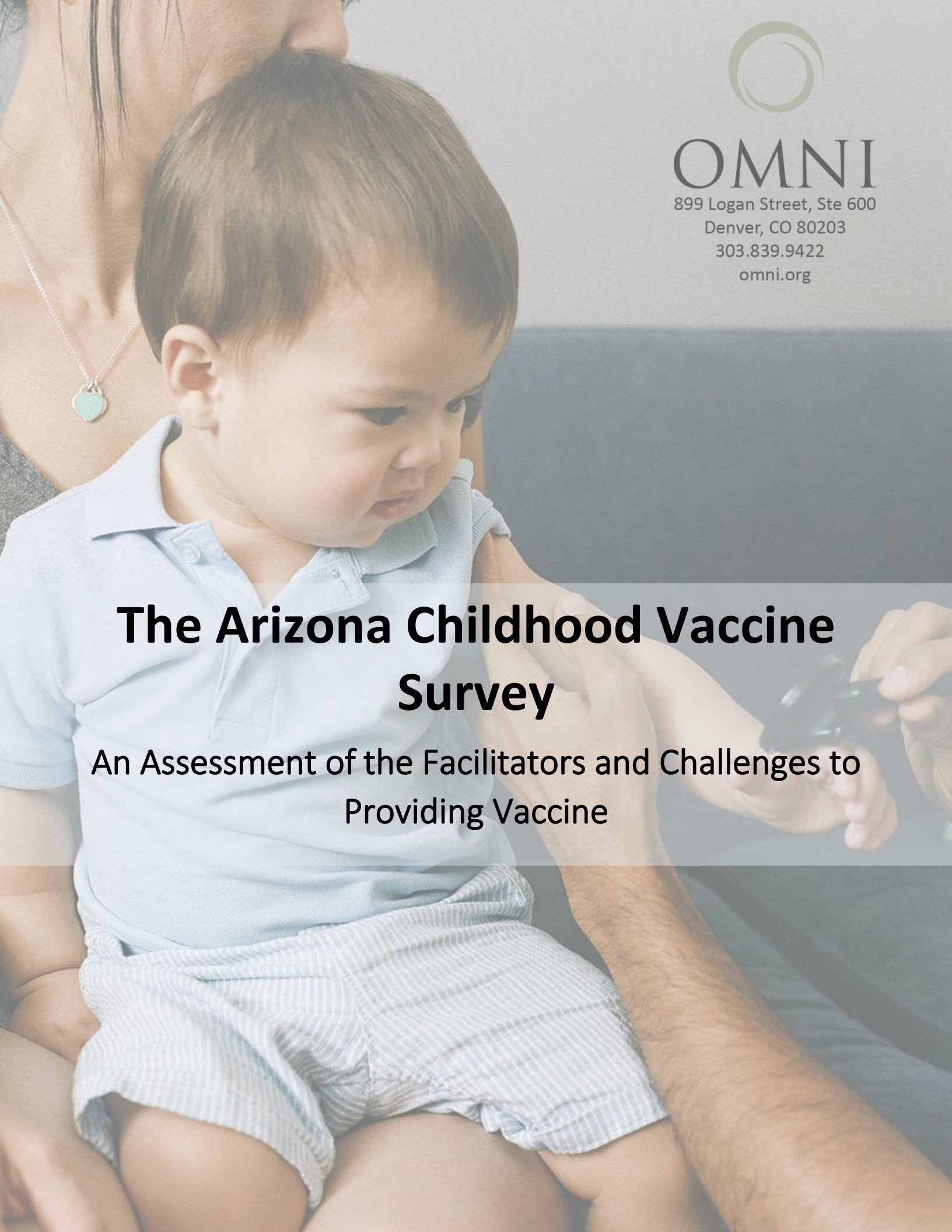


OMNI
899 Logan Street, Ste 600
Denver, CO 80203
303.839.9422
omni.org

The Arizona Childhood Vaccine Survey

An Assessment of the Facilitators and Challenges to Providing Vaccine

MARICOPA COUNTY
PUBLIC HEALTH

Public Health
4041 N. Central Ave., 14th Floor
Phoenix, Arizona 85012

P: 602.506.6601
E: marcy.flanagan@maricopa.gov

Maricopa.gov/PublicHealth

November 30, 2023

Partner in Health:

Through the last decade, here in Maricopa County we have steadily seen a decrease in immunization rates, first among our privately insured kids and then with our publicly insured kids. During the COVID-19 pandemic, the largest pandemic in most of our lifetimes, we continued to see less people choosing to be vaccinated for COVID than other jurisdictions of our size.

As the 3rd largest health jurisdiction in the United States, and as an agency that prides itself on basing strategic decisions on data, it was important to Maricopa County Department of Public Health (MCDPH) to understand all the reasons why we continue to see immunization rates decline, especially among those who participate in the Vaccines for Children (VFC) program.

To get an unbiased look at the system, MCDPH contracted with the statewide immunization coalition, The Arizona Partnership for Immunizations or TAPI, to study this issue and prepare a report describing the facilitators and challenges to participating in the VFC program from healthcare providers' perspectives, as well as recommendations for reversing this course. TAPI hired OMNI Institute, a social sciences non-profit consultancy to conduct this assessment.

The results of this assessment help to paint a picture of opportunity. Opportunity to look at each spoke in this very complicated vaccine delivery system and address how it could be done more efficiently and effectively for all parties involved. With so many of the spokes leading to federal and state regulation, it made sense that many of the recommendations cited in the report looked at system improvements.

In the spirit of continuous quality improvement, MCDPH leadership sat down and talked with the Arizona Department of Health Services (ADHS) leadership about this assessment and potential areas of improvement. ADHS listened intently and asked questions as we explained concerns cited in the report. They agreed that a deeper dive into the system and the policies

MARICOPA COUNTY
PUBLIC HEALTH

that make up the system made sense. In fact, an immediate response from ADHS was to host a working group made up of providers and partners to dig into some of the challenges brought forth in this report. This is a great first step.

We left our meeting with ADHS excited about the future of immunizations in Arizona. It was clear from that meeting that we both believe in the importance of a collaborative and effective vaccine delivery system focused on maximizing immunization rates and will work together to improve the system and ensure access for all.

We look forward to working collectively with our colleagues at ADHS as well as our partners throughout Maricopa County to address the opportunities this assessment brought forth.

Sincerely,

Marcy Flanagan, DBA, MPH, MA
Executive Director

ARIZONA DEPARTMENT
OF HEALTH SERVICES

November 30, 2023

Dear Provider Community:

One of the most important functions of public health is to vaccinate children to protect them against preventable diseases. I want to express my gratitude to all of the vaccine providers who work tirelessly to vaccinate children throughout Arizona. We can't succeed without you, and your dedication to the children of Arizona is deeply appreciated.

The release of the report by the OMNI Institute assessing the Vaccines for Children (VFC) Program provides an opportunity for the Arizona Department of Health Services (ADHS) to take a step back and evaluate how we can collaboratively improve the program. We are committed to working with you to identify and implement solutions. My team and I share your concerns about the troubling decrease in the number of VFC providers. While multiple, complex factors impact participation in the program, we recognize that federal and state regulations impact the ease at which providers can implement the program.

I would like to touch on one of the more challenging policies: the dose-for-dose restitution policy. The policy was originally put in place at the urging of the CDC to improve the accountability and management of vaccines. The policy calls for providers to replace vaccine doses when their annual percentage of wasted or unaccounted for doses exceeds 5 percent. ADHS has not enforced this policy since 2020, and has not asked providers to replace doses since then. We will continue this pause while we work with partners on the best approach to vaccine management that is also compliant with the parameters placed on us by the CDC.

To move forward, we will convene a workgroup of providers and partners to review current policies and practices and collaboratively determine changes to improve the provider experience within the program. If you are interested in participating in the workgroup, please email the Director's Office at andrea.schoenecker@azdhs.gov. I anticipate the workgroup will launch in early 2024.

My team and I stand with partners and providers in the shared goal of increasing vaccination rates of children and protecting them from preventable diseases. I appreciate the work of the Arizona Partnership for Immunization (TAPI) and the Maricopa County Department of Public Health in seeking to better understand the pain points and positive supports experienced by providers participating in the VFC program. We also want to recognize the hard work of our Bureau of Immunization Services and reiterate our commitment to working with our vaccine partners to identify and implement improvements to the VFC program. We look forward to our continued partnership and collaboration on improving public health in Arizona.

Sincerely,

Jennifer Cunico

Jennifer Cunico
Director/CEO

The Vaccines for Children (VFC) Program in Arizona

An Assessment of the Facilitators and Challenges to Participation in the Program

Submitted to:
Bob England, MD, MPH

The Arizona Partnership for Immunization (TAPI)

June 30, 2023

Project Team: Paola Molina, Jean Denious, Oskar Berger, Meredith Newhouse, Cindy Vigil, Devanae Allen, Shon Reed, and Leon Mait.

For More Information:

Project Code: [project code]

projects@omni.org

Acknowledgements

The OMNI Institute would like to thank Maricopa County for providing grant funding to The Arizona Partnership for Immunization (TAPI) for the provision of this report. OMNI would also like to thank TAPI and FrameShift Group for its collaboration on the assessment. We would also like to thank Equality Health and Equality Health Network for their support in helping to disseminate our online survey to childhood vaccine providers. Finally, OMNI thanks the Arizona medical community for participating in our survey and qualitative data gathering efforts. Their feedback was invaluable in shaping this report and the recommendations that are offered.

Suggested Citation:

The OMNI Institute (2023). The Vaccines for Children Program in Arizona: An Assessment of the Facilitators and Challenges to Participation in the Program. Submitted to The Arizona Partnership for Immunization (TAPI), Phoenix, Arizona.

The Arizona Partnership for Immunization (TAPI)

December 4, 2023

Dear Valued Coalition Partners,

The critical role of vaccines in public health is undeniable, contributing significantly to the eradication of numerous infectious diseases throughout the last century. Despite these achievements, the ongoing challenges posed by the COVID-19 pandemic, Federal vaccine management, and vaccine financing have impacted healthcare providers' ability to offer vaccines, leading to a decrease in availability. This shift has resulted in more patients seeking vaccines at county public health departments and an alarming rise in patients missing out on crucial vaccinations.

Recognizing the concerning decline in childhood immunization rates, The Arizona Partnership for Immunization (TAPI) collaborated with the Maricopa County Department of Public Health (MCDPH) and engaged OMNI Institute to conduct a comprehensive statewide assessment on the Barriers & Challenges to Childhood Immunizations. This initiative aimed to comprehend the intricate challenges faced by the immunization system, particularly in the wake of the COVID-19 pandemic. The recommendations, largely focused on the impact of Federal Vaccine management, draw from insights gathered from offices participating in the assessment, many of which are current AZ Vaccines for Children providers.

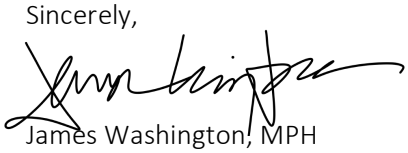
While the 2012 Office of Inspector General (OIG) study emphasized the need for simplicity in safeguards against vaccine wastage, the evolving landscape of technology, policy, and reporting, compounded by the pandemic, has introduced new barriers, as outlined in the OMNI recommendations. Our coalition partners recognize the urgency of being responsible stewards of the Vaccines for Children (VFC) program to safeguard a vital tool in disease prevention.

We trust that OMNI's recommendations will guide us in establishing best practices that strike a balance between accountability and ensuring access to vaccines for vulnerable children. The collaborative efforts of The Arizona Department of Health Services (ADHS), MCDPH, TAPI, and our immunization coalition partners align with the goal of working alongside physicians, office managers, vaccine coordinators, state vaccine programs, Medicaid health plans, and the CDC to find this delicate equilibrium.

We extend our gratitude to the OMNI Institute for dedicating considerable time to comprehend the intricate vaccine delivery system, fostering meaningful discussions with our partners, and providing the insightful report and recommendations.

Together, we are committed to navigating these challenges and enhancing the immunization landscape for the well-being of our communities.

Sincerely,



James Washington, MPH
Chief Executive Officer
The Arizona Partnership for Immunization

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Executive Summary

With funding from Maricopa County, The Arizona Partnership for Immunization (TAPI) partnered with OMNI Institute, a social sciences non-profit consultancy, to better understand the facilitators and challenges/barriers to participating in the Vaccines for Children (VFC) program in Arizona. We designed and implemented a mixed methods assessment to examine the landscape of the VFC program in Arizona. Specifically, we proposed three assessment goals that taken together allowed us to generate data-driven and evidence-based recommendations for policy, system, and environmental strategies to advance vaccine equity for the county, its five regions, and the state of Arizona. The priorities for each goal included the following:

- Goal 1: Assessing vaccine coverage gaps and needs through the identification and synthesis of relevant available secondary data.
- Goal 2: Conducting primary data collection to gather the input, experiences, and perspectives of current VFC providers and non-VFC providers on the facilitators and challenges to participating in the VFC program.
- Goal 3: Reviewing and analyzing the interpretation, application, and implications of federal (CDC) and state immunization policies.

Findings at a Glance

Goal 1: Assessing Vaccine Coverage and Gaps

Goal 1 was established to identify and synthesize relevant available secondary data that could help to characterize levels of vaccine need and coverage in Maricopa County and its five-county region. Within each of the five regions of Maricopa County, the number of VFC providers roughly tracks the size of the VFC-eligible population.

- Population Demographics: The Central Valley/Phoenix region ranks the highest of the regions with a population that is under the poverty line (16.2%), uninsured (4%), and American Indian/Alaska Native (1%), which, when considered together, provide reasonable proxies for VFC eligibility.
- Provider Reach: The Central Valley/Phoenix region has approximately 13.2 VFC providers per 100,000 people, second only to the Southwest Valley (13.9 per 100,000 people). Meanwhile, the Northeast Valley stands out as having relatively fewer VFC providers per capita (8.8 per 100,000 people), but this aligns with its greater average household income relative to the other four regions, with only 6.9% of its population under the poverty line, and only 1% of the population that is both under 18 and uninsured.
- Provider Type: Across all five regions, the most common provider types are Family/General, Pediatrics, Community Health Centers, and Specialty providers. The one exception to this pattern is the Northeast Valley, for which Indian Health Services (IHS) is the third most common provider type. It should be noted, however, that the counts of providers in our report do not account for differences in size of practices and/or the number of VFC-eligible children they serve; thus, these findings should be interpreted with caution.

- Providers with "Eligibility" Requirements: The Central Valley/Phoenix region has the highest percentage of providers with eligibility requirements (i.e., are closed systems) at 13.3%. This is in large part due to providers such as the Indian Health Services (IHS), jail facilities, and the Unaccompanied Minors program residing in the Central Valley. The Southwest Valley has the fewest providers with eligibility requirements (3.1%).
- Full Schedule of Childhood Vaccines: In all five regions, roughly 2 out of 3 providers provide the full schedule of childhood vaccines (vs. a specialized series, such as only flu shots). The Southeast Valley has the highest rate (69.7%) and the Northwest Valley has the lowest rate (61.4%).

Our synthesis of relevant available secondary data yielded a number of considerations for improving understanding of vaccine coverage and gaps. In general, better ways of estimating and consistently tracking VFC-eligible population numbers over time and across geographies should be explored. This could entail determining agreed-upon data indicators, leveraging information that is required for VFC-provider reporting, carefully documenting changes in how data points are defined or who is included in TAPI's internal data sets, and using best practice metrics or benchmarks to contextualize the extent and nature of vaccine-coverage gaps, set goals, and monitor progress.

Goal 2: VFC Provider Perspectives

Goal 2 was designed to understand current policy implications, VFC implementation facilitators and challenges, and barriers for VFC and non-VFC providers. Primary data collection of providers included an online survey (n=280), and qualitative efforts (11 key informant interviews and 3 focus groups), to gather insights from current VFC providers, former VFC providers, and providers that have never participated in the VFC program. Major findings included:

- Current VFC Providers: Of the 246 current VFC providers that were sampled, 80% were satisfied or very satisfied with the VFC program, which is down from 98% in TAPI's 2011 survey. Current VFC providers were most satisfied with the variety of vaccine-brand choices available (90%), VFC site visits (84%), and the written guidance received on VFC policy and procedures (83%). Additionally, 68% of current VFC providers found the program to be between "slightly" and "moderately" challenging, and 12% found the program to be between "very" and "extremely" challenging. The biggest challenges respondents indicated experiencing were reconciling VFC vaccine inventory (64%), delays in receiving VFC vaccines (46%), and dose-for-dose restitution of vaccine by the VFC program (23%). Qualitative Feedback: Respondents expressed frustration with the complexity surrounding ordering and returning vaccines, the challenges integrating practice electronic medical record (EMR) systems with the Arizona State Immunization Information System (ASIIS), and the administrative burdens regarding compliance and reconciliation. When asked about the significant challenges/barriers to their continued participation in the VFC program, a common theme respondents raised was an adversarial tone in the enforcement of VFC policies and communications, with administrative errors (some of which stemmed from ASIIS) often being met with accusations of fraud and/or wastage.
- Non-VFC Providers: For non-VFC providers (n=34), we learned that the top three factors that led to their non-participation were too few children in the practice or coverage area to justify program participation (47%), staff time/administrative costs needed to adhere to VFC policy (33%), and compliance requirements (30%). Qualitative feedback: Many non-VFC providers pointed to administrative burdens, expensive charges to rectify incorrect dose counts, and a

generally punitive tone from the VFC program as rationales for their non-participation. It should be noted, however, that due to the small sample, findings regarding non-VFC providers should be interpreted with caution.

Goal 3: VFC Policy Review

For Goal 3, we carried out a review and analysis of current interpretation, application, and implications of federal (CDC) and state immunization policies to the extent possible with limited data, including examination of how federal policies are being applied in other states similar to Arizona in demography/geography and vaccine programming. Goal 3 also included a review of COVID-19 best practices that may be transferrable to the VFC program, and a review of how AHCCCS could increase reimbursement to VFC participating practices. Major findings included:

- State Interpretation of federal CDC guidance: Through our review, we found that state interpretation and implementation of VFC federal guidance varies. Arizona takes a noticeably cautionary approach, emphasizing prevention and compliance. Other states, such as California, Texas, and Kentucky, adopt a more collaborative and supportive approach that emphasizes guidance, education, and identifying providers' needs. In general, vaccine management practices vary across states in terms of administrative requirements (e.g., duration of temperature log retention) and policies regarding dose-for-dose replacement of wasted or expired vaccines (e.g., negligence definitions). This variation underscores the need for increased collaboration, transparency around requirements, and perhaps clearer guidelines to ensure effective management of the VFC program across states.
- COVID-19 best practices: It would be prudent to draw best practices from the policies surrounding the COVID-19 vaccine and apply them to childhood vaccine where possible. For example, reducing the penalties for wastage, using on-site vaccination services and mobile clinics, simplifying regulations and alleviating administrative burden, and building data standards and processes together with local health actors were successful strategies surrounding the COVID-19 vaccine, and should be applied to the VFC program.
- AHCCCS Reimbursement: Feedback from VFC providers in this assessment indicates that current payments do not adequately cover the costs of provider and staff resources. The Arizona Health Care Cost Containment System (AHCCCS/the state's Medicaid program) may wish to reassess available billing and reimbursement options, increasing provider awareness about billable fees, and advocating that federal Medicaid and Medicare further increase the maximum fee caps on VFC providers and then working towards increasing maximum reimbursements.

Recommendations

VFC Program Policy and Supports:

Reduce bureaucracy: ADHS should evaluate regulations and requirements to simplify processes, minimize compliance regulations, and reduce unnecessary red tape.

Policy review: ADHS can revise its policies around financial penalties for providers unless *actual* fraud is proven. Prioritize support, education, training, and guidance to help providers meet program standards effectively and encourage participation.

Resource support: ADHS may wish to consider facilitating the provision of necessary resources such as refrigeration units and supplies for vaccine storage for providers with financial barriers.

Provider support: AHDS can bolster assistance to providers in identifying and resolving issues (e.g., duplicate vaccine records), streamline reconciliation processes, and continue to improve interconnectivity between EMR systems and ASIIS.

VFC Communication and Engagement:

Collaborative approach: ADHS can foster better communication and collaboration between VFC representatives and participating practices. Fostering a collaborative and understanding environment that prioritizes patient care and effective use of resources is recommended. Further, ADHS may wish to consider establishing a committee or platform for physicians and VFC program representatives to communicate and provide feedback.

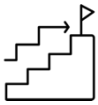
Improve communication and support: ADHS can enhance communication channels, provide timely responses, minimize delays, and offer clear guidance. Providing up-to-date information and regular updates to providers about changes, policies, and requirements related to vaccine administration is recommended.

Timely vaccine delivery: ADHS can improve the timeliness of vaccine orders and deliveries, expedite the process, and reduce delays and gaps in vaccination schedules.

Increase VFC staffing: As possible, ADHS is encouraged to allocate additional staff resources to the program to enhance efficiency and responsiveness.

Education and Training:

Education and training: ADHS in partnership with TAPI can continue to provide comprehensive education, training sessions, workshops, and resources to help providers understand program processes and compliance obligations. ADHS may wish to consider holding regular immunization conferences for providers to receive education, training, and networking opportunities.



Focus on vaccination goals: ADHS can simplify processes, facilitate timely training, and address concerns to ensure vaccination goals are prioritized. Shift the emphasis and tone from administrative compliance toward maximizing immunization rates.

Technology and Data Enhancements:

Technology enhancements: ADHS can improve accessibility and ease of use of ASIIS, support automation and integration with temperature monitoring systems for efficient temperature log management, explore improvements to barcode scanning for vaccine boxes, and improve website accessibility and self-run reporting capabilities.

Improve data for estimating and tracking VFC-eligible populations and disparities: ADHS, AHCCCS, TAPI, and other stakeholders may wish to partner to explore better ways to estimate and consistently track VFC-eligible population numbers over time and across

geographies. Leverage information required for VFC provider reporting to better characterize and understand provider capacity, patient population, and vaccine uptake. Consider adding additional data fields for vaccine orders to facilitate better monitoring and understanding of provider coverage and needs. Further, ADHS may wish to develop a 'data dictionary' for reliable comparisons of data sets and variables from year to year.

Inventory Management:

Flexibility in vaccine management: ADHS is encouraged to allow for more flexible vaccine inventory management, such as the ability to transport vaccines, share vaccines between sites and/or between private vs. VFC stock when necessary. Provide flexibility in ordering, allowing providers to place smaller orders more frequently to manage inventory effectively. Further, decreasing regulations that prevent VFC providers from setting up on-site vaccination services and/or mobile clinics in schools or community sites can support the goal of increasing the number of children vaccinated.

Apply Best Practices from COVID-19: ADHS can consider modifying vaccine wastage policies in the VFC program to prioritize maximizing vaccination coverage without penalizing doses wasted. The CDC's approach to COVID-19 vaccine wastage emphasized the importance of vaccinating every eligible person. Aligning the VFC program with this principle can help improve vaccination rates for children and alleviate administrative burdens for providers.

Increase Reimbursement:

Review billing and reimbursement options: AHCCCS can assess their existing billing and reimbursement options to ensure they align with the maximum fee caps set by the Centers for Medicare & Medicaid Services. Additionally, AHCCCS can leverage federal matching programs for Medicaid to enhance payments to VFC providers; consider reimbursing VFC providers for combination vaccine counseling administration (offering a higher reimbursement rate for each additional antigen administered); and introduce an enhanced payment, beyond the VFC regional fee cap, to cover additional inventory management costs faced by providers. By clarifying the state's official fee cap and publishing it along with any enhanced payment, VFC providers will have clear guidelines for billing higher VFC administration rates, and Medicaid health plans will have transparent payment guidelines.

Enhance provider awareness of billable fees: AHCCCS should ensure that VFC providers are well-informed about the billable fees available to them. While VFC statutes do not prohibit providers from charging an office visit fee alongside the vaccine administration fee, AHCCCS may consider covering the office visit fee as an additional means of increasing payments to providers and relieving their staff and resource costs. AHCCCS should actively educate providers on the utilization of the newly added non-vaccinating counseling code (which is now available for all vaccines and not limited to COVID-19 vaccine counseling).

Collaborate with VFC providers for increased coverage: AHCCCS may can establish a collaborative partnership with VFC providers, ADHS, TAPI, and other stakeholders to boost the number of vaccinated children annually. While this approach may not directly increase

payments per child, it can streamline processes, enhance efficiency, and reduce staff and resource costs.

Consider adopting a universal state vaccine financing system: AHCCCS in partnership with ADHS and other relevant stakeholders can reduce financial burdens and storage constraints on VFC providers by allowing state-purchased vaccines to be used for all eligible children, eliminating the need for separate vaccine stocks and storage spaces.

The recommendations presented in this report provide actionable steps to enhance the VFC program in Arizona. By implementing these recommendations, the VFC program can alleviate administrative challenges, enhance vaccination coverage, and make substantial progress in its mission to protect Arizona children's health through immunizations.

Introduction

The Arizona Partnership for Immunization (TAPI) is a non-profit statewide coalition of over 500 members that was formed in 1993 to support system-level efforts to improve immunization coverage rates in Arizona, with a focus on increasing access to vaccines and related care for underserved populations. The federally funded Vaccines for Children (VFC) program is managed in Arizona through the Arizona Department of Health Services (ADHS) and plays an integral role in ensuring access to vaccines for underserved populations across the state and in the county, including individuals who are Arizona Health Care Cost Containment System (AHCCCS/the state's Medicaid program) -eligible, uninsured, and American Indian/Alaska Native (AI/AN). TAPI provides support and training to VFC providers by conducting monthly webinars, creating and disseminating patient education materials, serving as a liaison to the ADHS VFC program, and facilitating individualized technical assistance to clinics experiencing challenges storing, handling, administering, or accounting for VFC vaccine.

With funding from Maricopa County, TAPI partnered with OMNI Institute, a social sciences non-profit consultancy, to better understand the facilitators and challenges/barriers to participating in the VFC program in Arizona. We designed and implemented a mixed methods assessment to examine the landscape of the VFC program in Arizona. Specifically, we proposed three assessment goals that taken together allowed us to generate data-driven and evidence-based recommendations for policy, system, and environmental (PSE) strategies to advance vaccine equity for the county, its five regions, and the state of Arizona. The priorities for each goal included the following:

- Goal 1: Assessing vaccine coverage gaps and needs through the identification and synthesis of relevant available secondary data.
- Goal 2: Conducting primary data collection to gather the input, experiences, and perspectives of current VFC providers and non-VFC providers on the facilitators and challenges to participating in the VFC program.
- Goal 3: Reviewing and analyzing the interpretation, application, and implications of federal (CDC) and state immunization policies.

When reading this report: Please note that "providers" is used throughout in this report, but this is not meant as all medical providers in the healthcare field generally. Instead, "providers" is utilized as a shortened term to mean VFC providers.

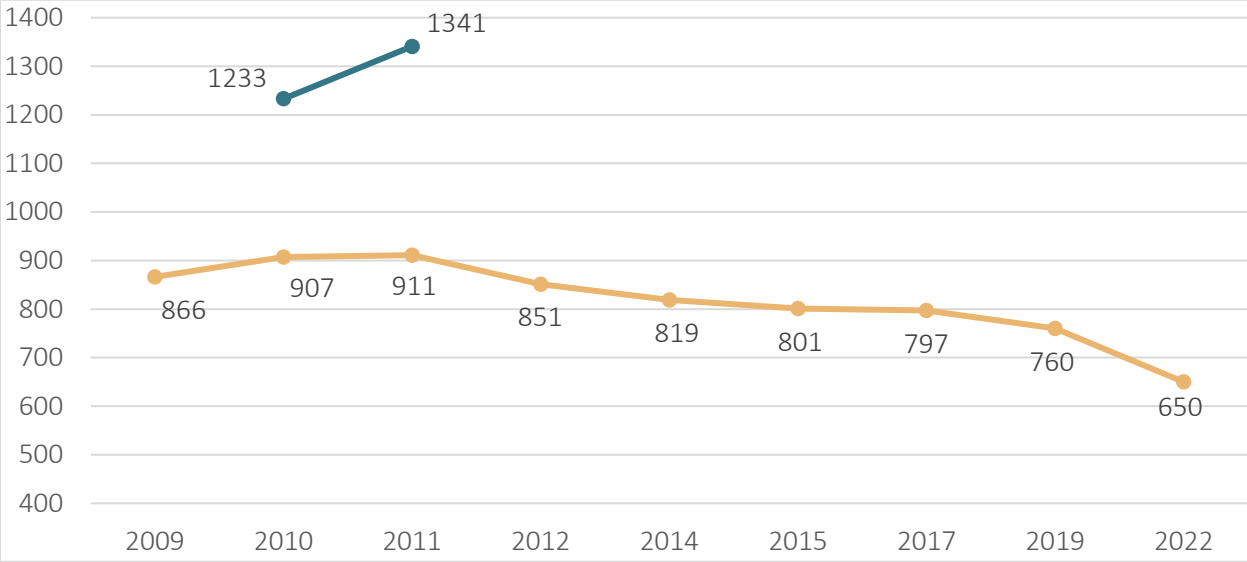
Background

In the United States, a primary mechanism for achieving equity of access to childhood immunizations is the VFC program. VFC relies upon the existing system of healthcare providers, including private pediatricians and family practitioners, in addition to specialized providers such as community health centers. Therefore, recruiting and retaining as many of these healthcare providers as possible is essential to VFC's success – not only for maintaining a high childhood immunization rate but by extension for also supporting overall primary care access. In addition, the existence of a robust system to administer vaccines to children is essential to the use of vaccines in response to a health crisis, such as the COVID-19 pandemic, through which we have all been living.

Here in Arizona, public health and healthcare leadership have worked collaboratively for more than 20 years to improve access to life-saving vaccines for all Arizonans. The public-private partnership allows for all sectors of the vaccine industry to meet and strategize to address strengths and gaps in immunization delivery for effective system change. This partnership led to an increase in childhood vaccine coverage until 2011 (Arizona Health Care Cost Containment System [AHCCCS], 2018).

Since 2011, complexities in the vaccine system have likely led to the observed decline in coverage for children living at or below poverty and most often uninsured or on AHCCCS. For example, DTaP#4 (Diphtheria, Tetanus, and Pertussis) coverage levels for children at or below poverty in Arizona decreased from 88.5 percent in 2007 to 77.8 percent in 2017 (Centers for Disease Control and Prevention [CDC], 2017). Further, VFC provider identification numbers (PINs) have decreased over time despite a program change requiring multi-location group practices and community health centers (CHCs) to have a separate PIN for each vaccination site. For example, in 2011, the Maricopa County Department of Public Health (MCDPH) had one PIN for multiple sites. Currently, four PINs are required, one for each of their four clinic sites. Despite this change, as Table 1 shows, there has been a decline in PINs over time.

Table 1: The Number of VFC Provider PINs from 2009 to 2022 and the Number of VFC Provider Locations from 2010 to 2011



Source: TAPI. (2023). Arizona Vaccine Congress

Further, as the table above shows, in 2011, Arizona listed 1,341 separate VFC *locations* where VFC vaccine could be obtained (these numbers came from the VFC survey mailing lists provided to TAPI). Since each location now requires its own PIN, it is likely that the number of actual locations has decreased from 1,341 to 650 over that 11-year period, a more than 50% decline. An examination of Maricopa County VFC vaccine orders over time further indicates a net loss of at least 40 provider locations and 45,000 fewer VFC vaccines given, despite an increase in VFC eligible kids through population growth (Maricopa County, 2020, as cited by TAPI).

Maricopa County has also experienced the most population growth in the nation for several years in a row (U.S. Census Bureau, 2023). Over 440,000 Maricopa County children are under the age of 19 and eligible for VFC vaccine, most through AHCCCS and 8.3 percent because they are uninsured (Annie E. Casey Foundation, 2023). The national average of 24 providers per 10,000 AHCCCS enrolled children is far higher than Maricopa's current level of 10 providers per 10,000 kids (National Center for Immunization and Respiratory Diseases, 2019). Appointments for routine childhood immunizations are a driver of primary care utilization for young children, and access to primary care is a social determinant of health and is particularly important during early childhood (Turner, 2018). Therefore, inequities in the availability or distribution of childhood immunizations magnify impacts on health equity broadly, beyond the already crucial importance of vaccines themselves.

In this assessment, we hypothesized that the documented decrease in VFC providers reflects recent VFC policy changes that have effectively shifted the federal burden of vaccine inventory management to providers, as well as increased their costs. This impacts public health safety net services, as more families must access public health clinics for vaccines. Additionally, The COVID-19 pandemic resulted in many county immunization clinics being temporarily shut down, as staff had to prioritize COVID clinics. The constraints of small county budgets also mean that these clinics are expected to do more with inadequate funding, putting additional strain on public health resources. The burdens around VFC vaccine inventory management also affects the private sector and combined with the constraints on public health clinics has likely reduced the overall vaccination rate and exacerbated inequities in vaccine access in Arizona.

In our efforts to gain insight into the VFC program in Arizona, we conducted a comprehensive assessment. By focusing on the three primary goals outlined above, we aimed to gather data and develop evidence-based recommendations for advancing vaccine equity. These goals encompassed assessing vaccine coverage gaps and needs (Goal 1), gathering input from VFC and non-VFC providers on program facilitators and challenges (Goal 2), and reviewing state immunization policies for analysis and interpretation (Goal 3).

Methods

In this section we provide further details about the methodological decisions and considerations for each of the three goal areas of this assessment.

Goal 1: Assessing Vaccine Coverage Gaps and Needs

As part of OMNI's work with TAPI and their partner FrameShift Group, an initial Goal ("Goal 1") was established to identify and synthesize relevant available secondary data that could help to characterize levels of vaccine need and coverage in Maricopa County and its five-county region. Given the initial source of funding (a Building Healthy and Resilient Communities grant from the Maricopa County Department of Public Health (MCDPH), with a focus on the five county regions - Central, Southwest, Southeast, Northwest, Northeast - the original questions we sought to address with secondary data focused on understanding the picture of vaccine coverage and needs within and across these five county regions. A further objective was also to understand how this picture has changed over time, given the tremendous growth in the county's population over the past decade at the same time as provider participation in the VFC program has appeared to wane.

Once exploration of available data commenced, however, it became clear that the questions in their original form could not be fully and confidently answered given limitations of (a) Census data for precisely estimating the VFC-eligible population, and (b) provider data (derived from vaccine order information) for examining levels of provider coverage over a significant time period.

- Census data: To calculate the VFC-eligible population, Maricopa County regions have boundaries that can be defined in terms of zip codes or city municipalities, which makes it possible to aggregate some Census-derived data that are useful for estimating the VFC-eligible population. However, these data points are not sufficiently fine-grained to address the original questions as posed. For instance, and as further described below, Census data allows for estimates of the number of individuals under the age of 18 who are American Indian or Alaska Native but not the percentage who are under 18 and on Medicaid or who are under-insured.
- Provider data: Usable data were only available for 2017 and 2020, precluding the ability to examine trends in coverage over the past decade.

As a result, the priority questions were subsequently modified to reflect the constraints of the available data. Additionally, the funding for the project shifted to another source held by MCDPH, such that there was a reduced focus and need to capture information by region. Nonetheless, because Maricopa County is so vast and diverse, and much of the regional analysis had already been completed, we retained a focus on the five regions.

The final, revised questions we sought to address with the secondary data were:

1. How do the potential populations of VFC-eligible children vary by the 5 regions of Maricopa County (MC)? Specifically, what are the numbers or rates of the population in each region on the following related demographics: population under 18; % population under poverty line; uninsured; American Indian/Alaska Native?
2. What are the number and types of VFC providers in each of the 5 regions of MC?

3. What is the estimated number of VFC providers in each of the 5 regions of MC that have eligibility requirements (i.e., are 'closed' systems), and that provide the full schedule of childhood vaccines vs. not?
4. What are considerations and recommendations for improving understanding of vaccine coverage and gaps?

Goal 2: VFC Provider Perspectives

Goal 2 was designed to understand current policy implications, VFC implementation facilitators and challenges, and barriers for VFC and non-VFC providers. Primary data collection of providers included an online survey and qualitative efforts (11 key informant interviews and 3 focus groups), to gather insights from current VFC providers, former VFC providers, and providers that have never participated in VFC with the aim of better understanding current immunization policy implications, VFC implementation facilitators and challenges, resource needs, and barriers.

Online Survey

In collaboration with TAPI and FrameShift group, OMNI developed a brief online survey for medical providers and key VFC personnel to take. The survey was structured so that current VFC providers, former VFC providers, and providers that have never participated in VFC could participate. Questions were intentionally focused on facilitators and challenges/barriers to VFC participation, key organizational information, and information about the medical providers' referral practices for vaccines (i.e., when medical providers refer out for vaccines and to whom; see the Appendix for the survey instrument).

Data were collected from November of 2022 to February 2023. TAPI facilitated statewide outreach and recruitment through its extensive networks, and we leveraged existing electronic/media forums for advertising the survey and project goals to providers, including existing list serves, social media groups, and other mechanisms.

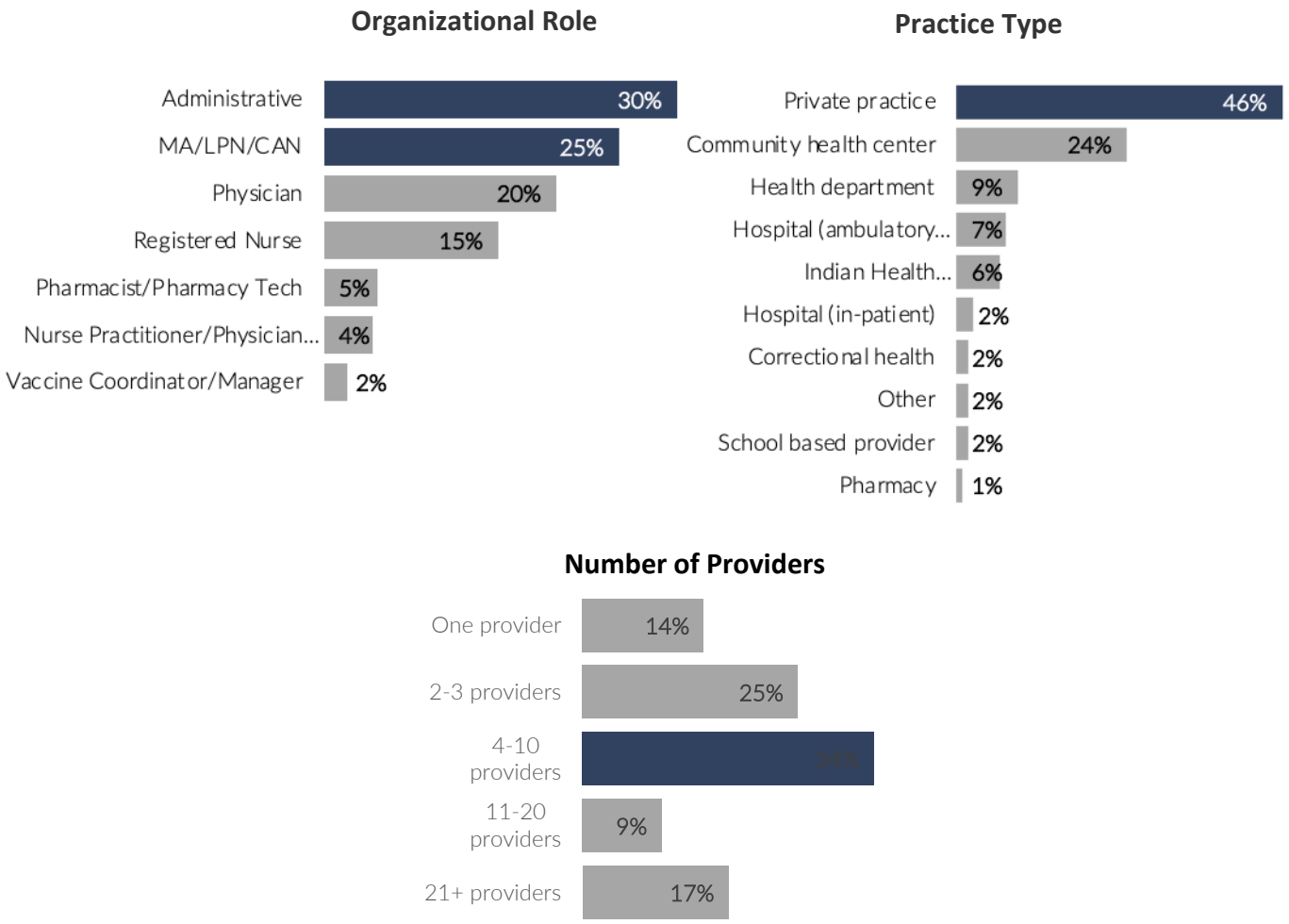
In total, 280 providers[1] participated – 246 current VFC providers responded to the survey, 10 former VFC providers, and 24 providers that have never participated in VFC responded to the survey. Below we share further demographic information about respondents separated by current VFC providers and all non-VFC providers including former providers and those who have never been a VFC provider.

Demographics of Current VFC Providers

At the time of the survey, current VFC providers (n=246) had participated in the program for an average of 12 years. Most of the respondents (46%), worked in private practices, followed by community health centers (24%). Of those who selected private practices, 70% worked in pediatrics. The most common roles of respondents were administrative roles (30%), and Medical Assistants/Licensed Practical Nurses/Certified Nursing Assistants (25%). Thirty-four percent (34%) of respondents worked in a practice size of 4-10 providers.

[1] For simplicity, providers will be used as short-hand for medical providers and key VFC personnel.

Figure 1: Current VFC Providers' Key Demographics



Demographics of Non-VFC Providers

Due to a smaller number of respondents (n=34), former VFC providers (n=10) and providers that have never participated in the VFC program (n=24) were grouped together. Most non-VFC respondents (42%) worked in private practices, and of those, 57% selected family practice as their primary practice. Thirty percent (30%) worked in administrative roles and 21% were registered nurses. Thirty-four percent (34%) of respondents had a practice size of 1 provider. At the time of the survey, the last time previous VFC providers had been in the program was two years ago. It should be noted that 9% of non-VFC providers indicated they were community health center providers, even though these centers are generally considered VFC sites.

Figure 2: Non-VFC Providers' Key Demographics

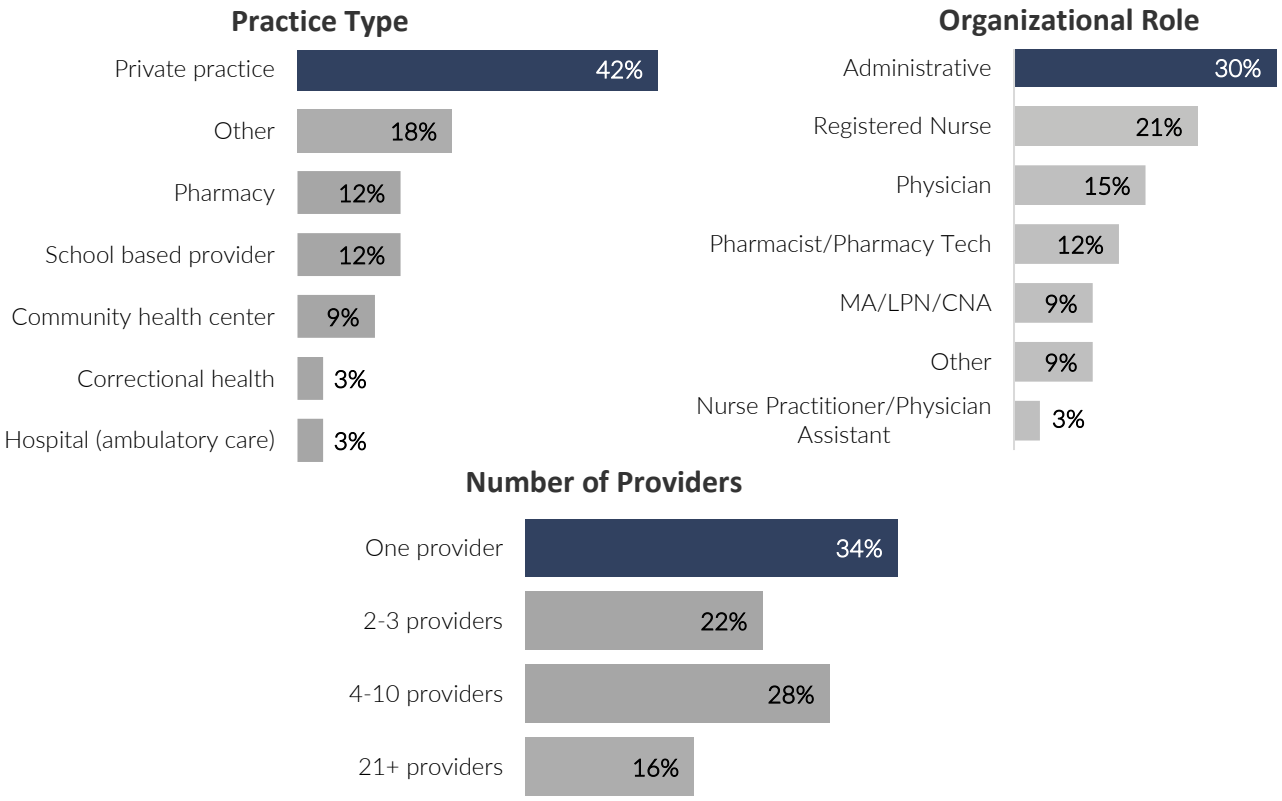
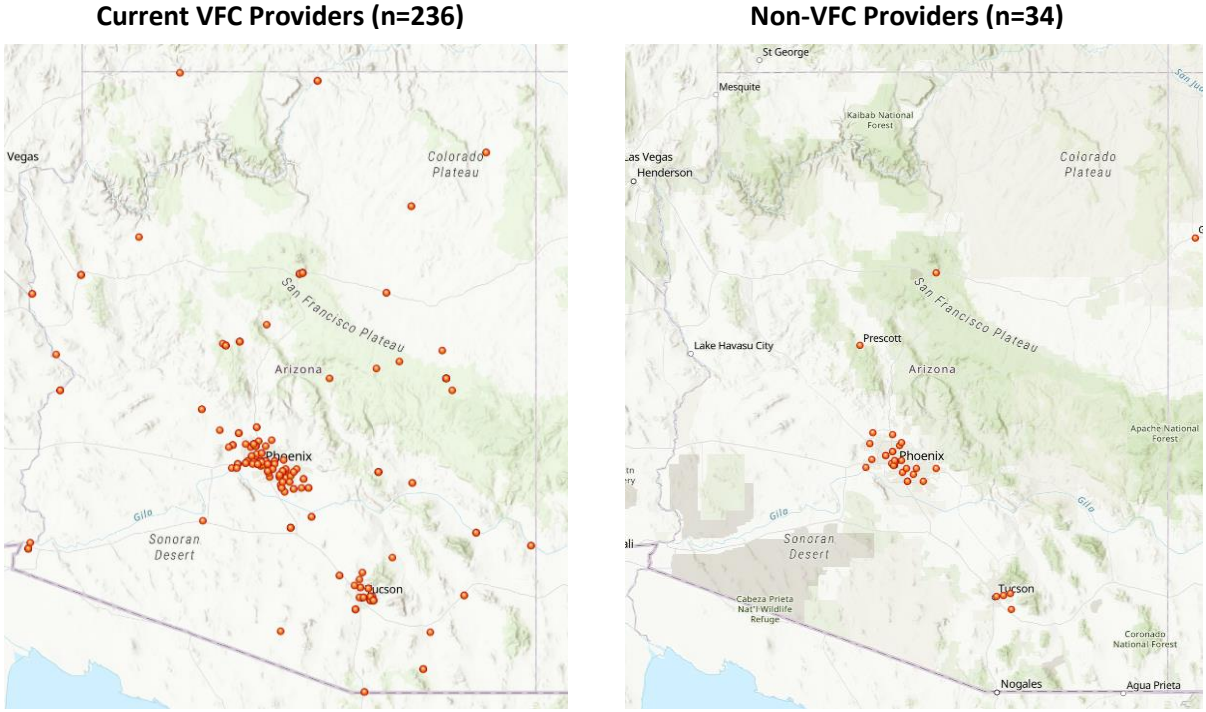


Figure 3: Geographic Location of Current and Non-VFC Providers



Aggregate Analysis

A total of 280 respondents took the online survey – 246 current VFC providers responded to the survey, 10 former VFC providers, and 24 providers that have never participated in VFC. We grouped former providers and providers that had never been in the program due to the small numbers. We then analyzed the data and organized the findings in this report around: Current VFC providers (n=246) and non-VFC providers (n=34). We employed descriptive statistics for aggregate analyses (e.g., frequencies). Further, due to the sample size of current VFC providers in the sample, we were also able to further examine key sub-group differences.

Sub-Group Analyses

To examine sub-group differences, we ran statistical tests using a binomial test on the proportion of respondents who indicated they were satisfied with various supports offered by the VFC program that is administered by the Arizona Department of Health Services (responded with 'Satisfied' or 'Very satisfied') on the survey. This approach derives from expert analysis of the annual National Student Satisfaction Survey (NSS) and has the following strengths germane to our project[2]:

- It avoids converting Likert responses to mean values, which is problematic because the Likert scale is not linear and interpreting something akin to 0.43 of the gap between 'neutral' and 'agree' is not straight forward.
- It avoids the 'marmite effect' whereby very different response profiles can have similar means. For instance, means will be similar among responses that were distributed uniformly from "very dissatisfied" to "very satisfied" and those that were extreme with most being either "very dissatisfied" or "very satisfied" and those where no responses were at the extremes and most concentrated in the middle from "satisfied" to "dissatisfied".
- Similarly, it is easy to over-interpret significant differences between "satisfied" and "very satisfied" which may occur for reasons that are random, arbitrary, or for factors that cannot be identified. This approach avoids that as well.

For the analysis, we examined the satisfaction questions on the survey for the following key sub-groups:

- Providers by the percentage of AHCCCS eligible patients served with:
    - "high" AHCCCS eligible patient load being defined as 75% or more patients were AHCCCS eligible, an
    - "intermediate" AHCCCS eligible patient load when it fell between 50-74%, and a
    - "low" AHCCCS eligible patient load when it was 49% or lower.

  We hypothesized that satisfaction with program components may vary in meaningful ways between practices that have low, intermediate, or high AHCCCS eligible patient loads.
- Practice type was also examined. Private practice versus community health center providers were compared, as these reflected the largest groups in terms of practice type in the sample. We hypothesized that because private practices have such different infrastructure, staff capacity constraints, etc. than community health centers that there could be meaningful differences in satisfaction with different aspects of the program.

[2] For a discussion of these issues see this reference.

In each case we used the sub-groups as predictor (independent) variables and the response (dependent) variables were the Likert-scale questions that covered satisfaction with various aspects of VFC experiences.

Qualitative Data

To supplement and expand upon survey findings, qualitative efforts were also carried out that included 11 key formant interviews and three focus groups with 18 VFC providers and coordinators (n=29). Further, open-ended survey questions were analyzed for related themes, and findings in the body of the report were combined across all qualitative data collection for ease of reading. Interview and focus group questions were designed to explore the facilitators and challenges/barriers to administering the VFC program. The open-ended survey questions also asked about challenges and what feedback providers would share to improve the VFC program (see the Appendix for the interview and open-ended survey questions that were asked). Quotations included in the body of the report have been lightly edited for ease of reading.

Data Collection

To identify potential respondents for qualitative data collection, we leveraged TAPI and FrameShift Group's deep knowledge of the VFC provider landscape to employ purposeful sampling. This better ensured that we had a diverse sample with key characteristics (see Demographics below). We generated a list of potential respondents in two main ways – first, through TAPI's list of current and former providers. Second, at the end of the online survey, we invited respondents to click a separate link to a survey or "interest form" if they were interested in providing additional input. In total, 96 respondents filled out the interest form – 88 current VFC providers and eight non-VFC providers (only one of which was a former VFC provider; the other seven providers had never been part of the program).

Qualitative data were collected from December 2022 to May 2023. Interviews and focus groups were conducted via Zoom, an online video-conferencing platform. Respondents were provided with necessary log-in information to join at the scheduled time and date. Respondents were then provided with information about the process and verbal consent to participate. Interviews and focus groups lasted from approximatley 30-to-75 minutes and were recorded for transcription purposes, and recordings were saved on an excrypted folder that requires password credentials to access.

Data Analysis

Qualitative analysis included both deductive and inductive strategies. We developed preliminary codes based on initial review of transcripts, data scan, key research priorities and questions. We refined coding structures to capture emerging themes. We used Dedoose, a qualitive analysis software, to organize and code data into thematic categories for analysis. Analytic operators were used to allow for comparisons of themes between variables of interest. The result was reported in a format that is clear and digestible, while ensuring the technical details that are critical for key contributors and decision makers are accessible and comprehensive.

Demographics for Key Informant Interviews and Focus Groups

Interviews: In total, we Interviewed 11 respondents – eight current VFC Providers and three former VFC providers. Respondents included 8 medical providers and three nurses, five of whom had sole VFC responsibilities. Time implementing the VFC program ranged from eight months to up to 30 years. Practice types varied widely: Two were from community health centers, two from health departments, four from private practices, one from a large outpatient medical group, and one from a large outpatient medical group.

Focus groups: Additionally, we held three focus groups to gather additional input from current VFC providers (n=18) due to the high number of responses we received via our interest form. This included holding a focus group for one large community health center with a mix of medical providers, including the overseeing VFC Medical Director, and VFC coordinator staff. Two additional focus groups were held where we invited respondents to join across different types of practices.

Data Limitations

In terms of data limitations, it should be noted tha fewer former VFC providers participated in data collection than we hoped to reach. Of the 280 respondents who took the online survey, only 10 were former VFC providers (4% of the sample). As described above, this meant we needed to combine former VFC provider perspectives (n=10) with providers that had never been part of the program (n=24) in order to have sufficient cases for quantitative analysis (n=34). Similarly, of the 11 key informant interviews that were conducted, only three respondents were former VFC providers (27%). Because of these limited data, findings in this report that detail experiences from former VFC providers should be read as suggestive.

Goal 3: VFC Policy Review

Finally, for Goal 3, we carried out a review and analysis of current interpretation, application, and implications of federal (CDC) and state immunization policies, including examination of how federal policies are being applied in other states similar to Arizona in demography/geography and vaccine programming. As part of this work, we aimed to review and analyze CDC federal guidance to better understand how states were interpreting and implementing the policy differently. However, we were unable to locate/access the document, and when we inquired with the Arizona Department of Human Services (ADHS), we were informed that the guidance is only made available to states (grantees). As such, our review of the interpretation of CDC guidance was done at the level of states where we reviewed several state operations guides and compared them to Arizona's operations guide. Research questions to address included:

1. What were the policy recommendations of the Office of Inspector General vaccine Report?
2. How are federal (CDC) policies being interpreted and applied in Arizona and in similar states?
3. What best practices for the COVID-19 vaccine could be applied to childhood vaccine?
4. How can AHCCCS increase payments to reflect liability and staff time to participate in the VFC program?

Goal 1: Assessing Vaccine Coverage Gaps and Needs

The final, revised questions we sought to address with the secondary data that were available included the following (see Methods for a further discussion on secondary data limitations):

1. How do the potential populations of VFC-eligible children vary by the 5 regions of Maricopa County (MC)? Specifically, what are the numbers or rates of the population in each region on the following related demographics: population under 18; % population under poverty line; uninsured; American Indian/Alaska Native?
2. What are the number and types of VFC providers in each of the 5 regions of MC?
3. What is the estimated number of VFC providers in each of the 5 regions of MC that have eligibility requirements (i.e., are 'closed' systems), and that provide the full schedule of childhood vaccines vs. not?
4. What are considerations and recommendations for improving understanding of vaccine coverage and gaps?

Overview of Data Sources and Definitions for Regions and Populations

Maricopa County Regional Data Definitions

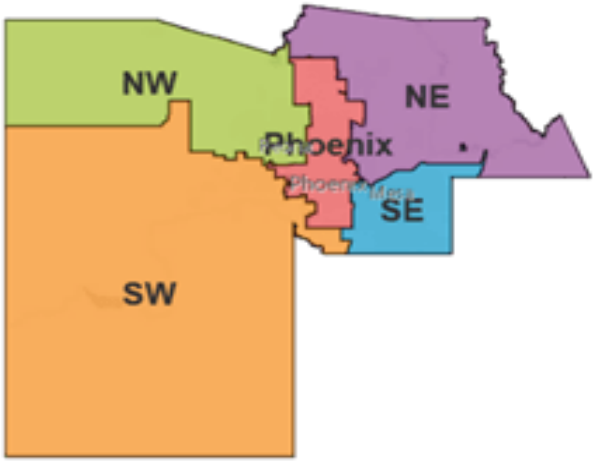
A County Region is an atypical geographic unit. However, Maricopa County is the fourth most populous county in the United States and contains a great deal of economic, racial, and cultural heterogeneity. Thus, public health policy makers in Maricopa Country have sub-divided the County into regions for analysis and planning purposes. Even though most secondary data sources are not organized by County Region, the boundaries of these regions are such that they are non-overlapping with cities and zip codes. This allowed us to use Census data at the zip code or city level to calculate regional differences.

The regions are:

- Northwest Valley: Youngtown, Wickenburg, Surprise, Peoria, El Mirage, Glendale
- Southwest Valley: Tolleson, Litchfield Park, Goodyear, Buckeye, Avondale (Gila Bend not present)
- Northeast Valley: Scottsdale, Paradise Valley, Fountain Hills, Cave Creek (Carefree not present)
- Southeast Valley: Queen Creek, Tempe, Mesa, Guadalupe, Gilbert, Chandler

Figure 4 on the following page displays The Maricopa County Government provides a map of the regions, as displayed below.

Figure 4: Map of Maricopa County Regions



OMNI utilized the geographic descriptions and boundaries of the regions to develop a key that linked each county region, zip code, and city. This key was then used to aggregate secondary data sources from zip codes or cities to regions, and broadly characterize the regions.

Regional Population and VFC Provider Numbers

Both the regional calculations based on Census data and the VFC provider data provided by TAPI were used to understand population size and provider coverage. As shown in the table below, Central/Phoenix and Southeast Valley are the most populous regions, while both the Northeast and Southwest Valley regions are far smaller, with less than a quarter of the population of the largest two regions. Even after taking its lower population size into account, the Northeast Valley has fewer providers per capita than the other regions. However, this may reflect lower levels of coverage need which are further examined in the following section.

Table 2: Regional Population and VFC Provider Numbers

Region	Total Population	Number of Cities	Number of Zip Codes	Number of Providers in 2020	Providers per Capita
Central/Phoenix	1,624,569	2	41	214	13.2
Southeast Valley	1,312,533	6	31	149	11.4
Northwest Valley	637,449	6	16	71	11.1
Southwest Valley	309,736	7	10	43	13.9
Northeast Valley	306,553	5	12	27	8.8

VFC Eligibility Criteria

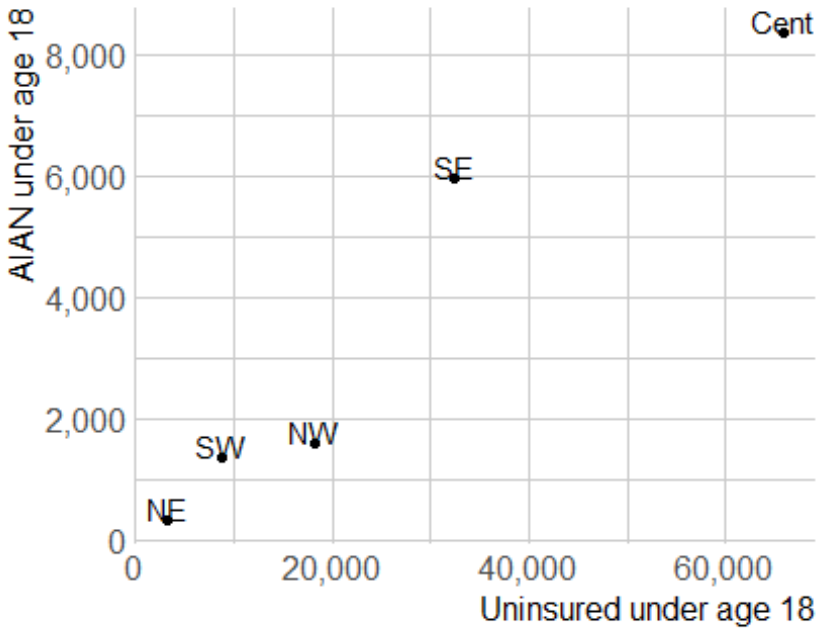
Eligibility for the VFC program is determined by multiple criteria, including:

- Medicaid eligible, specifically any eligibility for a Medicaid/state-sponsored program
- Uninsured
- American Indian or Alaska Native

- Under-insured, defined as having health insurance that doesn't include vaccine coverage.

Thus, to estimate the numbers of VFC eligible children under 18, we sought to obtain available data on each of these criteria. Unfortunately, we were unable to locate publicly available data that could be aggregated to county region to generate estimates of Medicaid eligible or under-insured children. However, we were able to use census data to estimate the uninsured population and the American Indian or Alaska Native (AIAN) population in each county region. See Figure 5 below which shows the correlation between these estimates (AIAN on y-axis, uninsured on x-axis) for each region. The estimates for the number of individuals under 18 who are uninsured and the number of individuals under 18 who are American Indian or Alaska Native are highly correlated with one another. In line with overall population numbers, estimates for the Central/Phoenix region were the highest by far, with the Northeast Valley having the lowest estimate.

Figure 5: How Two Measures of the VFC-Eligible Population Related to Each Other (uninsured under 18 and American Indian or Alaska Native under 18)



Thus, the total population of need could follow this ranking, from *highest* to l*owest*:

1. Central/Phoenix
2. Southeast Valley
3. Northwest Valley
4. Southwest Valley
5. Northeast Valley

Because the two measures of VFC eligibility are so highly correlated (and produce the same rankings of county regions), we chose to use the number of uninsured individuals under the age of 18 as the best available proxy for the total potential number of VFC eligible individuals.

To provide additional context for understanding regional levels of need and eligibility, we also examined median household income by county region, which was appreciably higher for the Northeast Valley, also the least populated region and having the fewest providers per capita. See Figure 6 below. The number of VFC providers for the Northeast Valley therefore appears similarly proportional to the size of its VFC eligible population, relative to most other regions (see Figure 7). The Southeast Valley, however, *may* have more providers per eligible population than the other regions.

Figure 6: How Median Household Income Relates to VFC Providers Per Capita

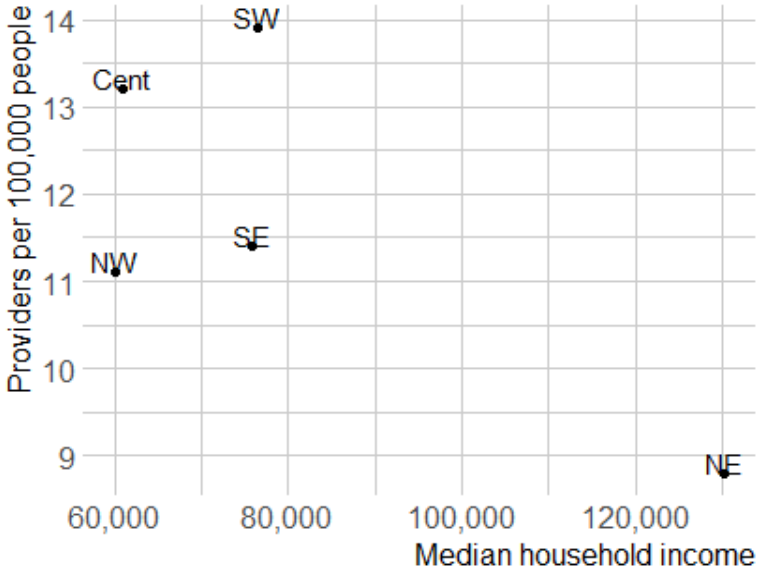
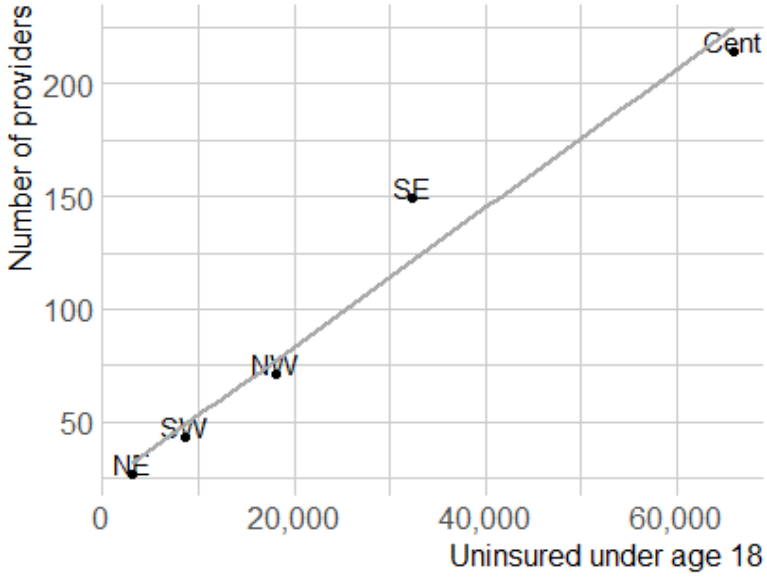
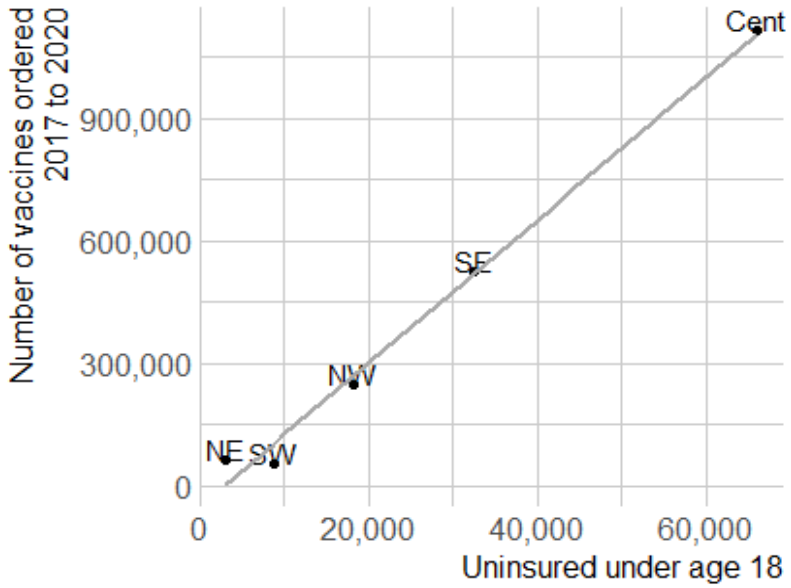


Figure 7: The Relationship Between the Number of Uninsured Individuals Under 18 Years of Age and the Number of VFC Providers



The number of vaccines ordered from 2017 to 2020 is also similarly proportional to the VFC eligible population across regions. Please note this includes safety net providers. See Figure 8 below.

Figure 8: The Relationship Between the Number of Vaccines Ordered by VFC Providers from 2017 to 2020 and the Number of Uninsured Individuals under 18 Years of Age



Key Questions

Question 1: How do the potential populations of VFC-eligible children vary by the 5 regions of Maricopa County?

To address this question, we examined the numbers or rates of the population in each region on the following related demographics as described in the previous section: Population under 18; % population under poverty line; uninsured; and American Indian/Alaska Native. It should be noted that these categories are not mutually exclusive, thus the data can only be examined together to understand *potential* range and variations in VFC-eligibility by region. Overall, the Central/Phoenix region has the largest numbers in terms of the population under 18, population under the poverty line, and population who are under 18 and uninsured. The Southwest Valley has the largest percentage of population under the age of 18, followed by the Central Valley/Phoenix (see Table 3 below).

Table 3: Percentage of Population by Region by Measures of Eligibility and Poverty

Region	Percent of population under 18	Percent of population under poverty line	Percent of under 18 uninsured	Percent AIAN under 18
Central Valley/Phoenix	25.7	16.2	4	1
Northeast Valley	15.1	6.9	1	<1
Northwest Valley	24.9	12.2	3	<1
Southeast Valley	24.3	10.7	2	<1
Southwest Valley	27.1	9.1	3	<1

Note: <1 indicates less than 1% of the population is American Indian/Alaska Native in that region.

Question 2: What are the numbers and types of VFC providers in each of the 5 regions of Maricopa County?

Table 4 below displays the total number of providers and provider rate per capita by region. As previously noted, the Northeast Valley initially stood out for having relatively fewer providers per capita, but this was accounted for by a lower proportion of VFC eligible population, and tracks with its greater average household income relative to other regions.

Table 4: Number of VFC Providers and Providers per 100,000 People by Region

Region	Number of VFC Providers	VFC Providers per 100,000 people
Central Valley/Phoenix	214	13.2
Northeast Valley	27	8.8
Northwest Valley	71	11.1
Southeast Valley	149	11.4
Southwest Valley	43	13.9

Table 5 below enumerates the various types of providers in each county region. Family/General, Pediatrics, Community Health Center, and Specialty were the top four provider types across all of the regions, with the exception of the Northeast Valley, for which Indian Health Services (IHS) was the third most common provider type given its geographic location. Indeed, 3 out of 7 of the county's IHS providers are located in the NE Valley. It should also be noted that not all provider units are equal. For example, a large community health center may serve many more VFC eligible children than a small private office. In the table below, each of these sites counts as a single provider unit. Thus, findings should be read with caution.

Table 5: Counts of Each VFC Provider Type by County Region

Region	Central /Phoenix	Northeast Valley	Northwest Valley	Southeast Valley	Southwest Valley
Community Health Center	29	5	7	13	6
Family/General	85	8	28	58	17
Fire Dept Baby Shots	1	0	1	2	0
Health Department	2	1	0	2	0
Hospital	8	0	3	6	0
IHS/Tribal/Urban Indian	4	3	0	1	0
Mass Immunizer	1	0	0	1	0
Pediatrics	67	12	27	59	7
Prison/Jail	3	0	0	0	0
School Based Clinic	3	0	0	2	0
Specialty	18	1	3	9	2
Unaccompanied Minor	5	0	1	2	0

Question 3: What is the estimated number of VFC providers in each of the 5 regions of Maricopa County that have eligibility requirements (i.e., are "closed" systems), and that provide the full schedule of childhood vaccines vs. not?

As Table 6 shows, the region with the highest percentage of providers with eligibility requirements (i.e., are part of a "closed" system) is the Central Valley/Phoenix. This is in large part due to providers such as the Indian Health Services (IHS), a greater number of jail facilities, and the Unaccompanied Minors program residing in the Central Valley. The Southwest Valley has the fewest providers with eligibility requirements. See Table 5 below.

Table 6: Percentage of VFC Providers with Eligibility Requirements by Region

Region	Total # of Providers	# w/o Eligibility Requirements	# with Eligibility Requirements	% with Eligibility Requirements
Central Valley/Phoenix	226	196	30	13.3
Northeast Valley	30	27	3	10.0
Northwest Valley	70	66	4	5.7
Southeast Valley	155	144	11	7.1
Southwest Valley	32	31	1	3.1

Table 7 below displays the number and percentage of providers that give the full series of vaccines versus a specialized series such as just giving flu shots. With the exception of 6 of the providers that serve only toddlers, all of the providers that give the full series provide this to both toddlers and teens.

Table 7: Percentage of VFC Providers that Give the Full Series of Vaccines (i.e., HIB, MCV4, or both)

Region	Total # of Providers	# w/o Full Series	# with Full Series	% with Full Series
Central Valley/Phoenix	226	72	154	68.1
Northeast Valley	30	10	20	66.7
Northwest Valley	70	27	43	61.4
Southeast Valley	155	47	108	69.7
Southwest Valley	32	11	21	65.6

Question 4: What are considerations and recommendations for improving understanding of vaccine coverage and gaps?

Explore better ways to estimate and consistently track VFC-eligible population numbers over time and across geographies. As noted above, census data allowed us to provide some estimate of the VFC-eligible population using the numbers of individuals under 18 who are uninsured as a proxy, but we could not calculate precise estimates. Further, not all census data points are collected every year making it difficult to rely upon as a source for annual estimates. It is possible that the state or county has access to other sources of data that could be used to more precisely estimate and track yearly the numbers of VFC-eligible individuals, but these are not known to us.

In the absence of such data, it could still benefit TAPI and other stakeholders, such as MCDPH to determine an agreed-upon data indicator (or set of indicators) that - even if imprecise – can be consistently used over time and across geographies to reliably measure the VFC eligible population. For example, AHCCCS may wish to partner with TAPI, MCDPH, and other stakeholders around zip code data of enrolled children to compare to VFC providers. This will help to more closely monitor and demonstrate trends in vaccine coverage and gaps going forward to inform where there are health disparities in geographic areas and populations. Note, however, that we do not necessarily recommend the use of county regions as a geographic unit. First, to our knowledge, robust secondary data sources aren't readily available at this level. Second, given our analyses did not reveal much difference across regions, it is possible these divisions are not sufficiently granular or bounded to elucidate where gaps are greatest and where resources should be directed. Better data can inform not only health equity strategies within childhood vaccine work but also other heath initiatives.

Explore opportunities to better leverage information that is required for VFC provider reporting and/or to enhance provider-level data collected as part of vaccine orders. It may be worth exploring whether there are ways to obtain and utilize relevant data points provided in provider reports to better characterize and understand provider capacity and burden, patient population, and vaccine uptake. Such data would allow for more nuanced analysis of supply and demand issues, coverage gaps, and the level of administrative burden and sustainability for providers enrolled in the program. If it is not possible to leverage data from provider reports, TAPI may still wish to explore whether adding a few additional data fields for what is collected for vaccine orders could facilitate better monitoring and understanding of provider coverage and needs (e.g., capturing the % of patient population that is Medicaid-eligible). As the following section

of this report highlights, VFC providers engaged in the survey and interviews shared that reporting requirements are onerous and detailed. Efforts to streamline reporting are recommended.

Ensure any changes over time in how data points are defined, or who is included in TAPI's internal data sets, are carefully documented and accounted for so that reliable comparisons can be conducted across years. Given vaccine policies are complex and dynamic, with the pandemic a compounding factor, it is challenging for information on VFC providers, both past and current, to be consistently gathered and for data to be consistently defined. Even when it is not possible to maintain consistency, it can be helpful to document these differences and changes so that any analysis of these data takes such limitations into account. It is recommended that moving forward, ADHS explore opportunities to develop and update a detailed 'data dictionary' that can be used to ensure accurate understanding of data sets and variables from year to year.

Use best practice metrics or benchmarks to contextualize the extent and nature of vaccine coverage gaps, set goals, and monitor progress. In the absence of robust longitudinal data to capture trends in vaccine coverage and gaps, it can be particularly useful to have objective comparison points for contextualizing annual numbers and distribution of VFC providers and rates of vaccine coverage per population. For example, establishing ideal ratios of providers per capita, or providers per VFC-eligible population, and/or identifying key provider types that must be sufficiently represented among VFC providers within and across geographies, can help to pinpoint and quantify particular shortfalls in current coverage and capacity. In future efforts, it will be important to capture (to the extent that is possible) the size of provider sites, as the number of patients served can vary widely between VFC providers.

Goal 2: Provider Perspectives

To hear directly from providers who administer childhood vaccines, OMNI carried out a mixed-methods primary data collection effort. This section presents findings from the online survey that sampled current and former VFC providers, along with providers who have never been in the program. We also synthesize qualitative findings from open-ended survey feedback, interviews, and focus groups.

Current VFC Providers

A total of 246 Current VFC providers answered the online survey, and over 100 respondents provided open-ended feedback through both the online survey and interviews and focus groups. Below we summarize findings for current VFC providers' experience with participating in the program.

Vaccine Process

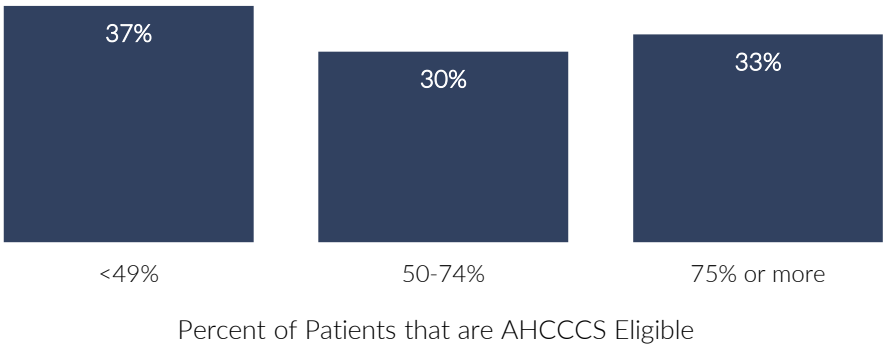
When asked how VFC respondents were involved in the vaccination delivery process, 77% indicated that they were involved in inventory management (including ordering vaccines, accounting for doses, etc.), followed by 70% of respondents indicating they administered vaccines (including counseling patients, obtaining consent, and providing the injection). Please note that because respondents may be involved in the system in multiple roles, percentages below exceed 100 percent.

Table 8: How Current VFC Providers are Involved in the Vaccination Delivery Process

How are you involved in the vaccination delivery process? (Check all that apply)	Percent of respondents
Inventory management (including ordering vaccines, accounting for doses, etc.)	77%
Administer vaccines (including counseling patients, obtaining consent, providing injection)	70%
Update patient records in the electronic medical record (EMR) and/or registry	69%
Review/track immunization coverage of patient population	53%
Billing	26%
Administrative oversight	7%
Other	2%

In terms of the proportion of patients that were eligible for the Arizona Health Care Cost Containment System (AHCCCS or Arizona's Medicaid agency), practices roughly fell within thirds – 37% of VFC providers indicated that less than 49% of their patients were AHCCCS eligible; 30% of respondents selected that 50-74% of their patients were AHCCCS eligible; and 33% selected that 75% or more of their patients were AHCCCS eligible (see Figure 9).

Figure 9: The Percent of AHCCCS Eligible Patients Among VFC Providers



VFC providers were also asked how they reported VFC information to the Arizona State Immunization Information System (ASIIS). The majority of current VFC providers (48%) reported that their electronic medical record (EMR) had a connection to ASIIS with uploading, downloading, and working inventory (i.e., a connection through an HL& interface to report child records and lot number inventory data).

Table 9: How VFC Providers Report to ASIIS

How respondents report to ASIIS	Percent of Respondents
Our EMR has a connection to ASIIS with uploading, downloading & working inventory	48%
Our EMR has a connection to ASIIS but reporting/inventory requires manual corrections	24%
We type in all the data to the ASIIS web portal	22%
I don't know	5%
Other	1%

However, in qualitative feedback, respondents shared that connecting to ASIIS can be technically challenging for a variety of reasons (discussed further under Challenges and Barriers below).

VFC providers were also asked about what electronic medical record (EMR) system they used in their office. The most common system used was eClinical Works at 21%. However, many other systems were mentioned highlighting a diverse range of systems employed. This diversity can also make consistent experiences interfacing with ASIIS challenging between practices, which is further discussed in the Challenges and Barriers section.

Table 10: Current VFC Providers' Type of EMR System Used

What EMR system do you use in your office?	Percent of Respondents	What EMR system do you use in your office?	Percent of Respondents
eClinical Works	21%	RPMS	6%
Other	19%	Office Practicum	5%
EPIC	11%	Allscripts	3%
NextGen	9%	Amazing Charts	2%
Athena	9%	TechCare	2%
Cerner	7%	I don't know	1%
None	6%		

Satisfaction with the VFC Program and Facilitators to Participation

VFC providers were asked about their satisfaction with specific VFC supports, services, and processes. As Table 11 shows, respondents were the most satisfied with:

- The variety of vaccine-brand choices available (90% were satisfied or very satisfied)
- VFC site visits (84% satisfied or very satisfied)
- Written guidance on VFC policy and procedure (83% satisfied or very satisfied)

However, more dissatisfaction was expressed around VFC inventory reconciliation with 61% of respondents indicating they were satisfied or very satisfied, and the ASIIS help desk with 64% of respondents indicating they were satisfied or very satisfied (see further detail in Challenges described below).

Table 11: VFC Providers' Satisfaction with VFC Program Supports, Services, and Processes

Please rate your level of satisfaction with the following support(s), service(s), and or aspect(s) of the VFC program	Very dissatisfied	Dissatisfied	Neither dissatisfied nor satisfied	Satisfied	Very Satisfied
The variety of vaccine-brand choices available for VFC vaccines	0%	2%	8%	45%	45%
VFC site visits	2%	2%	13%	54%	30%
Written guidance on VFC policy and procedure	1%	3%	13%	47%	36%
The VFC vaccine-ordering system	2%	7%	11%	51%	29%
Communications between VFC and my practice about policy changes	2%	9%	17%	44%	28%
The VFC program reporting requirements	5%	10%	15%	45%	24%

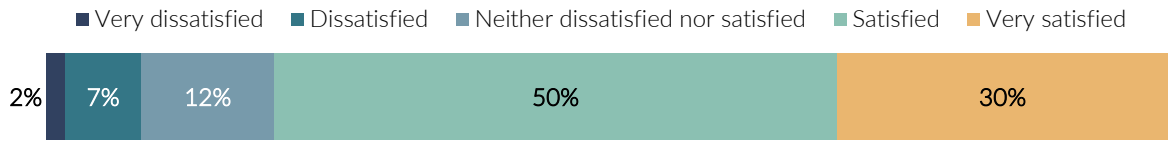
Please rate your level of satisfaction with the following support(s), service(s), and or aspect(s) of the VFC program	Very dissatisfied	Dissatisfied	Neither dissatisfied nor satisfied	Satisfied	Very Satisfied
Availability of VFC to respond to inquiries	4%	13%	15%	`40%	28%
The required annual VFC recertification process	4%	11%	20%	48%	18%
ASIIS help desk	4%	16%	16%	35%	29%
VFC inventory reconciliation	6%	17%	16%	40%	21%

Qualitative feedback included:

- *"I don't have any issues with any process. Questions get answered, just recently a delay with shipment but otherwise very satisfied."*
- *"The people working there [at ADHS] are great, but they need help, more staff. Also, changes to ASIIS really should be tested out with some 'super users' willing to do it instead of on all of Arizona."*
- *"We appreciate the leadership [at ADHS] who always responds quickly to questions/concerns."*

As a summary question, providers were also asked overall about their satisfaction overall with the VFC program. As Figure 10 below shows, 80% respondents indicated that they were satisfied or very satisfied with the VFC program.

Figure 10: VFC Providers' Overall Satisfaction with the Program



Although 80% of current VFC providers indicated they were satisfied with the program, which is a positive finding, it should be noted that satisfaction with the program has gone down over time. For example, in TAPI's 2011 survey to VFC providers (n=441), they asked providers how satisfied they were with the VFC program. In that survey, 98% of respondents agreed and strongly agreed with the statement, "Overall I am satisfied with the VFC program." This decrease in satisfaction suggests a potential decline in overall satisfaction levels among VFC providers. Further, as the Background section of this report highlights, there has been a decline in VFC providers over time. A decrease in satisfaction can suggest or indicate that this is a factor for the decline in VFC providers.

Factors that have Facilitated Continued Provision of VFC Services

VFC providers were asked what factors facilitated VFC program implementation. Respondents shared that having strong internal systems and processes can serve as facilitators for healthcare practices to remain in the VFC program.

Key practice processes that support VFC implementation:

- Good record-keeping: Keeping accurate records of patient encounters and vaccinations helps in tracking when individuals are due for vaccines and facilitates outreach efforts. This allows healthcare providers to proactively schedule appointments and ensure timely administration of vaccines. Leveraging technological advances also supports record-keeping.
- Documentation practices: Although electronic systems are preferred, some practices use paper-based forms to document patient encounters and serve as back-up documentation, including the vaccines administered and lot numbers. These forms are securely stored for the required duration, typically seven years, to maintain compliance with VFC program regulations.
- Diligence and daily reconciliation: Practices emphasized the importance of diligence and daily reconciliation. This involves regularly reviewing and verifying vaccine records, ensuring proper documentation, and addressing any discrepancies or issues promptly. Daily reconciliation prevents delays or backlogs that may lead to errors or incomplete reporting.
- Vaccine coordinators and champions: Having dedicated staff members, vaccine coordinators, and/or vaccine champions responsible for managing vaccine inventory, ordering, and overall VFC program compliance is highly beneficial. These coordinators handle the administrative aspects, ensuring smooth operations and reducing the burden on other healthcare providers.
- Staff training: Providing comprehensive training for staff members on VFC program requirements and procedures is crucial. Training may include topics such as proper vaccine administration, storage guidelines, record-keeping, and program compliance. Ongoing education and updates help maintain staff competence and awareness of program changes.

By implementing these internal systems and processes, many practices have effectively navigated the VFC program, maintained compliance, and provided quality care to eligible patients.

Example quotations included:

- *"Probably the most important thing in our practice is diligence, having operations or processes in place that don't let it slide. You have to-have to reconcile on a daily basis. If you're waiting till the end of the week and then trying to catch up and find things, it's not okay. You've gotta have little systems in place. For example, making sure that everything [is] transferred through ASIIS electronically and having a paper backup. We still do our old system on paper, and we just use it as a backup system."*
- *"One thing that they have changed over the years is they used to tell us that we could only order every two months and now they're saying that we can do smaller orders anytime we want. So that has been very helpful."*
- *"With the VFC standards that I've learned, I use all those with my commercial stock too. I don't just use the VFC standards for the VFC stock only. We carry that over… [and use] the framework that VFC has in place as, like, a best practice."*

Challenges and Barriers with the VFC Program

VFC providers were also asked about challenges they experienced with the VFC program. As Table 112 shows, reconciling vaccine inventory (64%), delays in receiving VFC vaccines (46%), and dose-for-dose restitution of vaccine by the VFC program (23%) were the top challenges for VFC providers.

Table 12: VFC Providers' Challenges with Different Components of the Program

What challenges, if any, has your practice experienced with the VFC program?	Percent of respondents
Reconciling VFC vaccine inventory	64%
Delays in receiving VFC vaccines	46%
Been asked to make dose for dose restitution of vaccine by VFC program	23%
Lack of VFC vaccine due to delays in shipment after loss of power, refrigerator failure, other temperature excursions	19%
Ordering VFC vaccines	16%
Filing borrowing reports	12%
Errors in the ASIIS system (e.g., wrong patients being merged)	5%
VFC responsiveness/communications	5%
Other	4%
Participation in the program is confusing, time-consuming, etc.	4%
Dis-enrolled from the VFC program	3%
Put on probation by VFC program	3%

Note: In the overall sample (n=246), 33% of respondents noted "no challenges." We removed these cases from the percentages above to derive a valid percentage that focused on providers with challenges indicated.

Qualitative feedback:

Reconciling VFC vaccine inventory and dose-for-dose restitution: VFC providers expressed frustration most with the process of reconciling VFC vaccine inventory. They believed there should be a better way to handle inventory reconciliation, as mistakes can occur despite automated systems. Correcting errors can make it appear as if the inventory was mishandled, causing additional time to rectify. Providers also disliked the increased complexity of inventory reconciliation (e.g., where it has transitioned from a single page to multiple pages). Providers had difficulty understanding and managing the new reconciliation and ordering process, finding it cumbersome and unclear. The reconciliation process was deemed non-user-friendly, lacking explanations on deactivating vaccines when the inventory reaches zero, for example. Additionally, the new VOMS system does not allow providers to zero out lot numbers that are no longer in use during reconciliation. Further, providers varied in how challenging the reconciliation process was for their practices. One major factor is the type of provider. For example, the administrative burden to reconcile vaccines was harder on small private practices versus community health centers and large hospital systems that could have dedicated VFC coordinator roles.

Example quotations included:

- *"Too much time required for many of these regulations. Dose-for-dose accountability and inventory tracking is VERY time consuming and costly to have staff spend so much time on the subject. Process is overdue for simplification, especially for [Indian Health Services] facilities where practically ALL pediatric patients qualify for the VFC vaccine by default. Consider less stringent requirements for IHS vs. private sector to reduce unnecessary time spent to adhere to the program rules."*
- *"There has to be a better way to reconcile inventory. It's done automatically, but we're human. If mistakes are made, correcting it makes it look like we messed up our inventory. It also is very time consuming."*
- *"I do not like inventory reconciliation, as it went from one page to several pages. Do not like the idea of having to input all vaccine on hand to remove a zeroed-out vaccine. Waste of time."*
- *"I have to reconcile many doses because doses are not reported correctly a lot of the time. I have also experienced doses only reporting as half a dose."*
- *"The new Reconciliation and Ordering process is not clear, very cumbersome and difficult to manage."*
- *"The reconciliation page is not user friendly. It wasn't explained how to deactivate when at zero left. Also, our EMR system is connected but when vaccines are put in, they deactivate our patients, and it does not subtract from our inventory."*
- *"If we have a smaller pediatric population, I'd rather use my commercial stock and have that get wasted versus having [wastage] with the state and then do all the required paperwork."*
- *"We are a very small office, and so for us, the stock is the worst. And when I order more, they expire about the same time as the ones I just [used at] the office. We have never been under that wastage percentage, and we don't have a lot of children. So, it is very, very difficult and it's very discouraging.*

Delays in receiving VFC vaccines: Some respondents also raised concern about receiving short-dated vaccines, emphasizing that vaccines should have an expiration date of more than six months to allow sufficient time for their administration. Others raised that shipment delays could cause frustration.

- *"Something that bugs me, though, is that I have gotten short-dated vaccine and they really shouldn't be sending you anything, like, less than six months. It should be more than that. It should be more than six months to get rid of it."*
- *"I don't have any issues with any process. Questions get answered, just recently a delay with shipment but otherwise very satisfied."*

Errors in ASIIS: Although not a big theme reflected in the table above, qualitatively, respondents spoke at length about challenges with the ASIIS system including integration challenges with practice electronic medical record (EMR) systems. Connecting EMR data to the ASIIS registry has been a difficult journey, involving numerous upgrades and updates that have required significant manual labor from providers. Issues such as billing errors, improper decrementing of doses, incorrect merging of patient records with similar names and birth dates (e.g., twins), and fixing data discrepancies require significant time and effort. The compatibility between EMRs and ASIIS was noted as a major barrier, leading to double entry and labor-intensive processes. Inadequate interface and communication between systems make counting and reconciliation difficult. Time-consuming tasks include correcting incorrectly populated doses,

transferring data to ASIIS during EMR transitions, and dealing with non-functioning reconciliation processes. These challenges not only consume valuable time but also create confusion and hinder efficient patient care.

- *"We have spent a lot of time decrementing doses that populated into ASIIS incorrectly. One that is most common are doses populating as historical when they are not. By the time that you have reviewed each area of documentation to confirm that information has been submitted appropriately it's been 10-15 minutes. Multiply this by 10 doses and it takes away a lot of valuable time that could have been spent with patients."*
- *"I continue to find multiple duplicate patients in ASIIS, sometimes triplicate. Often times we find vaccines that don't decrement even though our documentation in the EMR is correct."*
- *"EMR incapability is our largest barrier. Our EMR tells us they're interoperable with ASIIS but ASIIS staff can never get it to work. Our EMR tells us it's because ASIIS is archaic. Double entry isn't cost effective and is very labor intensive."*

VFC help desk responsiveness: Providers also expressed dissatisfaction with the VFC Help Desk, stating that they are unable to provide effective assistance beyond sending emails to VFC representatives and waiting for responses. Providers found it futile to call the help desk in many cases as issues can require escalation to receive support. Providers also indicated receiving conflicting guidance based on the VFC representative they connected with and voiced frustration with the direction towards a call center and not being about to speak with a VFC representative directly/immediately.

- *"I don't even bother calling in to the help desk as they can rarely help me, everything must be escalated. While there have been a number of incredibly helpful individuals I have worked with, our annual enrollment was a nightmare, doses often take days to decrement, borrowing and wastage reports are often not processed completely or correctly the first time. I spend far too much time managing things that don't just work correctly the first time."*

Additionally, respondents were asked about the significant challenges or barriers to their continued participation in the VFC program. Staff time/administrative costs needed to adhere to VFC policy (54%), compliance requirements (40%), and ongoing financial costs to store and administer vaccines (32%) were the top barriers selected as Table 13 shows.

Table 13: VFC Providers' Significant Challenges or Barriers Participating in the VFC Program

How significant are the following challenges or barriers for your continued participation in the VFC program?	Percent of respondents
Staff time/administrative costs needed to adhere to VFC policy (e.g., to enroll/re-enroll in VFC, for administrative and inventory management, to do reimbursement process, etc.)	54%
Compliance requirements (e.g., keeping detailed temperature logs, participating in site visits by state officials, having handling plans for routine and emergency storage, etc.)	40%
Ongoing financial costs to store and administer vaccines (e.g., maintaining medical-grade equipment, insurance/replacement costs)	32%
Staff shortages have affected our ability to adhere to the VFC program requirements (e.g., adherence to policy and compliance requirements)	31%
Increased regulations over the past few years	27%
Ability to maintain a collaborative relationship with VFC to sustain program implementation and problem-solve issues	27%
Lack of EMR integration with ASIIS; AIIS/EMR challenges	28%
Reimbursement does not adequately cover the cost of administering VFC vaccines	14%
There is no one in our office championing the effort	4%
Wastage (e.g., due to small population, staff shortage, etc.)	3%

Qualitative Feedback:

Administrative costs/staff time: Respondents expressed frustration with the time-consuming and complicated process of managing the purchase, ordering, and return of vaccines. Returning vaccines in particular was a pain point among providers, with one respondent highlighting a vaccine remaining in their refrigerator for eight months before it could go back to the VFC program. Respondents also raised concerns about receiving short-dated vaccines with expiration dates of less than six months, which creates challenges in utilizing them before they expire.

- *"We get paid $21 per dose of vaccine that we deliver. That hasn't changed in over 20 years. The workload has increased astronomically for doing this. And we are not being paid at all for it. We are doing their work for them. That is a basic principle of how Arizona runs this. I don't know about other systems, but we're doing the work for them."*
- *"It doesn't feel like the goal of the VFC program is to get kids vaccinated. It feels like the goal is to do all the administrative work around the vaccine program. The administrative burden of this program is significant and impacts the overall operations of our health center. Staff are less productive because of the amount of time it takes to manage this program. Most communication we have received lately is all about COVID vaccines. Training that is promised around new processes or procedures does not always happen, which creates more frustration."*
- *"I've been here 20 years, so yes, things change, but we went from recording temperatures twice a day to needing chart recorders. And then those weren't good enough, so they changed them to data loggers that we had to check twice a day, and write them down. And then that wasn't good*

enough, so now we have to download them and send them into them for them to look at. So, I don't know what else they're going to want."

Compliance requirements: Relatedly, VFC providers discussed facing various challenges related to compliance requirements in the VFC Program. The paperwork and administrative tasks associated with compliance are time-consuming. Providers expressed the need for an easier path for compliant users to avoid burnout. Managing inventory accurately during busy office hours is a challenge. State requirements, such as daily manual temperature logs despite having electronic data loggers, and the demand for timely reports before ordering vaccines, contribute to the burden. Respondents discussed delays in VFC communication, staff shortages, "nitpicking" at site visits, and restrictive policies, which they believed hinder VFC providers. Additionally, the extensive adherence to regulations imposes a significant workload on personnel. The re-enrollment process was also described as particularly burdensome, with respondents noting a lack of alignment between the instructions provided in the PDF and online and the actual process requirements. This mismatch has led to confusion, and providers suggested that more information is needed to do the re-enrollment process than initially indicated.

- *"It takes an inordinate amount of time and energy to ensure we are giving the appropriate vaccine to patients (private v VFC)—confirming insurance or lack of and the many nuances, ordering correctly, and then if there is a mistake it requires so much effort to reconcile it and becomes a major issue. We have to pay staff members who spend an inordinate amount of time on VFC vaccine requirements/ordering/reconciling VFC vaccine inventory. We only do it for the kids' benefit, but it is not easy"*
- *"To adequately adhere to VFC policy requires a significant amount of time and resources, which are on short supply during a pandemic. We have had issues with doses decrementing properly and it is very difficult to correct that issue once it has occurred."*

Ongoing financial costs to store and administer the vaccine: Providers discussed various financial challenges related to the VFC program. The complexity and cost of administering vaccines, including ordering, storing, and overhead expenses, has caused practices to lose money. There were also concerns about the costs and inefficiencies associated with providing physical paper vaccine information sheets, the costs of new equipment, and there was a mention that grants typically do not cover equipment expenses (although private practices do not typically receive grants).

- *"Providers are getting paid the same amount of money to do exponentially more work and constantly under threat of being [accused] of fraud or, you know, 'You're bad people.' … Pediatricians are already paid less than [providers who care for adults with] Medicare. … And then you add on top of that the burden of giving vaccines, the cost. And [if] you make an error, then that's money out of your pocket at private cost. … It just keeps getting that cost up. So, you're punishing the people that are doing the good work, and the work that's needed. And so, a lot of people say, 'No way, I'm not going to take Medicaid, I'm just not going to do it. It's just too hard.'"*
- *"Temperature incursions due to repeated power outages in this rural remote location [is my biggest challenge] despite a generator and then super long waits to find out if can still use vaccines. Lots of money spent on new refrigerators, but we still continue to have issues."*

Staff shortages: Adhering to VFC policies requires significant time and resources, which has been even more challenging during the pandemic when practices have experienced staff shortages. In particular, a lack of medical assistants was a major challenge, though it was noted this was a larger issue in health care (not VFC specific).

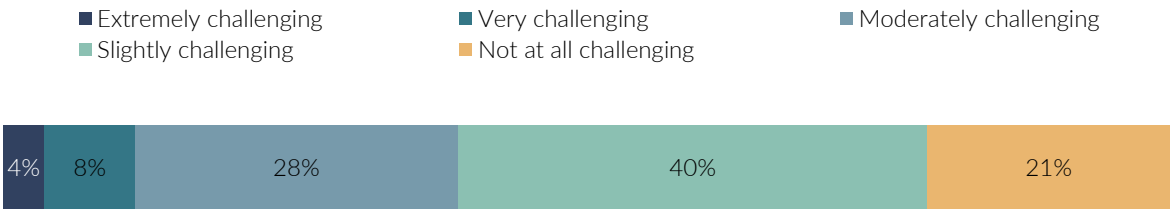
- *"Our challenges are staff and finances. We're a rural clinic with no support. Unable to do anything when there are electrical outages."*
- *"We are a small practice in a rural community. Finding qualified staff in our area in recent years has been challenging. Challenges are not specifically related to the program itself."*

Ability to maintain a collaborative relationship with VFC: Lastly, an adversarial or punitive tone in the enforcement of VFC policies and communications was a common theme among VFC providers. Providers described feeling overworked and underpaid, while facing accusations of fraud and/or wastage. Providers have felt bullied and harassed, and not supported. While the tone has improved recently and been more collaborative under the pandemic, there is still room for improvement and concern among providers.

- *"Just prior to the pandemic, it became a very punitive culture. Almost like we were being bullied, harassed, policed, and 'You will do this, or we will make you pay.' And, in my opinion, that got ugly. We didn't feel very supported at all. Then more recently, I think things have improved but are still not perfect."*
- *"I think that what we got was a very sudden, immediate change to go from a system where it's like, 'Just do your best,' to, 'This is where you're falling short. Your numbers are such and such, and you are wasting this amount of vaccine and you're gonna pay for all of it'. And threatening letters. [We have] not gotten a lot of help from VFC."*
- *"They had 86,000 doses that they said were unaccounted for in their VFC inventory, and they were going to charge providers $6 million for restitution. And that was at private vaccine cost, which is a whole other issue. So, of these 500 providers, 192 of them went through the work of trying to reconcile and everything. 38% of those that were of the original 500 were able to prove to VFC that they did not owe anything. They're not even looking to try and see if these people really owe anything. They're just saying, 'You're bad, you're guilty.'"*
- *"The VFC office in Arizona is almost impossible to deal with. They start from the assumption that pediatricians and pediatric offices are guilty of fraud when it is extremely difficult to follow the draconian VFC rules that do not take into account how difficult they are to follow and how much completely unpaid work we have to do to meet their requirements. In essence, our offices are doing VFC's job for them and not getting paid for it! Our office is in the process of transitioning from private practice to a hospital-based practice, and the difficulty of dealing with VFC is a contributing factor. If you look at the number of pediatricians in Arizona who are VFC providers, the number has decreased dramatically in recent years, and the difficulty of dealing with the Arizona VFC office is a major factor."*

As a summary question in the survey, respondents were asked to rate the level of challenges they experienced with the VFC program from not at all challenging to extremely challenging. As Figure 11 below shows, 68% of respondents found the program to be between "slightly" and "moderately challenging." Only 12% found the program to be between "very" and "extremely" challenging, and 21% of respondents did not find the program to be challenging at all.

Figure 11: VFC Providers' Overall Challenges with the Program



Impacts of COVID-19

Respondents raised various concerns related to the pandemic:

- Reduction in well child visits: During the peak of the pandemic, there was a significant decrease in the number of well child visits (e.g., one practice noted a 50-60% decrease). Further, during the pandemic, there were restrictions on who could enter medical buildings for well child visits or preventive care. Those with known exposures to COVID-19 or in isolation could not be seen, leading to a reduction in the delivery of well child services.
- Decreased trust in government and CDC: A few participants noted that the pandemic has affected public trust in the government and the CDC, leading to reluctance among parents to bring their children for vaccinations. Many individuals no longer trust the CDC's recommendations or information, making it challenging to communicate the importance of vaccines like HPV.
- Impact on immunization practices: The pandemic and the focus on COVID vaccines have resulted in changes to immunization practices. Providers may be more hesitant to administer standard vaccines when a child is ill, reverting to old practices from decades ago. The rise of anti-vaccine sentiments has also put all vaccines under greater scrutiny.
- Loss of training opportunities and experienced staff: Virtual trainings and the overall impact of the pandemic have resulted in the loss of ground in training opportunities. Experienced staff members, particularly medical assistants, have also been leaving the field, making it challenging to maintain previous levels of expertise and teach newer staff members.

Example quotations included:

- *"I guess the pandemic really has affected the amount of people who come in for vaccines. There are a lot of the public here [that] is untrusting of the government again now."*
- *"Because of the COVID vaccine, I think a lot of the practices have changed, and many of our providers are reluctant to give even the standard vaccines when a child is ill. They kind of reverted to, like, old ways from decades ago, and that's not necessarily VFC [related]. That's just because of the COVID vaccine."*

Respondents also raised a few benefits that have come from the pandemic. Namely, there was a shift in the partnership between providers and the program, with a more cooperative and understanding approach rather than a punitive one. For example, the threat of financial penalties for wastage was temporarily lifted during the pandemic to alleviate the pressures on providers. However, concerns arise

regarding the future and whether the repayment policy will be reinstated now that the pandemic is over, leaving providers uncertain about the financial implications.

- *"[During the pandemic] it was much more of a cooperative partnership. It wasn't a punitive one. There was much more of an understanding like, 'Hey, we know you guys are under a lot of pressure and you've got other commitments as well, so now how can we help you?'"*
- *"The threat [of paying for wastage] was taken away when the COVID pandemic hit. Because all of a sudden they said, 'Okay, we're not going to implement repayment.' I mean, they were going to implement it – it was originally March of 2020. People were going have to pay the money back, and they suspended it to September of 2020. And then they just dropped it entirely during the pandemic. So, with the pandemic being over, you know, what's going happen?"*

Current VFC Providers' Practices around Vaccine Referrals

Figures 12 and 13 highlight findings around referring. As Figure 12 shows, 37% of providers refer families to other agencies if they do not carry a specific vaccine, while 33% of providers do not refer families elsewhere for vaccines. When providers do refer families out for vaccines, 63% refer to a health department and 27% refer to a pharmacy (see Figure 13).

Figure 12: Reasons VFC Providers Refer out for Vaccines

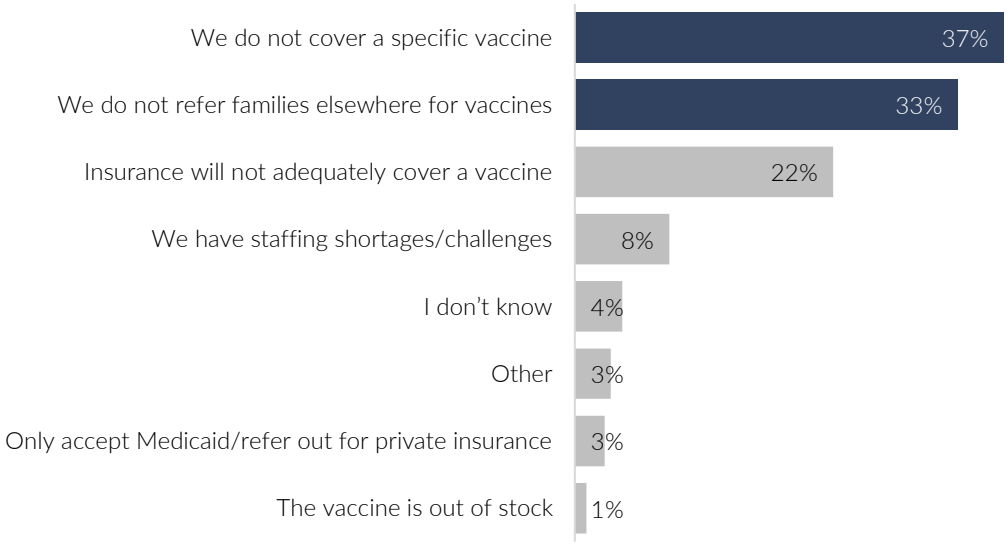
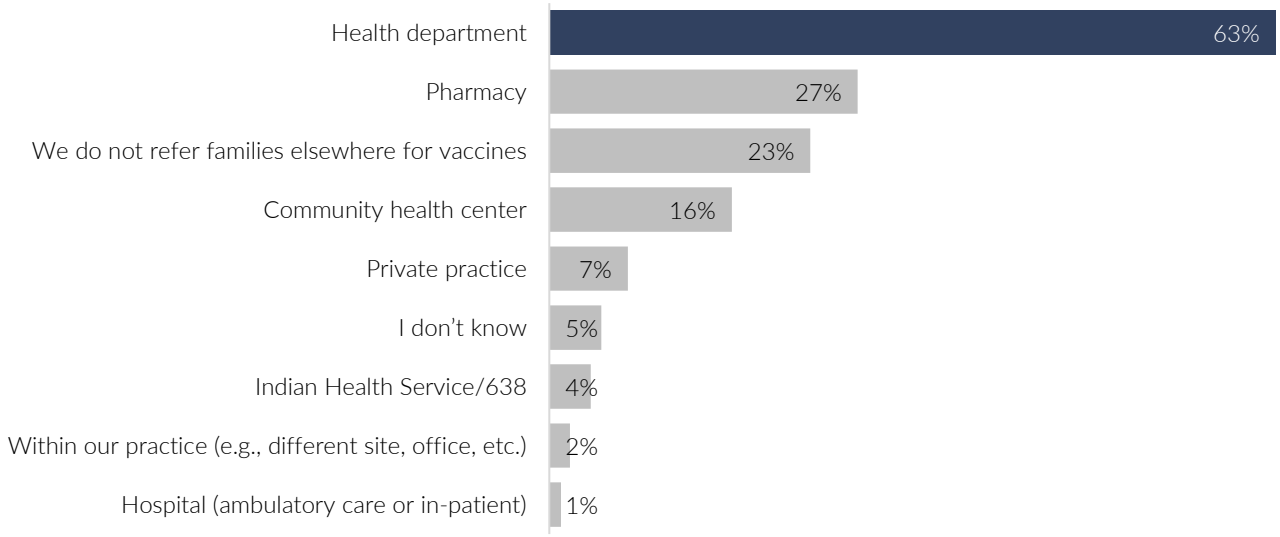


Figure 13: Referral Sources for VFC Providers



Qualitative Feedback included:

Referring patients to the health department for vaccines can pose challenges. Although a strategy that current VFC providers may leverage, referring families to health departments for childhood vaccines can increase burden on both families and providers. First, it can tax health departments that already have high workloads and limited resources. Further, the geographical distance between patients and the nearest health department office, especially for those residing in more rural areas, adds to patient and family burden.

- *"The issue when referring patients to health department is the health department is also overloaded and underpaid and doesn't have the wherewithal to do all of that. Plus, now we're talking about somebody who maybe lives in, say, Casa Grande or Queen Creek, and we're asking them to drive into Phoenix. Even if the county has an office closer to them, it's still a burden, because it means taking their kids out of school, it means all of that stuff. So then, what we have is the school saying, 'Well you don't have the school-required vaccines, so you either have to get them or you have to sign this exemption.' And that's why exemptions go up."*

Moreover, as the quotation above highlights, the logistical challenges of accessing distant health department offices can potentially lead to an increase in vaccine exemptions.

There were also concerns among providers about the future of the medical home model. Respondents discussed the potential loss of continuity and comprehensive care for children when referring out for vaccines. The effectiveness of providing immunizations and well-child care in one location plays a crucial role in ensuring that children receive all necessary healthcare services. Vaccinations often act as a primary motivator for families to visit pediatricians, leading to the opportunity to address other health needs and monitor development. Collaborating with non-physician entities or referring patients to health departments can compromise the educational aspects of vaccination, as well as the thoroughness of data management and follow-up according to respondents.

- *"Being able to provide immunizations and well childcare at the same location is a critical part of the medical home model."*
- *The problem with [referring out to the health department] is in terms of continuity of care and in terms of medical home and in terms of what gets kids to the office. A lot of what gets kids to go to the pediatrician is because they need to get their vaccines. So, if they're not getting their vaccines there, then we run the risk of they just go to the health department, get their shots, but never get the rest of the stuff. No one's watching their development, no one's watching their growth, no one's making sure that they're going to the dentist, no one's managing their chronic diseases. A lot of times, vaccines is what gets them into the door so they get everything else they need in the medical home."*
- *"We can partner with [pharmacies], we could do something like that. And great, we have another person to deliver them. But you're also missing a lot of the work that goes behind with vaccines, the education piece, the understanding piece, and those little risks that we capture because we have seen them multiple times. And then you're taking out that bread and butter that brings patients in to do the medical home and the education. … So you take that out and you put it into the hands of people that are not physicians—that understand that other side—and it becomes just a business to give a vaccine."*

Needed Supports, Resources, and Training to Providers

In interviews and focus groups, respondents were asked about the supports, resources, and trainings that VFC providers need. Respondents raised the following key needs.

- Culture change: Providers suggested that changing the culture within the VFC program would have a positive impact. This included fostering a collaborative and understanding environment that prioritizes patient care and effective use of resources.
    - Collaborative approach: Providers desire a cooperative and collaborative relationship with the VFC program and other organizations involved in immunization. They surfaced a need for working together towards common goals rather than facing punitive measures or adversarial interactions.
    - Accountability and transparency: Providers emphasize the need for accountability and transparency from the VFC program. They highlighted instances where mistakes were made by VFC, but no accountability was taken. They believe that accountability should be shared, and VFC mistakes should be acknowledged and rectified.
- Communications:
    - Up-to-date information: Providers appreciate staying informed and receiving regular updates about changes, policies, and requirements related to vaccine administration.
    - Enhanced communication and feedback: Providers suggest establishing a committee or platform for physicians and VFC program representatives to communicate and provide feedback. This would facilitate better understanding and problem-solving.
- Ordering:
    - Attention to regular orders: Providers would like more attention given to regular orders, especially when they are short-dated, to avoid wastage and ensure efficient distribution to smaller counties.

    - Flexibility in ordering: Providers value the ability to place smaller orders more frequently, rather than being restricted to ordering every two months. This flexibility allows them to manage their inventory effectively.
- Compliance support and resources:
    - Resources for process improvement: Providers would benefit from resources and expertise to identify and improve operational inefficiencies between practices and the VFC program. This includes assistance with billing issues, process optimization, and addressing challenges specific to individual practices.
- Advocacy: Providers expressed the need for organizations like the Arizona Chapter of the American Academy of Pediatrics (AAP) to advocate for them and represent their interests during discussions with the government and VFC program.
- Recognition and awards: Providers proposed the idea of awards or recognition for practices that demonstrate improvement and commitment to the VFC program. This could help incentivize participation and highlight success stories.

Sub-Group Analyses for Current VFC Providers

As discussed in the Methods section of this report, we applied a binomial test to each Likert response in the survey to see which had levels of satisfaction that differed significantly from the overall average level of satisfaction (which was ~74% satisfaction). In the Appendix, we provide a full table of statistical details for each test. Here we summarize the results that were statistically detectable (p value > 0.05). In our overview of results each time we say "…less likely" or "…more likely" this indicates a response that is significantly below or significantly above the average overall level of satisfaction with the given aspect of the VFC program.

AHCCCS/Medicaid Eligibility and VFC Satisfaction

To examine differences between providers based on the percentage of patients who were AHCCCS or Medicaid eligible in their practices, we made the following groupings: "high' AHCCCS eligible patient load = 75% or more of patients are AHCCCS eligible; "intermediate" AHCCCS eligible patient load = 50-74%; and "low" AHCCCS patient load = 49% or less of patients are on AHCCCS. As indicated in the Methods section of this report, in each case we used the sub-groups as predictor (independent) variables and the response (dependent) variables were the Likert-scale questions that covered satisfaction with various aspects of VFC experiences. Figures 14 through 16 highlight significant differences grouped by, "high", "intermediate", and "low" AHCCCS providers. The significant differences are all tested against the overall group average (all providers together).

As Figure 14 below shows, providers with "high" AHCCCS eligible populations (75% or more) were:

- less likely to be satisfied with the ASIIS help desk.
- more likely to be satisfied with the ordering system.
- more likely to be satisfied with VFC site visits.
- more likely to be satisfied with the overall program.

Figure 14: Satisfaction among Providers with a "High" AHCCCS Patient Load Compared to the Average Level of Satisfaction

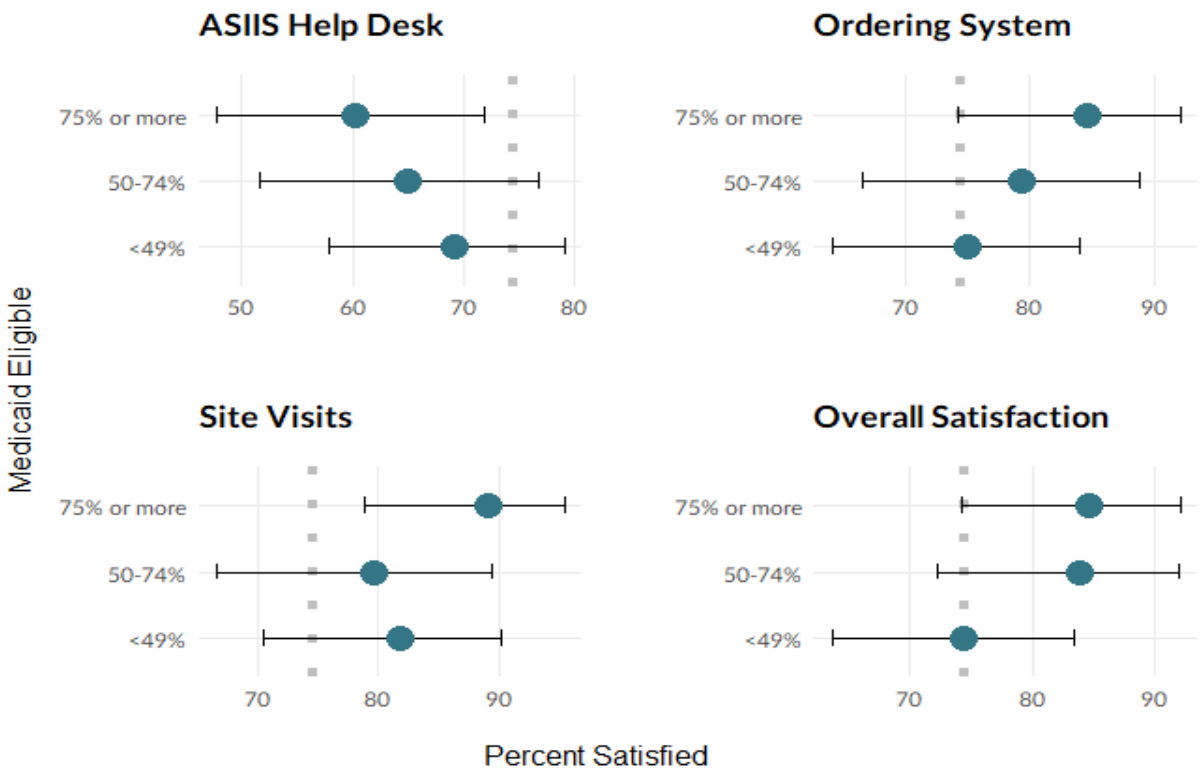
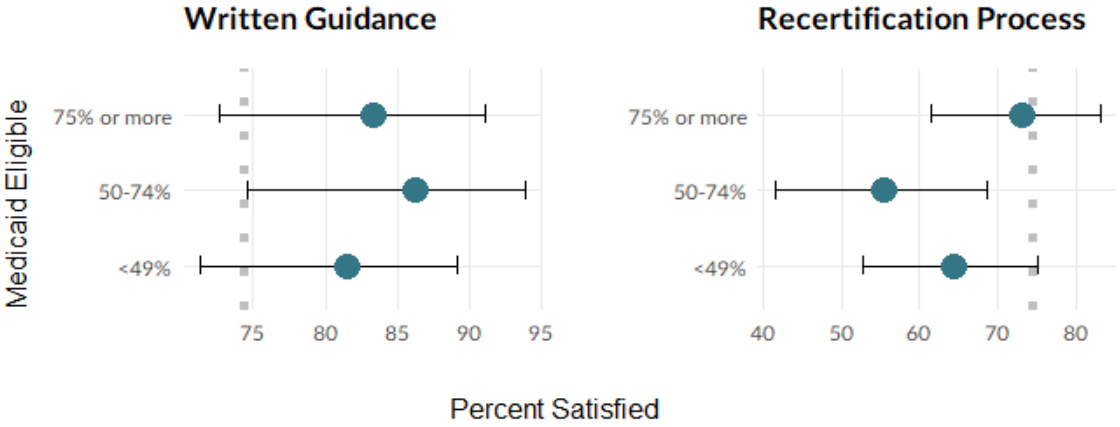


Figure 15 shows that providers with intermediate levels of AHCCCS eligible populations (50-74%) were:

- more likely to be satisfied with written guidance on VFC policy and procedure.
- less likely to be satisfied with the required annual re-certification process.

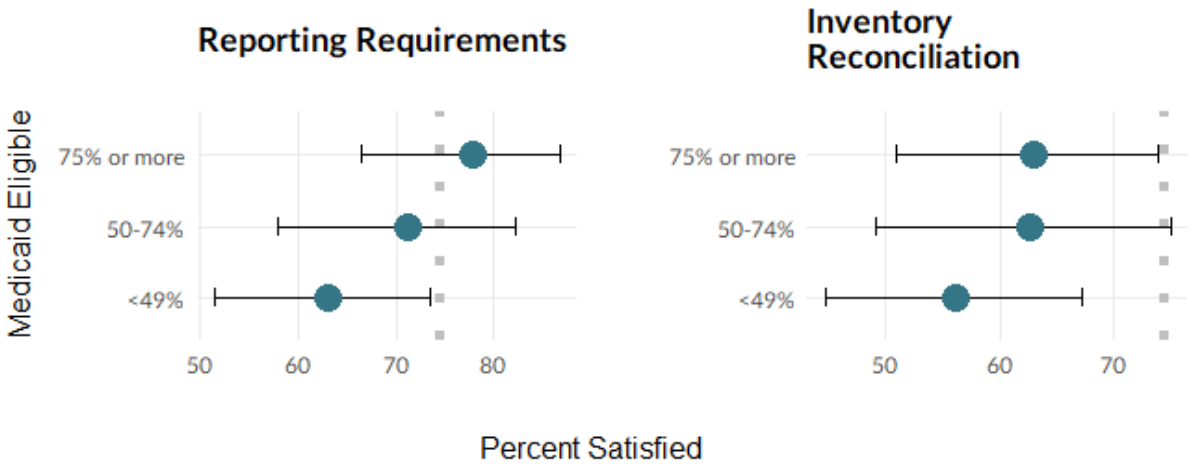
Figure 15: Satisfaction among Providers with an "Intermediate" AHCCCS Patient Load Compared to the Average Level of Satisfaction



As Figure 16 shows, providers with low AHCCCS eligible populations (less than 49%) were:

- less likely to be satisfied with VFC program reporting requirements.
- less likely to be satisfied with inventory reconciliation.

Figure 16: Satisfaction among Providers with a "Low" AHCCCS Patient Load Compared to the Average Level of Satisfaction



Overall, VFC providers' satisfaction with different components of the program varied based on the percentage of AHCCCS eligible patients in their practices. Higher AHCCCS patient loads were associated with greater satisfaction in certain areas, such as ordering systems, site visits, and the overall program. By contrast, VFC providers with lower AHCCCS patient loads expressed dissatisfaction with specific aspects like help desk support, the recertification process, program reporting requirements, and inventory reconciliation. These findings suggest that the composition of a provider's patient population can influence their satisfaction with various aspects of the VFC program.

Practice Type and VFC Satisfaction

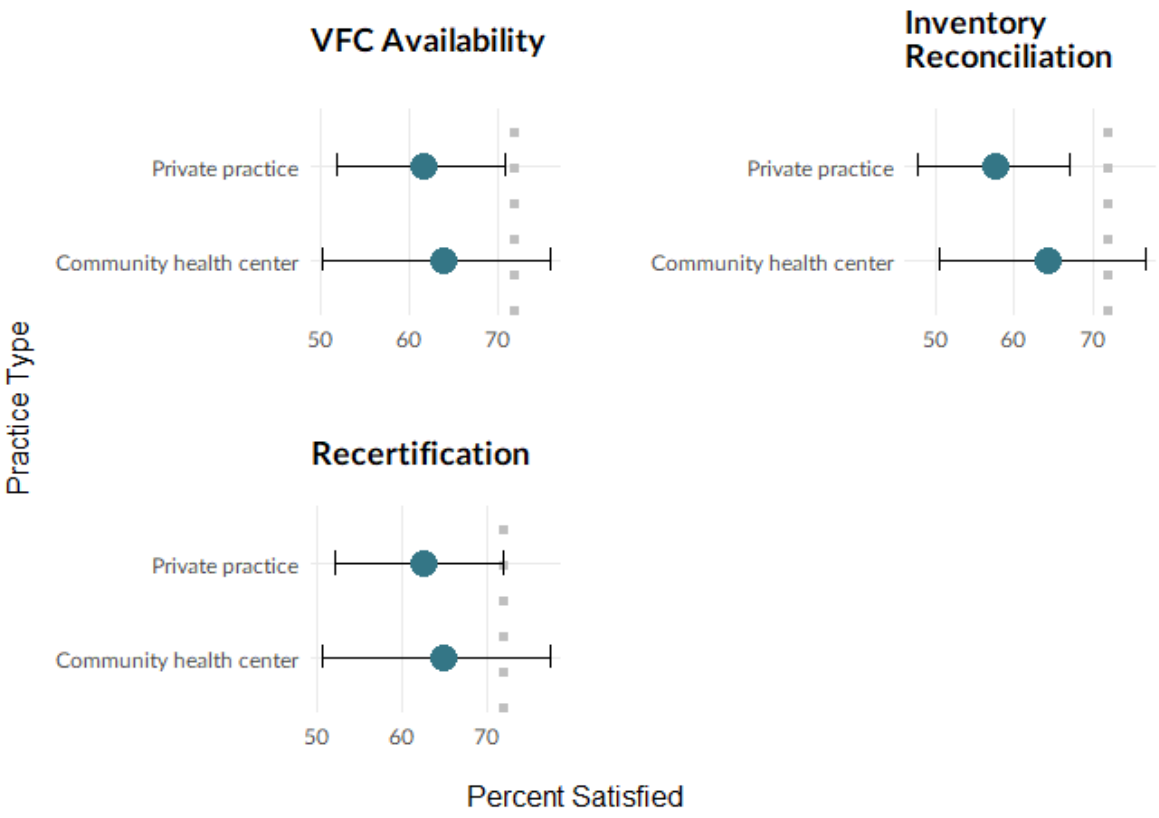
We conducted a similar analysis based on differences between private practices and community health centers. For this analysis we filtered the data to include only private practices and community health centers[3]. A binomial test was applied to each Likert question to evaluate if the levels of satisfaction of private practices and community health centers differed from their average level of satisfaction of ~72%.

[3] The two most common types of practice in the data were community health center (n=59) and private practice (n=113). By comparing these two practice types to each other the following other practice types were removed from this analysis: correctional health (n=4), health department (n=21), hospital, ambulatory care (n=17), in-patient hospital, Indian health service (n=15), pharmacy (n=2), school based provider (n=4), and Other (n=4).

As Figure 17 shows, providers that were private practices were:

- less likely to be satisfied with VFC availability to respond to inquiries.
- less likely to be satisfied with inventory reconciliation.
- less likely to be satisfied with the required annual VFC recertification process.

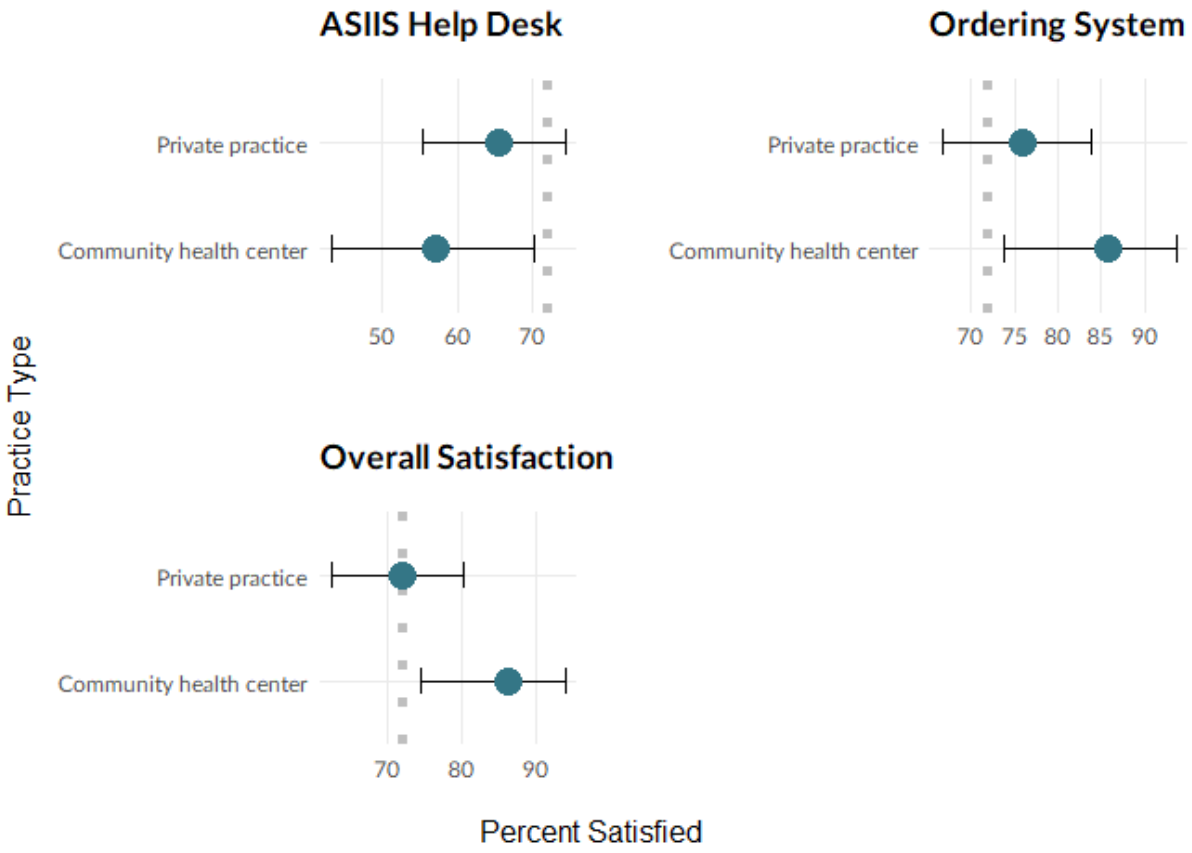
Figure 17: Private Practice Satisfaction Compared to the Average Level of Satisfaction



Providers that were community health centers were (Figure 18):

- less likely to be satisfied with the ASIIS help desk.
- more likely to be satisfied with the VFC vaccine ordering system.
- more likely to be satisfied with the overall program.

Figure 18: Community Health Center Satisfaction Compared to the Average Level of Satisfaction

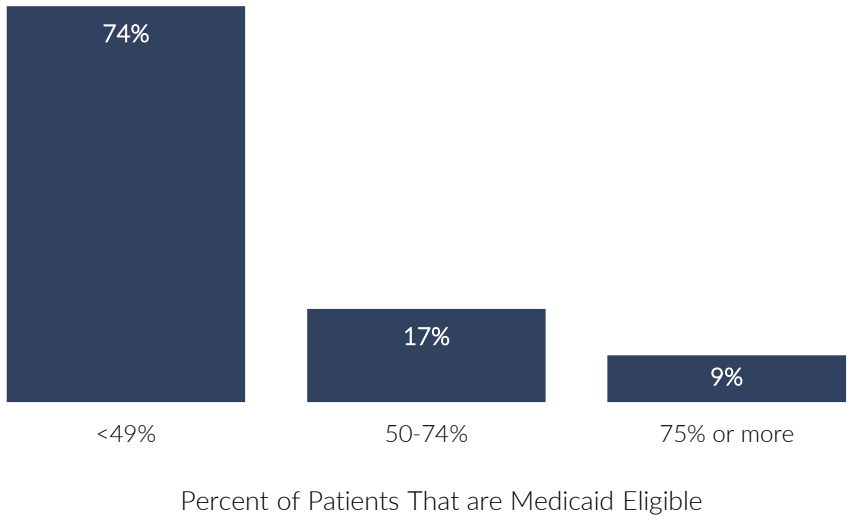


These findings indicate that private practices and community health centers have varying levels of satisfaction with different aspects of the VFC program. Private practices expressed lower satisfaction with VFC availability, inventory reconciliation, and the recertification process. On the other hand, community health centers showed lower satisfaction with the ASIIS help desk but higher satisfaction with the vaccine ordering system and the overall program. These findings suggest that different practice types need different supports to be able to participate in VFC.

Non-VFC Providers

The survey also gathered the perspectives of non-VFC providers. In total, 35 non-VFC providers took the online survey – 10 former VFC providers and 24 providers that have never participated in the program. As Figure 19 shows, 74% of non-VFC providers indicated that 49% or less of their patients were AHCCCS eligible (compared to 37% of current VFC providers [see Figure 8]).

Figure 19: The Percentage of AHCCCS Eligible Patients among Non-VFC Providers



Non-VFC providers were also asked if they provide vaccines and who they provide them for. As the table shows, 30% of respondents indicated that they did not provide vaccines, and the majority (60%) of respondents provided vaccines to adults.

Table 14: Non-VFC Providers' Provision of Vaccines Status

Do you provide vaccines? (Select all that apply)	Percent of Respondents
Yes – to adults (18 years old and older)	60%
Yes – to adolescents (12 – 17 years old)	33%
Yes – to children (3-11 years old)	33%
Yes – to infants and toddlers (under 3 years old)	23%
No	30%
I don't know	3%

Note: Percentages do not total to 100% due to the option to select more than one response.

Factors for not Participating in VFC

Non-VFC providers were asked what factors led their practice to not participate in the VFC program. The top three factors indicated were too few children in the practice or coverage area to justify program participation (47%), staff time/administrative costs needed to adhere to VFC policy (33%), and compliance requirements (30%).

Table 15: Factors that have led Non-VFC Providers to Not Participate in the VFC Program

What factor(s) have led your practice not to participate in the VFC program?	Percent of respondents
Too few children in the practice or coverage area to justify program participation	47%
Staff time/administrative costs needed to adhere to VFC policy (e.g., to enroll/re-enroll in VFC, for administrative and inventory management, to do reimbursement process, etc.)	33%
Compliance requirements (e.g., keeping detailed temperature logs, participating in site visits by state officials, having handling plans for routine and emergency storage, etc.)	30%
Other	17%
Staff shortages have affected our ability to adhere to the VFC program requirements (e.g., adherence to policy and compliance requirements)	17%
My practice does not accept AHCCCS	13%
Ongoing financial costs to store and administer vaccines (e.g., maintaining medical-grade equipment, insurance/replacement costs)	13%
Reimbursement does not adequately cover the cost of administering VFC vaccines	13%
Ability to maintain a collaborative relationship with VFC to sustain program implementation and problem-solve issues	10%
Lack of EMR integration with ASIIS	10%
Increased regulations over the past few years	7%
There is no one in our office championing the effort	7%

Qualitative Feedback:

Open-ended survey responses from providers who are not part of the VFC program highlighted various challenges and suggestions. A few providers expressed disappointment in having to stop seeing AHCCCS eligible children due to the burdensome nature of the VFC program. Others mentioned the need for an easier way to return unused vaccine doses before they expire. The inability to transfer doses to other clinics was also raised as a significant issue.

In interviews, respondents went on to describe how providers started sending children to public health clinics instead of participating in VFC due to the administrative burden involved. Further, the introduction of charges by VFC for incorrect dose counts became a barrier for some practices. Providers were required

to use their own private vaccines to replace VFC vaccines, which were more expensive. They felt punished and were seen as gaming the system, which created a difficult environment.

- *"It was a sad day for me when I had to stop seeing AHCCCS kids because VFC was too burdensome."*
- *"If there were an easy way to send back unused doses before they expire to the health department, we might still be with the program, but we had so few children and no way to connect to get the doses to another clinic."*
- *"It just wasn't worth it for those docs. They started sending kids to the public health clinics, and that's not a great practice builder. But, if everybody does it, it's not really a negative. So many small family-medicine clinics started doing that because it was just so much administrative work to keep VFC going. And then what happened that was kind of a deal breaker, I think, was around 2012 or 2013, VFC started to charge the practices if they didn't count their doses correctly. And many times, it was a VFC error, but it was on you as the clinic or the doctor or the nurses or whoever they had, maybe their administrator, to prove that you didn't mess up."*
- *"What they did was say you had to use your own private [vaccine] to reinstate that vaccine that was given at the cost of a private cost, which is about—I don't know if I remember—it's about 30 to 40% more expensive than you would get for what the cost is to VFC vaccine that you'd give. So, you were actually punished, and you were actually shamed. Like, you were seen as gaming the system. And that was kind of the last three, four, or five years before I left. That was very difficult. So, physicians were held to be perfect—knowing the complexity of the whole thing of giving vaccines and also knowing the complexity of just being human. … At that point in time, we were still trying to get the lasers where they read the labels, as putting the manual in there can be mistakes. And instead of giving you an error percentage, they said, 'No, any imperfections, you are fraudulent.' And VFC was not held to the same standards, so when they made a mistake, it was more one-sided."*
- *'I'm a school nurse. … My understanding is at some point, the district did actually do some vaccines and we had some vaccines on site, and they would run some programs. [Becoming a VFC provider again] has been looked at occasionally. It has not been looked at seriously, frankly, just because the record keeping and storage requirements of the program make it difficult for individual schools to be able to comply… and I'm not sure we're necessarily set up to bill AHCCCS."*

To participate in the VFC program, providers raised the following:

- Better reimbursement
- Simplified regulations
- Easier enrollment and more information on the process
- More pharmacy considerations
- Improved ways to facilitate vaccine dose entry into ASIIS

"The regulations are extremely burdensome. What can help is what New Mexico did where ALL children receive VFC vaccines and if they have commercial insurance, the VFC program requests reimbursement from the insurance. Then we don't have to keep separate (commercial insurance and VFC) stocks of vaccines."

Non-VFC Providers' Practices around Vaccine Referrals

Like current VFC providers, non-VFC providers were also asked the reasons they refer families out for vaccines and to whom (Figures 20 and 21). The most common reason (43%) to refer families out for vaccines was when providers did not offer a specific vaccine. Most non-VFC providers referred patients out to a health department, community health center, or a pharmacy.

Figure 20: Reasons for Non-VFC Providers to Refer out for Vaccines

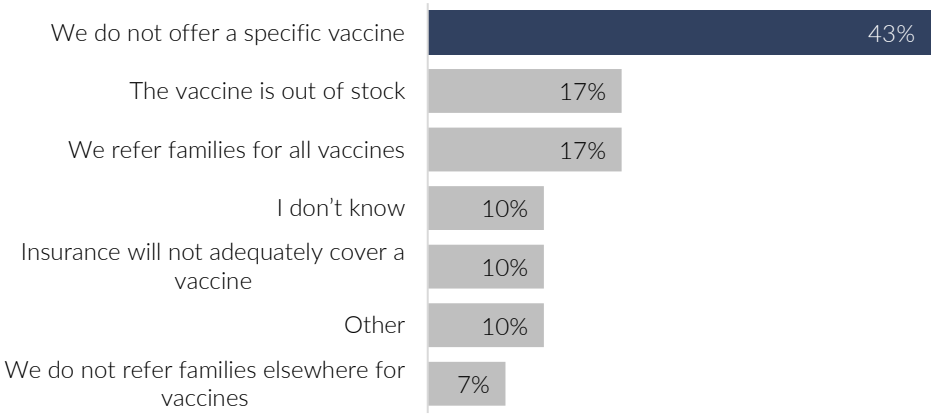
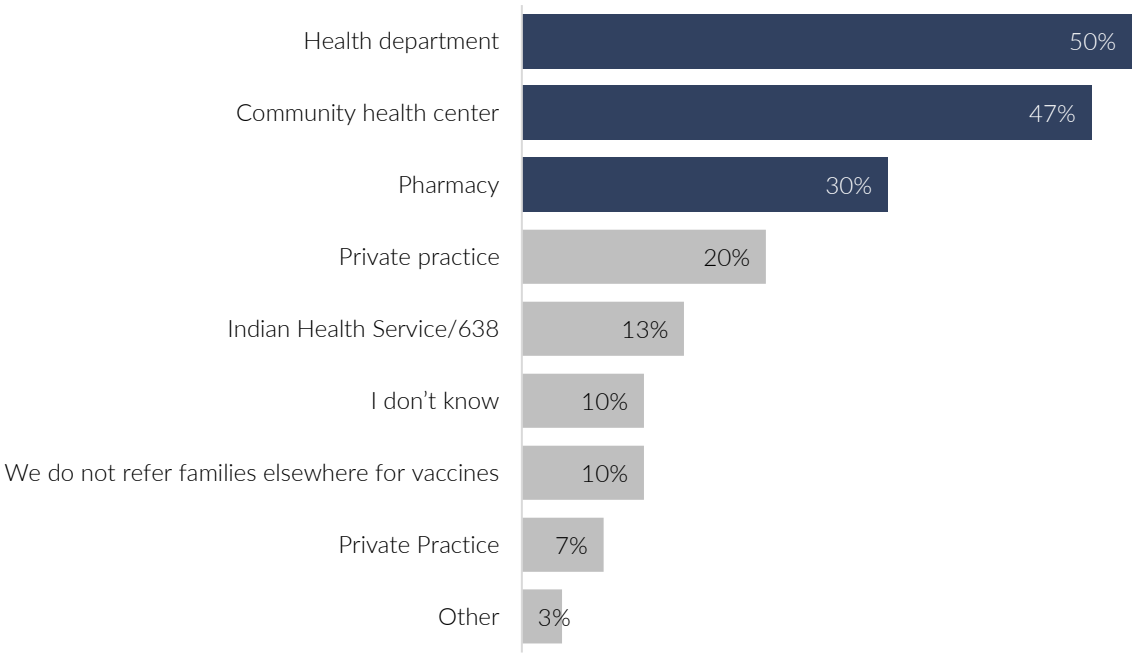


Figure 21: Referral Sources for Non-VFC Providers



Goal 3: Policy Review

The purpose of Goal 3 is to review and summarize current interpretations, applications, and implications of federal (CDC) and state immunization policies and payments. Research questions to address included:

5. What were the policy recommendations of the Office of Inspector General vaccine Report?
6. How are federal (CDC) policies being interpreted and applied in Arizona and in similar states?
7. What best practices for the COVID-19 vaccine could be applied to childhood vaccine?
8. How can AHCCCS increase payments to reflect liability and staff time to participate in the VFC program?

A data limitation that we discussed in the Methods section for Goal 3 that is important to underscore is that our ability to review state interpretation of CDC guidance was limited due to lack of access to the federal CDC guidance. Secondary data on state implementation was also limited, which meant we focused our review on selected state operations guides.

Office of Inspector General Vaccine Report Recommendations

Question 1: What were the policy recommendations of the Office of Inspector General vaccine Report?

In 2012, the Office of Inspector General (OIG), within the Department of Health & Human Services, published a report to examine vulnerabilities in vaccine management (Levinson, 2012). Using CDC data, the OIG sampled 45 VFC providers from the 5 grantees with the highest volume of vaccines ordered in 2010. They carried out site visits at these providers' medical practice locations, interviewed their vaccine coordinators, and observed their vaccine management practices. They also independently measured these providers' vaccine storage unit temperatures for a two-week period. Finally, they interviewed the five grantees' VFC program staff regarding their program oversight.

Major findings:

- Although the majority of storage temperatures that were independently measured during a two-week period were within the required ranges, 76 percent of the 45 selected providers stored VFC vaccines in a way that exposed the vaccines to inappropriate temperatures for at least five cumulative hours during that period.
- Freezer storage: VFC vaccines stored in 28 of 41 selected providers' freezers were exposed to temperatures above the maximum permitted temperature (5°F) for at least 5 cumulative hours during the 2-week period.
- Refrigerator storage: VFC vaccines stored in 22 of 45 selected providers' refrigerators were exposed to temperatures outside the required range (above 46°F, below 35°F, or both) for at least 5 cumulative hours during the 2-week period.
- All 45 providers had recorded temperatures that differed from the OIG's independently measured temperatures during the two-week period. On average, providers' recorded freezer and refrigerator temperatures varied from the OIG's independently measured temperatures by 4 and 2 degrees Fahrenheit, respectively.

- Sixteen of 45 providers had expired vaccines. Thirteen providers stored expired vaccines together with nonexpired vaccines, increasing the risk of mistakenly administering the expired vaccine.
- None of the 45 providers that were reviewed met vaccine management requirements in all 10 categories, and 38 of the 45 maintained required VFC documentation. Similarly, none of the five selected grantees met all VFC program oversight requirements, and grantee site visits were not effective in ensuring that providers met vaccine management requirements over time.

Recommendations:

The OIG report recommended that CDC continue to work with grantees and providers to ensure that:

(1) VFC vaccines are stored according to FDA requirements and that providers have freezers and refrigerators that can maintain vaccines within the required temperature ranges, as well as accurate temperature-monitoring devices that are regularly calibrated and centrally placed with freezers and refrigerators. "Providers without appropriate equipment, such as those with dorm-style storage units or noncalibrated thermometers, should not receive VFC vaccines," the report describes.

(2) Expired vaccines are identified and separated from nonexpired vaccines, with providers immediately reporting expired vaccines following state (grantee) guidance on the disposal of expired vaccines. "Where possible, grantees should ensure that providers return expired VFC vaccines for excise tax credit."

(3) States (grantees) better manage providers' vaccine inventories to reflect needs and reduce vaccine waste. Before approving vaccine orders, states (grantees) should review providers' profile forms; their inventories of current vaccine, including expiration dates; and their doses-administered reports. Further, the report explains that states (grantees) should "ensure that providers notify them upon identifying vaccines that will expire before the providers can use them. To prevent program waste, grantees should consider alternate approaches, such as increasing the use of these vaccines through vaccination drives."

(4) States (grantees) meet oversight requirements. Before distributing vaccines to providers, the OIG recommended that CDC "should review grantees' policies for ensuring accountability and preventing fraud and abuse, as well as the training materials, the written procedures, and document templates they have developed for providers. CDC should ensure that grantees' templates and training materials focus on: (1) the vaccine management requirements that selected providers met least frequently and that have the greatest impact on vaccine potency and efficacy and (2) VFC program accountability requirements. Finally, CDC should review the reports from grantees' annual site visits to identify grantees' specific needs for provider training. CDC should periodically train grantees' site visit staffs to ensure that grantee site visits to providers result in improved vaccine management and program accountability."

Since the report, federal and state offices have implemented additional checks and balances to ensure the protection of the federal vaccine fund. However, changes to technology, federal and state policy and reporting have caused a new set of barriers to care as this report highlighted under Goal 2. There is also the question whether these new barriers to care are federally driven or due to state interpretation of CDC

guidance to states (grantees). Below, we summarize available information regarding differences in state interpretation and implementation of VFC federal guidance.

Interpretation of CDC Policies Across States

Questions 2: How are federal (CDC) policies being interpreted and applied in Arizona and in similar states?

In this review, we examined several states' VFC Operations Guides to compare the policies and mechanisms for inventory management, as well as the overall language used, between Arizona and other states. We selected comparison states that were in geographical proximity to Arizona and/or that had similar immunization rates as Arizona. Note, our selection was restricted to only those states whose VFC Operations Guides were publicly available. The most noticeable differences between Arizona and other states that we reviewed are summarized below.

Language, framing, and tone in implementing VFC policies: Overall, while Arizona takes a more cautionary approach, states such as California, Texas, and Kentucky adopt a more collaborative and supportive tone, offering guidance, education, and resources to ensure the effective implementation of vaccination programs.

- Arizona: The overall approach to VFC implementation is generally cautionary or negative in tone, emphasizing the cost and preventability of vaccine loss. Providers are held responsible for maintaining vaccine quality and are urged to follow sound vaccine management practices to minimize waste and ensure the safety of VFC children.
- California: The approach generally focuses on key factors for success and providing rationales for policies. The benefits for both patients and providers are highlighted, including the protection of patients from preventable diseases, availability of vaccines when needed, uninterrupted ordering privileges, and reduced revaccination recalls. The policy defines key terms and provides instructions, including visual aids.
- Texas: The approach emphasizes learning from providers through an annual satisfaction survey. The focus is on identifying areas for improvement within the TVFC/ASN programs.
- Kentucky: The approach is also more towards learning, aiming to provide providers with tools and support to be successful in preventing vaccine-preventable diseases. The manual includes step-by-step instructions, photos, and educational resources to help providers become immunization champions in Kentucky.

Framing of site visits in relation to VFC program compliance: While Arizona emphasizes prevention and compliance, other states like California, Texas, Colorado, and Utah, and Kentucky adopt a more promotion-oriented approach, viewing site visits as opportunities for education, support, clarification, and identifying providers' needs to enhance program compliance and vaccine management.

- Arizona: The site visit is focused on prevention and protecting against fraud and abuse. The purpose is to ensure compliance with program requirements, minimize vaccine loss, verify eligibility of recipients, and promote vaccine stewardship and accountability.
- California: Site visits are seen as educational opportunities aimed at improving compliance with the VFC program and enhancing patient immunization levels.

- Texas: The purpose of compliance visits is to assess, support, and educate staff on TVFC policies and procedures, with no intention of critique.
- Colorado: Enrolled providers agree to scheduled site visits every 24 months, which evaluate compliance with VFC requirements and offer support and clarification to providers.
- Utah: The goal of compliance visits is to assess clinic implementation of VFC requirements and recommendations while providing education and technical assistance to clinic staff.
- Kentucky: The goal of VFC site visits is to identify the educational needs of enrolled providers, support them in meeting program requirements, and ensure proper management of vaccines for VFC-eligible children.

Vaccine management practices: Vaccine management practices vary across states in terms of time frames for noting changes, entering vaccine administration data, frequency of temperature logger data review, duration of temperature log retention, and treatment of power outages.

- Time frames for noting changes: Arizona requires changes to be noted within 1 week, while Kansas, and Texas allow 10 business days, and Utah provides no indication.
- Time frames for entering vaccine administration data: Arizona allows 30 days for data entry, while Kentucky allows 90 days, Kansas requires within 24 hours, Utah within 14 days, and Texas within 30 days.
- Frequency of temperature logger data review: Arizona requires data to be downloaded and reviewed twice a month, Kentucky once a month, Colorado once a week (recommended), and Texas recommends at least once per week. California specifies data review at the end of every two-week reporting period.
- Duration of temperature log retention: Arizona retains temperature logs for 6 years, while Kentucky, Kansas, New Mexico, and California retain them for 3 years. Texas retains them for 5 years, and Utah retains them for 7 years.
- Treatment of power outages: Arizona requires providers to service the cold storage unit and provide service receipts if experiencing unexplained temperature excursions. If multiple vaccine incidents occur due to power outages, a summary document from the power company is required. California allows spoiled or expired vaccines to be returned for tax credit but does not specify repercussions for power outages. Utah and Colorado suspend providers from ordering or receiving VFC vaccines during temperature excursion investigations, while Texas and Kansas seem to require incident reporting without specific consequences.

Policies regarding transporting vaccine: States differ in the extent to which they allow vaccines to be transported off-site and under what circumstances. All reviewed states recognize that certain emergency situations might require vaccines to be transported to a different location. A number of the states additionally allow for vaccines to be taken off-site for mass clinics, such as seasonal flu outreach or school-based clinics, or mobile clinics.

- Arizona: In our review, Arizona does not specify whether mass vaccination clinics are allowed. Although mobile clinics are allowed, these are limited to only those providers that are pre-approved, and the vaccines must be shipped to the location where the mobile unit will be administering vaccines. Otherwise, transportation of vaccine may only occur during an emergency, in the event of an unexpected extended power outage, or when vaccines will expire

in less than 90 days. Providers are required to get approval prior to transporting vaccines except in emergency situations.

- California: Mass vaccination clinics are allowed with prior authorization and enhanced storage/handling practices. The vaccines must be shipped to the permanent address and then transported to the temporary clinic. Mobile units are also allowed but must be registered upon enrollment and recertification into the VFC program. Lastly, California provides step-by-step instructions for transporting vaccines to other facilities in the event of an emergency or transferring them to other providers if they are to expire soon.
- Kansas: Off-site or mass-vaccination clinics are allowed with prior authorization and enhanced storage/handling practices. Kansas also requires prior authorization for transferring vaccines if the transport time will be one hour or more. There is, however, no mention of mobile clinics.
- Texas: Off-site and mass-vaccination clinics are allowed to be set up for seasonal vaccines (e.g., influenza), but these cannot occur outside of a provider's jurisdiction. Providers wishing to conduct an off-site clinic must also develop a mass vaccination protocol and get it approved. Vaccines must be transported to the site of the mass clinic, rather than shipped directly there, and the total time that the vaccine can be away from the permanent clinic is 8 hours (e.g., if transport to the off-site clinic takes 1 hour each way, the clinic can only run for 6 hours). The Operations Guide provides step-by-step instructions for transporting vaccines during emergencies but does not specify whether mobile clinics are allowed for VFC vaccine.
- Kentucky: Off-site or mass-vaccination clinics are also allowed with prior approval and enhanced storage/handling practices. It is recommended that the transport time be 30 minutes or less but can be more if the temperature is logged hourly. Like Texas, the total time of transport and storing vaccines off site also cannot exceed 8 hours. The Operations Guide also provides step-by-step instructions for transporting vaccines during emergencies but does not specify whether mobile clinics are allowed.
- Utah: Like Arizona, Utah allows for transporting vaccine only in emergency situations (e.g., power outage or unit failure) and prior to vaccine expiration but only with advanced authorization. There is no mention of mass or mobile clinics.

Restitution policies regarding dose-for-dose replacement for wasted or expired vaccines: Reviewed states have different restitution policies regarding dose-for-dose replacement of wasted or expired vaccines, with variations in thresholds, negligence definitions, and completion timelines. Generally, each of the reviewed states similarly defines a "wasted" dose as an unusable vaccine—resulting from, for example, breaking a syringe or vial, or drawing up but not administering the dose—or a vaccine that was lost or unaccounted for in the state's online inventory-reporting system. Some states, including Arizona, also include doses that have expired in this definition. Finally, not all states require restitution for all forms of wastage.

- Arizona: Sites are allowed up to 5% wastage of doses that expire in a year. If the 5% threshold is exceeded, all wasted doses must be replaced by the site at its expense through private vaccine purchase. The definition of wastage includes expired doses. The timeline to complete restitution is 60 days.
- California: Any vaccine loss is investigated to determine if provider actions are negligent. If the loss is deemed due to negligence, the provider is required to compensate the VFC Program.

Negligence includes allowing VFC-supplied vaccines to expire or spoil due to inappropriate vaccine management, including temperature monitoring. The timeline for completion is 90 days.

- Kansas: VFC providers are responsible for repaying avoidable vaccine loss on a dose-per-dose basis. Avoidable vaccine loss includes administering vaccines with longer expiration dates before those with shorter expiration dates and failure to notify the KIP three months in advance of the vaccine expiration date when unable to use all the doses on hand. The timeline for completion is 90 days.
- Texas: TVFC or ASN-enrolled sites may be required to reimburse the DSHS Immunization Section for vaccine losses resulting from negligence, including expired vaccines when the site did not notify RE 60 to 90 days before expiration. No specific timeline for completion is mentioned.
- Utah: Providers agree to replace vaccine loss on a dose-per-dose basis upon signing the VFC Provider Profile and Enrollment Agreement. If spoilage occurs due to negligence, the provider may be held responsible for replacing the spoiled vaccine dose-for-dose. No specific timeline for completion is mentioned.
- Kentucky: The KIB Restitution Policy requires negligent KIB providers to replace lost vaccines on a dose-for-dose basis. Negligence includes failure to rotate vaccine stock to use those with the shortest expiration date first and failure to notify KIB at least 90 days prior to the vaccine expiration date. The timeline for completion is 30 days.

The framing of unintentional mistakes in relation to VFC program compliance:

- Arizona: If VFC provider offices fail to meet requirements or procedures but no intentional deception, misrepresentation, or negligence is found, staff may be required to participate in training or take other actions to rectify the situation.
- California: Common mistakes during routine order submission that can lead to denied orders are explicitly outlined.
- Texas: Due to the increasing complexity of immunizations and related programs, sites enrolled in TVFC/ASN may unintentionally commit acts that could be perceived as fraud or abuse. All staff should familiarize themselves with common practice errors to avoid allegations of fraud or abuse, even if unintentional.
- Utah: In case of vaccine misuse, whether intentional or accidental, providers are required to immediately notify the Utah VFC Program.
- Kentucky: If a VFC provider's actions are determined not to be intentional fraud or abuse, they would receive education and follow-up from the Kentucky Immunization Branch staff until the situation is resolved.

The differences highlighted in our review underscore the need for increased collaboration, standardization, and clearer guidelines to ensure consistency and effective management of the VFC program across states. In an interview we carried out for Goal 2, a provider that oversees the VFC program across various states echoed the need for the CDC to provide more specific guidelines to address the variation in state interpretations of requirements. Clear guidelines would alleviate the burden on states in implementing the program and enable organizations operating across state lines to develop policies that meet the needs of each state. The respondent shared: *"I wish that the CDC was more prescriptive about what we could do. I think that would stop some of the state-to-state interpretation of the guidelines. … I think that would take some burden off our states in implementing the program, but it*

would also help a group like mine where we cross state lines to be able to implement policies and procedures that meet the need of every state."

Based on this review of available information from state operations guides, CDC may wish to consider:

- Enhancing transparency on time frames, temperature logger data review, expiration policies, and other VFC requirements: Establish clear guidelines that are publicly available for noting changes and entering data across all participating states in the VFC program (e.g., around time frames for entering data, the frequency for downloading and reviewing temperature logger data, expiration policies, etc.). This will ensure that states can effectively manage and update information in a timely and accurate manner and may lead to less state interpretation of CDC guidance.
- Establishing power outage response protocols: Collaboratively develop protocols for managing power outages to minimize vaccine spoilage. Emphasize proactive measures such as timely communication, power backup solutions, and mutual support among providers to mitigate potential risks.

In addition, ADHS may wish to consider the following:

- Revising restitution and loss prevention strategies towards greater collaboration: Foster a collaborative approach to restitution policies by providing educational resources and training opportunities to help providers minimize vaccine loss and wastage. Focus on building a culture of shared responsibility and continuous improvement. Emphasize collaboration and knowledge sharing. Include practical instructions, case studies, and success stories to promote shared learning and continuous quality improvement.
- Fostering more supportive site visits: Reframe site visits as collaborative opportunities to support VFC providers in meeting program requirements and improving immunization practices. Offer guidance, technical assistance, and resources during site visits to facilitate a positive learning experience.
- Promoting a culture of learning and improvement: Emphasize the importance of continuous learning, improvement, and shared responsibility within the VFC program. Encourage providers to participate in surveys, feedback sessions, and knowledge-sharing initiatives to foster a collaborative environment.

By focusing on collaboration, knowledge sharing, and support, a sense of partnership and shared responsibility among VFC providers and ADHS can be further fostered, ultimately improving the effectiveness of the program. These recommendations are synthesized with similar recommendations/themes that came up under the other goal areas and are included in the Conclusion of the report.

COVID Vaccine Best Practices for Consideration in Childhood Vaccine

Question 3: What best practices for the COVID-19 vaccine could be applied to childhood vaccine?

The COVID-19 vaccine required the development of administrative strategies and best practices that can be considered for childhood vaccines. Strategies around documentation and reporting, vaccine wastage, regulations, and the use of mobile clinics could be applied to childhood vaccines. When the COVID-19 vaccine became available there were many regulations that were updated and eased. Recommendations on vaccine wastage focused on getting as many people vaccinated as soon as possible and did not create penalties for doses wasted. The CDC resource on COVID vaccine wastage and operations states "Providers should not miss any opportunities to vaccinate every eligible person who presents at a vaccination site, even if it means puncturing a multidose vial to administer vaccine without having enough people available to receive each dose" (CDC, 2022a). Reducing the penalties for wastage in the VFC program would help more children get vaccinated and ease the administrative load for VFC providers.

Leveraging on-site vaccination services and mobile clinics: The use of on-site vaccination services and mobile clinics became an important strategy to administer the COVID-19 vaccine. To increase vaccination rates, it is critical to bring the vaccine to the people who need it. The Illinois Department of Health partnered with school districts and community sites to vaccinate children ages 12 to 17 and 5 to 11 years old (CDC, 2022b). During the vaccination rollout for children ages 12 to 17, they set up 870 mobile clinics, vaccinating two thirds of the 12 to 17 population, which was the highest rate in the Midwest (CDC, 2022b). Another example of the use of mobile clinics is Mattapan Community Health Center and Codman Square Health Center in Boston who, in summer 2020, deployed mobile clinics as an adjunct to their in-person preventative pediatric clinical services (Leibowitz et al., 2021). Vaccines were stored and transported in portable coolers and insulating materials and conditioned water bottles were utilized in accordance with the CDC vaccine storage protocols (Leibowitz et al., 2021). Prior to the mobile clinic Mattapan had never achieved more than 70% routine vaccination coverage of children up to two years old but through their mobile clinic they were able to achieve a 73% vaccine coverage (Leibowitz et al., 2021). Mattapan found that the mobile clinic provided a critical point of healthcare access and mobile services likely improved accessibility by decreasing the need for transportation and childcare (Leibowitz et al., 2021). Though counties were able to offer school-based vaccine clinics for COVID-19 and other childhood vaccines, other providers, like federally qualified health centers have been prohibited from doing so in recent years. Decreasing regulations that prevent VFC providers from setting up on-site vaccination services in schools or community sites would increase the number of children vaccinated.

Simplifying regulations: To administer the COVID vaccine, providers were able to do so even if they only worked part-time. Requiring providers to be open four days a week to be eligible for the VFC program greatly reduces the number of providers who can participate in the program. This greatly impacts the ability for school-based health centers to offer vaccines and many rural clinics that do not serve enough patients to be staffed with a provider more than just a few days a week and should be reconsidered. Further, some VFC regulations and penalties that were reduced or removed during COVID should be considered for continued implementation to increase participation in the VFC program. Continuing to suspend VFC penalties and not requiring providers to re-enroll every year would greatly reduce the

administrative burden on VFC providers. However, annual re-enrollment seems to be a federal CDC requirement, as our review of state operational guides showed that other states also discussed this process. It is important to reduce administrative burden, regulations, and penalties of the VFC program in order to increase participation and have more children vaccinated.

Partnering with local health actors: Documentation and data collection are often significant challenges for providers when it comes to vaccines including the COVID-19 vaccine. Reports following the COVID-19 vaccine roll out found that working directly with providers and other local healthcare workers to build data standards and processes together as well as simplifying information channels and chains of command was key to the success of the vaccine administration (OECD, 2021).

Another challenge with the COVID-19 vaccine was passing on key health information and instructions to local governments, providers, and healthcare workers without loss of information and significant delays (OECD, 2021). Reports found that governments that took a decentralized approach to passing on information experienced information loss and significant delays (OECD, 2021).

In order to successfully communicate information to local governments, providers, and healthcare workers it was found that dynamic and interactive forms of internal information were most effective. Providing internal communication in multiple different ways and easily accessible led to greater buy-in from stakeholders (OECD, 2021). Simplifying internal information channels and utilizing traditional and digital platforms of communication around documentation requirements, data collection rules, and regulations could help adherence to the VFC program and make it less difficult to be a VFC provider.

Increasing AHCCCS Payments

Question 4: How can AHCCCS increase payments to reflect liability and staff time to participate in the VFC program?

Ensuring adequate compensation to VFC providers has been found to increase childhood vaccination rates. A 2018 study found that every one dollar increase in state Medicaid payments resulted in an increase of childhood vaccinations by two percent (Tsai, 2018). Currently, VFC providers are paid a maximum of $21.33 per vaccine administration in the state of Arizona (Arizona Department of Health Services, 2020). From available information, this rate appears to fall in between rates reimbursed by other states. For instance, New Hampshire reimburses $3.00 through Medicaid, while Alaska pays $33.69 through Medicaid (Tsai, 2018). However, it should be noted when comparing between states that states can differ in approach (e.g., shot-based versus antigen-based, which affects the reimbursement amounts). Although Arizona's reimbursements may be higher than some states, feedback by VFC providers in this assessment indicates that these payments do not adequately cover the costs of provider and staff resources. AHCCCS has several avenues to increase payments to VFC providers that we highlight below.

Reassess available billing and reimbursement options: AHCCCS should consider their available billing and reimbursement options. From available information, it is not known if the current Arizona maximum VFC reimbursements reflect the maximum fee caps as put forth by the Centers for Medicare & Medicaid Services. Further, AHCCCS should ensure that they are fully capitalizing on federal matching programs for Medicaid. For fiscal year 2024, Arizona's federal medical assistance percentage (FMAP) rate for Medicaid

is 66% (KFF.org, 2023). This means that the federal government will match 66 cents to every dollar spent by Arizona on Medicaid related expenditures, including VFC repayments. If this matching program is not fully leveraged, then this may be a way to increase payments to VFC providers. A first step that can be taken is exploring how this approach may be leveraged within Arizona's AHCCCS waiver, fully capitated system.

Additionally, AHCCCS can begin reimbursing VFC providers for combination vaccine counseling administration (i.e., using the multiple antigen 90461 code of *at least* $10.67 per additional antigen). For example, practices can give polio, Hib and Hep B vaccines as separate injections and be paid ~$20 per dose for a total of $60 versus giving one combination shot with a payment of just $20. This higher reimbursement incentivizes practices to give more shots per visit. Private plans and other state Medicaid agencies pay additional antigen codes to account for the increase in counseling for each disease the combination vaccine covers. For a polio, Hib, and Hep B combination vaccine, plans pay $20 for the first disease antigen (polio) plus an additional $10 for Hib and $10 for Hep B for a total of $40

Further, AHCCCS can add an enhanced payment (beyond the VFC regional fee cap) to cover the additional inventory management cost burden. Ideally, practices need an enhanced payment to cover costs of ASIIS based inventory reporting, lost doses, billing, and restitution insurance. Work can be done to clarify the state's official fee cap as the enhanced CMS payment $21.33 from 2012 versus the original fee cap of $15.43. AHCCCCS can publish the fee cap, plus any enhanced payment, so that VFC providers feel confident billing the higher VFC administration rates and the Medicaid health plans have clear payment guidelines (TAPI provided information).

Increase provider awareness about billable fees: AHCCCS should ensure that VFC providers are fully aware of the billable fees that are available to them. Currently, VFC statutes do not prohibit VFC providers from charging an office visit fee in addition to the vaccine administration fee (ADHS, 2020). This fee, albeit not guaranteed to be able to be paid by the patient, may assist in alleviating staff and resource costs on the part of the provider. AHCCCS may consider covering the office visit fee as another means of increasing payments to VFC providers. Although reimbursement may already be included in the office visit, how much the individual AHCCCS plan reimburses may vary and efforts can be made to make reimbursement of the office visit more widely known. Further, in June 2023, AHCCCS added a non-vaccinating counseling code to allow for more in-depth conversations about vaccinating to the schedule put out by the Advisory Committee on Immunization Practices (ACIP). AHCCCS can begin to provide education to providers on use of the new codes for all vaccines (not just for the COVID-19 vaccine counseling that was first implemented federally).

Partner with VFC providers to increase coverage through a multi-pronged approach: AHCCCS may consider working closely with VFC providers to increase the number of children that they vaccinate on an annual basis. While such efforts would not increase the amount paid to VFC providers by AHCCCS per child, an increase in the number of children vaccinated may streamline processes and efficiency, thus saving on staff and resource costs. According to the Childhood Immunization Completion Rates report prepared by AHCCCS (2018), vaccination rates at the state level are below the Medicaid average for Flu (40% versus 45%) and Rotavirus (61% vs 69%). These percentages also reflect a general decreasing trend in vaccination rates following previous assessments of AHCCCS rates. Regarding counties, Mohave (IPV, MMR, HiB, VZV, RV, and Flu), Yavapai (MMR, HiB, VZV, Hep A), Pinal (DTaP, IPV, HiB, RV), and Navajo (RV and Flu) counties all show low levels of vaccination for specific diseases. These counties may serve as

prime candidates for targeted awareness campaigns and measures to increase the number of children vaccinated on an annual basis.

Leverage existing reminder and recall systems: It is recommended that AHCCCS work with VFC providers to leverage Arizona's ASIIS Reminder and Recall System. A 2018 study that reviewed the effectiveness of reminder and recall systems in child, adolescent, and adult outpatient settings found that the use of patient reminder and recall systems increased vaccinations rates by an average of 8% (Jacobson Vann et al., 2018). Reminders that involved one-to-one communication over the phone were most effective, but auto-dialer calls, letters/postcards, or text messages were also effective in increasing vaccinations. This was true regardless of whether the provider was a private doctor's office, medical center, or public health department. The boost in vaccinations associated with the use of the reminder and recall system may assist in increasing the amount of funds received by VFC providers and further assist in developing more efficient administration and billing processes.

Advocate for an increase in fee caps: AHCCCS may wish to advocate that federal Medicaid and Medicare further increase the maximum fee caps on VFC providers. Initial maximum fees for VFC providers were set in 1994 but were increased in 2012 when the Centers for Medicare & Medicaid Services ruled in favor of a fee increase per vaccine administration (Centers for Medicare & Medicaid Services, 2012). Likely successful advocacy efforts would require a joint initiative by multiple states. Obtaining current VFC reimbursement rates from different states may illuminate potential partners. Once fee caps are raised, AHCCCS can work towards increasing maximum reimbursements.

Consider adopting a universal state vaccine financing system: Although staffing and time costs are of serious concern to VFC providers, the purchasing and storage of vaccines can serve as severe financial and space burdens to providers as well. Several state vaccine financing systems exist that influence VFC providers' need to maintain separate vaccine stocks and storage spaces. For example, VFC-only financing systems (see Table 16 below) provide state-purchased vaccines for providers which are only eligible for children who need to be vaccinated under the VFC program. As such, these states require that VFC providers maintain and store separate stocks of vaccines that may only be used for VFC-eligible children or those privately insured, respectively. Such financing systems place increased financial costs on providers as they must purchase private vaccine stocks out-of-pocket and use staffing capacity to surveil vaccine expiration dates for two separate sets of vaccines.

Juxtaposed to this, states that use a universal state vaccine financing structure purchase the entirety of the vaccine stock for VFC providers, regardless of whether the vaccines will be used for VFC-eligible children or those who are privately insured. These financing structure save costs for providers as providers do not need to use clinic funds to purchase vaccines (with the hopes of using the entirety of the stock and billing private insurance companies) as the state supplies the vaccines through a mix of state and federal funds (Roth et al., 2022). This further lessens the burdens on VFC providers as they only need to commit staff to maintaining one vaccine stock and can use a singular storage method.

Currently, Arizona uses the VFC-only state vaccine financing structure and requires that VFC providers maintain a separate stock of vaccines for VFC purchased vaccines and those purchased privately (ADHS, 2020). This approach can increase the overhead required for providers to participate in the VFC program, as this assessment has surfaced. Therefore, it is recommended that Arizona consider pursuing a universal state vaccine funding system. Should this prove to be too costly, several states (e.g., Alaska, Minnesota) utilize a hybrid model that aims to reduce financial burdens on the state, while also reducing the financial

cost placed on providers. For instance, the universal-select model involves the state purchasing all vaccines except for a specific subset of vaccines as determined by the state. While such an approach would not reduce the storage costs for VFC providers, it would reduce the overhead associated with purchasing vaccine stocks for children who are privately insured.

Table 16: State Vaccine Financing Systems

State Vaccine Financing Systems (2019 Estimation)	
VFC Only	Alabama, Arizona, Arkansas, California, Colorado, Delaware, District of Columbia, Florida, Hawaii, Illinois, Indiana, Iowa, Kentucky, Louisiana, Mississippi, Missouri, Montana, Nebraska, Nevada, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, Tennessee, Texas, Virginia, West Virginia, Wisconsin
VFC & Underinsured Select	Georgia, Maryland, Michigan, Minnesota, New York, Utah
Universal Select	Alaska (0-35 months), Connecticut, Idaho, Maine, Massachusetts, South Dakota
Universal	New Hampshire, New Mexico, Rhode Island, Vermont, Washington, Wyoming
Definitions: 1. Universal: Immunization program supplies all vaccines to all providers. (uses federal for VFC-eligible and state funds for all others) 2. Universal-Select: Immunization program supplies all vaccines to all providers with the exception of one or more vaccines, e.g., pneumococcal conjugate vaccine. 3. VFC & Underinsured: Immunization program supplies all vaccines for VFC-eligible and underinsured children to all VFC-enrolled providers. 4. VFC & Underinsured-Select: Immunization program supplies most vaccines for VFC-eligible and underinsured children to all VFC-enrolled providers, e.g., pneumococcal conjugate vaccine supplied only to VFC-eligible children. 5. VFC-Only: Immunization program supplies VFC vaccine to all VFC enrolled providers. However, public health clinics may provide all vaccines to all children who present for vaccination.	

Conclusion

The Vaccines for Children (VFCC) program in Arizona, with its commitment to providing free vaccines to eligible children, holds immense value in safeguarding public health and preventing vaccine-preventable diseases among Arizona's children. The program also faces several challenges and opportunities for improvement. By addressing issues such as streamlining processes, enhancing communication and support, revising punitive policies, and investing in education and resources, the VFC program can create a more collaborative and supportive environment for VFC providers.

With funding from Maricopa County, The Arizona Partnership for Immunization (TAPI) partnered with OMNI Institute, a social sciences non-profit consultancy, to carry out an assessment to better understand the facilitators and challenges/barriers to participating in the VFC program in Arizona. We designed and implemented a mixed methods assessment to examine the landscape of the VFC program in Arizona. Specifically, we proposed three assessment goals that taken together allowed us to generate data-driven and evidence-based recommendations for policy, system, and environmental (PSE) strategies to advance vaccine equity for the county, its five regions, and the state of Arizona. The priorities for each goal included the following:

- Goal 1: Assessing vaccine coverage gaps and needs through the identification and synthesis of relevant available secondary data.
- Goal 2: Conducting primary data collection to gather the input, experiences, and perspectives of current VFC providers and non-VFC providers on the facilitators and challenges to participating in the VFC program.
- Goal 3: Reviewing and analyzing the interpretation, application, and implications of federal (CDC) and state immunization policies.

Below, we offer various recommendations for improving the VFC program. Implementing the recommendations below will not only help to alleviate the administrative burden on providers but also improve vaccination coverage and ensure the well-being of eligible children. With a concerted effort to foster effective partnerships and streamline program operations, the Arizona VFC program can make significant strides in achieving its goal of protecting the health of children through immunizations.

Recommendations

VFC Program Policy and Supports:

Reduce bureaucracy: ADHS should evaluate regulations and requirements to simplify processes, minimize compliance regulations, and reduce unnecessary red tape.

Policy review: ADHS can revise its policies around financial penalties for providers unless *actual* fraud is proven. Prioritize support, education, training, and guidance to help providers meet program standards effectively and encourage participation.

Resource support: ADHS may wish to consider facilitating the provision of necessary resources such as refrigeration units and supplies for vaccine storage for providers with financial barriers.

Provider support: AHDS can bolster assistance to providers in identifying and resolving issues (e.g., duplicate vaccine records), streamline reconciliation processes, and continue to improve interconnectivity between EMR systems and ASIIS.

VFC Communication and Engagement:

Collaborative approach: ADHS can foster better communication and collaboration between VFC representatives and participating practices. Fostering a collaborative and understanding environment that prioritizes patient care and effective use of resources is recommended. Further, ADHS may wish to consider establishing a committee or platform for physicians and VFC program representatives to communicate and provide feedback.

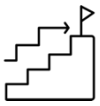
Improve communication and support: ADHS can enhance communication channels, provide timely responses, minimize delays, and offer clear guidance. Providing up-to-date information and regular updates to providers about changes, policies, and requirements related to vaccine administration is recommended.

Timely vaccine delivery: ADHS can improve the timeliness of vaccine orders and deliveries, expedite the process, and reduce delays and gaps in vaccination schedules.

Increase VFC staffing: As possible, ADHS is encouraged to allocate additional staff resources to the program to enhance efficiency and responsiveness.

Education and Training:

Education and training: ADHS in partnership with TAPI can continue to provide comprehensive education, training sessions, workshops, and resources to help providers understand program processes and compliance obligations. ADHS may wish to consider holding regular immunization conferences for providers to receive education, training, and networking opportunities.



Focus on vaccination goals: ADHS can simplify processes, facilitate timely training, and address concerns to ensure vaccination goals are prioritized. Shift the emphasis and tone from administrative compliance toward maximizing immunization rates.

Technology and Data Enhancements:

Technology enhancements: ADHS can improve accessibility and ease of use of ASIIS, support automation and integration with temperature monitoring systems for efficient temperature log management, explore improvements to barcode scanning for vaccine boxes, and improve website accessibility and self-run reporting capabilities.

Improve data for estimating and tracking VFC-eligible populations and disparities: ADHS, AHCCCS, TAPI, and other stakeholders may wish to partner to explore better ways to estimate and consistently track VFC-eligible population numbers over time and across geographies. Leverage information required for VFC provider reporting to better characterize and understand provider capacity, patient population, and vaccine uptake. Consider adding additional data fields for vaccine orders to facilitate better monitoring and

understanding of provider coverage and needs. Further, ADHS may wish to develop a 'data dictionary' for reliable comparisons of data sets and variables from year to year.

Inventory Management:

Flexibility in vaccine management: ADHS is encouraged to allow for more flexible vaccine inventory management, such as the ability to transport vaccines, share vaccines between sites and/or between private vs. VFC stock when necessary. Provide flexibility in ordering, allowing providers to place smaller orders more frequently to manage inventory effectively. Further, decreasing regulations that prevent VFC providers from setting up on-site vaccination services and/or mobile clinics in schools or community sites can support the goal of increasing the number of children vaccinated.

Apply Best Practices from COVID-19: ADHS can consider modifying vaccine wastage policies in the VFC program to prioritize maximizing vaccination coverage without penalizing doses wasted. The CDC's approach to COVID-19 vaccine wastage emphasized the importance of vaccinating every eligible person. Aligning the VFC program with this principle can help improve vaccination rates for children and alleviate administrative burdens for providers.

Increase Reimbursement:

Review billing and reimbursement options: AHCCCS can assess their existing billing and reimbursement options to ensure they align with the maximum fee caps set by the Centers for Medicare & Medicaid Services. Additionally, AHCCCS can leverage federal matching programs for Medicaid to enhance payments to VFC providers; consider reimbursing VFC providers for combination vaccine counseling administration (offering a higher reimbursement rate for each additional antigen administered); and introduce an enhanced payment, beyond the VFC regional fee cap, to cover additional inventory management costs faced by providers. By clarifying the state's official fee cap and publishing it along with any enhanced payment, VFC providers will have clear guidelines for billing higher VFC administration rates, and Medicaid health plans will have transparent payment guidelines.

Enhance provider awareness of billable fees: AHCCCS should ensure that VFC providers are well-informed about the billable fees available to them. While VFC statutes do not prohibit providers from charging an office visit fee alongside the vaccine administration fee, AHCCCS may consider covering the office visit fee as an additional means of increasing payments to providers and relieving their staff and resource costs. AHCCCS should actively educate providers on the utilization of the newly added non-vaccinating counseling code (which is now available for all vaccines and not limited to COVID-19 vaccine counseling).

Collaborate with VFC providers for increased coverage: AHCCCS may can establish a collaborative partnership with VFC providers, ADHS, TAPI, and other stakeholders to boost the number of vaccinated children annually. While this approach may not directly increase payments per child, it can streamline processes, enhance efficiency, and reduce staff and resource costs.

Consider adopting a universal state vaccine financing system: AHCCCS in partnership with ADHS and other relevant stakeholders can reduce financial burdens and storage constraints on VFC providers by allowing state-purchased vaccines to be used for all eligible children, eliminating the need for separate vaccine stocks and storage spaces.

The recommendations presented above provide actionable steps to enhance the VFC program in Arizona. By implementing these recommendations, the VFC program can alleviate administrative challenges, enhance vaccination coverage, and make substantial progress in its mission to protect Arizona children's health through immunizations.

Appendix

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The Arizona Childhood Vaccine Provider Survey

The Arizona Partnership for Immunization (TAPI) invites your feedback and opinions regarding the Arizona Vaccines for Children (VFC) program. We ask that you please take a few moments to answer this brief survey. Your answers will help us improve the VFC program.

This survey is intended to be taken by owners and employees of medical provider offices that administer vaccines to children whether they are privately insured, covered by AHCCCS and uninsured. Because we are interested in better understanding the facilitators and barriers to VFC program participation, you are invited to participate whether you are a current, former, or non-VFC provider. We also understand that experiences and perspectives with the VFC program may vary depending on respondents' involvement in the vaccination delivery process. To better ensure high quality data, we ask that you please mark "I don't know" when in doubt.

The survey has been designed to be as brief as possible and should take approximately 10-15 minutes to complete depending on your answers. We ask that you please take the survey in one sitting. Lastly, if you are interested in participating in an interview, please fill out a brief interest form after you complete the survey. Your contact information will be gathered via a separate survey link and will not be attached to your survey responses.

1. What is your VFC provider status?

- ☐ I am a current VFC provider **(Skip to 1b below on Page 1)**
- ☐ I am a past VFC provider (Skip to Page 6 for remaining questions)
- ☐ I have never been a VFC provider (Skip to Page 6 for remaining questions)

VFC Provider Questions

1b. [Skip logic from Q1] When did you become a VFC provider?

Note: If you are not certain on an exact date, please pick an approximate date for when you became a VFC provider. [Date] _____

2. Please choose what best describes your practice from the list below.

Note: If you can make more than one selection, please choose the type of practice that most closely aligns with your day-to-day work.

- ☐ Community health center
- ☐ Health department
- ☐ Hospital (ambulatory care)
- ☐ Hospital (in-patient)
- ☐ Indian Health Services/638
- ☐ Pharmacy

- ☐ Private practice
- ☐ Other (please specify): _____

2b. [If private practice is selected] What type of primary practice?

- ☐ Pediatrics
- ☐ Family Practice
- ☐ Other (please specify); _____

3. What is your zip code? _____

4. What is your current role in the practice?

Note: If you have more than one role for your practice, please choose the role that most closely aligns with your daily duties.

- ☐ Administrative
- ☐ MA/LPN/CAN
- ☐ Nurse Practitioner/Physician Assistant
- ☐ Pharmacist
- ☐ Physician
- ☐ Registered Nurse
- ☐ Other (please specify): _____

5. What is the size of your practice?
   - ☐ One provider
   - ☐ 2-3 providers
   - ☐ 4-10 providers
   - ☐ 11-20 providers
   - ☐ 21+ providers

6. How are you involved in the vaccination delivery process? (Check all that apply)
   - ☐ Inventory management (including ordering vaccines, accounting for doses, etc.)
   - ☐ Administer vaccines (including counseling patients, obtaining consent, providing injection)
   - ☐ Update patient records in the electronic medical record (EMR) and/or registry
   - ☐ Billing
   - ☐ Review/track immunization coverage of patient population
   - ☐ Other (please describe): _____

7. What percentage of your patients are AHCCCS (state Medicaid) eligible?

   - ☐ <10%
   - ☐ 11-24%
   - ☐ 25-49%

- ☐ 50-74%
- ☐ 75% or more
- ☐ I don't know

8. What EMR/EHR system do you use in your office?

   - ☐ Athena
   - ☐ Cerner
   - ☐ eClinical Works
   - ☐ NextGen
   - ☐ RPMS
   - ☐ None
   - ☐ Other (Please describe): _____
   - ☐ I don't know

9. How do you report to ASIIS?

   - ☐ We type in all the data to the ASIIS web portal
   - ☐ Our EMR has a connection to ASIIS with uploading, downloading & working inventory
   - ☐ Our EMR has a connection to ASIIS but reporting/inventory requires manual corrections
   - ☐ We haven't started reporting yet
   - ☐ Other (Please describe): _____
   - ☐ I don't know

10. Please rate your level of **satisfaction** with the following support(s), service(s), and or aspects of the VFC program:

    1=Very dissatisfied; 2= Dissatisfied; 3=Neither dissatisfied nor satisfied; 4=Satisfied; 5=Very satisfied; 6=N/A or Don't Know

    - ☐ Written guidance on VFC policy and procedure
    - ☐ Availability of VFC to respond to inquiries
    - ☐ Communications between VFC and my practice about policy changes
    - ☐ ASIIS help desk
    - ☐ The VFC program reporting requirements (e.g., tracking eligibility, doses administered, inventory, refrigerator temperatures, etc.)
    - ☐ The VFC vaccine-ordering system
    - ☐ VFC inventory reconciliation
    - ☐ The variety of vaccine-brand choices available for VFC vaccines
    - ☐ VFC site visits
    - ☐ The required annual VFC recertification process (i.e., submission of Enrollment, Agreement, Profile, Supplemental forms, etc.)
    - ☐ Your overall satisfaction with the VFC program

11. What challenges, if any, has your practice experienced with the VFC program? (Check all that apply)

    - ☐ Been asked to make dose for dose restitution of vaccine by VFC program
    - ☐ Delays in receiving VFC vaccines
    - ☐ Dis-enrolled from the VFC program
    - ☐ Filing borrowing reports
    - ☐ Reconciling VFC vaccine inventory
    - ☐ Lack of VFC vaccine due to delays in shipment after loss of power, refrigerator failure, other temperature excursions
    - ☐ Ordering VFC vaccines
    - ☐ Put on probation by VFC program
    - ☐ Other (Please describe): _____
    - ☐ No challenges

12. How significant are the following challenges or barriers for your continued participation in the VFC program? Please check up to 5 barriers.

    - ☐ Ability to maintain a collaborative relationship with VFC to sustain program implementation and problem-solve issues
    - ☐ Reimbursement does not adequately cover the cost of administering VFC vaccines
    - ☐ Ongoing financial costs to store and administer vaccines (e.g., maintaining medical-grade equipment, insurance/replacement costs)
    - ☐ Staff time/administrative costs needed to adhere to VFC policy (e.g., to enroll/re-enroll in VFC, for administrative and inventory management, to do reimbursement process, etc.)
    - ☐ Compliance requirements (e.g., keeping detailed temperature logs, participating in site visits by state officials, having handling plans for routine and emergency storage, etc.)
    - ☐ Increased regulations over the past few years
    - ☐ There is no one in our office championing the effort
    - ☐ Staff shortages have affected our ability to adhere to the VFC program requirements (e.g., adherence to policy and compliance requirements)
    - ☐ Lack of EMR integration with ASIIS
    - ☐ Other (Please describe): _____

13. Overall, please rate your level of challenges with the VFC program.

    - ☐ Not at all challenging
    - ☐ Slightly challenging
    - ☐ Moderately challenging
    - ☐ Very challenging
    - ☐ Extremely challenging

14. Please share more about what challenges and barriers you have experienced

_____

_____

15. In what circumstance(s) does your practice refer families out for vaccines? (Check all that apply)

- ☐ The vaccine is out of stock
- ☐ We do not cover a specific vaccine
- ☐ Insurance will not adequately cover a vaccine
- ☐ We have staffing shortages/challenges
- ☐ We do not refer families elsewhere for vaccines
- ☐ I don't know
- ☐ Other (please specify): _____

16. Where does your practice refer families? (Check all that apply)

- ☐ Community health center
- ☐ Health department
- ☐ Hospital (ambulatory care)
- ☐ Hospital (in-patient)
- ☐ Indian Health Services/638
- ☐ Pharmacy
- ☐ Private practice
- ☐ We do not refer families elsewhere for vaccines
- ☐ I don't know
- ☐ Other (please describe): _____

17. What recommendations do you have to improve the VFC program? What else would you like to share if anything?

_____

_____

_____

THANK YOU FOR COMPLETING OUR SURVEY!

Former VFC and Non-VFC Provider Questions

1b. [Skip logic from Q1] When were you last a VFC provider?

Note: If you are not certain on an exact date, please pick an approximate date for when you were last a VFC provider. [Date] _____

2. Please choose what best describes your practice:

Note: If you can make more than one selection, please choose the type of practice that most closely aligns with your day-to-day work.

- ☐ Community health center
- ☐ Health department
- ☐ Hospital (ambulatory care)
- ☐ Hospital (in-patient)
- ☐ Indian Health Services/638
- ☐ Pharmacy
- ☐ Private practice
- ☐ Other (please describe): _____

2b. [If private practice is selected] What type of primary practice?

- ☐ Pediatrics
- ☐ Family Practice
- ☐ Other (please specify); _____

3. What is your zip code? _____

4. What is your role in the practice?
   - ☐ Physician
   - ☐ Nurse Practitioner/Physician Assistant
   - ☐ Registered Nurse
   - ☐ MA/LPN/CNA
   - ☐ Administrative
   - ☐ Other (please describe): _____

5. What is the size of your practice?
    - ☐ One provider
    - ☐ 2-3 providers
    - ☐ 4-10 providers
    - ☐ 11-20 providers
    - ☐ 21+ providers

6. What percentage of your patients are AHCCCS (state Medicaid) eligible?

    - ☐ 0%
    - ☐ <10%
    - ☐ 11-24%
    - ☐ 25-49%
    - ☐ 50-74%
    - ☐ 75% or more
    - ☐ I don't know

7. What factor(s) have led your practice not to participate in the VFC program? Please check up to 5 barriers.

    - ☐ Too few children in the practice or coverage area to justify program participation
    - ☐ My practice does not accept Medicaid
    - ☐ Ability to maintain a collaborative relationship with VFC to sustain program implementation and problem-solve issues
    - ☐ Reimbursement does not adequately cover the cost of administering VFC vaccines
    - ☐ Ongoing financial costs to store and administer vaccines (e.g., maintaining medical-grade equipment, insurance/replacement costs)
    - ☐ Staff time/administrative costs needed to adhere to VFC policy (e.g., to enroll/re-enroll in VFC, for administrative and inventory management, to do reimbursement process, etc.)
    - ☐ Compliance requirements (e.g., keeping detailed temperature logs, participating in site visits by state officials, having handling plans for routine and emergency storage, etc.)
    - ☐ Increased regulations over the past few years
    - ☐ There is no one in our office championing the effort
    - ☐ Staff shortages have affected our ability to adhere to the VFC program requirements (e.g., adherence to policy and compliance requirements)
    - ☐ Lack of EMR integration with ASIIS
    - ☐ Other (Please describe): _____

8. Do you provide vaccines? (Check all that apply)

- ☐ Yes – to infants and toddlers (under 3 years old)
- ☐ Yes – to children (3-11 years old)
- ☐ Yes – to adolescents (12 – 17 years old)
- ☐ Yes – to adults (18 years old and older)
- ☐ No
- ☐ I don't know

9. In what circumstance(s) does your practice refer families out for vaccines? (Check all that apply)

- ☐ The vaccine is out of stock
- ☐ We do not offer a specific vaccine
- ☐ Insurance will not adequately cover a vaccine
- ☐ We have staffing shortages/challenges
- ☐ We do not refer families elsewhere for vaccines
- ☐ I don't know
- ☐ Other (please specify): _____

10. Where does your practice refer families for vaccines? (Check all that apply)

- ☐ Community health center
- ☐ Health department
- ☐ Hospital (ambulatory care)
- ☐ Hospital (in-patient)
- ☐ Indian Health Services/638
- ☐ Pharmacy
- ☐ Private practice
- ☐ We do not refer families elsewhere for vaccines
- ☐ I don't know
- ☐ Other (please describe): _____

11. What recommendations do you have to improve the VFC program? What else would you like to share if anything?

_____

_____

_____

THANK YOU FOR COMPLETING OUR SURVEY!

Interview and Focus Group Guide

Introduction

The Arizona Partnership for Immunization (TAPI) has partnered with our organization, OMNI Institute (a social sciences nonprofit research and evaluation consultancy), to carry out an assessment to better understand the facilitators and challenges/barriers to participation in the Vaccines for Children (VFC) program. As part of this assessment, OMNI has conducted a brief online survey to current, former, and non-VFC providers who provide vaccinations to children, and key informant interviews with respondents who have key experience and perspectives of the VFC process. You have been identified for a key informant interview because of your unique perspective.

In our 1:1 interview, I'll ask around:

Your background/role: Your name; role in your organization; how you are involved in the VFC process; when your practice/clinic became a VFC provider; etc.

Implementation practices: What has worked well in managing VFC program requirements; what has been challenging; how COVID-19 has affected your ability to administer the VFC program, if at all; etc.

Policies: What policies you think encourage participating in VFC, if any; what policies you think inhibit or discourage participating in VFC, if any.

Needs: What improvements could be made regarding VFC, if any; what types of support, resources, and/or training would be useful to VFC providers.

The interview will take approximately one hour depending on your responses.

Go Over Participant Rights

Before we begin, I'd like to review a few things about your participation.

Participation in today's interview is completely voluntary. This means you do not have to answer any questions you feel uncomfortable answering, and you are free to leave at any time. There will be no penalty or consequence if you choose not to answer a question or take part in this discussion. You can also ask me any questions that you may have.

Also, what we talk about today is completely confidential. I am going to ask several questions about your experience as a VSP provider and combine what you tell me with information I learn in other interviews. In the report, although we will not attribute any of your responses to you in the report, it may be possible that someone knowledgeable about VSP and your role in the work could identify you depending on your answers. We will do our best to anonymize feedback to avoid this as much as possible. This is a small little risk to you for participating in the interview.

- Do you understand the purpose of the interview and give your consent to participate?

Lastly, I would like to record our interview. This allows me to focus on the conversation while making sure we capture your comments. No one outside of the OMNI evaluation team will hear the recording.

- Do you consent to be audio recorded?

********** (START RECORDING)**********

Confirm Rights and Agreement to Participate (Verbal Consent) when recording starts

Now that we've started recording, I'd like to confirm the points we just covered:

- You know your rights as a participant in this interview discussion - meaning, your participation is voluntary, you can answer or not answer any question; you can ask me any question; and you can stop participating at any time.
- Your name will not be used in any published reports.
- You consent to have this Zoom call recorded and this recording is now on.

Do you consent to participate? [Confirm verbal consent]

Questions for Participating Clinics

- Background
    - Can you please introduce yourself – your name and role within your organization?
    - When did your clinic become a VFC Provider?
    - Why did your clinic enroll in VFC?
    - How are you involved in the vaccination delivery process?

- Implementation practices
    - Can you please tell me more about how the state monitors your management of VFC program requirements and/or clinic office procedures?

    - Tell me more about your EHR process.
        - What EHR do you use?
        - Do you do HL7 or manual reporting?

    - What practices have worked well in managing VFC program requirements?
        - Could these practices be replicated in other Arizona clinics?
            - If so, how?
            - If not, why might that be?
    - What practices have been challenging/what are the main challenges you experience with being a VFC Provider, if any?
        - Probe around expenses to manage VFC if not surfaced – staff time? Time from overseeing doctor? Does it reduce exam visit time? Are they doing any hiring of consultants to support?
    - [COVID-19] In what way(s), if any, has COVID-19 affected your ability to administer the VFC program?
        - What policies or practices were loosened/changed because of COVID (e.g., dose-by-dose accountability, site visits, temp log submissions, emergency plans, etc.) – if any?
- Policies
    - What policies do you think encourage participating in VFC, if any?
    - What policies do you think inhibit or discourage participating in VFC, if any?

        - Probes: Ask around time, expense, staffing; what trade-offs there are if any
- Needs
    - What improvements could be made regarding VFC, if any?
    - What types of support, resources, and/or training would be useful to VFC providers?

Questions for Non-Participating Clinics

- Background
    - Can you please introduce yourself – your name and role within your organization?
    - Have you ever attempted becoming a VFC provider?
        - If so, were you a provider?
            - When? What factors led your practice/clinic to no longer be a provider?
        - If not, what factors led to the decision to not pursue becoming a provider?
- Implementation
    - [If prior VFC provider] What practices were challenging/what were the main challenges you experienced with being a VFC Provider, if any?
    - [If never a VFC provider] What were the main challenges you experienced in attempting to become a provider [if attempted]?
    - [COVID-19] In what way(s), if any, has COVID-19 affected your ability to participate in the VFC program?
    - Do you administer vaccine to privately insured patients or those covered by Medicare?
        - [If former VFC provider]: Probe if they got rid of all vaccines or just VFC
- Policies
    - What policies do you think encourage participating in VFC, if any?
    - What policies do you think inhibit or discourage participating in VFC, if any?
- Needs
    - What improvements could be made regarding VFC, if any? If improvements were made, would you re-consider becoming a provider, why or why not?
    - What is needed for you to reconsider becoming a VFC provider again? What types of support, resources, and/or training would be useful to VFC providers?

Binomial Test Results

The following two tables show the results of the statistical test for subgroup differences in the Likert scale satisfaction questions from the VFC provider survey. The first column is the subject of each question and repeats for the number of sub-groups in each test (three in the first table and two in the second). One binomial test is run per question. Multiple comparrison adjustments to the p-values have not been made. The binomal test allows for calculation of 95% confidence intervals in the proportion satisfied, which are displayed in the columns Lwr, Med, and Upr. The column N is the sample size of responses for each response option. The column "N Sat" is the number who reported being satisfied within each subgroups.

Table A.1: Binomial Test Results For Satisfaction by Provider Medicaid Eligible Patient Load

Response Variable	Medicaid Eligible	Test per	Lwr	Med	Upr	N	N Sat	P Val
Written guidance	50-74%	74.4	74.6	86.2	93.9	58	50	0.049
Written guidance	75% or more	74.4	72.7	83.3	91.1	72	60	0.104
Written guidance	<49%	74.4	71.3	81.5	89.2	81	66	0.162
Vfc availablity	50-74%	74.4	53.0	66.1	77.7	62	41	0.146
Vfc availablity	75% or more	74.4	62.9	74.6	84.2	71	53	1.000
Vfc availablity	<49%	74.4	53.5	65.0	75.3	80	52	0.072
Vfc communication	50-74%	74.4	57.4	70.5	81.5	61	43	0.466
Vfc communication	75% or more	74.4	65.1	76.8	86.1	69	53	0.783
Vfc communication	<49%	74.4	57.9	69.1	78.9	81	56	0.308
Asiis help desk	50-74%	74.4	51.6	65.0	76.9	60	39	0.104
Asiis help desk	75% or more	74.4	47.7	60.3	72.0	68	41	0.012
Asiis help desk	<49%	74.4	57.8	69.2	79.2	78	54	0.300
Vfc reporting	50-74%	74.4	57.9	71.2	82.2	59	42	0.553
Vfc reporting	75% or more	74.4	66.4	77.8	86.7	72	56	0.590
Vfc reporting	<49%	74.4	51.5	63.0	73.4	81	51	0.022
Ordering system	50-74%	74.4	66.6	79.3	88.8	58	46	0.454
Ordering system	75% or more	74.4	74.3	84.7	92.1	72	61	0.043
Ordering system	<49%	74.4	64.1	75.0	84.0	80	60	1.000
Inventory recon	50-74%	74.4	49.1	62.7	75.0	59	37	0.051
Inventory recon	75% or more	74.4	50.9	63.0	74.0	73	46	0.031
Inventory recon	<49%	74.4	44.7	56.2	67.3	80	45	0.000
Vaccine variety	50-74%	74.4	81.6	91.7	97.2	60	55	0.001
Vaccine variety	75% or more	74.4	82.7	91.7	96.9	72	66	0.000
Vaccine variety	<49%	74.4	78.2	87.5	93.8	80	70	0.007
Site visits	50-74%	74.4	66.5	79.6	89.4	54	43	0.438
Site visits	75% or more	74.4	78.8	89.1	95.5	64	57	0.006
Site visits	<49%	74.4	70.4	81.8	90.2	66	54	0.204
Recertification	50-74%	74.4	41.5	55.4	68.7	56	31	0.002
Recertification	75% or more	74.4	61.4	73.2	83.1	71	52	0.787
Recertification	<49%	74.4	52.7	64.5	75.1	76	49	0.064
Overall satisfaction	50-74%	74.4	72.3	83.9	92.0	62	52	0.108
Overall satisfaction	75% or more	74.4	74.3	84.7	92.1	72	61	0.043
Overall satisfaction	<49%	74.4	63.6	74.4	83.4	82	61	1.000

Table A.2: Binary Test Results for Satisfaction by Community Health Center and Private Practice Provider Types

Response Variable	Practice Type	Test per	Lwr	Med	Upr	N	N Sat	P Val
Written guidance	Community health center	71.9	69.1	81.8	90.9	55	45	0.132
Written guidance	Private practice	71.9	71.3	80.2	87.3	106	85	0.066
Vfc availablity	Community health center	71.9	50.1	63.8	76.0	58	37	0.188
Vfc availablity	Private practice	71.9	51.8	61.7	70.9	107	66	0.023
Vfc communication	Community health center	71.9	55.9	69.6	81.2	56	39	0.766
Vfc communication	Private practice	71.9	56.9	66.7	75.4	108	72	0.239
Asiis help desk	Community health center	71.9	43.2	57.1	70.3	56	32	0.017
Asiis help desk	Private practice	71.9	55.4	65.4	74.4	104	68	0.156
Vfc reporting	Community health center	71.9	60.3	73.7	84.5	57	42	0.883
Vfc reporting	Private practice	71.9	54.3	64.2	73.2	106	68	0.084
Ordering system	Community health center	71.9	73.8	85.7	93.6	56	48	0.025
Ordering system	Private practice	71.9	66.6	76.0	83.8	104	79	0.385
Inventory recon	Community health center	71.9	50.4	64.3	76.6	56	36	0.234
Inventory recon	Private practice	71.9	47.6	57.5	67.1	106	61	0.002
Vaccine variety	Community health center	71.9	87.9	96.5	99.6	57	55	0.000
Vaccine variety	Private practice	71.9	78.8	86.8	92.6	106	92	0.000
Site visits	Community health center	71.9	68.6	82.0	91.4	50	41	0.118
Site visits	Private practice	71.9	70.9	80.4	88.0	92	74	0.081
Recertification	Community health center	71.9	50.6	64.8	77.3	54	35	0.288
Recertification	Private practice	71.9	52.2	62.4	71.8	101	63	0.036
Overall satisfaction	Community health center	71.9	74.6	86.2	93.9	58	50	0.013
Overall satisfaction	Private practice	71.9	62.5	72.0	80.2	107	77	1.000