



Advancing High Performance Health



**HPV Vaccination Best Practices Learning Collaborative
Summary Report and Lessons Learned | November 2021**

EXECUTIVE SUMMARY



A National Partnership

In 2019, AMGA (**American Medical Group Association**) and the **National HPV Vaccination Roundtable** launched a learning collaborative (November 2019 – May 2021) to improve HPV vaccination rates. We engaged eight healthcare organizations (HCOs) that implemented multiple and diverse interventions aimed at improving HPV vaccination rates for adolescents receiving care at their organizations. Despite the COVID-19 pandemic declared soon after the project kick-off in 2020¹, participating HCOs were able to demonstrate improvements across the six specific measures used to track performance during the collaborative. Every participating organization improved in at least one measure and every measure was improved by at least one organization.



Human Papillomavirus (HPV)

HPV infections are common, and nearly all men and women will get an HPV infection at some point in their lives. Nearly 80 million Americans are currently infected with HPV. About 14 million Americans, including teens, become newly infected each year.² Human papillomavirus infections can lead to cancers of the cervix, oropharynx, anus, penis, vagina, and vulva later in life. **It is possible to protect children from developing these adult HPV-related cancers by vaccination, ideally between the ages of 9 and 12.** HCOs are well-positioned to help eliminate HPV cancers by increasing HPV vaccination rates among the adolescent populations that they serve.



Collaborative Approach and Goal

The goal of the **HPV Vaccination Best Practices Learning Collaborative** was to develop and implement evidence-based strategies and interventions to improve adolescent HPV vaccination rates in multispecialty medical groups and integrated healthcare delivery systems.

The Collaborative used the AMGA Best Practices Learning Collaborative Framework, which is the standard for all AMGA population health initiatives. Three previous best practices learning collaboratives leveraged this framework to improve adult vaccination rates, resulting in over 5 million influenza and pneumococcal vaccinations administered or documented.³

¹ <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020>

² <https://www.cancer.org/content/dam/cancer-org/online-documents/en/pdf/flyers/hpv-take-a-shot-at-cancer.pdf>

³ 2019 and 2020

National Advisory Committee

A **National Advisory Committee** consisting of experts and thought leaders was recruited to contribute to the collaborative program design, selection of the participating organizations, and provision of insight and expertise.

Participating Organizations and Activities

In October 2019, the **AMGA Foundation** issued a call for participation to participate in the **HPV Vaccination Best Practices Learning Collaborative**. Eight medical groups and health systems were selected by a National Advisory Committee to participate in the Collaborative.

Participating groups created multidisciplinary project teams and implemented the following actions:

- Obtained high-level organizational leadership buy-in and support sign-off on the Collaborative
- Created a project team that included a provider or clinical champion as a team leader who was dedicated to the project and interested in HPV vaccinations
- Regularly collaborated with peers and experts
- Established action plans and monitored progress
- Reported quarterly on HPV vaccination initiation and completion rates, stratified by age and sex

Technical Support

The Collaborative supported the participating organizations with:

- An in-person kick-off meeting in February 2020 and a virtual wrap-up meeting in May 2021
- Bi-monthly webinars featuring subject matter experts and advocates, as well as dissemination and facilitation of shared learning and benchmarking to support quality improvement initiatives
- Online communication forums, using a dedicated website for participant material sharing and a Listserv for idea sharing and collaboration
- Virtual consultation from AMGA, National HPV Vaccination Roundtable, and external experts
- Virtual site visits with AMGA and HPV Roundtable staff

Box 1: National Advisory Committee

Tammy Beckham, DVM, Ph.D.

Ilka Chavez, M.P.A.

Kara Elam, Ph.D., M.P.H., M.S.

Melissa Gilkey, Ph.D.

Jonathan Hill, M.P.H.

Sarah Kobrin, Ph.D., M.P.H.

Jason Maxwell, M.D.

Kristin Oliver, M.D., M.H.S.

Andrea Polkinghorn, B.S.N., RN-BC

Melinda Wharton, M.D., M.P.H.

Box 2: Participating Organizations

[Arizona Community Physicians](#)

[Baton Rouge Clinic](#)

[Carle Physicians Group](#)

[Hattiesburg Clinic](#)

[The Iowa Clinic](#)

[Marshfield Clinic Health System](#)

[Sentara Medical Group](#)

[St. Elizabeth Physicians](#)

Table 1: Project Timeline

Activities	Date
Participants Selected	November 8 – 11, 2019
Getting Started Checklist Calls	November 2019
Orientation and Data Webinar	December 11, 2019
Measure Reporting Period	Q4 2019 – Q2 2021
In-Person Kick-Off Meeting	February 24 – 26, 2020
COVID-19 Collaborative Pause	April – June 2020
Bi-monthly Webinars, Action Plans, Clinical Outreach	March 2020 – April 2021
Virtual Site Visits	March – June 2021
Virtual Wrap-Up Meeting	May 2021
Final Data Report	August 2021



INTERVENTIONS

Each participating organization selected interventions that fit their local populations and contexts.

The primary interventions implemented are described below.

Provider education interventions were implemented using community meetings, pediatric provider meetings, guest speakers, weekly newsletters, encouraging articles about HPV vaccinations during cervical cancer month, social media, and HPV educational webinars that reinforced the cancer prevention message by reviewing the latest vaccination rates.

Provider incentives were implemented by linking adolescent immunizations to provider performance and often compensation, increasing the use of value-based arrangements to bolster participation, and working with payers to support HPV vaccination.

Patient education interventions were implemented by incorporating patient education resources in patient exam rooms for parents to read and providers to hand out during parental conversations. Resources included flyers on HPV-related cancers, the value of starting the vaccine on time, and a simple description of the HPV vaccine. Patient education strategies also included letters, emails, text messages, electronic health record (EHR) features, webinars, myth-versus-fact handouts, resources from the HPV Roundtable, and point-of-care conversations.

Table 2: Adolescent Vaccination Schedule

Age (years)	Vaccination Series
7+	Influenza (IIV) or (LAIV4) 1-dose annually
9-14	Human papillomavirus 2-dose series if initiated before age 15 <small>*5 months minimum interval between doses</small>
11-12	Meningococcal serogroups A,C,W,Y (MenACWY-D)
11-12	Tetanus, diphtheria, acellular pertussis (Tdap)
15+	Human papillomavirus 3-dose series if initiated at age 15 <small>*4 weeks minimum interval between doses 1 and 2, 12 weeks minimum interval between doses 3 and 4</small>
16	Meningococcal serogroups A,C,W,Y (MenACWY-D) <small>*Booster</small>

See the most current [schedule](#).

During the Collaborative period in Spring of 2021, a two-dose COVID-19 vaccination series was added for children ages 12 and up. As of publication in November 2021, children ages 5 and older should be vaccinated per the ACIP.

Patient outreach interventions were implemented using gap-closure and missed opportunities reports and personal phone calls based on monthly “one more dose due” reports, scripts to answer common questions from parents and patients, and HPV postcard campaigns around cancer prevention. In addition, patients were contacted using letters, calls, and EHR features such as reminder messages.

Patient scheduling interventions were implemented using telehealth and virtual exam rooms and adding HPV vaccines to drive-through flu vaccine settings, in-school onsite vaccination services, back-to-school campaigns, and annual wellness visits. Standing orders were developed to improve HPV vaccination efficiency in the clinical setting.

EHR feature interventions were implemented using reports and alerting messages. Reports included overdue-for-visit reports, overdue-for-vaccination reports, and alerts that gave providers real-time vaccination information during visits. Provider dashboards and scorecard reports were also generated by EHR systems.

Box 3: Measures

Measures were informed by:

- [CDC 2019 Recommended Child and Adolescent Immunization Schedule](#)
- [NCQA HEDIS 2019 Volume 2 Technical Specifications for Health Groups: Immunizations for Adolescents](#)

Learning Collaborative Focus: HPV vaccine initiation and completion

- By age 13
- Ages 9-10, 11-12, 13-17
- Stratified by sex

Additional vaccine measures (for benchmarking)

- Meningococcal and Tdap initiation, ages 13-17 by sex



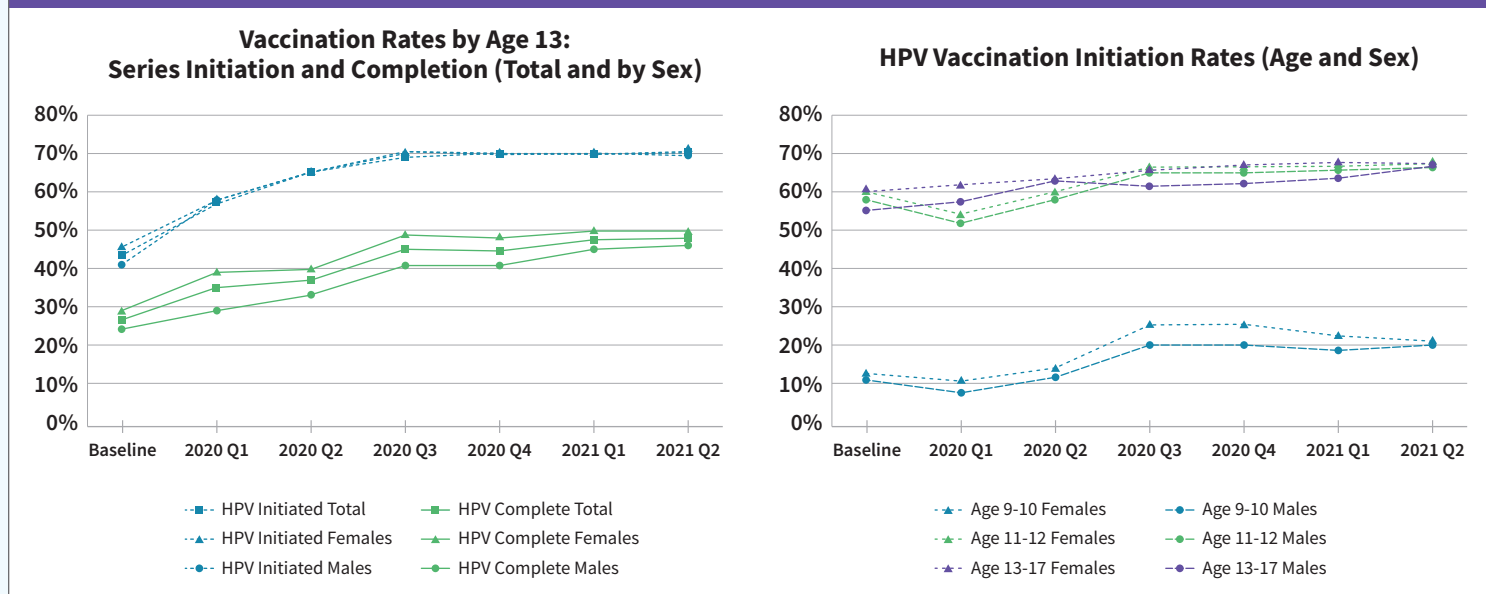
VACCINATION GOALS AND MEASURES

The Collaborative focused on HPV vaccination initiation and completion rates for adolescents aged 9-10, 11-12, and 13-17, stratified by sex. HPV rates were compared with meningococcal and Tdap rates for the age 13-17 group by sex. Age 13 included anyone who reached 13 years of age during the reporting period.

The Collaborative strove to meet the Healthy People 2020 goal of an 80% immunization rate for all adolescents. The significant variation in overall vaccination rates across the HCOs and differences in rates between boys and girls within each organization created the need for interim and stretch goals. AMGA provided each HCO with an individualized goal based on reducing the organization's rate of unvaccinated adolescents at baseline by 20%. In addition, the gender gap was tracked and reported for each measure throughout the Collaborative. The goal was to vaccinate every child, boys and girls, and eliminate the difference in rates.

The Collaborative also provided participants with extensive preconstructed spreadsheets, templates, and graphs for tracking their data. For example, Figure 1 shows one HCO's progress over the course of the Collaborative for boys and girls (separately and combined) for HPV vaccination rates, across age groups. These are two examples of the self-populating figures included as part of the reporting template to allow HCOs to easily view and track their progress over time.

Figure 1: Example of Data Tracking Tools Provided to Participating Organizations



RESULTS AND LESSONS LEARNED

Populations Reached

The Collaborative’s reach included more than 132,500 adolescents between the ages of 9 to 17 across the eight participating healthcare organizations.

- **21%** were aged 9-10 (28,000)
- **25%** were aged 11-12 (33,500)
- **54%** were aged 13-17 (71,000)

Overall 70,400 adolescents aged 9–17 had at least one HPV vaccination administered or documented. 77% of those who initiated completed the HPV vaccination series (ages 11–17).

Vaccination Rate Increases

On average, and despite the unprecedented challenges posed by COVID-19, organizations in the Collaborative increased vaccination rates for all age 11 to 17 collaborative HPV vaccine measures by approximately 8%-18% relative to baseline (Q4 2019). Every organization saw improvement in one or more measures, and every measure saw improvement within at least one organization.

Table 3: Collaborative Performance Summary

Measures	Collaborative Average Healthcare Organization Outcomes				
	Baseline Rate	2021 Q2 Rate	Absolute Δ	Relative Δ	Additional Patients [†]
Age 9–10*					
HPV ≥1	9.8%	9.3%	-0.5%	N/A	142
Age 11–12					
HPV ≥1	53.1%	58.7%	5.6%	10.5%	1,738
HPV Complete	30.5%	33.0%	2.5%	8.2%	1,446
By Age 13					
HPV ≥1	55.4%	63.5%	8.1%	14.6%	747
HPV Complete	35.8%	42.3%	6.5%	18.2%	940
Age 13–17					
HPV ≥1	64.0%	69.5%	5.5%	8.6%	3,972
HPV Complete	51.1%	57.5%	6.4%	12.5%	4,639

* This measure was added at the request of some participants that wanted to pivot focus to this younger age group. Because this is the youngest age at which patients can be vaccinated against HPV, this measure is particularly sensitive to the pause and/or slowdown in adolescent, pediatric in-person care due to COVID-19 (all children aging into the 9-10 cohort throughout the Collaborative, came in unvaccinated, based on CDC guidelines). Even so, one HCO was able to improve rates by 7.8% (a 61% relative improvement).

† Additional patients for a measure is the sum of positive improvements at each HCO (absolute improvement from BL to 2021Q2 * 2021Q2 denominator population). Additional patients can be aggregated for 9-10-, 11-12-, and 13–17-year-olds for HPV vaccine initiation and 11–12- and 13–17-year-olds for HPV vaccine completion because the measure denominators for these age groups were designed to be distinct from the others.

The highest gains were achieved in HPV series initiation (≥ 1) and completion (or up-to-date [UTD]) by age 13, with relative improvements of 15% and 18%, respectively.

For patients that were 11-17 years of age, improvement in vaccination rates achieved by individual organizations throughout the Collaborative equate to approximately an additional 5,700 adolescents with HPV vaccination initiated over baseline and 6,100 additional patients with HPV series completed (these are not necessarily mutually exclusive).

Data Measurement Is Critical

Measurement, benchmarking, and internal sharing of vaccination data were strong internal motivators for improvement within the Collaborative organizations. For example, as shown in Figure 2, one HCO, upon viewing their HPV vaccination data for the first time, was motivated by their low baseline rates as compared to other HCOs, as well as the state's rates. This organization was able to dramatically improve their rates among 11-17- year olds by 3%-16% from baseline. The organization more than tripled the baseline rate of completion for ages 11-12 (from 7% to 23%) and reduced the gap between the baseline rates and the state NIS-TEEN rates by 65% for series initiation and 80% for series completion. In addition, because of the focus on adolescent vaccines, the HCO improved rates for established vaccines among patients 13-17, ≥ 1 Meningococcal increased from 44% to 61%, and Tdap vaccinations went from 75% to 87%.

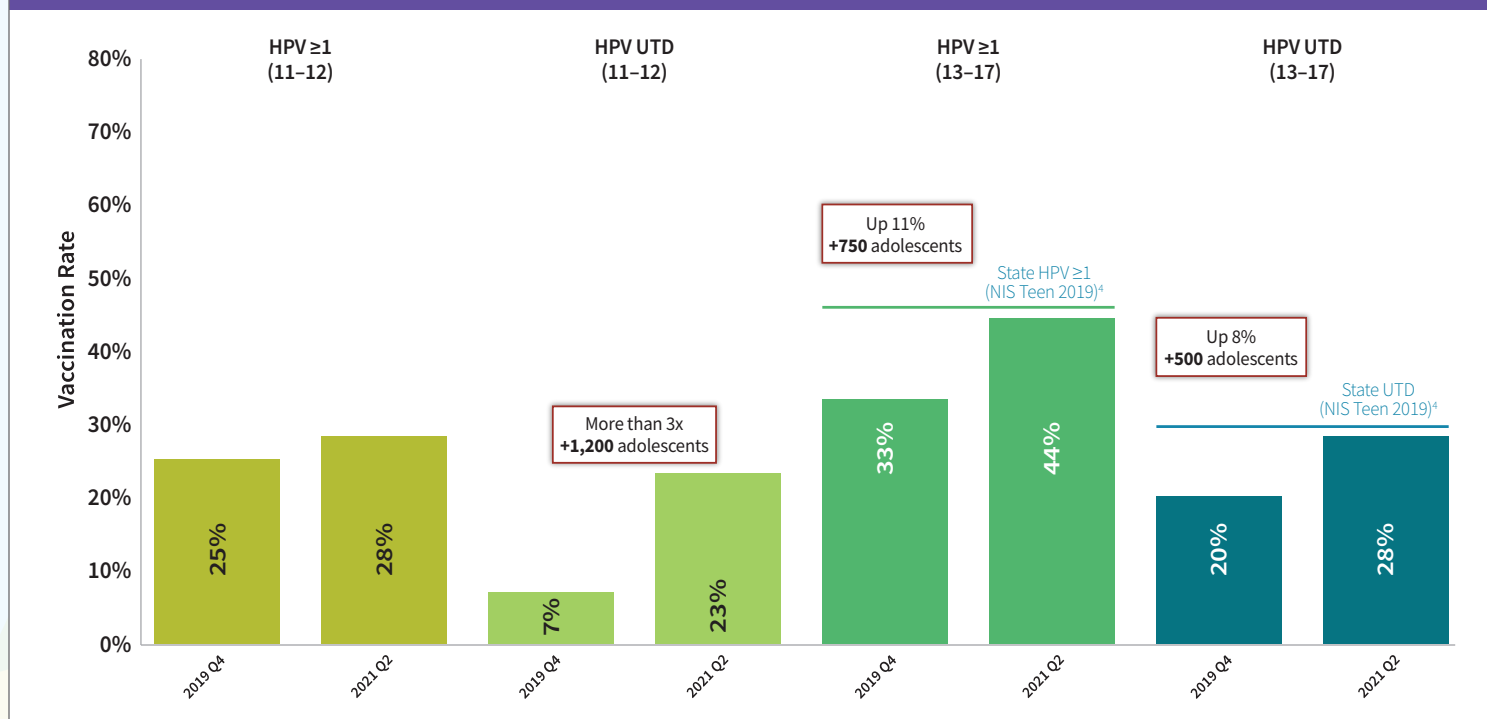


✓ Measure What You Want to Improve

✓ Benchmark with External Sources

✓ Share Data Internally

Figure 2: You Can't Improve What You Don't Measure



⁴ <https://www.cdc.gov/vaccines/imz-managers/coverage/teenvaxview/data-reports/hpv/trend/index.html>

Competition Motivates Providers

Providers in organizations were strongly motivated to increase their vaccination rates with transparent reports of trusted data and clear goals for desired outcomes. A Collaborative participant with a background of effectively utilizing these quality improvement/sustainment tools began with baseline rates for ages 11-17 that were above the NIS state and national benchmarks for HPV vaccination. As shown in Figure 3, even from that strong starting point, the organization continued to improve vaccination rates during the COVID-19 pandemic and increased rates in five categories by 3%-8% (HPV UTD by age 11-12 had a 1% increase). They attributed most of this success to transparent reporting and goals aligned with adolescent preventive care targets combined with the new focus on HPV vaccinations (collaborative-driven provider education combined with patient education and outreach).

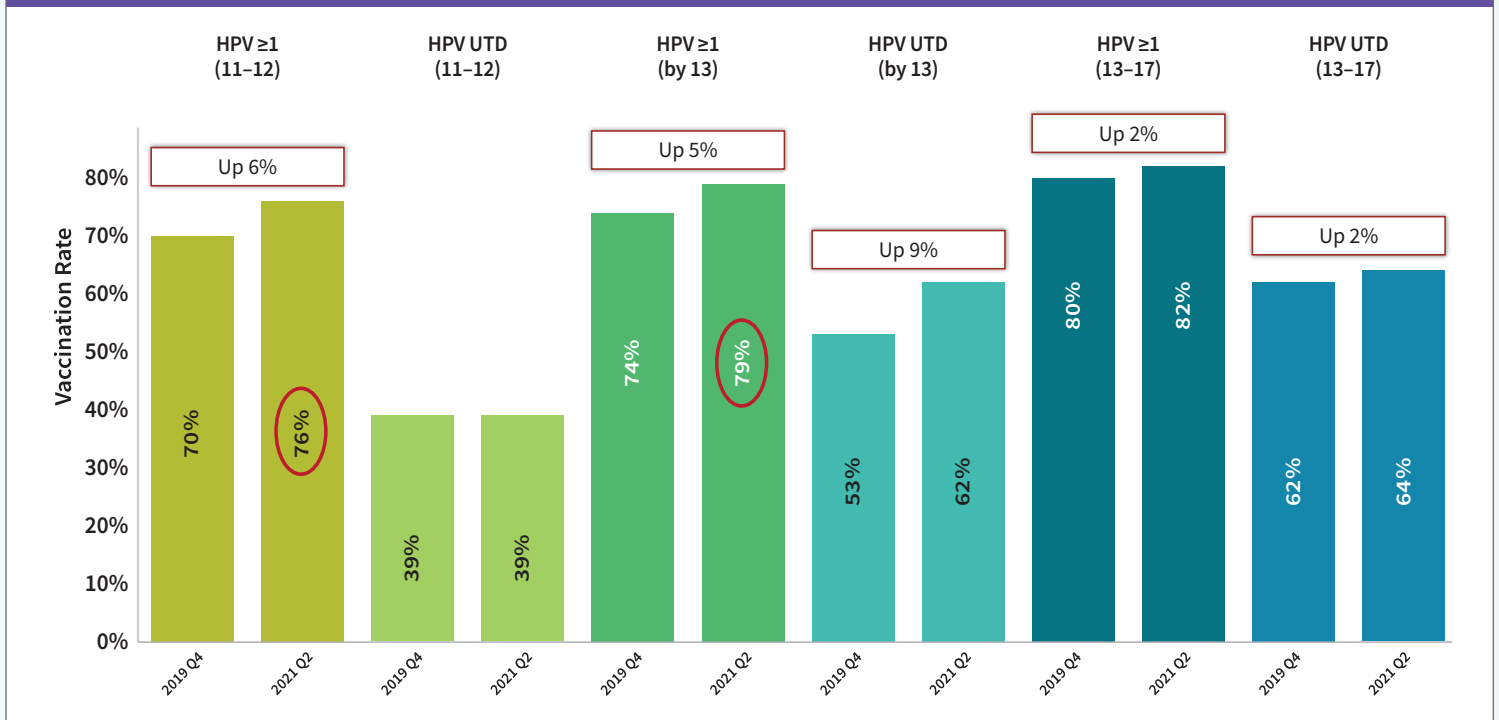


- ✓ Transparent Reporting at the Provider Level
- ✓ Reports Pushed Out to Providers (don't rely on pull only)

- ✓ Set Goals to Achieve Ultimate Outcome
- ✓ Tie to Value-Based Compensation if Possible

- ✓ Provider and Staff Must Trust the Data


Figure 3: Providers Are Motivated by Competition



Note: The circles in the chart above indicate that the group met their individualized goal for the measure (reduce unvaccinated, measured at BL, by 20% or more).

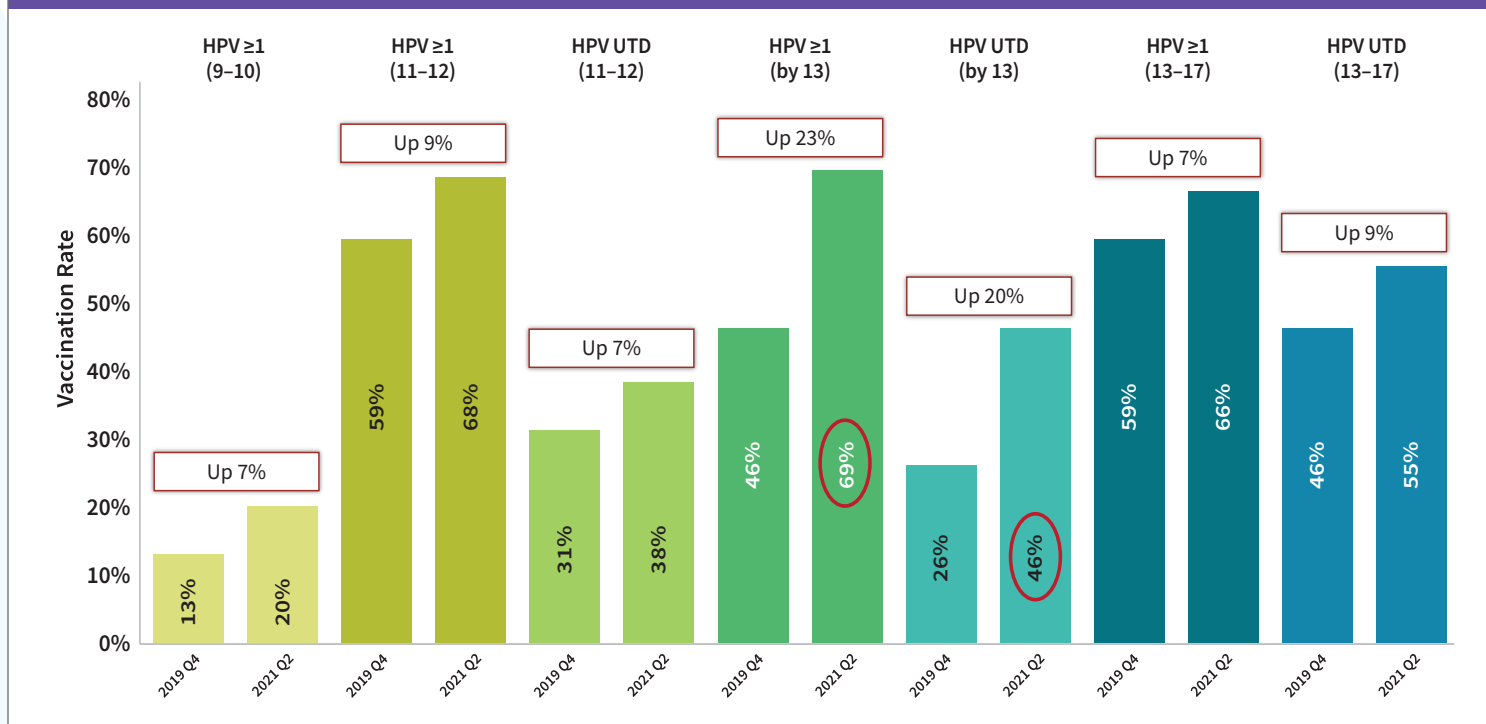
Leverage Organizational Culture

Cultural factors that contributed to the success of the project were team ownership of the project, transparent reporting, and setting early expectations for parents and patients. This was demonstrated by one physician-owned organization that was known for its familiarity with the AMGA Collaborative model, its culture of accountability, and its agile behaviors toward quality improvement. As shown in Figure 4, the organization increased HPV vaccination rates in all six categories by 7%-23%. The largest improvements were seen in categories for series initiation (≥ 1 HPV vaccination) and series completion (UTD) by age 13, improving by 23% and 20%, respectively. They were also the only group, despite the COVID-19 pandemic, that improved vaccination rates for patients aged 9-10, increasing these rates from 13% to 21% (a relative improvement of more than 60%).



- ✓ Set Expectations for Parents/Patients Early
- ✓ Leadership Buy-In and Support
- ✓ Maintain Agility for Rapid Transformation
- ✓ Transparent Reporting
- ✓ Clinical Practice Team Ownership

Figure 4: Leveraging a Culture of Rapid Change








Note: The circles in the chart above indicate that the group met their individualized goal for the measure (reduce unvaccinated, measured at BL, by 20% or more).

CHALLENGES

The main challenge faced by all organizations in the Collaborative was the impact of the COVID-19 pandemic. Just weeks after the kick-off meeting in February 2020, the Collaborative timeline was impacted by the COVID-19 pandemic, which was officially declared in March 2020.¹ Since AMGA member organizations were on the front lines of the COVID-19 outbreak, they needed time to reevaluate how they could participate in the HPV Collaborative. Accordingly, all Collaborative activities were paused for three months (April –June 2020) so that members could focus on the pandemic.

The COVID-19 pandemic decreased the availability of clinical and vaccination services during the first part of the pandemic and increased the reluctance of patients to visit clinics for vaccination, which persisted throughout the Collaborative time period. Nonetheless, the overall results showed that organizations in the Collaborative *increased* their HPV vaccination rates throughout the last 12 months of the 15-month project.

Box 4: Key Lessons from the HPV Vaccination Best Practices Learning Collaborative

	<p>Measurements are critical because you cannot improve what is not measured.</p>
	<p>Benchmarking of trusted data is essential for comparison.</p>
	<p>Providers may be motivated by competitive benchmarking of trusted data.</p>
	<p>Facilitated shared learning generated the improvements.</p>
	<p>Organizational change is a slow process, so begin as soon as possible.</p>

ACCOMPLISHMENTS OF THE EIGHT HEALTH SYSTEMS

Figures 5 and 6 show the improvement in vaccination rates (initiation and completion of the HPV vaccine) by age 13 for all patients in the collaborative and across the eight participating HCOs.

From the charts, one can see the variation in starting rates, reflecting unique regional and organizational challenges faced by each of the HCOs and where they were on their path to improving HPV vaccinations at the start of the Collaborative. Organizations overcame these challenges to improve HPV vaccination rates despite the significant burden each faced due to the COVID-19 pandemic conditions in their local area.

Over the course of the Collaborative, HPV vaccination initiation rates by age 13 improved 6% (range across HCOs: 3% to 23%) or 11% relative to baseline (range: 4% to 52%). Among the 15,000 active adolescent, pediatric patients that turned 13 during the 12 months ending June 30, 2021, this improvement was equivalent to 940 additional patients initiating the series by the age of 13. HPV vaccination completion rates by 13 improved an average of 5% (range: 3% to 19%) across HCOs or 13% relative to baseline (range: 4% to 78%). That equates to 740 additional patients with HPV vaccination series completed, relative to baseline.

Figure 5: HPV Vaccination by Age 13: Initiation (≥ 1)

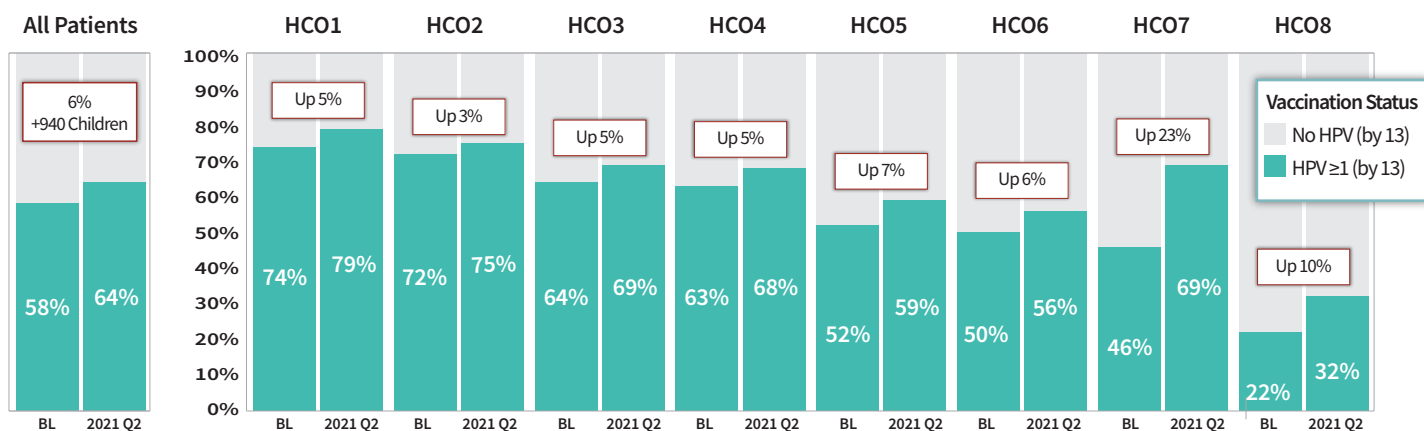
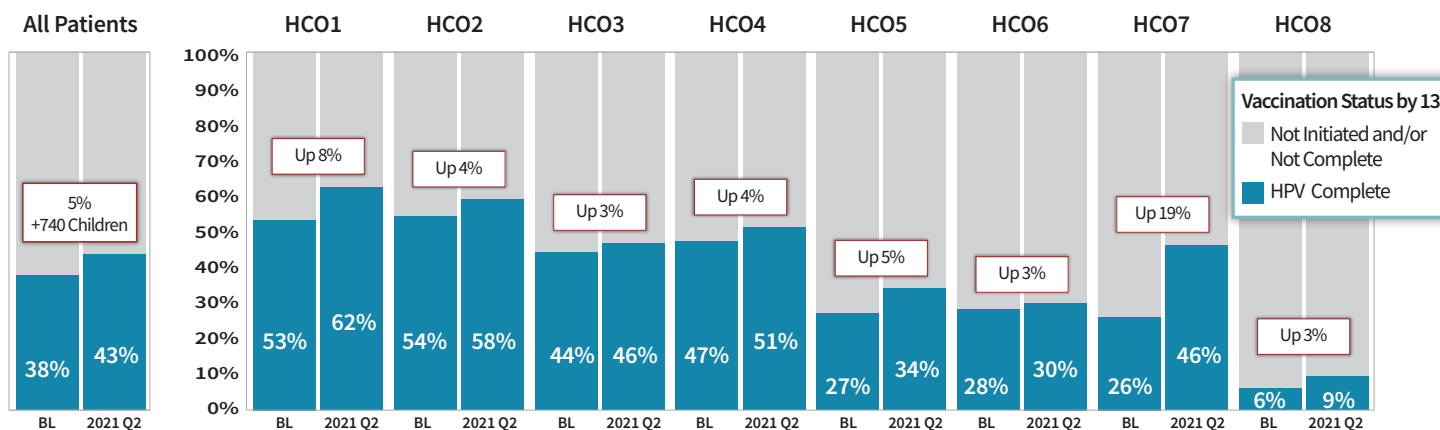


Figure 6: HPV Vaccination by Age 13: Series Complete

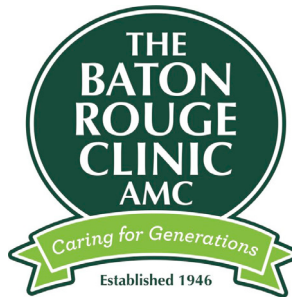


Sorted by baseline (BL) HPV vaccine initiation (by 13). BL = 12 months ending with 2019 Q4.

CONCLUSION

In total, organizations that participated in the **HPV Vaccination Best Practices Learning Collaborative** impacted more than 132,500 male and female adolescents aged 9-17. All groups improved on one or more of the measures, and on average, the collaborative achieved relative improvement in HPV vaccination initiation rates of 9% and 8% for their 11-12- and 13-17-year-old patients, respectively. Additionally, series completion rates for these adolescents were improved by 5% and 11%, respectively, relative to Q4 2019. Over the course of the Collaborative, an estimated additional 5,700 adolescents aged 11-17 initiated HPV vaccination as compared to the baseline, and an additional 6,100 completed the series.

PARTICIPATING ORGANIZATIONS



RECOGNITION

The **HPV Best Practices Learning Collaborative** recognizes the important contributions of AMGA staff and national advisors who supported the participating health system teams, including:

Advisory Committee

- **Tammy Beckham**, DVM, Ph.D., Associate Director, Resilient Supply Chain and Shortages Prevention Program, FDA
- **Ilka Chavez**, M.P.A., U.S. Department of Health and Human Services
- **Kara Elam**, Ph.D., M.P.H., M.S., Research & Policy Strategist, Office on Women's Health
- **Melissa Gilkey**, Ph.D. Assistant Professor, Department of Health Behavior, University of North Carolina Gilling's School of Global Health
- **Jonathan Hill**, M.P.H., Public Health Analyst, Centers for Disease Control and Prevention
- **Sarah Kobrin**, Ph.D., M.P.H., Chief of Health Systems and Research Branch, National Cancer Institute
- **Jason Maxwell**, M.D., Department Chair of Pediatrics and Practices, Health Partners, Como Clinic
- **Kristin Oliver**, M.D., M.H.S., Assistant Professor, Icahn School of Medicine at Mount Sinai Department of Environmental Medicine and Public Health, Department of Pediatrics
- **Andrea Polkinghorn**, B.S.N., RN-BC, Immunization Strategy Leader, Sanford Health
- **Melinda Wharton**, M.D., M.P.H., Associate Director for Vaccine Policy, NCIRD at Centers for Disease Control and Prevention

AMGA Foundation

- **John W. Kennedy**, M.D., President, AMGA Foundation, and Chief Medical Officer, AMGA
- **Danielle Casanova**, M.B.A., Senior Director, Population Health Initiatives
- **Earlean Chambers**, RN, M.S., C.P.H.Q., Director of Clinical and Quality, Population Health Initiatives
- **Erin Leaver-Schmidt**, M.P.H., Senior Program Manager, Population Health Initiatives
- **Cameron Meade**, Coordinator, Population Health Initiatives

AMGA Analytics

- **Elizabeth Ciemins**, Ph.D., M.P.H., M.A., Vice President, Research and Analytics
- **Cori Rattelman**, M.S., Senior Research Analyst

American Cancer Society

- **Jennifer Nkonga**, M.S., Director, National HPV Vaccination Roundtable, Health Systems and Provider Engagement
- Special appreciation to team members **Lisa Oliver**, now retired, and **Ashley Armstrong**, now with the CDC Foundation.

ABOUT AMGA

AMGA is a trade association leading the transformation of health care in America. Representing multispecialty medical groups and integrated systems of care, we advocate, educate, innovate, and empower our members to deliver the next level of high performance health. AMGA is the national voice promoting awareness of our members' recognized excellence in the delivery of coordinated, high-quality, high-value care. More than 175,000 physicians practice in our member organizations, delivering care to over one in three Americans. <http://amga.org>

AMGA Foundation is the philanthropic arm of AMGA that works with healthcare systems on quality improvement projects to advance population health and the delivery of health care. **AMGA Foundation** serves as a catalyst, connector, and collaborator for translating the evidence of what works best in improving health and health care in everyday practice. <https://amga.org/foundation>

AMGA Analytics offers robust resources for data analysis and implementation research, assisting member healthcare organizations to improve population health using comparative benchmarking to discover opportunities and predictive analytics to identify high-risk patients. AMGA Analytics drives the discovery and sharing of best practices and helps its members to translate them into practice. <https://www.amga.org/about-amga/subsidiaries/amga-analytics>

ABOUT THE HPV ROUNDTABLE

The **National HPV Vaccination Roundtable** is a coalition of 65+ organizations working at the intersection of immunization and cancer control to prevent HPV cancers and work towards the elimination of HPV disease as a public health problem. Founded by the **CDC** and the **American Cancer Society** in 2014, the HPV Roundtable's power comes from passionate advocates representing survivors, researchers, health systems, providers, and public health leaders, among others. Members contribute expertise and activate their own organizations to advance the collective mission. <https://hpvroundtable.org>



Funding for this project was made possible by the Centers for Disease Control and Prevention under CFDA # 93.421 – Strengthening Public Health Systems and Services through National Partnerships to Improve and Protect the Nation's Health, Cooperative Agreement grant number 6 NU38OT000283-02-01.

The content in this document does not necessarily reflect the office policies of the Department of Health and Human Services, nor does the mention of trade names, commercial practices, or organizations imply endorsement by the U.S. Government.

Special appreciation goes to the Office of Infectious Disease & HIV Policy for investing in HPV cancer prevention work.