:

- Shortening the length of e-mails regarding First STEPS learning activities and announcements.

- Offering flexibility to practices regarding their PDSA focus (e.g. each practice identifies their own goals; when First STEPS participants convenes as a group they can share their goals with one another).
- Addressing the length and time for travel when coordinating day-long learning sessions. Perhaps offer two learning sessions in two different regions of Maine, reducing the burden of extended travel for providers.
- Re-considering the time that coaching calls are offered. Lunchtime is very busy yet at the same time, there may not be a common ideal time for busy practices.
- Reducing the amount of information that participants have to retain from the learning session (or perhaps build in review strategies).
- Learning activities/lectures about vaccines/sharing stories/examples of how providers deal with vaccine refusals are helpful;
- Small incentives, games or gifts may be distracting.

In addition to the above suggestions, one practice recommended extending the amount of time in each phase (at least a year) so that practices can have more opportunity to experience real improvements.

Other System Changes and Barriers Identified through First STEPS Phase I

By convening providers in the First STEPS Phase I learning sessions and using standardized IHOC measures to track improvements, several barriers to collecting and using these data were identified throughout the process that are worthy of note as an indirect outcome of the learning sessions. Barriers identified include:

Using the state immunization registry data to produce practice-level reports of IHOC immunization measures was more difficult than originally anticipated. As part of their participation in First STEPS Phase I learning sessions, practices had committed to raising their practice's immunization rates for IHOC immunization measures.[9] To reduce reporting burden on practices already entering immunization data into the state immunization registry (ImmPact), IHOC took steps to modify ImmPact so that practices could produce monthly practice-level reports of IHOC measures that would reflect rates based on near real time dose data. While practices already had the ability to produce practice-level rates, the rates were calculated differently than IHOC (discussed further below). Making the modifications to include IHOC reports in ImmPact proved more complicated than previously understood and took longer to implement than anticipated. As a result, IHOC developed an interim solution for producing monthly user-friendly practice-level reports that were shared with participating practices for use in First STEPS Phase I. While the IHOC reports gave practices the same monthly rates that they would have been able to produce on their own through ImmPact with the modifications in place, the drawback was that practices were not able to identify individual patients included in the rates for each of the reports, and therefore could not investigate why they were missing certain vaccines. Some practices expressed that having access to patient-level data would have helped them improve their rates even more and would allow them to validate rates in order to increase their level of trust in the data.

9 CHIPRA Initial Core Set of Children's Health Care Quality measures #5 and #6 and immunization for 6 year olds (MMR,etc), and additional required vaccines for 13 year olds (e.g. HPV) that had been vetted and approved by IHOC clinical advisors and stakeholders as meaningful to track.

Explaining differences in practice immunization-rates generated for IHOC reports versus rates in the state immunization registry required significant education of providers by both the Maine Immunization Program (MIP) and IHOC/First STEPS staff. Existing practice-level reports generated from ImmPact data reflect rates based on recommendations from the US CDC Advisory Committee on Immunization Practices (ACIP) which employs a complicated algorithm of acceptable vaccine schedules and clinically valid "late up to date" doses. While useful in many ways, these reports did not align exactly with the IHOC measures, which are based on specifications from the CHIPRA Initial Core Set of Children's Health Care Quality Measures, plus additional measures. CHIPRA/IHOC/Meaningful Use measures include additional vaccines and age cohorts not included in the Maine Immunization Program reports for the CDC and are defined differently in terms of the as-of-date utilized in calculating rates (24 months for CHIPRA/IHOC/Meaningful Use, and 35 months for MIP) and how doses are counted or estimated. For example, influenza, rotavirus and hepatitis A are not on the list of standard vaccines tracked by the current ImmPact reporting function for practice-level reports. These differences mean that although similar vaccines are being measured for similar populations, the resulting rates will not be identical. These disconnects between measure definitions and resulting rates were a source of confusion for many of the practices, potentially delaying or discouraging the use of data for practice improvement. The IHOC initiative worked with the Maine Immunization Program to produce a clarifying Frequently Asked Questions (FAQ) provider reference to help them understand differences between the rates (See Appendix D).

This experience highlighted the need to acknowledge, define, and communicate differences in immunization measures across state and federal agencies. Clearly defining the multiple sources of data and methods for calculating rates and the corresponding purposes and utility behind each of them is key to obtaining provider participation and buy-in. In addition, it pointed to the need for greater alignment in immunization-related quality measures across federal agencies to reduce confusion, enhance provider knowledge, and increase participation in quality measurement activities. IHOC has communicated this barrier to implementing CHIPRA immunization-measures at the practice-level to the Centers for Medicare and Medicaid Services (CMS).

Based on observation and participation in learning sessions and coaching calls as well as feedback from providers and program implementers, the evaluation team also identified several key system-level lessons and policy changes resulting from First STEPS Phase I. These include:

First STEPS Phase I increased the use of ImmPact, Maine's state immunization registry. By utilizing the state immunization registry data for tracking First STEPS Phase I immunization measures, the initiative helped encourage greater use of the state immunization registry system, ImmPact. Several practices participating in Phase I began using the state immunization registry and/or expanded their use from vaccine management alone to entering patient-specific dose data. The initiative also helped improve the quality of the data reported in the registry as practices spent significant time entering historical immunization doses to ensure their monthly data reports reflected actual rates. The Phase I immunization initiative also overlapped with the roll-out of the state's new universal vaccine law which requires practices to use the state immunization registry to order free vaccines for children. First STEPS learning sessions provided an additional venue to educate providers about these new requirements and reinforce the value of using the registry.

First STEPS identified important changes to the state immunization registry to make it more useful for practice-level quality improvement. For measures to be most useful for quality improvement, they need to be collected at the practice-level and used to provide timely feedback and information. The First STEPS Phase I learning sessions helped identify several important changes to the ImmPact registry that are likely to increase its functionality for practice improvement going forward. These include:

- Flagging the up-to-date status clearly on the client page every time the page is visited;
- Allowing providers to access IHOC coverage reports in addition to existing ACIP reports;
- Providing the ability to run reports across sites that have an association with each other (affiliate reporting), and
- Producing reminder/recall patient lists to assist providers in outreach to patients that are due or past due for vaccinations.

While many of these ImmPact changes were not able to be operationalized during the First STEPS Phase I learning session, as described above, once these enhancements are available through the registry, they will help support sustainability of immunization-related practice improvement over time both within First STEPS participating practices and for practices statewide.

First STEPS highlighted the need for a uniform standard for validating registry patient lists. Updating registry patient lists is important for practices to ensure that only the patients for whom they are responsible are counted in their immunization rates. Many practices found that some patients on their practice's registry patient list were no longer active patients at the practice. In order to ensure that only active patients are included in the ImmPact immunization rates, practices began removing inactive patients from both their patient panel and their ImmPact patient list through a process known as Moved or Gone Elsewhere (MOGE). As a result of this activity, IHOC collaborated with MaineCare and the Maine Immunization Program to clarify MaineCare requirements for discharging a patient from a practice. These guidelines were captured in a revised MaineCare form which was then made available to practices on both the ImmPact and MaineCare websites.

Piloting IHOC measures in First STEPS practices helped gain support for using these measures in other pay-for-performance and public reporting efforts in MaineCare and the state. Positive feedback from providers and improvements in immunization rates through First STEPS have received the attention of quality organizations and health systems in the state that are now integrating child health measures into performance incentive programs and quality reporting efforts. To support continued improvement in immunization rates, the MaineCare program is proposing to add childhood immunization measures (reported in ImmPact if feasible) to its primary care incentive payment program. Effective September 2012, the state's Pathways to Excellence quality reporting program also has included IHOC immunization measures as part of its public reporting program. In addition, several health systems have added IHOC immunization measures into provider contracts for incentive payments.

Summary and Conclusion

In this evaluation, we found that the vast majority of practices participating in the First STEPS Phase I Learning Initiative (86%) increased their overall immunization rates during the study period. Across First STEPS practices, immunization rates significantly increased on average by 5.1 percentage points after only 12 months, which exceeded the 4 percentage point target after one year. Rates continued to improve after 12 months, to 7.1 percentage points above baseline after 15 months. Rates improved for all age-specific combination measures and for 15 out of 16 individual immunizations.

In terms of immunization-related office procedures, participating practices were significantly more likely to have staff receive training on how to discuss the importance of vaccinations with hesitant patients. More practices also reported regularly using recall and reminder systems when children are past due for vaccinations. Practices also were significantly more likely to report routinely reviewing vaccination rates in their practice, reviewing ImmPact data prior to patient visits to determine if any vaccinations were received at alternate sites, and updating historical vaccination data in ImmPact.

Practices' experiences with the Phase I First STEPS Learning Initiative were overwhelmingly positive. Many practices had not been previously tracking immunization rates internally. Most providers indicated that having data on their practice's immunization rates through the First STEPS initiative helped them in targeting areas for improvement, motivating staff, and assessing progress. Practices generally felt their participation was worthwhile because it helped identify strategies for improving immunization rates, thereby improving the health of the children they serve.

Finally, the First STEPS Learning Initiative has helped support systems level changes that will provide tools and incentives to support practices statewide in continuing to improve Maine's immunization rates in the future.

Appendix A: First STEPS Target Rates

2 year olds (10 measures and one Combination)		
Immunizations	**Maine 2010 Estimated Baseline Immunization Rates***	**First STEPS Target Rates**
Up to date on all vaccines except Influenza and Rotavirus (Combination)		No Target
Diphtheria, Tetanus and Pertussis	87%	91%
Haemophilus influenzae type B	84%	88%
Hepatitis A	19%	29%
Hepatitis B	90%	94%
Influenza	40%	50%
Measles, Mumps, and Rubella	91%	95%
Pneumococcal conjugate vaccine	82%	86%
Polio	92%	96%
Rotavirus	28%	38%
Varicella (chickenpox)	90.5%	94%
6 year olds (4 measures and one Combination)		
Immunizations	**Maine 2010 Estimated Baseline Immunization Rates***	**First STEPS Target Rates**
Up to date on all vaccines (Combination)		No Target
Diphtheria, Tetanus and Pertussis	94.5%	96%
Measles, Mumps, and Rubella	93%	96%
Polio	93%	96%
Varicella (chickenpox)	90.5%	96%
13 year olds (3 measures and one Combination)		
Immunizations	**Maine 2010 Estimated Baseline Immunization Rates***	**First STEPS Target Rates**
Up to date on MCV and TD (Combination)		No Target
Human Papillomavirus	28%	38%
Meningococcal vaccine	47%	57%
Tetanus, Diphtheria	82%	86%

* Baseline rates for 2010 are based on Maine National Immunization Survey data.

Appendix B: Number of Measures At or Above Target Rate, by Practice

Practice ID	# Measures >= Target Rate		
	at Starting Month	After One Year (Sept 2012)	Change
Site A	3	8	5
Site B	2	4	2
Site C	4	7	3
Site D	4	10	6
Site E	4	5	1
Site F	5	9	4
Site G	6	10	4
Site H	8	7	-1
Site I	7	7	0
Site J	6	10	4
Site K	4	5	1
Site L	10	13	3
Site M	5	7	2
Site N	8	9	1
Site O	5	5	0
Site P	10	10	0
Site Q	12	16	4
Site R	7	6	-1
Site S	4	4	0
Site T	11	10	-1
Site U	0	1	1
Overall average	6	8	2

Appendix C: Summary of Results from Pre and Post Immunization Office Systems Surveys, September 2011 and April 2012

First STEPS Phase I practices level of use and importance ratings in September 2011 and April 2012

Recommended Practice	Frequent Use*			High Importance**		
	Sept 2011	April 2012	Percentage Point Change	Sept 2011	April 2012	Percentage Point Change
• Routinely review vaccination rates	44%	88%	44%	88%	100%	12%
• Staff trained with hesitant parents	47%	87%	40%	87%	100%	13%
• Recall system in place	31%	63%	32%	88%	94%	6%
• Update historical vaccine data in ImmPact	64%	93%	29%	93%	100%	7%
• ImmPact consulted/ alternate sites	43%	71%	28%	79%	86%	7%
• Assess records and provide vaccinations at all visits	40%	67%	27%	80%	93%	13%
• Vaccine Policy Statement	16%	39%	23%	46%	54%	8%
• Enter in ImmPact at administration	64%	86%	22%	86%	93%	7%
• Reason for not administering vaccine documented	63%	81%	18%	100%	94%	-6%
• Remove MOGE from ImmPact	64%	79%	15%	93%	93%	0%
• Uses ImmPact to record per dose	79%	93%	14%	100%	100%	0%
• Post ACIP in all exam rooms	27%	40%	13%	60%	47%	-13%
• Walk in Nurse Only vaccinations	47%	60%	13%	47%	67%	20%
• Staff confirms vaccine hx	69%	81%	12%	94%	87%	-7%
• Designated Staff Member	80%	93%	13%	100%	93%	-7%

Recommended Practice	Frequent Use*			High Importance**		
	Sept 2011	April 2012	Percentage Point Change	Sept 2011	April 2012	Percentage Point Change
• Schedule next visit/confirm contact info	81%	94%	13%	100%	88%	-12%
• Educational materials and resources re: vaccine safety	69%	81%	12%	94%	88%	-6%
• Simple screening questionnaire safety of vaccinating	8%	17%	9%	58%	33%	-25%
• Shots only visits	50%	56%	6%	100%	81%	-19%
• Call/send notice if appt	81%	88%	7%	100%	94%	-6%
• Standing Orders	64%	71%	7%	93%	100%	7%
• Help patients evaluate reliability of health info/refer to health educator	71%	71%	0%	79%	79%	0%
• Documents vaccine reviewed in chart	33%	33%	0%	73%	67%	-6%
• Vaccination Immunization Schedule (VIS) given to patients/other language	100%	100%	0%	100%	94%	-6%
• Agree to follow ACIP Schedule	100%	100%	0%	100%	100%	0%
• Staff administers multiple vaccinations	100%	100%	0%	100%	100%	0%
• Vaccines on Weekends/ Evenings	53%	53%	0%	53%	67%	14%
• Flag overdue in chart	63%	56%	-7%	88%	81%	-7%
• Use ACIP Catch-up schedule	100%	93%	-7%	100%	100%	0%
• Reminder system prior to appt for parents to bring updated immunization records	69%	56%	-13%	81%	75%	-6%
• Send reminders home at visit	81%	69%	-12%	100%	94%	-6%

*Frequent use is defined as practice response of always or very often

**High Importance is defined as practice response of important or very important

First STEPS Phase I practices level of use and importance ratings in September 2011 and April 2012, sorted by Frequency of Use in April 2012

Recommended Practice	Frequent Use*			High Importance**		
	Sept 2011	April 2012	Percentage Point Change	Sept 2011	April 2012	Percentage Point Change
• VISs given to patients/other language	100%	100%	0%	100%	94%	-6%
• Agree to follow ACIP Schedule	100%	100%	0%	100%	100%	0%
• Staff administers multiple vaccinations	100%	100%	0%	100%	100%	0%
• Schedule next visit/confirm contact info	81%	94%	13%	100%	88%	-12%
• Update historical vaccine data in ImmPact	64%	93%	29%	93%	100%	7%
• Uses ImmPact to record per dose	79%	93%	14%	100%	100%	0%
• Designated Staff Member	80%	93%	13%	100%	93%	-7%
• Use ACIP Catch-up schedule	100%	93%	-7%	100%	100%	0%
• Routinely review vaccination rates	44%	88%	44%	88%	100%	12%
• Call/send notice if appt	81%	88%	7%	100%	94%	-6%
• Staff trained with hesitant parents	47%	87%	40%	87%	100%	13%
• Enter in ImmPact at administration	64%	86%	22%	86%	93%	7%
• Reason for not administering vaccine documented	63%	81%	18%	100%	94%	-6%
• Staff confirms vaccine hx	69%	81%	12%	94%	87%	-7%
• Educational materials and resources re: vaccine safety	69%	81%	12%	94%	88%	-6%
• Remove MOGE from ImmPact	64%	79%	15%	93%	93%	0%
• ImmPact consulted/ alternate sites	43%	71%	28%	79%	86%	7%
• Standing Orders	64%	71%	7%	93%	100%	7%

Recommended Practice	Frequent Use*			High Importance**		
	Sept 2011	April 2012	Percentage Point Change	Sept 2011	April 2012	Percentage Point Change
• Help patients evaluate reliability of health info/refer to health educator	71%	71%	0%	79%	79%	0%
• Send reminders home at visit	81%	69%	-12%	100%	94%	-6%
• Assess records and provide vaccinations at all visits	40%	67%	27%	80%	93%	13%
• Recall system in place	31%	63%	32%	88%	94%	6%
• Walk in Nurse Only vaccinations	47%	60%	13%	47%	67%	20%
• Shots only visits	50%	56%	6%	100%	81%	-19%
• Flag overdue in chart	63%	56%	-7%	88%	81%	-7%
• Reminder system prior to appt for parents to bring updated immunization records	69%	56%	-13%	81%	75%	-6%
• Vaccines on Weekends/ Evenings	53%	53%	0%	53%	67%	14%
• Post ACIP in all exam rooms	27%	40%	13%	60%	47%	-13%
• Vaccine Policy Statement	16%	39%	23%	46%	54%	8%
• Documents vaccine reviewed in chart	33%	33%	0%	73%	67%	-6%
• Simple screening questionnaire safety of vaccinating	8%	17%	9%	58%	33%	-25%

*Frequent use is defined as practice response of always or very often

**High Importance is defined as practice response of important or very important

First STEPS Phase I practices level of use and importance ratings in September 2011 and April 2012, sorted by Importance Level in April 2012

Recommended Practice	Frequent Use*			High Importance**		
	Sept 2011	April 2012	Percentage Point Change	Sept 2011	April 2012	Percentage Point Change
• Routinely review vaccination rates	44%	88%	44%	88%	100%	12%
• Staff trained with hesitant parents	47%	87%	40%	87%	100%	13%
• Update historical vaccine data in ImmPact	64%	93%	29%	93%	100%	7%
• Uses ImmPact to record per dose	79%	93%	14%	100%	100%	0%
• Standing Orders	64%	71%	7%	93%	100%	7%
• Agree to follow ACIP Schedule	100%	100%	0%	100%	100%	0%
• Staff administers multiple vaccinations	100%	100%	0%	100%	100%	0%
• Use ACIP Catch-up schedule	100%	93%	-7%	100%	100%	0%
• Recall system in place	31%	63%	32%	88%	94%	6%
• Reason for not administering vaccine documented	63%	81%	18%	100%	94%	-6%
• Call/send notice if appt	81%	88%	7%	100%	94%	-6%
• VISs given to patients/other language	100%	100%	0%	100%	94%	-6%
• Send reminders home at visit	81%	69%	-12%	100%	94%	-6%
• Assess records and provide vaccinations at all visits	40%	67%	27%	80%	93%	13%
• Enter in ImmPact at administration	64%	86%	22%	86%	93%	7%
• Remove MOGE from ImmPact	64%	79%	15%	93%	93%	0%
• Designated Staff Member	80%	93%	13%	100%	93%	-7%
• Schedule next visit/confirm contact info	81%	94%	13%	100%	88%	-12%

Recommended Practice	Frequent Use*			High Importance**		
	Sept 2011	April 2012	Percentage Point Change	Sept 2011	April 2012	Percentage Point Change
• Educational materials and resources re: vaccine safety	69%	81%	12%	94%	88%	-6%
• Staff confirms vaccine hx	69%	81%	12%	94%	87%	-7%
• ImmPact consulted/ alternate sites	43%	71%	28%	79%	86%	7%
• Shots only visits	50%	56%	6%	100%	81%	-19%
• Flag overdue in chart	63%	56%	-7%	88%	81%	-7%
• Help patients evaluate reliability of health info/refer to health educator	71%	71%	0%	79%	79%	0%
• Reminder system prior to appt for parents to bring updated immunization records	69%	56%	-13%	81%	75%	-6%
• Walk in Nurse Only vaccinations	47%	60%	13%	47%	67%	20%
• Documents vaccine reviewed in chart	33%	33%	0%	73%	67%	-6%
• Vaccines on Weekends/ Evenings	53%	53%	0%	53%	67%	14%
• Vaccine Policy Statement	16%	39%	23%	46%	54%	8%
• Post ACIP in all exam rooms	27%	40%	13%	60%	47%	-13%
• Simple screening questionnaire safety of vaccinating	8%	17%	9%	58%	33%	-25%

*Frequent use is defined as practice response of always or very often

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Appendix D: IHOC Immunization Reports, Frequently Asked Questions

Prepared by IHOC and MIP in response to provider questions December 14, 2012

Why do we need the IHOC reports? Why can't we use the reports we can print out of ImmPact ourselves?

There are a number of important differences between the immunization rates in the IHOC reports and the rates displayed on the ImmPact Home Page and in the Immunization Coverage Reports. While it seems like these rates should align—especially when they are measuring the same vaccines—recognizing why they are different will help in selecting the right report for the right purpose and understanding what the different rates are saying.

The following Questions & Answers explain key features of the IHOC reports and how they may differ from what is available in ImmPact now. It's also important to note that changes to ImmPact are in process which will allow practices to generate reports similar to the IHOC reports. When those changes become available, providers will be notified by IHOC and the Maine Immunization Program.

Which Patients are Being Measured?

For the Two Year Old measures, the IHOC reports use ImmPact data to identify children in your panel who turned two years old during the measurement year. This is known as the 12 month cohort of two year olds.

The same process is used to identify the 12 month cohort for 6 year olds and 13 year olds, depending on the measures and reports being generated. The measurement year is essentially the 12 months prior to the "As Of" date of the report. The "As Of" date is the day that the data is actually pulled from ImmPact.

To generate the IHOC reports, the 12 month cohort of, for example, two year olds is identified and rates are calculated using all of the doses that have been entered into ImmPact for these specific children by the "As Of" date. The rates include doses that were entered retroactively (historical data) as well as doses that were entered by other providers. Unlike rates currently calculated in ImmPact, they do not include doses given after the 2nd birthday (more on this later).

Example A:

- An IHOC report is generated with an "As Of" date of September 15th, 2012.
- The 12 month cohort of two year olds includes all the children in the panel who were born between September 16th, 2009 and September 15th, 2010. These children had their *2nd birthday* between September 16th, 2011 and September15th, 2012.
- The rates are calculated based on doses in ImmPact that were given to these children from birth all the way up to the 2nd birthday.
- In order to include all the doses that were given by September 15th, 2012, the data for the report is extracted from ImmPact about two weeks after the "As Of" date (in this case, September 15th). This wait

period gives practices some additional time to get their doses entered into ImmPact.

If an IHOC report is generated for the same practice the following month, the 12 month cohort of two year olds will *drop* the children who turned 2 during the first month of the previous report, and *add* those who turned 2 during the month following the last month of the previous report.

Example B:

- An IHOC report is generated with an "As Of" date of October 15th, 2012.
- The 12 month cohort of two year olds includes all the children in the panel who were born between October 16th, 2009 and October 15th, 2010. These children had their *2nd birthday* between October 16th, 2011 and October 15th, 2012.
- The rates are calculated based on doses in ImmPact that were given to these children from birth all the way up to the 2nd birthday.
- In order to include all the doses that were given by October 15th, 2012, the data for the report is extracted from ImmPact about two weeks after the "As Of" date (in this case, October 15th). This wait period gives practices some additional time to get their doses entered into ImmPact.

For practices who receive periodic reports from IHOC (monthly, quarterly, etc.), the series of rates presented in the reports give a "rolling rate" that can be helpful in tracking change over time. However, each IHOC report can also be viewed as a stand-alone snapshot in time—a picture of how your practice is doing *in general* regarding immunization rates for your 2 year old patients.

What does "Late Up To Date" mean? Why aren't they counted in the IHOC reports?

The ImmPact Home Page calculates your practice's overall immunization rates by including clinically valid "Late Up To Date" doses. These are doses that are considered clinically valid because they were given according to the frequency and interval rules of a number of acceptable vaccine schedules, including catch-up schedules. This rate reflects the *clinical* Up To Date status of your patient panel overall, but does not provide information about how many of the doses were given *on time* versus those that were given on a catch-up or alternate schedule.

In contrast, the IHOC reports follow the CHIPRA measure specifications for childhood and adolescent vaccines which are based on the recommended vaccine schedules for 0 to 6 year olds and 7 to 18 year olds. The CHIPRA measure does not accommodate for alternate or catch-up schedules, and so Late Up To Date doses are not counted in the rates. This means that any doses given after the 2nd birthday, 6th birthday, or 13th birthday (depending on the report) will not be counted in the rate even if they were *clinically* valid. So, the IHOC rates reflect the *on time* Up To Date status of your patient panel overall, which may differ from the *clinically* Up To Date status of the same patient panel.

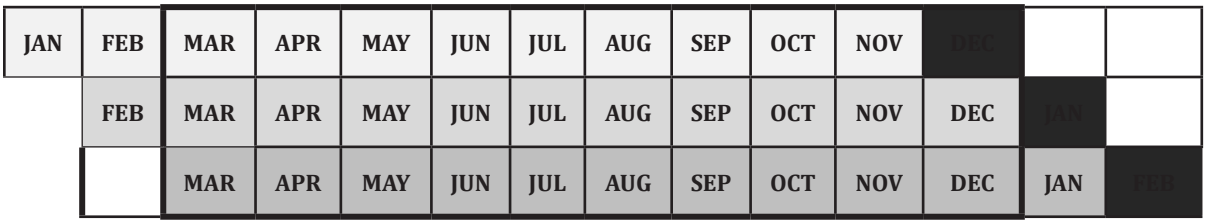
So, it is not uncommon for your IHOC rates to look different than the rates you see on the ImmPact Home Page. The difference between these two rates could be significant for practices that have been doing a lot of recent catch-up work. In these cases, you will see improvement reflected in your ImmPact Home Page rates sooner than you will in your IHOC rates.

Why does it take so long to see our rates go up in the IHOC reports? Our ImmPact rates are great!

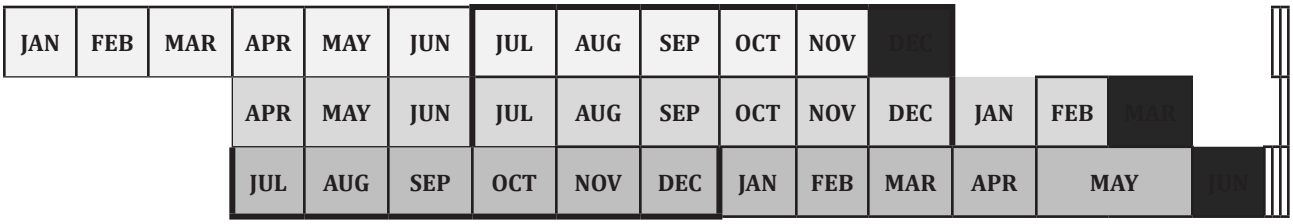
Seeing how the rolling rate is generated can help explain why it takes a while to see the rates improve in the IHOC reports, despite all the catch-up work and data entry you may be engaging in. The rolling rate in IHOC monthly reports is measuring the same group of children each time except for the first month and last month. This means that the biggest possible rate increase in one month's time is 8%, which could only be achieved if the month that is dropped off had an Up To Date rate of 0% and the new month had an Up To Date rate of 100% (highly unlikely). Therefore, even small improvements in these rolling rates should be viewed as significant. However, you may see a faster and more dramatic change in rates when running reports in ImmPact which include clinically valid "Late Up To Date" doses in the rate.

The graphs below illustrate that for three consecutive *monthly* IHOC reports, the majority of the rolling rate is accounted for by the same individuals. For three consecutive *quarterly* IHOC reports, half of the rolling rate is accounted for by the same individuals.

Three Monthly IHOC Reports (December, January, February)



Three Quarterly IHOC Reports (December, March, June)



Why *doesn't* CHIPRA count Late Up To Date doses?

This is a complicated question and is beyond IHOC's ability to answer fully, but providing some background information may help. The Maine Immunization Program (under Maine's Center for Disease Control and Prevention) is required to report immunization rates in a certain way to the US CDC. The US CDC is concerned with the clinical immunization status of a population so that they can identify areas that are under-protected as well as areas that have high rates of protection. Understandably, the Maine CDC also uses this information to inform its outreach and raising rates activities. ImmPact (as with other state immunization registries) has been developed to meet those data requirements and program needs, which is why it is important for the reports to capture *clinically valid* Late Up To Date doses. The CHIPRA measures, on the other hand, are quality measures adopted by the Centers for Medicare and Medicaid Services (CMS) which CMS has asked states to report on

annually. The CHIPRA immunization measure for childhood vaccines also aligns with meaningful use (NQF #0038) and HEDIS immunization measures.

ImmPact and IHOC both employ the US CDC's software program—the Comprehensive Clinic Assessment Software Application (CoCASA)—which is designed to take dose data imported from a registry (like ImmPact) and calculate rates based on a variety of complex algorithms that are selected according to the needs of the user. For example, the user can select "Apply ACIP Recommendations" to create a report that identifies valid doses according to recommended standard, catch-up, and alternate schedules from the Advisory Committee on Immunization Practices (ACIP). If the user does not select "Apply ACIP Recommendations," then every dose is considered valid and total dose count is used to determine Up To Date status. The CHIPRA measures were specified so that they could be calculated using claims data rather than data from a registry system (like ImmPact). The level of complexity that claims-based calculations can achieve in terms of identifying valid doses for vaccines is somewhat lower than what can be achieved using software programs and electronic calculation. These differences mean that although similar vaccines are being measured for similar populations, the resulting rates will not be identical.

The table below compares the methodology and specifications of common immunization reports.

Name of Report	Nat'l Immunization Survey (NIS)	ImmPact Home Graph	CoCASA (ME CDC)	CoCASA/IHOC (First STEPS & PTE)
Level of Data	Statewide	ImmPact Provider	ImmPact Provider	Practice
Rate Methodology	Lenient	Most Lenient	Stringent	Most Stringent
Includes Late Up to Date Doses	YES	YES	NO	NO
Includes Additional Recommended Vaccines	NO	NO	NO	YES

Can we use the IHOC report for reminder/recall activities?

While the CHIPRA measures are often used to give an overall picture of how states are doing over time, the *on time* Up To Date rate they reflect can also be useful in setting improvement targets at a statewide level and at the practice level. Having a sense of the *on time* rate can help practices pin point opportunities for improvement that will raise their overall Up To Date rates. However, it is important to understand that the IHOC reports are *not* ideal for reminder/recall activities that require identification of specific children who are Up To Date, Coming Due, or Overdue for vaccines, because:

- The IHOC reports present an aggregate rate for the practice and do not identify individual patients
- The IHOC reports do not include clinically valid "Late Up To Date" doses

Instead, practices should use the Patient List that is generated through the ImmPact Immunization Coverage

Report to identify individuals who are coming due (or who are overdue) for vaccines. For identifying a child's immunization status at the time of a visit, the Up-To-Date status on the ImmPact client page should be used.

ROTAVIRUS

For a rotavirus dose to be counted as valid and included in the rate for this measure, the dose had to be given after 42 days of age and before 32 weeks of age. Doses given outside of that range are not included in the rate.

Because rotavirus is given before 32 weeks of age, the rate is based on doses given between 16 and 24 months ago, not on doses given now. Catch-up work will be reflected in the IHOC rates, over time.

Practices can choose to give the 3-dose series vaccine or the 2-dose series vaccine for rotavirus. When we surveyed practices in First STEPS, all had used the 3 dose series 2 years ago so the current reports base their calculations on the 3 dose series. In the spring of 2010, the 3-dose series vaccine was recalled for several months and rates may have been skewed for practices that had to switch to the 2-dose series for a few months. As we move farther out from that recall period, this effect on rates will diminish.

Some Practices have switched to the 2-dose series due to the Universal Vaccines for Children law of January 2012. Remember that the IHOC reports that have been generated so far have not measured the cohort of children that will be affected by a switch in January 2012, because they haven't yet turned two years old. IHOC will continue to monitor the use of the two-dose series and will adjust the calculations accordingly, for future reports.

HEP A

For a child to be counted as Up To Date in the IHOC rate for HepA, the first dose must be given after 1 year of age and the second dose must be given six months after the first dose. Remember, though, that both doses must be given by the 2nd birthday in order to be included in the rate. Some practices have not been routinely giving HepA until recently, and so doses are commonly given after the 2nd birthday for this particular vaccine. As catch-up work continues, these rates should improve over time.

HPV for Girls and Boys

For a child to be counted as Up To Date in the IHOC rate for HPV, all three doses must have been given by the 13th birthday. Until recently, it was not possible to calculate separate rates for both boys and girls. The IHOC reports are able to do that, but because HPV for Boys has not yet been put into practice consistently, low rates are not unexpected for now. Also, it was very difficult to establish a target rate for boys since little data exists as of yet. Therefore, the IHOC report identifies a rate for girls and a rate for boys, but the rate for boys is not included in Good, Better, Best scoring for Pathways to Excellence. As practices engage in catch-up for HPV, rates for both boys and girls will improve over time, and targets may be re-assessed.