

Indian Health Service

Urban-Specific Immunization Analysis and Recommendations Report



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List of Abbreviations

| Word | Abbreviation |
|---|--------------|
| American Indian and Alaska Native | AI/AN |
| Calendar Year | CY |
| Coronavirus Disease 2019 | COVID-19 |
| Clinical Reporting System | CRS |
| Diphtheria-Tetanus-Pertussis | DTaP |
| Electronic Health Record | EHR |
| Fiscal Year | FY |
| Influenza vaccination | FLU |
| Government Performance and Results Act | GPRA |
| Haemophilus Influenzae Type B | HIB |
| Hepatitis A | HEPA |
| Hepatitis B | HEPB |
| Human Papillomavirus | HPV |
| Indian Health Care Improvement Act | IHCIA |
| Indian Health Service | IHS |
| Integrated Data Collection System Data Mart | IDCS |
| Kauffman & Associates, Inc. | KAI |
| Measles, Mumps, Rubella | MMR |
| Meningococcal Conjugate | MenACWY |
| National Immunization Reporting System | NIRS |
| National Data Warehouse | NDW |
| Office of Urban Indian Health Programs | OUIHP |
| Pneumococcal Conjugate Vaccine | PCV |

| Word | Abbreviation |
|--|--------------|
| Pneumococcal Vaccination | Pneumovax |
| Poliovirus | Polio |
| Resource and Patient Management System | RPMS |
| Tetanus-Diphtheria | TD |
| Tetanus, Diphtheria, and Pertussis | TDaP |
| Urban Indian Organizations | UIOs |
| Vaccines for Children | VFC |
| Varicella (Chickenpox) | VAR |
| Zoster Vaccination | Zostavax |

Executive Summary

The Indian Health Service (IHS) Office of Urban Indian Health Programs (OUIHP) conducted an evaluation of the 4-in-1 Grant Program over a three-year period for Grant Program Year 2019 (April 1, 2019 – March 31, 2020), Grant Program Year 2020 (April 1, 2020 – March 31, 2021), and Grant Program Year 2021 (April 1, 2021 – March 31, 2022). The overall 4-in-1 Grant Program is an integral component of the IHS health care delivery system and provides crucial funding to grantees. That funding strengthens grantees' ability to expand direct services for four distinct health program areas: (Health Promotion/Disease Prevention) (HP/DP) services, immunization services, alcohol/substance abuse-related services, and mental health services. This report presents findings from an evaluation of the grantees in which they built and expanded their work across their immunization program. The evaluation addressed the following questions to understand vaccination rates over time:

1. Have immunization rates improved over time?
2. If rates have changed over time, to what degree have the rates changed?
3. Which grantees are meeting the immunization reporting requirements and which ones are not?

Background

In 1976, Congress passed the Indian Health Care Improvement Act (IHCIA) to improve the health and well-being of all American Indians and Alaska Native (AI/AN) people. The IHCIA provides Title V funding, under which the IHS OUIHP and the Division of Grants Management administer the 4-in-1 Grant Program. According to the UDS Summary Trends Business Intelligence Dashboard, in 2020, more than 66,830 urban Indian patients access services through at least one of these UIO programs.¹

The 4-in-1 Grant Program, which consists of HP/DP services, immunization services, alcohol/substance abuse-related services, and mental health services, is an integral component of the Indian Health Service (IHS) and urban Indian

¹ This figure is derived from the UDS Summary Trends Business Intelligence Dashboard. The Office of Urban Indian Health Programs, in collaboration with the National Patient Information Reporting system (NPIRS), generates various end of year reports to support UIO performance metrics and monitoring. Business Intelligence dashboards provide key insight into critical information for national enterprise reporting of UDS Summary Reporting.

health care delivery system. To gain a high-level, holistic view of the 4-in-1 Grant Program outcomes, IHS requires grantees to submit quarterly reports.

Presently, OUIHP funds 41 non-profit UIOs across 11 IHS Areas in the United States and include: Albuquerque, Bemidji, Billings, California, Great Plains, Nashville, Navajo, Oklahoma City, Phoenix, Portland, and Tucson. Each Area has a unique group of Tribes that they work with on a day-to-day basis. Together, these grantees comprise one of three core components of the Indian health care delivery system – IHS, Tribal and Urban. The grantees provide several health care service types, including outreach and referral, dental services, comprehensive primary care services, limited primary care services, community health, substance abuse (outpatient and inpatient services), mental health services, immunizations, human immunodeficiency virus (HIV) activities, HP/DP services, and other health programs. For the purpose of this evaluation, immunization program data submitted by a cohort of 33 grantees will be analyzed for Grant Program Year 2019 (April 1, 2019 – March 31, 2020), Grant Program Year 2020 (April 1, 2020 – March 31, 2021), and Grant Program Year 2021 (April 1, 2021 – March 31, 2022).

Methodology

The IHS collaborated with an external contractor, Kauffman & Associates, Inc., (KAI) to conduct an evaluation of immunization data submitted for Grant Program Year 2019 (April 1, 2019 – March 31, 2020), Grant Program Year 2020 (April 1, 2020 – March 31, 2021), and Grant Program Year 2021 (April 1, 2021 – March 31, 2022). The evaluation incorporated culturally appropriate approaches and robust statistical quantitative and qualitative methods and analyses. This section of the report describes the data used and analyses conducted to support overall evaluation of the program.

The frequencies of performance outcomes were assessed on the 2019 to 2021 National Immunization Reporting System (NIRS) data by grantee to determine what proportion of grantees provided usable data. Statistical analyses, including means and descriptive information to assess variations in performance, within each grantee and across grantees, on key outcome measures over time were conducted. Data were compared across the data periods. Specific NIRS immunization measures assessed are outlined in Table 2.

The frequencies of performance outcomes were assessed on the 2016 to 2021 Government Performance and Results Act (GPRA) data by grantee to determine what proportion of grantees provided usable data. Statistical analyses, including means and descriptive information to assess variations in performance, within

each grantee and across grantees, on key outcome measures over time were conducted. Data were compared across the data periods. Specific GPRA immunization measures assessed included: Influenza vaccination 6 months to 17 years of age, influenza vaccination 18 years of age and older, childhood immunizations, and adult composite immunization.

Through the analysis, KAI looked at immunization rates over time to determine whether increases or declines occurred. This analysis answered the following questions:

1. Have immunization rates improved over time?
2. If rates have changed over time, to what degree have the rates changed?
3. Which grantees are meeting the immunization reporting requirements and which ones are not?

To answer questions (1) and (2), descriptive statistical analysis was performed in Excel for both the NIRS and GPRA data. Statistics presented include average annual immunization rate, average immunization rate across all program years, gross change per year, and percentage change across all program years.

To answer question (3), reporting rates were calculated by dividing the number of grantees who reported by quarter by the total number of grantees (33). Since the number of grantees who reported per quarter fluctuated over each program year, the sample size (“n”) of grantees is represented for each measure at the top of each table is an average across each quarter: the sum of grantees who reported each quarter divided by the number of quarters in each year.

Qualitative narrative analysis was conducted to complete an inventory of grantees’ applications as well as the grantee quarterly reports from 33 grantees across the four health program areas for Grant Program Year 2019 to Grant Program Year 2020. Grantees’ immunization data were extracted from the grantee quarterly reports and thematic coding was undertaken to decipher and understand grantees’ ability to improve quality, safety, and access to health care for their patient populations; current gaps in data; and any other potentially limiting factors related to their immunization program. In addition, data were analyzed to gain a deeper understanding of community-level outcomes, interorganizational measures for internal use, and process evaluation.

Qualitative analysis was conducted to identify and organize Grant Program Year 2019 unmet needs using a framework focused on health program areas, such as social determinants of health (SDOH), funding, capacity, data, cultural expertise, and external challenges, including 2019 Coronavirus Disease (COVID-19). Themes were developed by a subject matter expert familiar with grantees’ goals and missions. It is important to note that grantees could write in multiple unmet

needs and recommendations; therefore, the theme categories are not mutually exclusive. Details of the analysis can be found in an extensive report, Grant Program Year 2019 Unmet Needs, which was published and made available on the IHS 4-in-1 Grant Program webpage (ihs.gov/urban/4-in-1-grant-program).

Summary of Findings and Recommendations

This summary of immunization recommendations provides insights into grantees' program efforts and achievements during Grant Program Year 2019 (April 1, 2019 – March 31, 2020), Grant Program Year 2020 (April 1, 2020 – March 31, 2021), and Grant Program Year 2021 (April 1, 2021 – March 31, 2022). A summary of findings and recommendations by data source are provided below.

National Immunization Reporting System

The analysis of the 2019 to 2021 NIRS data revealed, that in general, immunization rates decreased among most age groups and vaccine types. This is likely at least partially the result of the COVID-19 pandemic; despite challenges due to the pandemic, the decrease in rates was not substantial. Decreases were not observed among all groups: for the youngest (3-27 months), rates stayed the same or increased, while among adults, the rate for all adults (19+ years) increased as well. In addition, more grantees were reporting to NIRS on average at the end of Grant Program Year 2021, than were reporting at the beginning of Grant Program Year 2021. This is consistent across all age groups (3-27 months, 2 years, adolescents, and adults). The more grantees reporting to NIRS consistently increases the confidence in the quality and accuracy of the data being analyzed. Based on the quantitative analysis, the following recommendations may improve future analyses.

Recommendations:

- Emphasize routine vaccinations for youngest (3 months-3 years) age groups, and importance of receiving additional appropriate vaccines
- Among adolescents and adults, emphasize importance of completing the entire series of a recommended vaccine, particularly the HPV vaccine. In addition, significant work is needed towards improving adult immunization rates, particularly among the older age group (60+).
- Influenza vaccination rates have historically had low uptake rates across the country. With the circulation of COVID-19, there is even more reason to encourage influenza vaccination. At the same time, there may be more opportunity to give influenza vaccines when patients come in for COVID-19 vaccines or boosters as there is no contraindication for giving both vaccines at the same time.

- Create more detailed program guidance for grantees and the program team on immunization indicators and examples of grantee program activities to enhance the quality and increase the quantity of immunization data reported
- Continue analyzing the NIRS data over a longer period of time to track relevant trends
- Compare adult vaccination rates with other grantee demographic data to assess the extent to which vaccine program is reaching its eligible adult population as the vaccination rates themselves remain low (less than a third of most adult vaccines)

Government Performance Result Act

Across the 2016-2021 GPRA data, decreases were observed for most of the immunization measures, including child and adult influenza immunizations, childhood immunizations, and adult composite immunizations. The only immunization rate that did not decrease was that of pneumococcal immunizations, a measure that was only collected until 2017 when it was replaced with the adult composite immunization measure. No immunization measure reached its national target during the reporting period. Based on the quantitative analysis, the following recommendations may improve future analyses.

Recommendations

- Provide grantees with technical assistance to support the process of entering and exporting visit and registration data from their electronic health records (EHR) to the NDW to complement GPRA reporting
- Perform follow up with grantees who have a history of low reporting rates, to better understand the factors that may be contributing to this issue
- Emphasize the importance of routine vaccinations, for all age groups, as well as the season vaccinations (influenza)
- Compare adult vaccination rates with other grantee demographic data to assess the extent to which vaccine program is reaching its eligible adult population as the vaccination rates themselves remain low (less than a third of most adult vaccines)
- Continue to analyze GPRA data over a longer period (5+ years) to better observe trends in immunization rates

Grantee Quarterly Reports and Unmet Needs

The analysis of the grantee quarterly reports highlighted contextual emerging themes in strengths and barriers/challenges across the immunization service program area. Although challenges were faced, especially with the COVID-19 pandemic, creative approaches were adopted to address community needs and

continue to provide support services. Based on the qualitative analysis, the following recommendations may improve future analyses.

Recommendations

- Provide grantees with technical assistance to support the process of entering data into the grantee quarterly reports and help grantees understand what has changed in reporting from year to year.
- Add a field to the reporting template to allow grantees to report data from their service-providing partners.
- Add a field to the reporting template that allows grantees to report vaccine hesitancy outreach efforts
- Provide technical assistance to grantees wishing to consolidate program aims across immunizations and HP/DP service areas

Introduction

The Indian Health Service (IHS) Office of Urban Indian Health Programs (OUIHP) conducted an evaluation of the 4-in-1 Grant Program over a three-year period for Grant Program Year 2019 (April 1, 2019 – March 31, 2020), Grant Program Year 2020 (April 1, 2020 – March 31, 2021), and Grant Program Year 2021 (April 1, 2021 – March 31, 2022). The overall 4-in-1 Grant Program is an integral component of the IHS health care delivery system and provides crucial funding to grantees. That funding strengthens grantees' ability to expand direct services for four distinct health program areas: HP/DP services, immunization services, alcohol/substance abuse-related services, and mental health services. This report presents findings from an evaluation of the grantees in which grantees built and expanded their work across their immunization program. The evaluation addressed the following questions to understand vaccination rates over time:

1. Have immunization rates improved over time?
2. If rates have changed over time, to what degree have the rates changed?
3. Which grantees are meeting the immunization reporting requirements and which ones are not?

This report provides background information on the 4-in-1 Grant Program, explains the evaluation methodology, presents evaluation findings, and summarizes key recommendations and conclusions in relation to only the immunization program evaluation questions.

Background

In 1976, Congress passed the Indian Health Care Improvement Act (IHCIA) to improve the health and well-being of all American Indians and Alaska Native (AI/AN) people. The IHCIA provides Title V funding, under which the IHS OUIHP and the Division of Grants Management administer the 4-in-1 Grant Program. According to the UDS Summary Trends Business Intelligence Dashboard, in 2020, more than 66,830 urban Indian patients access services through at least one of these UIO programs.²

The 4-in-1 Grant Program, which consists of HP/DP services, immunization services, alcohol/substance abuse-related services, and mental health services, is an integral component of the IHS and urban Indian health care delivery system. To gain a high-

² This figure is derived from the UDS Summary Trends Business Intelligence Dashboard. The Office of Urban Indian Health Programs, in collaboration with the National Patient Information Reporting system (NPIRS), generates various end of year reports to support UIO performance metrics and monitoring. Business Intelligence dashboards provide key insight into critical information for national enterprise reporting of UDS Summary Reporting.

level, holistic view of the 4-in-1 Grant Program outcomes, IHS requires grantees to submit quarterly reports.

Presently, OUIHP funds 41 non-profit grantees across 11 IHS areas. The Indian Health Service is divided into twelve physical areas of the United States: Albuquerque, Bemidji, Billings, California, Great Plains, Nashville, Navajo, Oklahoma City, Phoenix, Portland, and Tucson. Each area has a unique group of Tribes that they work with on a day-to-day basis. Together, these grantees comprise one of three core components of the Indian health care delivery system – IHS, Tribal, and Urban. The grantees provide several health care service types, including outreach and referral, dental services, comprehensive primary care services, limited primary care services, community health, substance abuse (outpatient and inpatient services), mental health services, immunizations, human immunodeficiency virus (HIV) activities, HP/DP services, and other health programs. For the purpose of this evaluation, immunization program data submitted by a cohort of 33 grantees will be analyzed for Grant Program Year 2019 (April 1, 2019 – March 31, 2020), Grant Program Year 2020 (April 1, 2020 – March 31, 2021), and Grant Program Year 2021 (April 1, 2021 – March 31, 2022).

Methodology

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Data Sources

The overall evaluation consisted of a review and analysis of quantitative and qualitative data from the NIRS, GPRA, and quarterly report and unmet needs report data sets. Figure 1 depicts the overall timeline for each data set. Details on each data source, including data type, data label, date, and data period, can be found in Table 1.

Beginning in Fiscal Year 2018, the GPRA year changed to match the fiscal year, from October 1st to September 30th. Prior to 2018, the GPRA year was collected from July 1st to June 30th. The GPRA data are collected according to the GPRA year but reported according to Fiscal Year. A stand-alone reporting form was used to collect data on unmet needs for Grant Program Year 2019 (April 1, 2019 – March 31, 2020). Data on unmet needs were integrated into the grantee quarterly reporting form as of April 1, 2020, during Grant Program Year 2020 (April 1, 2020 – March 31, 2021). Full descriptions of each data source can be found in Table 1.

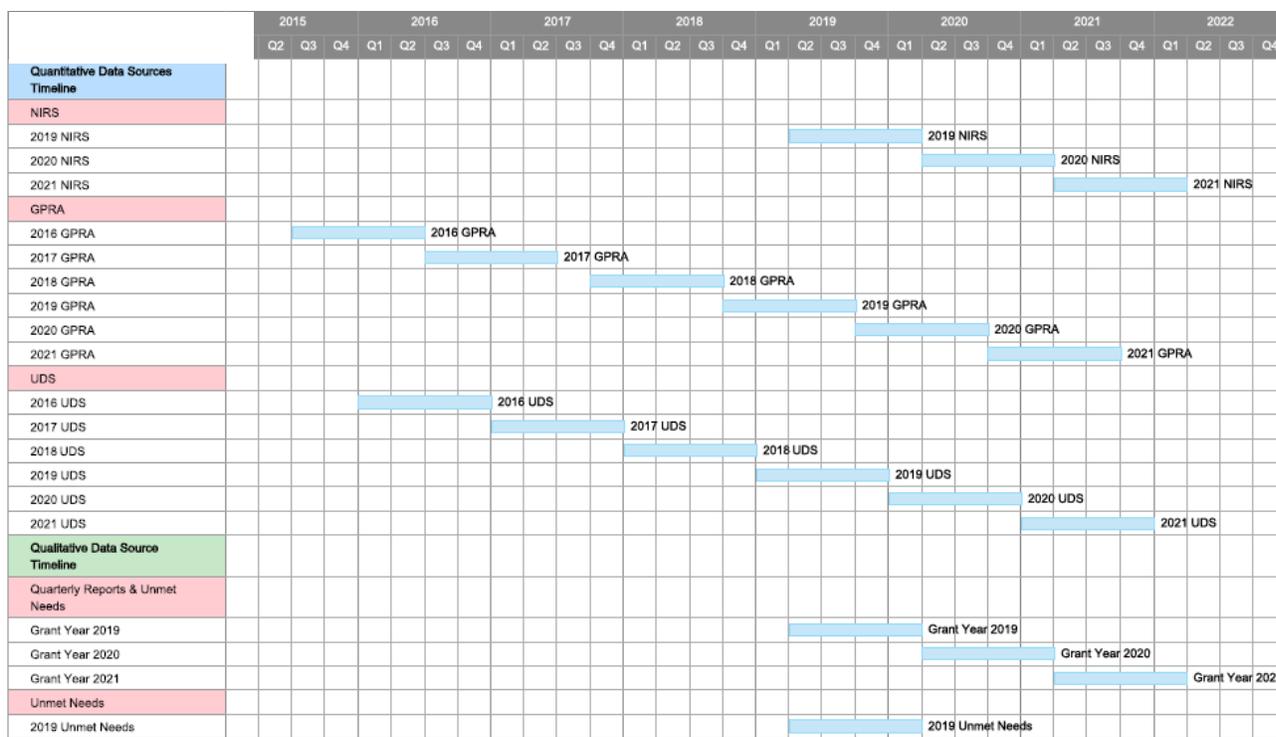


Figure 1: Timeline of data sources

Table 1: Overview of data sources to support evaluation

| Data Source | Data Type | Data Label | Date | Data Period |
|---------------------------------|-------------|-------------------------|---|--------------------------------|
| Quarterly Reports & Unmet Needs | Qualitative | Grant Program Year 2019 | Q1: April 1, 2019 – June 30, 2019 Q2: July 1, 2019 – September 30, 2019 Q3: October 1, 2019 – December 31, 2019 Q4: January 1, 2020 – March 31, 2020 | April 1, 2019 – March 31, 2020 |
| | | Grant Program Year 2020 | Q1: April 1, 2020 – June 30, 2020 Q2: July 1, 2020 – September 30, 2020 Q3: October 1, 2020 – December 31, 2020 Q4: January 1, 2021 – March 31, 2021 | April 1, 2020 – March 31, 2021 |
| | | Grant Program Year 2021 | Q1: April 1, 2021 – June 30, 2021 Q2: July 1, 2021 – September 30, 2021 Q3: October 1, 2021 – December 31, 2021 Q4: January 1, 2022 – March 31, 2022 | April 1, 2021 – March 31, 2022 |
| Unmet Needs (Stand-alone) | Qualitative | 2019 Unmet Needs | Q1: April 1, 2019 – June 30, 2019 Q2: July 1, 2019 – September 30, 2019 | April 1, 2019 – March 31, 2020 |

| Data Source | Data Type | Data Label | Date | Data Period |
|---|--------------|------------|---|--------------------------------|
| | | | Q3: October 1, 2019 – December 31, 2019 Q4: January 1, 2020 – March 31, 2020 | |
| Government Performance and Results Act (GPRA) | Quantitative | 2016 GPRA | FY 2016: October 2015 – September 2016 | July 1, 2015 – June 30, 2016 |
| | | 2017 GPRA | FY 2017: October 2016 – September 2017 | July 1, 2016 – June 30, 2017 |
| | | 2018 GPRA | FY 2019: October 2017 – September 2018 | Oct 1, 2017 – Sept 30, 2018 |
| | | 2019 GPRA | FY 2020: October 2018 – September 2019 | Oct 1, 2018 – Sept 30, 2019 |
| | | 2020 GPRA | FY 2021: October 2019 – September 2020 | Oct 1, 2019 – Sept 30, 2020 |
| | | 2021 GPRA | FY 2022: October 2020 – September 2021 | Oct 1, 2020 – Sept 30, 2021 |
| National Immunization Reporting System (NIRS) | Quantitative | 2019 NIRS | FY 2019 (Q3 – Q4) to FY 2020 (Q1 – Q2) | April 1, 2019 – March 31, 2020 |
| | | 2020 NIRS | FY 2020 (Q3 – Q4) to FY 2021 (Q1 – Q2) | April 1, 2020 – March 31, 2021 |
| | | 2021 NIRS | FY 2021 (Q3 – Q4) to FY 2022 (Q1 – Q2) | April 1, 2021 – March 31, 2022 |

National Immunization Reporting System Data

The NIRS is a web-based system designed to collect quarterly immunization data reports from the IHS-funded facilities. Data entered through the NIRS system are used to develop the IHS Area and National-level immunization reports. Each quarter, grantees report immunization data for the following groups: children ages 3–27 months, 2-year-old children, adolescents, adults, and patients with influenza. Grantees that do not use RPMS must record their aggregate immunization data on the grantee quarterly reporting form and then enter it into the NIRS. For this report, data from the 2019 to 2021 NIRS data sets were assessed (Table 1).

Government Performance Rating Act Data

The GPRA requires federal agencies to demonstrate they are using their funds effectively in accordance with their mission statements. Under Public Law 103-62 – August 3, 1993, ss3.,³ each agency is to have a 5-year strategic plan in place and submit annual performance plans that specifically describe what the agency intends to

³ Public Law 103-62 – Aug. 3, 1993. 103d Congress. 107 STAT. 285.
<https://www.govinfo.gov/content/pkg/STATUTE-107/pdf/STATUTE-107-Pg285.pdf>

accomplish. The GPRA also requires agencies to have performance measures with specific annual targets.

Every year, the IHS reports on the GPRA performance measures which can be found on the following webpage: <https://www.ihs.gov/crs/gprareporting/>. The clinical GPRA performance measures include care for patients with diabetes, cancer screening, immunization, behavioral health screening, and other preventive services. The non-clinical GPRA measures include rates of hospital accreditation, injury prevention, and infrastructure improvements. Measures of quality of care and safety, as outlined in the IHS strategic plan and used for this report, include the following vaccination rates:⁴

- Influenza children (6 months to 17 years)
- Influenza adults (18 years and older)
- Childhood immunizations (19 to 35 months)
- Adult composite immunizations (18 years and older)

Like tribal programs, urban programs are not required to use the Resource Patient Management System (RPMS) as their patient data management system. Prior to FY 2018, official GPRA/GPRAMA results were reported via RPMS and the Clinical Reporting System (CRS), a software application that runs off of RPMS. The use of CRS to collect GPRA data prevented non-RPMS health programs from having their GPRA data included in national totals. To enable non-RPMS health programs to report for GPRA, IHS switched from utilizing CRS for GPRA data collection to the Integrated Data Collection System (IDCS) Data Mart at the National Data Warehouse (NDW). As with the measure logic in CRS, the logic in the IDCS Data Mart is validated and the measure logic is updated centrally. Therefore, data from sites utilizing non-RPMS EHRs can be combined and reported as an aggregate rate along with RPMS data. Specific to this report, data assessed were from the 2016 to 2021 GPRA datasets, as outlined in Table 1.

Grantee Quarterly Reports and Unmet Needs

The 4-in-1 Grant Program began after Urban Indian community leaders advocated for federal funding to address the unmet health care needs of urban Indians. Specifically, under 25 U.S.C. § 1653(d), IHS is authorized to make grants to support immunization services to Urban Indians. Reporting of unmet needs is required by 25 U.S.C. §§ 1653

⁴ IHS. (2019). Appendix A: HHS strategic plan and IHS strategic plan crosswalk. <https://www.ihs.gov/strategicplan/appendices/>

and 1657. For the purpose of this report, qualitative data from the grantee quarterly immunization reports from Grant Program Year 2019 to Grant Program Year 2021, as well as the stand-alone 2019 Unmet Needs for the immunization program were analyzed (Table 1). Grantees must provide narrative outcomes about their immunization activities through the grantee quarterly progress reports (Grant Program Year 2019 to Grant Program Year 2021) and through a stand-alone unmet needs report (Grant Program Year 2019). Education and outreach programs, and ambulatory programs who do not record or collect quantitative data must document their immunization-service activities on the grantee quarterly progress report template.

Data Analysis

National Immunization Reporting System

The frequencies of performance outcomes were assessed on the 2019 to 2021 NIRS data by grantee to determine what proportion of grantees provided usable data. Statistical analyses, including means and descriptive information to assess variations in performance, within each grantee and across grantees, on key outcome measures over time were conducted. Data were compared across the data periods. Specific NIRS immunization measures assessed are outlined in Table 2.

Table 2: The NIRS vaccinations by age group

| Age Group | Vaccines |
|-----------------------------------|---|
| Children 3- to 27-months | <ul style="list-style-type: none"> • Four doses of diphtheria, tetanus, and pertussis (DTaP) • Three doses of inactivated poliovirus (Polio) • Three doses of Haemophilus Influenzae Type B (HIB) • Three doses of Hepatis B (HEPB) • Four doses of pneumococcal conjugate (PCV) • One dose of measles, mumps, rubella (MMR) • One dose of varicella (VAR) at minimum. |
| Children 2 Years of Age | <ul style="list-style-type: none"> • Diphtheria, tetanus, and pertussis (4-DtaP) • Polio (3-POLIO) • Haemophilus influenzae type b disease (3-HIB, 4-HIB) • Hepatitis B (3-HEPB) • Varicella (Chickenpox) – 1-VAR • Measles, mumps and rubella (1-MMR) • Hepatitis A (1-HEPA, 2-HEPA) • Pneumococcal disease (3-PCV, 4-PCV) • Influenza (2-FLU) |
| Adolescents (13- to 17-year-olds) | <ul style="list-style-type: none"> • Human papillomavirus (HPV): 2 doses (13-15 years) or 3 doses (15+) • Tetanus, diphtheria, and pertussis (TDaP): 1 dose |

| Age Group | Vaccines |
|-----------------------------------|--|
| | <ul style="list-style-type: none"> • Meningococcal conjugate (MenACWY): 1 dose (13 years) and 1 booster dose (17 years) • 1-TDaP + 1-MENACWY + HPV-Fully Vaccinated (HPV-FV) • 1-TDAP + 3-HEPB + 2-MMR + 1-MENACWY + 2-VAR + HPV-FV • 1-TDaP + 3-HEPB + 2-MMR + 1-VAR • 1-TDaP + 3HEPB +2-MMR + 1-MENACWY + 2-VAR • 1-TDaP + 1-MENACWY |
| Adults 18 years and older | <ul style="list-style-type: none"> • TD Booster <10 years (19+ years) • TDaP Booster <10 years (19+ years) • TDaP + TDaP/TD Booster <10 Years (19-59 years) • Pneumovax (Ever) (19+ years) • HPV 1 (males, 19-21 years) • HPV 1 (females (19-26 years) • HPV 2 (males, 19-21 years) • HPV 2 (females (19-26 years) • HPV 3 (males, 19-21 years) • HPV 3 (females (19-26 years) • Zostavax (60+ years) • Pneumovax (65+ Years) |
| Influenza | <ul style="list-style-type: none"> • 1-FLU children (10- to 23-months) • 1-FLU children (2-to 4-years) • 1-FLU adult (18-49 years) • 1-FLU adult (18-49 years at risk) • 1-FLU adult (65+ years) |
| Healthcare Personnel Immunization | <ul style="list-style-type: none"> • Mandatory flu vaccination |

Government Performance Rating Act

The frequencies of performance outcomes were assessed on the 2016 to 2021 GPRA data by grantee to determine what proportion of grantees provided usable data. Statistical analyses, including means and descriptive information to assess variations in performance, within each grantee and across grantees, on key outcome measures over time were conducted. Data were compared across the data periods. Specific GPRA immunization measures assessed included: Influenza vaccination 6 months to 17 years of age, influenza vaccination 18 years of age and older, childhood immunizations, and adult composite immunization. The GPRA immunization rates analysis excluded:

- Grantee GPRA data that had denominators less than or equal to 20, and
- Grantee GPRA measures that equaled 0%.

These data were excluded because small values can greatly shift the GPRA measure percentages when additional individuals are added or removed. The data where grantees' GPRA percentages equaled 0% present notable effects on aggregate means. Moreover, the GPRA data at 0% reflect services that were not provided, for which patients did not qualify, or that were provided but not reported. Removing these measures increased the reliability of the GPRA data analysis.

Methods

Through the analysis, KAI reviewed immunization rates over time to determine whether increases or declines occurred. This analysis answered the following questions:

1. Have immunization rates improved over time?
2. If rates have changed over time, to what degree have the rates changed?
3. Which grantees are meeting the immunization reporting requirements and which ones are not?

To answer questions (1) and (2), descriptive statistical analysis was performed in Excel for both the NIRS and GPRA data. Statistics presented include average annual immunization rate, average immunization rate across all program years, gross change per year, and percentage change across all program years.

To answer question (3), reporting rates were calculated by dividing the number of grantees who reported by quarter by the total number of grantees (33). Since the number of grantees who reported per quarter fluctuated over each program year, the sample size (“n”) of grantees is represented for each measure at the top of each table is an average across each quarter: the sum of grantees who reported each quarter divided by the number of quarters in each year.

Quarterly Progress Reports

Qualitative narrative analysis was conducted to complete an inventory of grantees’ applications as well as the grantee quarterly reports from 33 grantees across the four health program areas for Grant Program Year 2019 to Grant Program Year 2021. Grantees’ immunization data were extracted from the grantee quarterly reports and thematic coding was undertaken to decipher unpack and understand grantees’ ability to improve quality, safety, and access to health care for their patient populations; current gaps in data; and any other potentially limiting factors related to their immunization program. In addition, data were analyzed to gain a deeper understanding of community-level outcomes, interorganizational measures for internal use, and process evaluation.

Unmet Needs

Qualitative analysis was conducted to identify and organize Grant Program Year 2019 unmet needs using a framework focused on health program areas, such as SDOH, funding, capacity, data, cultural expertise, and external challenges, including Coronavirus Disease 2019 (COVID-19). Themes were developed by a subject matter expert familiar with grantees’ goals and missions. It is important to note that grantees could write in multiple needs and recommendations; therefore, the theme categories are not mutually exclusive. Details of the analysis can be found in an extensive report, Grant Program Year 2019 Unmet Needs, which was published and made available on the IHS 4-in-1 Grant Program webpage (ihs.gov/urban/4-in-1-grant-program).

Findings and Recommendations

This section reviews evaluation findings based on analyses of the quantitative and qualitative data sources. This section is organized by key data sources, including the NIRS, GPRA, grantee quarterly reports, and unmet needs.

National Immunization Reporting System Data Findings

The NIRS data findings are organized to first, provide an overview of reporting rates across the 2019 to 2021 NIRS reporting periods and second, provide more detailed reporting and immunization rates across the following categories: 3- to 27-months-old children, 2-year-old children, adolescents, adults, and flu vaccination.

National Immunization Reporting System Reporting Rates

To determine which grantees were meeting the reporting requirements for NIRS, rates were calculated for each quarter of the reporting period, from April 1, 2019-March 31, 2022. To create the rate per quarter, the number of grantees who reported for each age group was divided by the total number of grantees (33), and the average of each age group rate represents the aggregate rate displayed in Figure 2. Between the first quarter (April 1, 2019-June 30, 2019) and the last quarter (January 1, 2022-March 31, 2022), the reporting rate increased by 9.5% (61.4% to 70.9%).

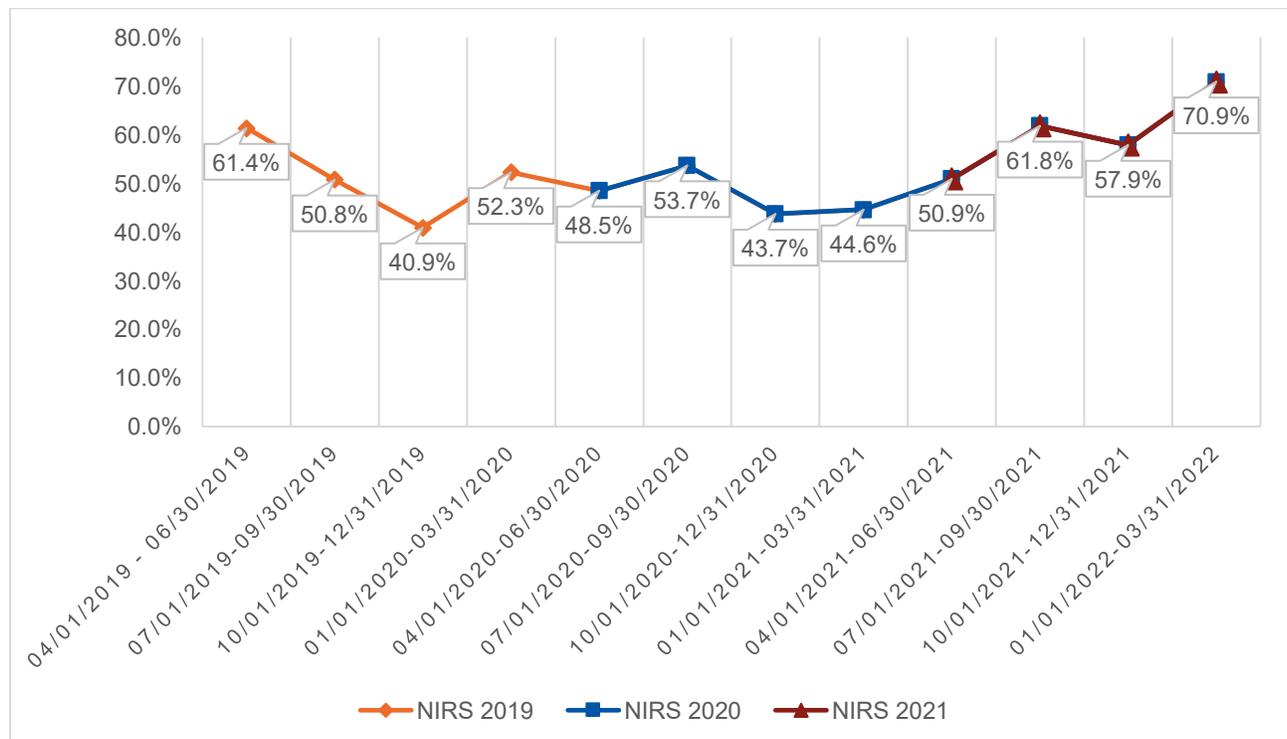


Figure 2: NIRS Aggregate Reporting Rates per Quarter

Table 3 provides an overview of the number of grantees reporting across each of the five immunization categories:

1. 3 to 27-month-olds
2. 2-year-olds
3. Adolescents
4. Adults
5. Influenza

The average reporting rates decreased for all groups between the 2019 to 2020 NIRS, but increased between the 2020 NIRS and 2021 NIRS. In the 2021 NIRS, the highest reporting rates across all program years were observed, with a majority of grantees reporting for each group. Between 17 and 27 grantees reported during the 2021 NIRS, in contrast to the 2020 NIRS, where only 10-12 grantees reported.

Table 3: Grantee Reporting Rates by five immunization reporting categories across the 2019 to 2021 NIRS data

| 2019 to 2021 NIRS Reporting Rates | | | | | | | | | | | | | | | |
|---------------------------------------|------------|------------|-------------|--------|-----------|------------|------------|-------------|--------|-----------|------------|------------|-------------|--------|-----------|
| | NIRS 2019 | | | | | NIRS 2020 | | | | | NIRS 2021 | | | | |
| | 3-27months | 2-year-old | Adolescents | Adults | Influenza | 3-27months | 2-year-old | Adolescents | Adults | Influenza | 3-27months | 2-year-old | Adolescents | Adults | Influenza |
| Average Grantee Reporting Rate | 78.3% | 61.7% | 82.1% | 82.1% | 42.3% | 68.8% | 68.8% | 68.8% | 68.8% | 37.5% | 76.0% | 75.0% | 75.9% | 82.4% | 25.0% |
| Number of Grantees Reported | 15 | 15 | 14 | 14 | 13 | 12 | 12 | 12 | 12 | 10 | 25 | 26 | 27 | 27 | 17 |

Table 4 provides an overview of which grantees reported to the NIRS system for any of the immunization groups during *any* quarter of the entire reporting period. Based on this, it can be seen that nine grantees achieved a 100% reporting rate across the 2019 to 2021 NIRS reporting period, meaning they reported at least once during each year:

1. Bakersfield American Indian Health Project
2. Denver Indian Health and Family Services, Inc.
3. Hunter Health - Wichita
4. Indian Family Health Clinic of Great Falls, Inc.
5. Indian Health Board of Minneapolis, Inc
6. Indian Health Center of Santa Clara Valley
7. Native American Health Center - Oakland
8. Native American Rehabilitation Association of the Northwest, Inc. - Portland
9. Texas Native Health* - Dallas

* Formerly known as Urban Inter-Tribal Center of Texas

Four grantees did not report to the NIRS system at all during the reporting period.

1. Native American Connections - Phoenix
2. Native American Lifelines of Boston and Baltimore
3. New York Indian Council Inc.
4. Tucson Indian Center

As a note, New York Indian Council Inc. and Native American Lifelines of Boston and Baltimore were grantees during the last two program years (2020-2021 NIRS). The majority of grantees all reported at least once for at least one year but did not report for all three years.

Table 4: Summary of Grantees who use the NIRS system (2019 to 2021 NIRS)

| Grantee Name | City | State | Area Office | 2019 NIRS | 2020 NIRS | 2021 NIRS |
|--|---------------|-------|-------------|-----------|-----------|-----------|
| All Nations Health Center-Missoula Urban Indian Health | Missoula | MT | BILLINGS | ● | X | ● |
| American Indian Health & Family Services | Detroit | MI | BEMIDJI | ● | ● | X |
| American Indian Health & Services | Santa Barbara | CA | CALIFORNIA | ● | X | ● |
| American Indian Health Service of Chicago, Inc. | Chicago | IL | BEMIDJI | ● | X | ● |
| Bakersfield American Indian Health Project | Bakersfield | CA | CALIFORNIA | ● | ● | ● |
| Denver Indian Health & Family Services, Inc. | Denver | CO | ALBUQUERQUE | ● | ● | ● |
| Billings Urban Indian Health and Wellness Center | Billings | MT | BILLINGS | X | X | ● |
| First Nations Community Healthsource | Albuquerque | NM | ALBUQUERQUE | X | ● | ● |
| Fresno American Indian Health Project | Fresno | CA | CALIFORNIA | ● | X | ● |

| Grantee Name | City | State | Area Office | 2019 NIRS | 2020 NIRS | 2021 NIRS |
|--|------------------|-------|---------------|-----------|-----------|-----------|
| Gerald L. Ignace Indian Health Center | Milwaukee | WI | BEMIDJI | ● | ● | X |
| Helena Indian Alliance - Leo Pocha Clinic | Helena | MT | BILLINGS | ● | X | ● |
| Hunter Health | Wichita | KS | OKLAHOMA CITY | ● | ● | ● |
| Indian Family Health Clinic of Great Falls, Inc. | Great Falls | MT | BILLINGS | ● | ● | ● |
| Indian Health Board of Minneapolis, Inc. | Minneapolis | MN | BEMIDJI | ● | ● | ● |
| Indian Health Center of Santa Clara Valley | San Jose | CA | CALIFORNIA | ● | ● | ● |
| Native American Connections | Phoenix | AZ | PHOENIX | X | X | X |
| Native American Health Center | Oakland | CA | CALIFORNIA | ● | ● | ● |
| Native American Lifelines of Baltimore and Boston | Baltimore | MD | NASHVILLE | X | X | X |
| Native American Rehabilitation Association the Northwest, Inc. | Portland | OR | PORTLAND | ● | ● | ● |
| Native Americans for Community Action, Inc. | Flagstaff | AZ | NAVAJO | X | X | ● |
| Native Health | Phoenix | AZ | PHOENIX | X | X | ● |
| Nebraska Urban Indian Health Coalition, Inc. | Omaha | NB | GREAT PLAINS | X | X | ● |
| Nevada Urban Indians Inc. | Reno | NV | PHOENIX | X | X | ● |
| New York Indian Council Inc.* | Long Island City | NY | NASHVILLE | X | X | X |

| Grantee Name | City | State | Area Office | 2019 NIRS | 2020 NIRS | 2021 NIRS |
|---|----------------|-------|---------------|-----------|-----------|-----------|
| Sacramento Native American Health Center | Sacramento | CA | CALIFORNIA | X | X | ● |
| San Diego American Indian Health Center | San Diego | CA | CALIFORNIA | X | X | ● |
| Seattle Indian Health Board | Seattle | WA | PORTLAND | X | X | ● |
| South Dakota Urban Indian Health, Inc. | Sioux Falls | SD | GREAT PLAINS | X | X | ● |
| The NATIVE Project | Spokane | WA | PORTLAND | X | X | ● |
| Tucson Indian Center | Tucson | AZ | TUCSON | X | X | X |
| United American Indian Involvement, Inc. | Los Angeles | CA | CALIFORNIA | X | X | ● |
| Urban Indian Center of Salt Lake | Salt Lake City | UT | PHOENIX | X | X | ● |
| Texas Native Health | Dallas | TX | OKLAHOMA CITY | ● | ● | ● |
| Total Reported Using the NIRS System | | | | 16 | 12 | 27 |
| Total Did Not Use the NIRS System | | | | 18 | 22 | 7 |
| <ul style="list-style-type: none"> ● Reported using the NIRS System X Did not report using the NIRS system *In Grant Program Year 2021, New York Indian Council replaced American Indian Community House | | | | | | |

Table 5 provides a breakdown of the use of the NIRS reporting system by each of the 33 grantees across each of the five immunization categories from the 2019 to 2021 NIRS. Reporting rates are presented as the percentage of quarters in each year that grantees reported data for (e.g., two quarters in 2019 for 2-year-olds: 50% reporting rate). Average reporting rates across all groups during each year are also presented. On average, reporting rates in the 2019 and 2020 NIRS ranged from 25-100%, and from 31-100% during the 2021 NIRS. Influenza was consistently the group for which data were least frequently reported across all program years. In the 2021 NIRS, almost all grantees (27 out of 33) reported data for adolescent and adult immunizations.

Table 5: The 2019 to 2021 NIRS Grantee Reporting Rates by Year

| Grantee Name | NIRS 2019 | | | | | NIRS 2020 | | | | | NIRS 2021 | | | | | Average Rates | | |
|--|--------------|------------|-------------|--------|------------|-------------|------------|-------------|--------|-----------|------------|------------|-------------|--------|-------------|---------------|-----------|-----------|
| | 3mos – 27mos | 2-year-old | Adolescents | Adults | Influenza* | 3mos- 27mos | 2-year-old | Adolescents | Adults | Influenza | 3mos-27mos | 2-year-old | Adolescents | Adults | Influenza** | NIRS 2019 | NIRS 2020 | NIRS 2021 |
| All Nations Health Center-Missoula Urban Indian Health | 100% | 100% | 100% | 100% | 100% | - | - | - | - | - | 100% | 75% | 100% | 100% | 50% | 100% | - | 85% |
| American Indian Health & Family Services | 50% | 50% | 50% | 50% | - | 25% | 25% | 25% | 25% | 50% | - | - | - | - | - | 50% | 30% | - |
| American Indian Health & Services | - | 25% | - | - | - | - | - | - | - | - | 50% | 50% | 50% | 75% | - | 25% | - | 56% |
| American Indian Health Service of Chicago, Inc. | 100% | 100% | 100% | 100% | 100% | - | - | - | - | - | 75% | 75% | 75% | 50% | 50% | 100% | - | 65% |
| Bakersfield American Indian Health Project | 100% | 75% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 75% | 100% | 100% | 50% | 95% | 100% | 85% |
| Billings Urban Indian Health and Wellness Center | - | - | - | - | - | - | - | - | - | - | 25% | 25% | 25% | 50% | - | - | - | 31% |
| Denver Indian Health & Family Services, Inc. | 50% | 50% | 50% | 50% | 50% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 50% | 50% | 100% | 90% |
| First Nations Community Healthsource | - | - | - | - | - | 25% | 25% | 25% | 25% | - | 50% | 75% | 75% | 50% | - | - | 25% | 63% |

| | NIRS 2019 | | | | | NIRS 2020 | | | | | NIRS 2021 | | | | | Average Rates | | |
|---|-----------|------|------|------|------|-----------|------|------|------|------|-----------|------|------|------|-----|---------------|------|------|
| Fresno American Indian Health Project | 25% | - | - | - | 50% | - | - | - | - | - | 50% | 50% | 50% | 50% | 50% | 38% | - | 50% |
| Gerald L. Ignace Indian Health Center | 25% | 25% | 25% | 25% | - | 25% | 25% | 25% | 25% | 50% | - | - | - | - | - | 25% | 30% | - |
| Helena Indian Alliance - Leo Pocha Clinic | 100% | 50% | 100% | 100% | 100% | - | - | - | - | - | - | - | 75% | 50% | 50% | 90% | - | 58% |
| Hunter Health | 75% | 50% | 75% | 75% | 100% | 75% | 75% | 75% | 75% | 100% | 50% | 50% | 50% | 75% | 50% | 75% | 80% | 55% |
| Indian Family Health Clinic of Great Falls, Inc. | 100% | 75% | 100% | 100% | 100% | 75% | 75% | 75% | 75% | 50% | 100% | 100% | 100% | 100% | 50% | 95% | 70% | 90% |
| Indian Health Board of Minneapolis, Inc. | 100% | 100% | 100% | 100% | 100% | 75% | 75% | 75% | 75% | 50% | 100% | 100% | 100% | 100% | 50% | 100% | 70% | 90% |
| Indian Health Center of Santa Clara Valley | 75% | 25% | 75% | 75% | 50% | 50% | 50% | 50% | 50% | - | 100% | 100% | 100% | 100% | - | 60% | 50% | 100% |
| Native American Connections | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Native American Health Center | 100% | 50% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | - | 75% | 100% | 100% | 50% | 90% | 100% | 81% |
| Native American Lifelines of Baltimore and Boston | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Native American Rehabilitation | 100% | 100% | 100% | 100% | 100% | 75% | 75% | 75% | 75% | 50% | 25% | 25% | 25% | 50% | - | 100% | 70% | 31% |

| | NIRS 2019 | | | | | NIRS 2020 | | | | | NIRS 2021 | | | | | Average Rates | | |
|--|-----------|---|---|---|---|-----------|---|---|---|---|-----------|------|------|------|-----|---------------|---|-----|
| Association the Northwest, Inc. | | | | | | | | | | | | | | | | | | |
| Native Americans for Community Action, Inc. | - | - | - | - | - | - | - | - | - | - | 100% | 100% | 100% | 100% | 50% | - | - | 90% |
| Native Health | - | - | - | - | - | - | - | - | - | - | 50% | 50% | 25% | 75% | | - | - | 50% |
| Nebraska Urban Indian Health Coalition, Inc. | - | - | - | - | - | - | - | - | - | - | 75% | 75% | 75% | 100% | 50% | - | - | 75% |
| Nevada Urban Indians Inc. | - | - | - | - | - | - | - | - | - | - | 50% | 50% | 50% | 75% | - | - | - | 56% |
| New York Indian Council Inc. | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Sacramento Native American Health Center | - | - | - | - | - | - | - | - | - | - | 100% | 100% | 75% | 100% | - | - | - | 94% |
| San Diego American Indian Health Center | - | - | - | - | - | - | - | - | - | - | 75% | 75% | 75% | 75% | - | - | - | 75% |
| Seattle Indian Health Board | - | - | - | - | - | - | - | - | - | - | 100% | 100% | 100% | 100% | 50% | - | - | 90% |
| South Dakota Urban Indian Health, Inc. | - | - | - | - | - | - | - | - | - | - | 50% | 50% | 50% | 75% | - | - | - | 56% |
| The NATIVE Project (Spokane) | - | - | - | - | - | - | - | - | - | - | 100% | 100% | 100% | 100% | 50% | - | - | 90% |
| Tucson Indian Center | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| United American Indian | - | - | - | - | - | - | - | - | - | - | 100% | 100% | 100% | 100% | 50% | - | - | 90% |

| | NIRS 2019 | | | | | NIRS 2020 | | | | | NIRS 2021 | | | | | Average Rates | | |
|----------------------------------|-----------|-----|-----|-----|-----|-----------|------|------|------|------|-----------|------|------|------|-----|---------------|------|-----|
| Involvement, Inc. | | | | | | | | | | | | | | | | | | |
| Urban Indian Center of Salt Lake | - | - | - | - | - | - | - | - | - | - | 100% | 100% | 100% | 100% | 50% | - | - | 90% |
| Texas Native Health | 75% | 50% | 75% | 75% | 50% | 100% | 100% | 100% | 100% | 100% | 75% | 75% | 75% | 75% | 50% | 65% | 100% | 70% |

*Note that influenza data is only reported for two quarters of each year, so the rate is calculated out of 2 rather than 4.

**In the 2021 NIRS, only Q4 influenza data was reported, although there are two quarters in the year. Rates were calculated out of 2 despite the missing quarter so as not to overinflate the average annual rates.

National Immunization Reporting System Immunization Findings

Based on the 2019 to 2021 NIRS data grantees reported immunizations for: 3 to 27-month-old children, 2-year-old children, adolescents, adults, staff, and patients with influenza. This section is organized to provide an overview of findings by each category.

Children 3- to 27-Month-Old Findings

Among children 3 to 27 months, Figure 3 displays reporting rates for each quarter of the reporting period for the 2019, 2020 and 2021 NIRS data. Between 2019 and 2021, the reporting rate increased by 9.1%.

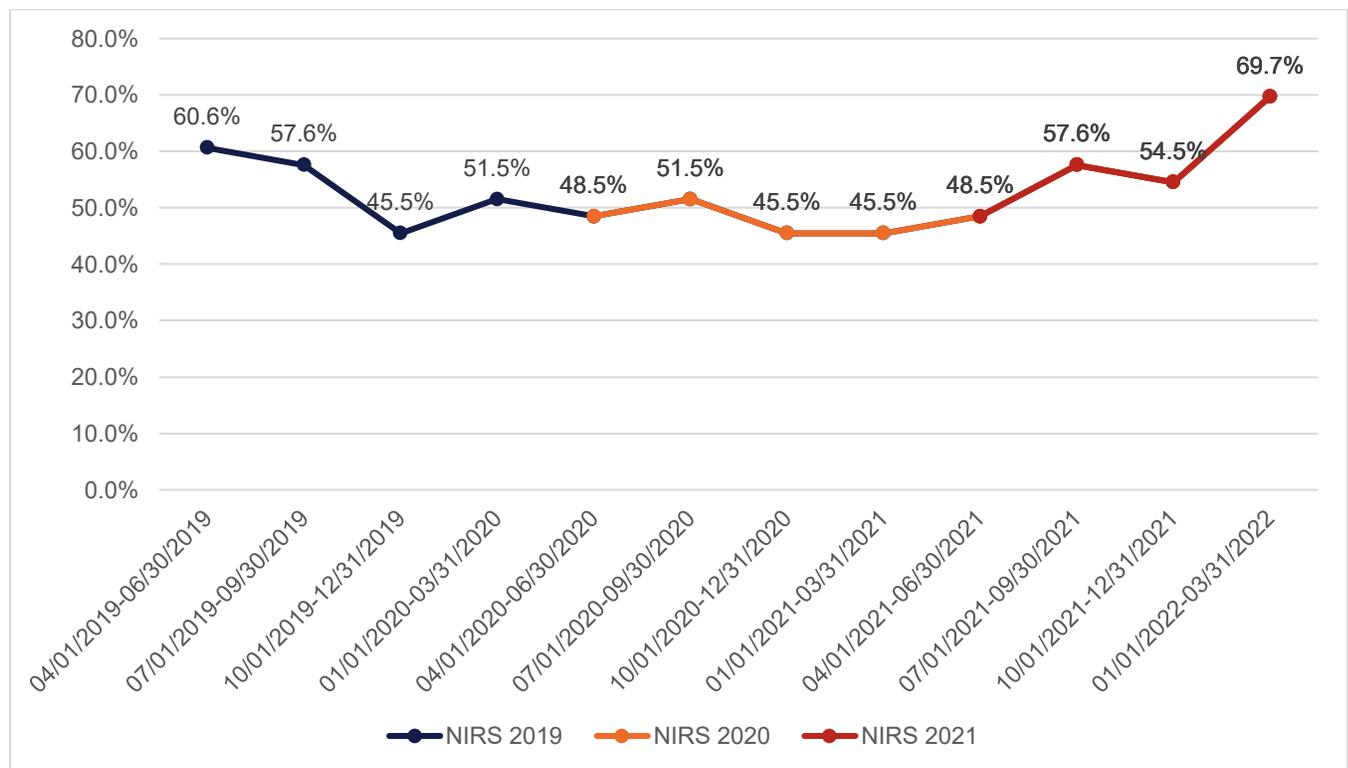


Figure 3: Reporting Rates for Ages 3- to-27-month-olds per Quarter (2019-2021 NIRS)

An immunization schedule key for ages 3- to 27-month-old children can be found in Table 6. By their second birthday, children should have received the following vaccines:

1. Four doses of diphtheria, tetanus, and pertussis (DTaP)
2. Three doses of inactivated poliovirus (Polio)
3. Three doses of Haemophilus Influenzae Type B (HIB)
4. Three doses of Hepatitis B (HEPB)
5. Four doses of pneumococcal conjugate (PCV)
6. One dose of measles, mumps, rubella (MMR)
7. One dose of varicella (VAR) at minimum

In addition to these minimum immunization recommendations, it is appropriate for children to receive three doses of rotavirus (ROTA).

This analysis was informed primarily by the NIRS Lookup Tables as well as the CDC recommended vaccination schedule. The NIRS Lookup Tables provide a codebook for variable terms and their uses within the NIRS. Although all vaccinations listed above are appropriate for this age group, NIRS differentiates between the minimum vaccine recommendations, as defined within the NIRS “Minimum Needs” category, and those who have received all age-appropriate vaccinations. The Minimum Immunization Recommendations category reflects those who have received the seven vaccines listed above, while the Appropriate Immunization Recommendations category reflects those who have received all vaccines appropriate for their age (i.e., all seven vaccines plus rotavirus vaccine).

Table 6: Immunization schedule for ages 3-to 27-month-olds

| | Diphtheria, Tetanus, Pertussis (DTaP) | Poliovirus (Polio) | Haemophilus influenzae Type B (HIB) | Hepatitis B (HEPB) | Pneumococcal (PCV) | Measles, Mumps, Rubella (MMR) | Varicella (VAR) | Rotavirus (ROTA) |
|--------------|---------------------------------------|--------------------|-------------------------------------|--------------------|--------------------|-------------------------------|-----------------|------------------|
| 3-4 months | 1 -DTaP* | 1 – Polio* | 1 – HIB* | 1 – HEPB* | 1 – PCV* | | | 1 - ROTA |
| 5-6 months | 2 – DtaP* | 2 – Polio* | 2 – HIB* | 2 – HEPB* | 2 – PCV* | | | 2 - ROTA |
| 7-15 months | 3 – DtaP* | 2 – Polio* | 2 – HIB* | 2 – HEPB* | 3 – PCV* | | | 3 – ROTA |
| 16-18 months | 3 – DtaP* | 2 – Polio* | 3 – HIB* | 2 – HEPB* | 4 – PCV* | 1-MMR* | 1 – VAR* | 3 - ROTA |
| 19-23 months | 4 – DtaP* | 3 – Polio* | 3 – HIB* | 3 – HEPB* | 4 – PCV* | 1 – MMR* | 1 – VAR* | 3 – ROTA |

| | | | | | | | | |
|------------------------------------|-----------|------------|----------|-----------|----------|---------|--------|----------|
| 24-27 months | 4 – DtaP* | 3 – Polio* | 3 – Hib* | 3 – HEPB* | 4 – PCV* | 1- MMR* | 1 VAR* | 3 - ROTA |
| *Minimum Immunization Requirements | | | | | | | | |

Based on the 2019 to 2021 NIRS data, minimum immunization recommendations were examined. In Figure 4, the overall immunization rate among 3- to 27-month-old children for minimum recommended vaccines is displayed. The average immunization rate among 3- to 27-month-old children was 48.0%. In the 2019 NIRS, the rate was 46.7%, increasing to 49.2% in the 2020 NIRS, and increasing again to 48.0% in the 2021 NIRS. Full details of reporting rates can be found in Appendix B, Table 21.

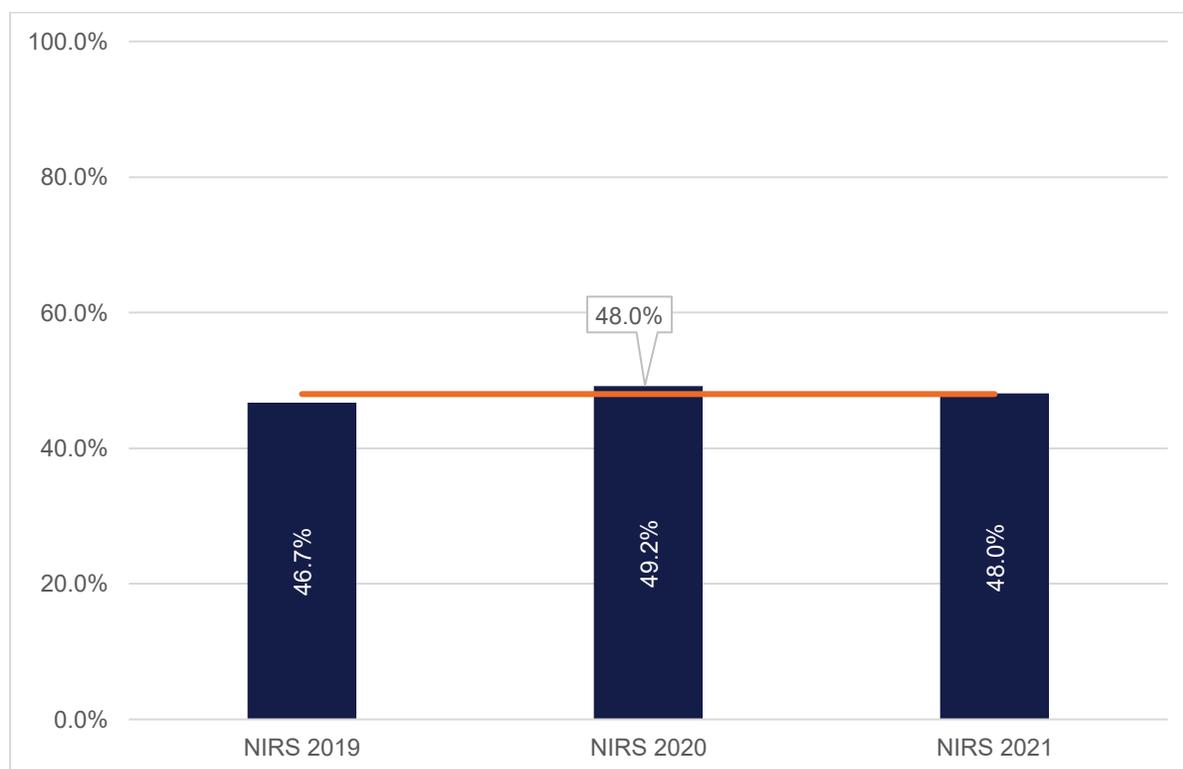


Figure 4: Minimum immunization recommendation rates per year for 3- to 27-month-olds (2019 to 2021 NIRS)

Figure 5 depicts the average immunization rates by each age sub-category for 3- to 27-month-old children. For individual age groups, increases in immunization rates were observed from 2019 to 2021.

The NIRS data for 3 to 27-month-old children can be further broken down into sub-age group categories which are: 3-4 months, 4-5 months, 7-15 months, 16-18 months, 19-

23 months, and 24-27 months. Across the 2019, 2020, and 2021 NIRS data, the average immunization rates were as follows:

- 3-4 months: 70.3%
- 5-6 months: 44.6%
- 7-15 months: 46.2%
- 16-18 months: 45.2%
- 19-23 months: 40.1%
- 24-27 months: 41.6%

Across all three years (2019 to 2021) immunization rates increased for the following age groups: 5-6 months (27.9% to 48.3%), 7-15 months (44.7% to 54.3%), and 19-23 months (38.2% to 39.6%). Decreases in immunization rates were observed within the following age groups: 3-4 months (75.1% to 68.0%), 16-18 months (55.2% to 41.1%), and 24-27 months (39.4% to 36.9%).

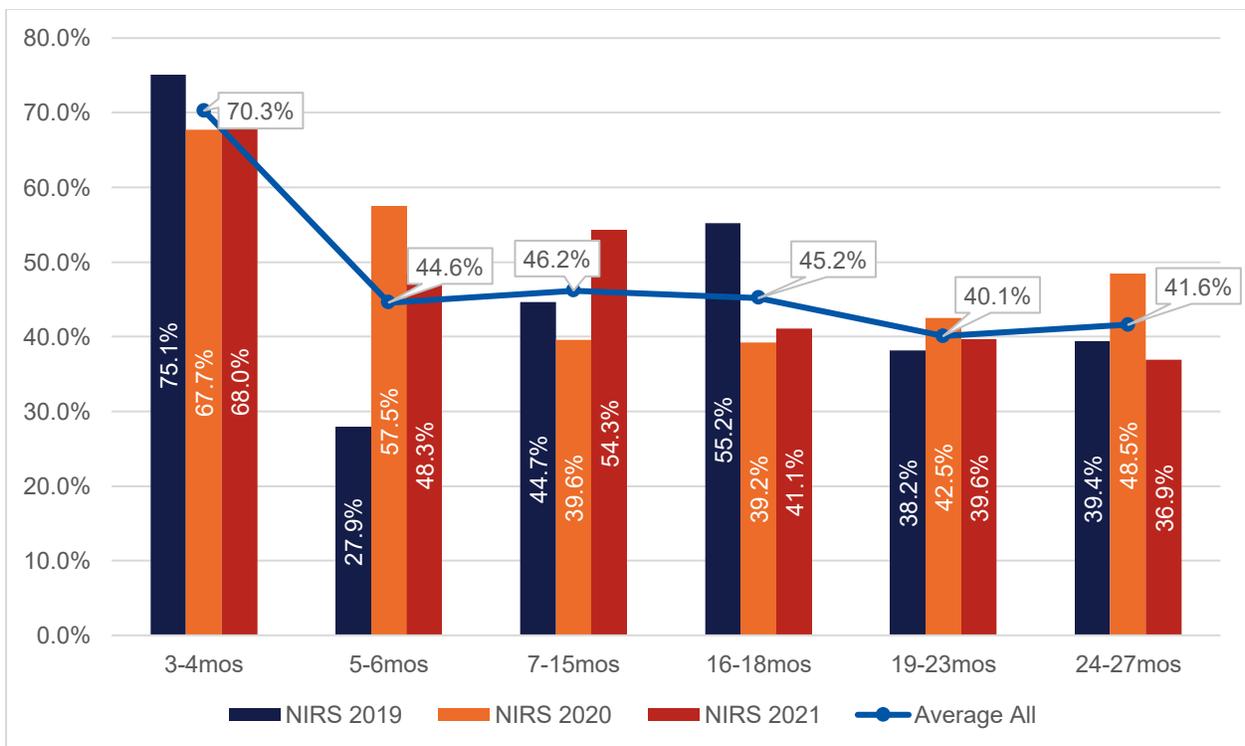


Figure 5: Minimum immunization recommendation rates per year for 3- to 27-month-olds by sub-age category (2019 to 2021 NIRS)

Appropriate immunization recommendations were also examined. Appropriate immunizations are the minimum vaccination recommendation with the addition of rotavirus vaccines (see Appendix B, Table 22). Based on the 2019 to 2021 NIRS data, the overall immunization rate among 3- to 27-month-old children for appropriate recommended vaccines increased by 17% (Table 22). As depicted in Figure 6, the 2019 NIRS the rate was 31.2%, increasing to 32.0% in the 2020 NIRS, and continuing to increase to 37.6% in the 2021 NIRS data set. The average immunization rate across all program years was 33.6%.

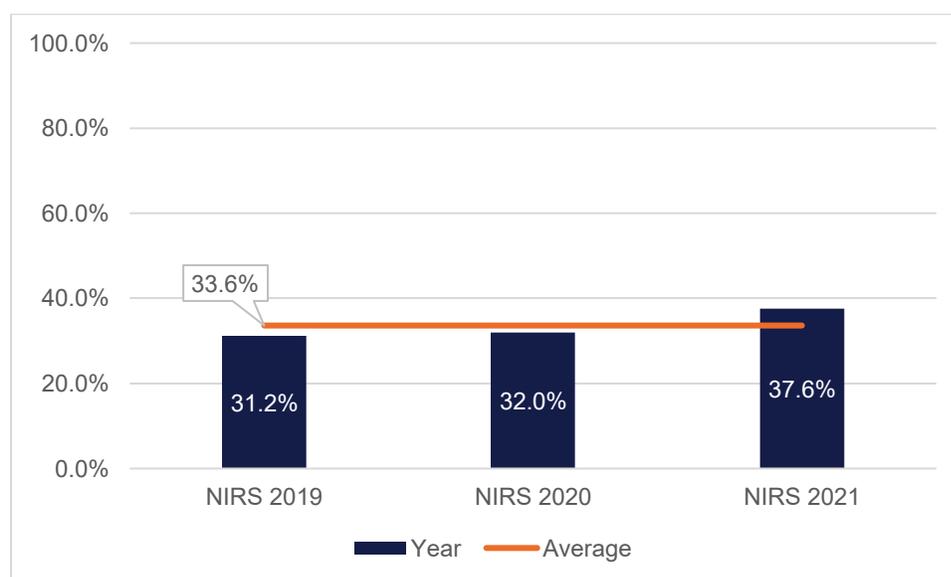


Figure 6: Appropriate immunization recommendation rates per year for 3- to 27-month-olds (NIRS 2019 to 2021)

The NIRS data for 3- to 27-month-olds can be further broken down into sub-age group categories which are: 3-4 months, 5-6 months, 7-15 months, 16-18 months, 19-23 months, 24- 27 months. Across the 2019, 2020, and 2021 NIRS data, the average appropriate immunization rates were as follows:

- 3-4 months: 62.7%
- 5-6 months: 34.9%
- 7-15 months: 31.9%
- 16-18 months: 26.3%
- 19-23 months: 21.9%
- 24-27 months: 24.1%

As depicted in Figure 7, increases in appropriate immunization rates from the 2019 to 2021 NIRS data were observed in four age groups: 5-6 months (17% to 41%), 7-15 months (27% to 45%), 19-23 months (8% to 28%), and 24-27 months (25% to 25.4%).

Decreases in appropriate immunization rates were observed in three age groups: 3-4 months (70% to 61%) and 16-18-months (31% to 26%).

Four age groups within this category saw increased immunization rates, including 5-6 months (17% to 41%), 7-15 months (27% to 45%), 19-23 months (8% to 28%), and 24-27 months (25% to 25.4%). Two age groups also saw decreases in their immunization rates: 3- to 4-months old (70% to 61%) and 16-18 months old (31% to 26%).

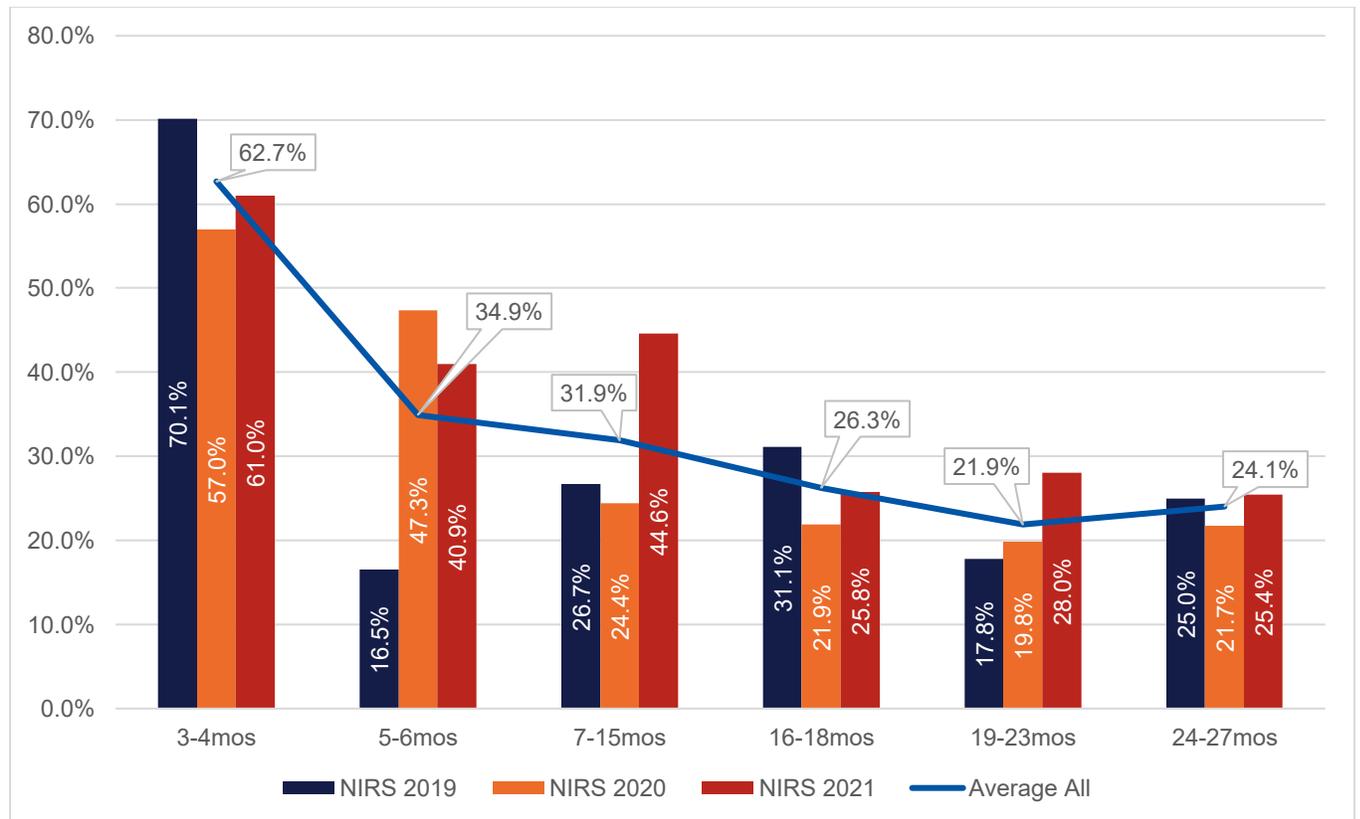


Figure 7: Appropriate immunization recommendation rates per year for 3- to 27-month-olds by sub-age category (2019 to 2021 NIRS)

2-Year-Old Immunization Findings

Figure 8 displays reporting rates for 2-year-olds for each quarter of the reporting period for the 2019, 2020 and 2021 NIRS data. Between 2019 and 2021, the reporting rate increased by 9.1%.

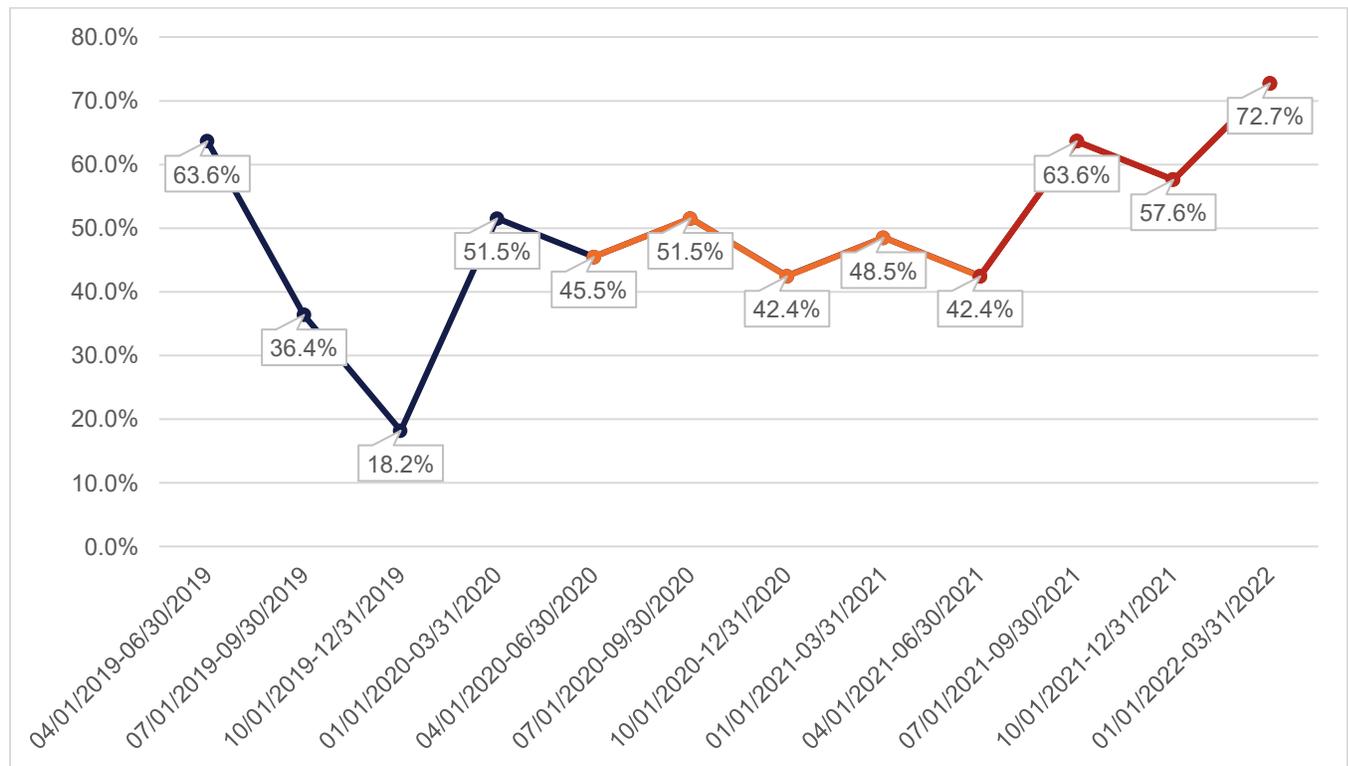


Figure 8: Reporting Rates for 2-Year-Old Category per Quarter (2019-2021 NIRS)

The 2-year-old category as collected within NIRS refers to children between the ages of 19 to 35 months. According to the CDC⁵, for children between 19 and 35 months of age (2-year-olds), the recommended minimum vaccinations are as follows:

- Diphtheria, tetanus, and pertussis (4-DtaP)
- Polio (3-POLIO)
- Haemophilus influenzae type b disease (3-HIB, 4-HIB)
- Hepatitis B (3-HEPB)
- Varicella (chickenpox) – 1-VAR
- Measles, mumps and rubella (1-MMR)

⁵ Centers for Disease Control and Prevention (CDC). (2022, February 17). *Child and Adolescent Immunization Schedule*. <https://www.cdc.gov/vaccines/schedules/hcp/imz/child-adolescent.html>

- Hepatitis A (1-HEPA, 2-HEPA)
- Pneumococcal disease (3-PCV, 4-PCV)
- Influenza (2-FLU)

It is also appropriate to receive the following vaccination:

- Rotavirus (3-ROTA)

The NIRS data is calculated by each vaccine type as well as by group of cumulative vaccines received. The first group (baseline) includes the 4-DtaP, 3-POLIO, and 1-MMR vaccines, with each subsequent group adding one to two recommended vaccines, cumulatively resulting in the final group in which all vaccines recommended for this age group have been received.

Figure 9 displays the aggregate immunization rates for each program year. The aggregate immunization rate here refers to the average rate of vaccines given across all vaccine types across all three program years. Based on the 2019 to 2021 NIRS data, the overall immunization rate among 2-year-olds across all vaccines given decreased by 7.4% (see Appendix B, Table 23). In the 2019 NIRS, the rate was 36.6%, increasing to 44.6% in the 2020 NIRS, and continuing to increase to 34.0% in the 2021 NIRS data. The average immunization rate across all program years was 38.4%.

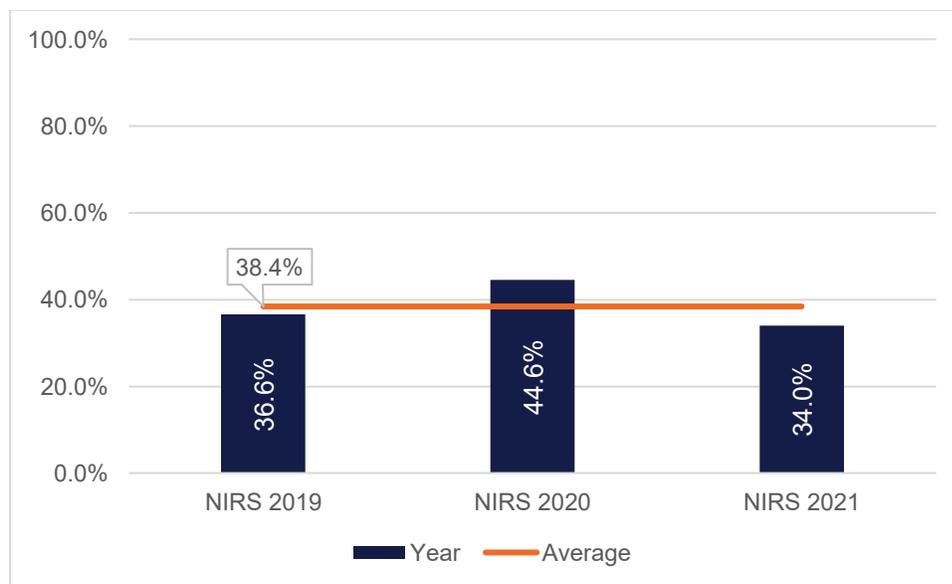


Figure 9: 2-year-old Aggregate Immunization Rates by Year (2019-2021 NIRS)

Average Immunization Rates by Individual Vaccine Type

As depicted in Figure 10, the average appropriate immunization rates for each individual vaccines for 2019, 2020, and 2021 NIRS data, were as follows:

- 4-DTaP: 34.8%
- 3-POLIO: 49.9%
- 3-HIB: 46.0%
- 4-HIB: 22.7%
- 3-HEPB: 52.2%
- 1-MMR: 48.4%
- 1-VAR: 48.1%
- 1-HEPA: 41.8%
- 2-HEPA: 23.1%
- 2-FLU: 23.6%
- 3-PCV: 45.6%
- 4-PCV: 30.7%
- 3-ROTA: 32.3%

Across each individual vaccine type, only three vaccines saw immunization rate increases: both HEPA doses increased (1-HEPA: 35.6% to 39.8%; 2-HEPA: 18.9% to 24.8%), and as well as 3-ROTA (27.6% to 30.8%). In this age group, most immunization rates for individual vaccines decreased over the reporting period.

- 4-DTAP: 35.0% to 31.8%
- 3-POLIO: 50.4% to 44.3%
- 3-HIB: 45.1% to 38.7%
- 4-HIB: 25.5% to 20.5%
- 3-HEPB: 51.2% to 46.1%
- 1-MMR: 45.5% to 41.5%
- 1-VAR: 45% to 40.7%
- 2-FLU: 20.7% to 20.1%
- 3-PCV: 45.7% to 35.3%
- 4-PCV: 29.0% to 28.1%

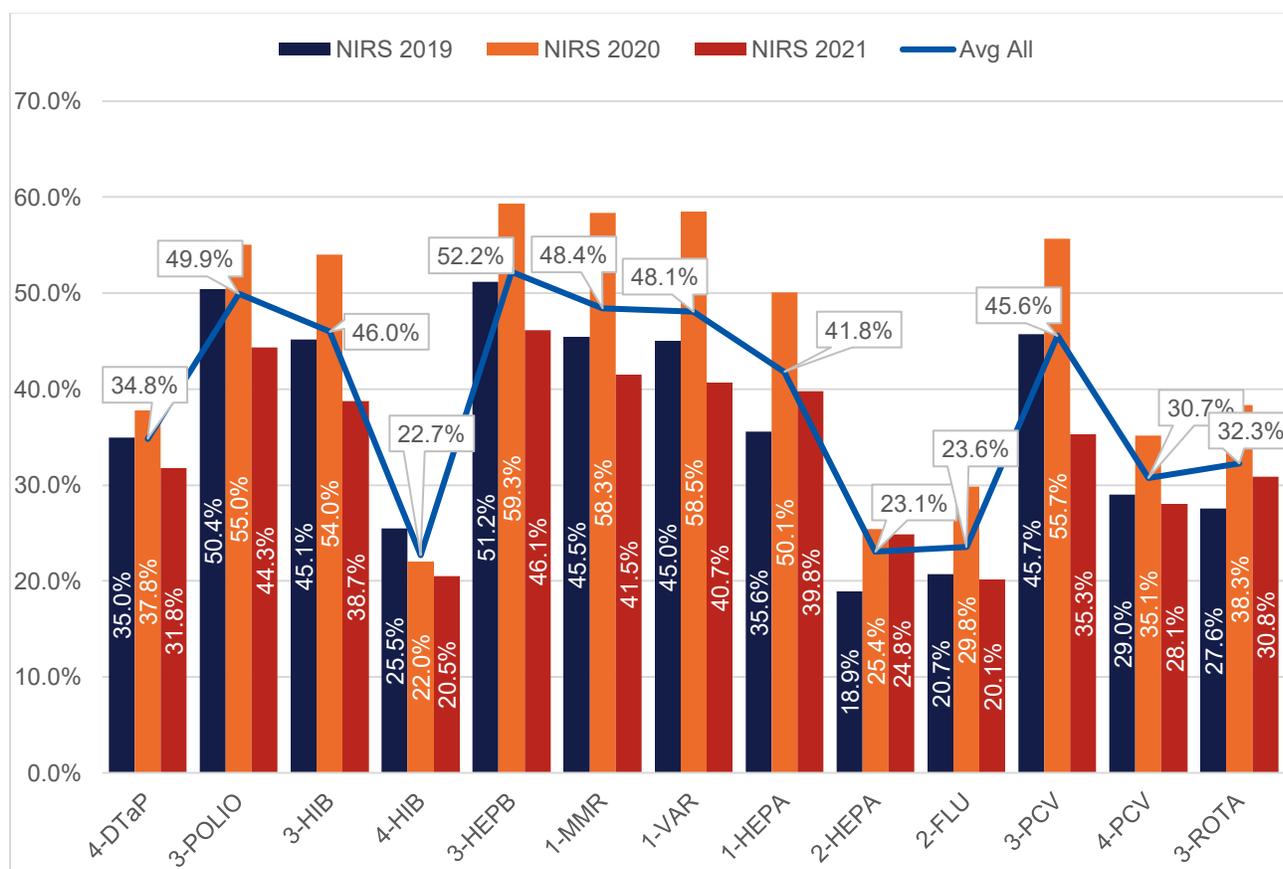


Figure 10: 2-year-old Immunization Rates per Year by Vaccine Type (2019-2021 NIRS)

Average – Cumulative Vaccine Groups

In Figure 11, cumulative vaccine groups are shown with the baseline group (4-DTaP + 3-POLIO + 1-MMR) used to establish the minimum vaccine requirements for this age group. With each additional vaccination, it is evident from the graph that the immunization rate subsequently decreases. This trend is most clear among the two groups that incorporate “optional” vaccines for rotavirus and influenza.

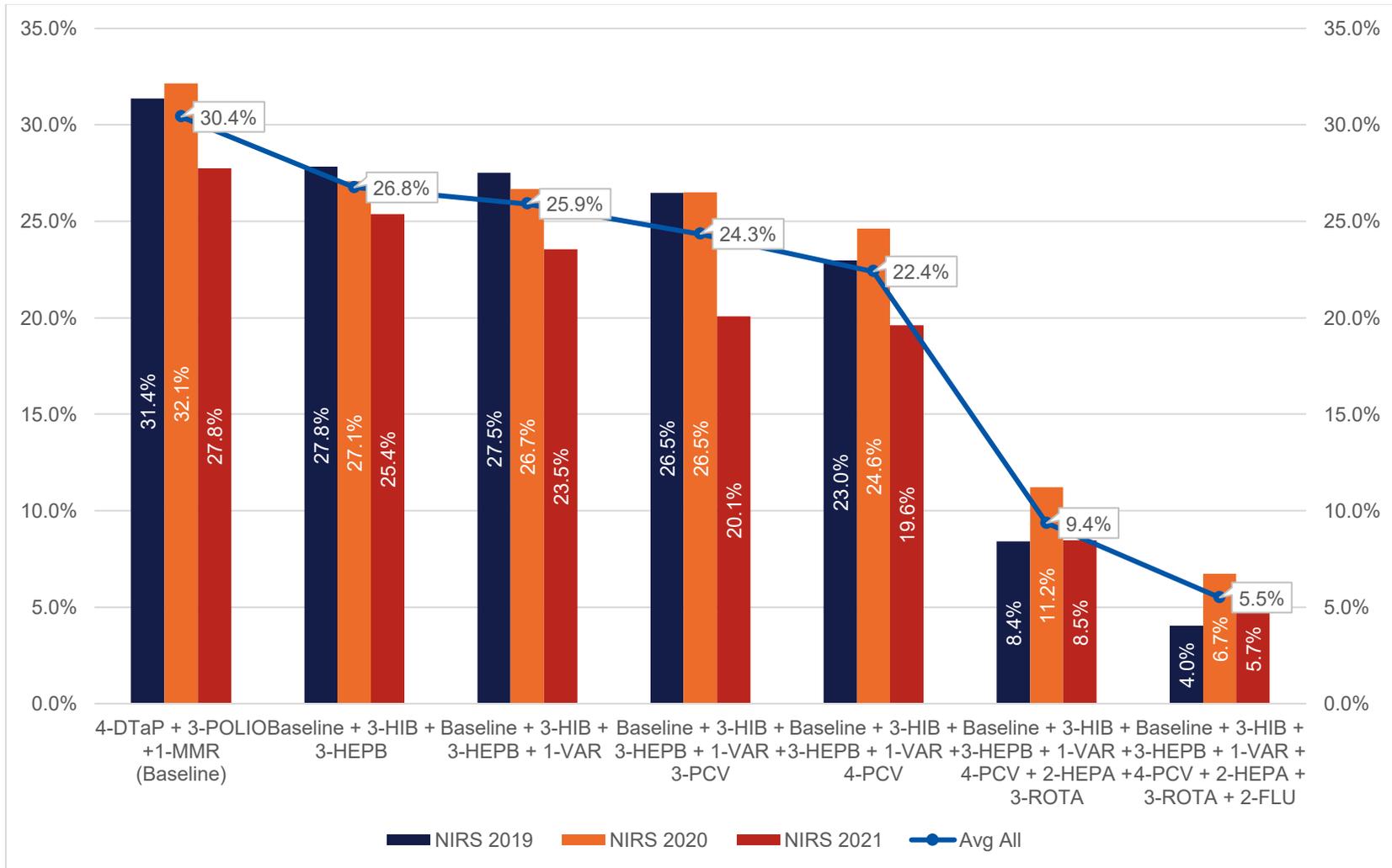


Figure 11: 2-year-old Immunization Rates per Year by Cumulative Vaccine Group

Across the 2019, 2020, and 2021 NIRS data, the average immunization rates for each cumulative vaccine group are outlined in Table 7. Of the vaccine groups, only two observed increases over the reporting period: baseline + 3-HIB + 3-HEPB + 1-VAR + 4-PCV + 2-HEPA + 3-ROTA (8.4% to 8.5%) and baseline + 3-HIB + 3-HEPB + 1-VAR + 4-PCV + 2-HEPA + 3-ROTA + 2-FLU (4.0% to 5.7%). Decreases were observed for the following vaccine groups: baseline group (31.4% to 27.8%), baseline + 3-HIB + 3-HEPB (27.8% to 25.4%), baseline + 3-HIB + 3-HEPB + 1-VAR (27.5% to 23.5%), baseline + 3-HIB + 3-HEPB + 3-PCV: (26.5% to 20.1%), Baseline + 3-HIB + 3-HEPB + 4-PCV (23.0% to 19.6).

Table 7: 2-year-old average immunization rates for each cumulative vaccine group (2019 to 2021 NIRS)

| Cumulative Vaccine Group | Average Immunization Rate |
|---|---------------------------|
| 4-DTaP + 3-POLIO +1-MMR (Baseline) | 30.4% |
| Baseline + 3-HIB + 3-HEPB | 26.8% |
| Baseline + 3-HIB + 3-HEPB + 1-VAR | 25.9% |
| Baseline + 3-HIB + 3-HEPB + 1-VAR + 3-PCV | 24.3% |
| Baseline + 3-HIB + 3-HEPB + 1-VAR + 4-PCV | 22.4% |
| Baseline + 3-HIB + 3-HEPB + 1-VAR + 4-PCV + 2-HEPA + 3-ROTA | 9.4% |
| Baseline + 3-HIB + 3-HEPB + 1-VAR + 4-PCV + 2-HEPA + 3-ROTA + 2-FLU | 5.5% |

The Adolescent Immunization Findings

This next section describes NIRS immunization rates among adolescents (13- to 17-years-old). Figure 12 displays reporting rates for each quarter of the reporting period for the 2019, 2020 and 2021 NIRS data. Between 2019 and 2021, the reporting rate increased by 9.3%.

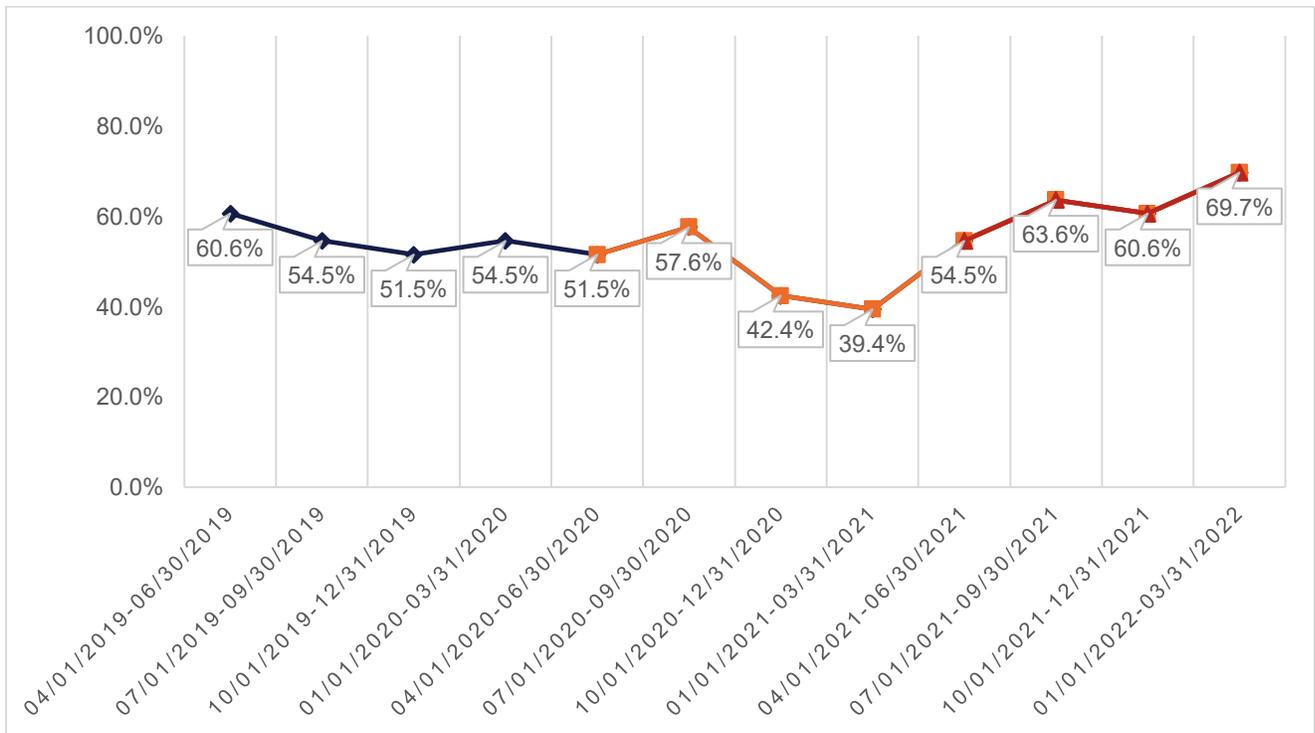


Figure 12: Reporting Rates for Adolescents per Quarter (2019-2021 NIRS)

The NIRS data also measures adolescent vaccinations for 13- to 17-year-olds. According to the Centers for Disease Control and Prevention's (CDC) recommended vaccine schedule for this age group, the following vaccines should be administered:

- Human papillomavirus (HPV): 2 doses (13-15 years) or 3 doses (15+)
- Tetanus, diphtheria, and pertussis (Tdap): 1 dose
- Meningococcal conjugate (MenACWY): 1 dose (13 years) and 1 booster dose (17 years)

In addition, there are several vaccine groups that reflect combinations of vaccines received recommended for ages 13-17:

- 1-TDaP + 1-MENACWY + HPV-Fully Vaccinated (HPV-FV)
- 1-TDAP + 3-HEPB + 2-MMR + 1-MENACWY + 2-VAR + HPV-FV
- 1-TDaP + 3-HEPB + 2-MMR + 1-VAR
- 1-TDaP + 3HEPB +2-MMR + 1-MENACWY + 2-VAR
- 1-TDaP + 1-MENACWY

Other vaccines, including Hepatitis B (HEPB), Hepatitis A (HEPA), Chickenpox Varicella (VAR), and Measles/mumps/rubella (MMR), may be administered if the child is catching up on missing vaccines and are reflected in the NIRS data. The CDC also recommends an annual influenza vaccine for everyone 6 months and older: this is covered for 13- to 17-year-olds here as well as in the separate “flu” section.

The NIRS data is divided into two age categories: for 13-year-olds and 13- to 17-year-olds. Each age group is broken down further based on vaccine type and gender: for 13-year-olds, there are measures for the total population, by gender (female and male) and by combined gender. For 13- to 17-year-olds, the same groupings were observed.

Note that in 2020, new adolescent form fields were implemented, therefore, some measures were not collected across all three program years.

Average Immunization Rates by Individual Vaccine Type – 13-years-olds

Figure 13 displays immunization rates all 13-year-olds. A table with more detailed information is displayed in appendix B, Table 26. Only 1-TDaP had data across all three program years, so the average immunization rate for the other measures only reflects data from the 2020 and 2021 NIRS.

Across the 2019 to 2021 NIRS data, the average immunization rates for all 13-year-olds were 13.3% for 1-TDaP. Across the 2020 and 2021 NIRS data, the average immunization rate for 13-year-olds was 10.5% (1-MENACWY) and 2.4% (1-TDaP + 1-MENACWY + HPV-FV).

Between the 2019 and 2021 NIRS, the 1-TDaP immunization rate decreased (14.2% to 11.8%). 1-MENACWY immunization rate also decreased from 10.8% (2020 NIRS) to 10.2% (2021 NIRS). In contrast, the rate of 13-year-olds who received 1-TDAP + 1-MENACWY + HPV-FV increased from 2.1% (2020 NIRS) to 2.7% (2021 NIRS).

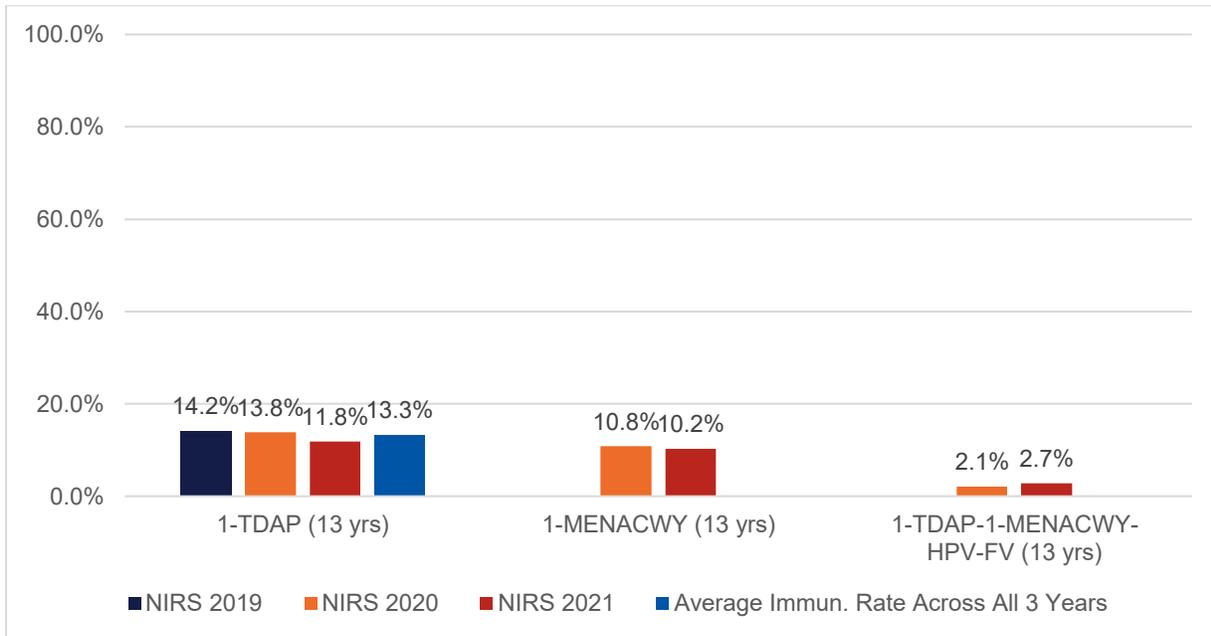


Figure 13: Adolescent Immunization Rates – 13-year-olds, All Genders (2019-2021 NIRS)

Figure 14 displays the immunization rates for 13-year-old females per program year. Only the three HPV doses had data collected for all three years of the reporting period, while the rest were limited to the 2020 and 2021 NIRS or only the 2021 NIRS (HPV-FV 3-Doses). The average immunization rates over the 2019 to 2021 NIRS were:

- 1-HPV: 59.3%
- 2-HPV: 34.9%
- 3-HPV: 5.3%

Data for HPV-FV 3-Doses was only collected during the 2021 NIRS reporting period, so no change could be observed.

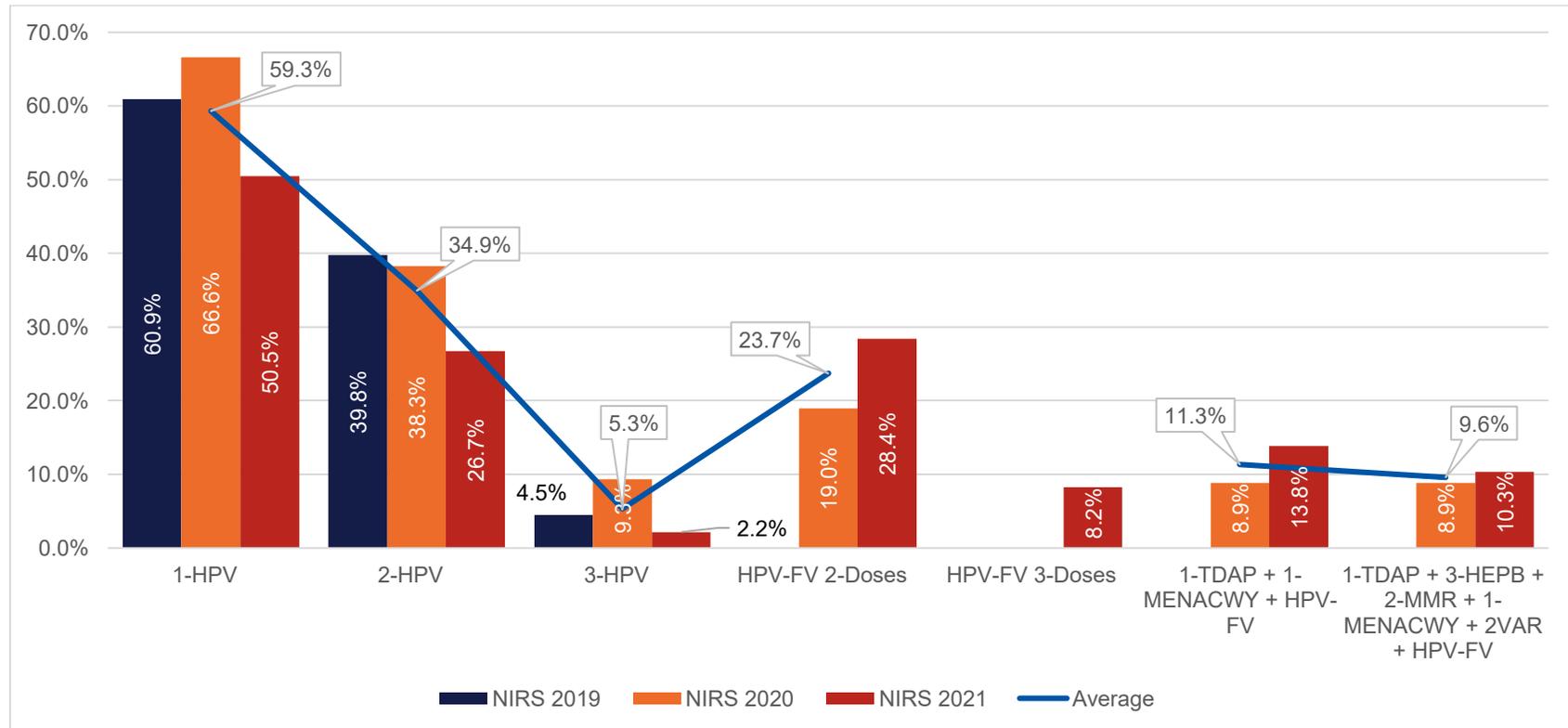


Figure 14: Adolescent Immunization Rates - 13-year-old Females (2019-2021 NIRS)

The average immunization rates for 13-year-old females over the 2020 to 2021 NIRS are provided in Table 8. From the 2019 to 2021 NIRS, there were decreases observed in all vaccine groups: 1-HPV (60.9% to 50.5%), 2-HPV (39.8% to 26.7%), and 3-HPV (4.5% to 2.2%). Between the 2020 to 2021 NIRS, increases were observed in three of the vaccine groups: HPV-FV-2-Doses (19.0% to 28.4%), 1-TDaP + 1-MENACWY + HPV-FV (8.9% to 13.8%), and 1-TDaP + 3-HEPB + 2-MMR + 1-MENACWY + 2-VAR + HPV-FV (8.9% to 10.3%). Full details of immunization rates can be found in Appendix B, Table 24.

Table 8: Average Immunization Rates, 13-year-old Females (2020 to 2021 NIRS)

| Immunization Group | Average Immunization Rate |
|--|---------------------------|
| HPV-FV-2-Doses: | 23.7% |
| 1-TDAP + 1-MENACWY + HPV-FV | 11.3% |
| 1-TDAP + 3-HEPB + 2-MMR + 1-MENACWY + 2VAR + HPV-FV: | 9.6% |

Figure 15 displays the immunization rates for 13-year-old males per program year. Only the three HPV doses had data collected for all three years of the reporting period, while the rest were limited to the 2020 and 2021 NIRS only, or the 2021 NIRS only (HPV-FV 3-Doses). The average immunization rates over the 2019 to 2021 NIRS were:

- 1-HPV: 62.0%
- 2-HPV: 35.3%
- 3-HPV: 5.3%

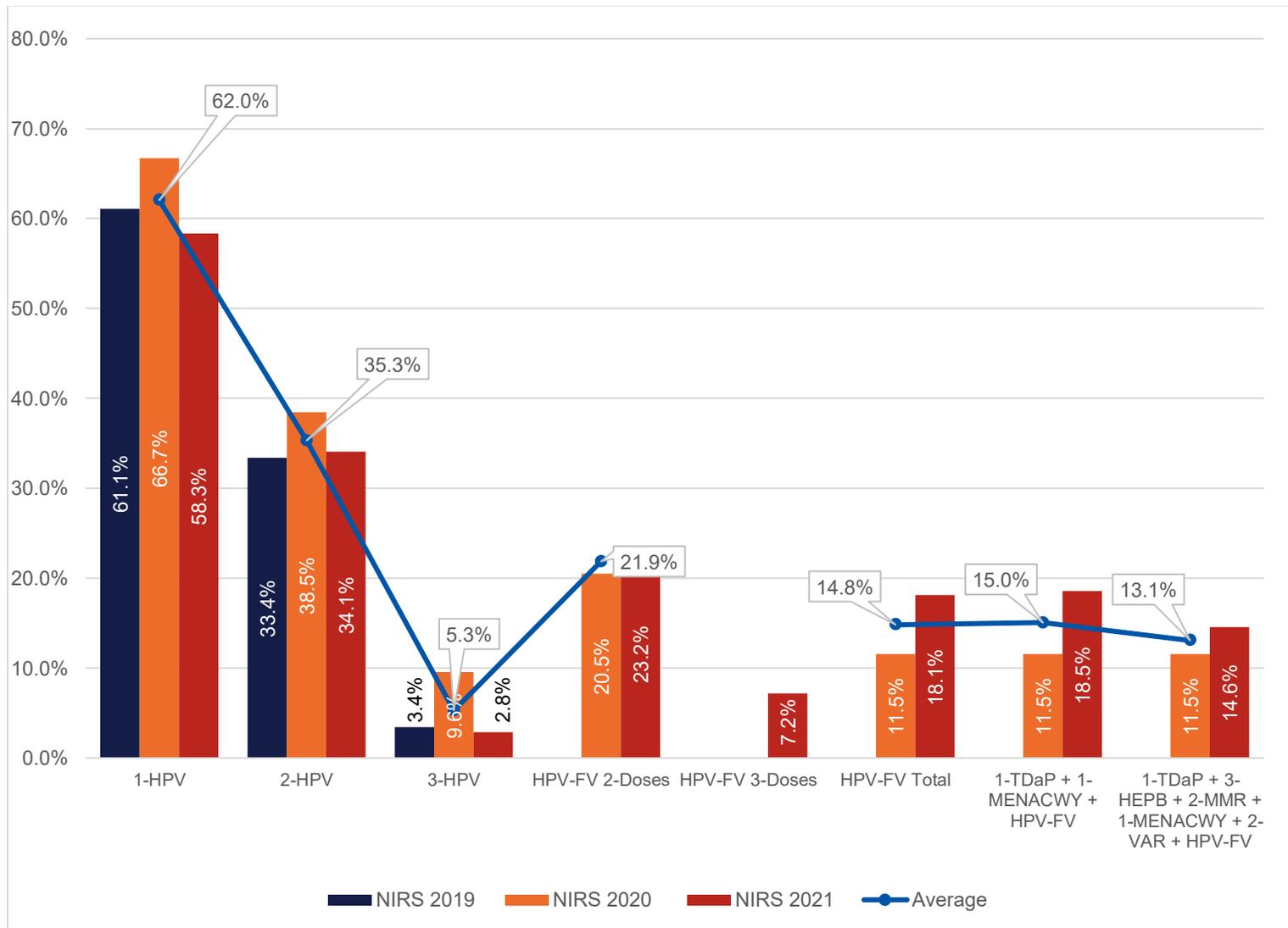


Figure 15: Adolescent Immunization Rates - 13-year-old Males (2019-2021 NIRS)

The average immunization rates over the 2020 to 2021 NIRS are provided in Table 9. From the 2019 to 2021 NIRS, there were decreases observed in all vaccine groups: 1-HPV (61.1% to 58.3%), 2-HPV (33.4% to 34.1%), and 3-HPV (3.4% to 2.8%). Between the 2020 to 2021 NIRS, increases were observed in all of the vaccine groups: HPV-FV-2-Doses (20.5% to 23.2%), HPV-FV Total (11.5% to 18.1%), 1-TDaP + 1-MENACWY + HPV-FV (11.5% to 18.5%), and 1-TDaP + 3-HEPB + 2-MMR + 1-MENACWY + 2-VAR + HPV-FV (11.5% to 13.1%). Data for HPV-FV 3-Doses was only collected during the 2021 NIRS reporting period, so no change could be observed. Full details of reporting rates can be found in Appendix B, Table 25).

Table 9: Average Adolescent Immunization Rates, 13-year-old Males (2019-2019 NIRS)

| Immunization Group | Average Immunization Rate |
|--|---------------------------|
| HPV-FV-2-Doses: | 21.9% |
| HPV-FV 3-Doses: | 3.6% |
| HPV-FV Total: | 14.8% |
| 1-TDAP + 1-MENACWY + HPV-FV: | 15.0% |
| 1-TDAP + 3-HEPB + 2-MMR + 1-MENACWY + 2VAR + HPV-FV: | 13.1% |

Figure 16 displays the immunization rates for both male and female 13-year-olds for each program year. None of the vaccine groups had data collected across all three of the program years: data is limited to the 2020 and 2021 NIRS only. The average immunization rates over the 2020 to 2021 NIRS were:

- 1-HPV: 44.9%
- 2-HPV: 28.8%
- 3-HPV: 1.6%
- HPV-FV 2-Doses: 26.4%
- HPV-FV 3-Doses: 1.7%

Between the 2020 to 2021 NIRS, increases were observed in three of the vaccine groups: 1-HPV (42.9% to 46.9%), 3-HPV (0.0% to 3.2%), HPV-FV 3-Doses (0.0% to 3.4%). Over the same period, decreases were observed among two of the vaccine groups: 2-HPV (29.5% to 28.1%) and HPV-FV 2-Doses (29.5% to 23.2%). There was no change observed in the HPV-FV 2-3 Doses group, which remained at 0.0% over the 2020 to 2021 NIRS. Full details of reporting rates can be found in Appendix B, Table 26.

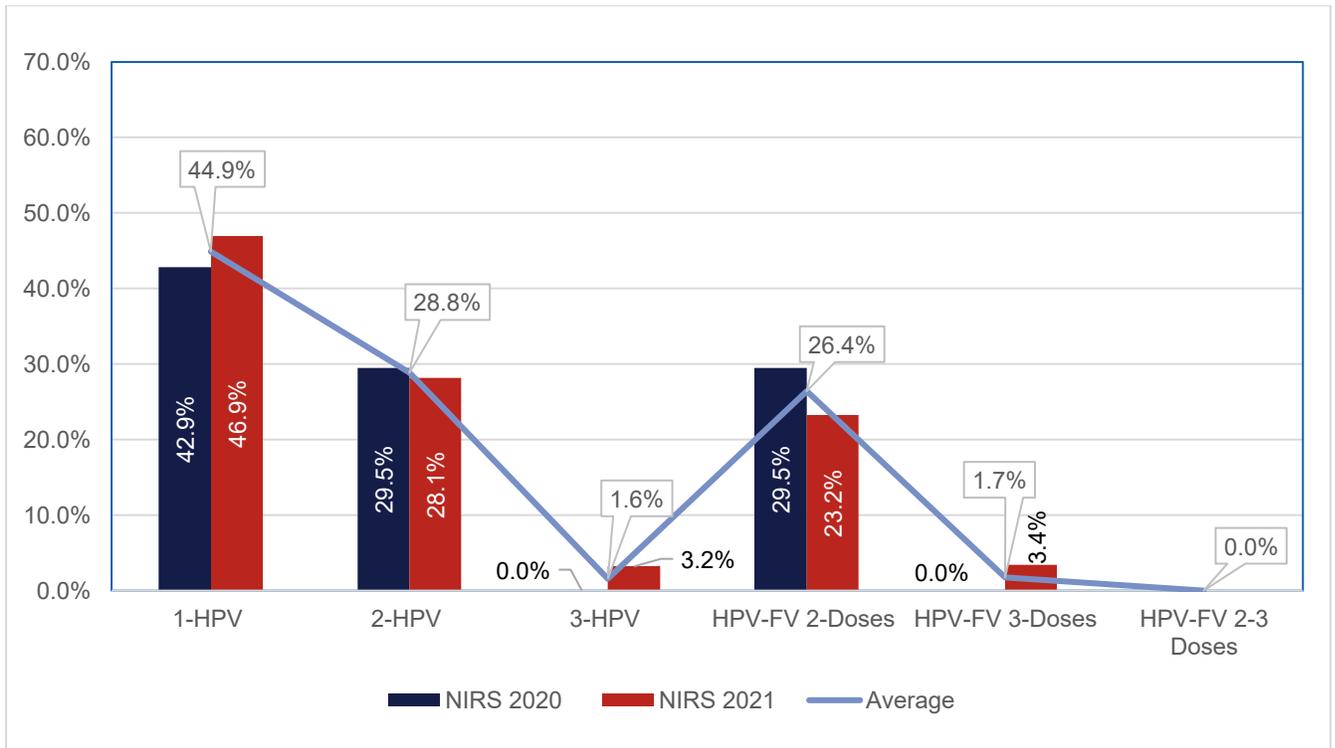


Figure 16: Adolescent Immunization Rates - 13-year-olds, Female and Male (2019-2021 NIRS)

In Figure 17, Immunization rates for all 13- to 17-year-olds with data collected across the 2019, 2020, and 2021 NIRS. The average immunization rates across all three program years for each vaccine were:

- 3-HEPB: 68.9%
- 2-MMR: 68.9%
- 1-VAR: 69.1%
- 2-VAR: 67.9%
- 1-TDaP: 67.7%
- 1-HEPA: 67.5%
- 2-HEPA: 66.2%
- 1-FLU: 18.2%

Between the 2019 and 2021 NIRS, immunization rates decreased for all vaccine groups: 3-HEPB (74.0% to 61.0%), 2-MMR (73.4% to 61.3%), 1-VAR (72.5% to 62.3%), 2-VAR (71.8% to 60.3%), 1-TDaP (71.4% to 62.0%), 1-HEPA (70.0% to 60.0%), 2-HEPA (68.8% to 59.6%), and 1-FLU (34.4% to 30.4%). Full details of reporting rates can be found in Appendix B, Table 27.

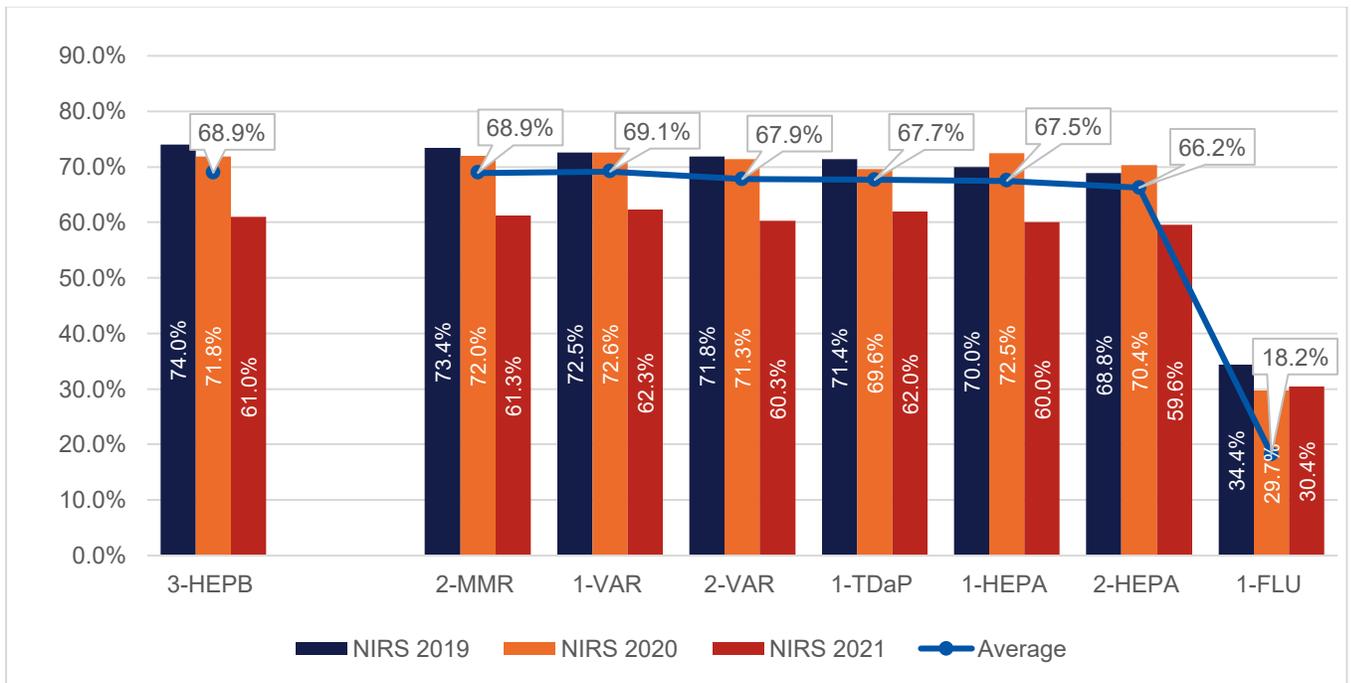


Figure 17: Adolescent Immunization Rates – 13- to 17-years-old, All Genders (2019-2021 NIRS)

In Figure 18, for the rest of the 13- to 17-year-old total population immunization rates, data was only collected during the 2020 and 2021 NIRS program years.



Figure 18: Adolescent Immunization Rates – 13- to 17-year-olds, All Genders (2020-2021 NIRS)

The average immunization rates across the 2020 and 2021 NIRS for each vaccine group were provided in Table 10. Between the 2020 and 2021 NIRS, immunization rates increased for three vaccine groups: 1-MENACWY (52.3% to 55.3%), 1TDaP + 1-MENACWY (38.3% to 48.8%), and 1-TDaP + 1-MENACWY + HPV-FV (12.4% to 21.6%). Over the same reporting period, immunization rates decreased for the other two vaccine groups :1-TDaP + 3-HEPB + 2-MMR + 1-VAR (48.7% to 47.0%) and 1-TDaP + 3-HEPB + 2-MMR + 1-MENACWY + 2-VAR (47.9% to 43.5%)

Table 10: Average Adolescent Immunization Rates, 13- to 17-year-olds, All Genders (2020-2021 NIRS)

| Immunization Group | Average Immunization Rate |
|--|---------------------------|
| 1-MENACWY: | 53.8% |
| 1-TDaP + 1-MENACWY: | 43.5% |
| 1-TDaP + 1-MENACWY + HPV-FV: | 17.0% |
| 1-TDaP + 3-HEPB + 2-MMR + 1-VAR: | 47.9% |
| 1-TDaP + 3-HEPB + 2-MMR + 1-MENACWY + 2-VAR: | 45.7% |

In Figure 19, the immunization rates for 13- to 17-year-old females for each program year (2019 to 2021 NIRS) are displayed. Only the three HPV doses had data collected for each year of the 2019-2021 NIRS. Immunization rates for the rest of the vaccine groups were limited to the 2020 and 2021 NIRS only. The average immunization rates over the 2019 to 2021 NIRS were:

- 1-HPV: 63.3%
- 2-HPV: 49.0%
- 3-HPV: 17.4%

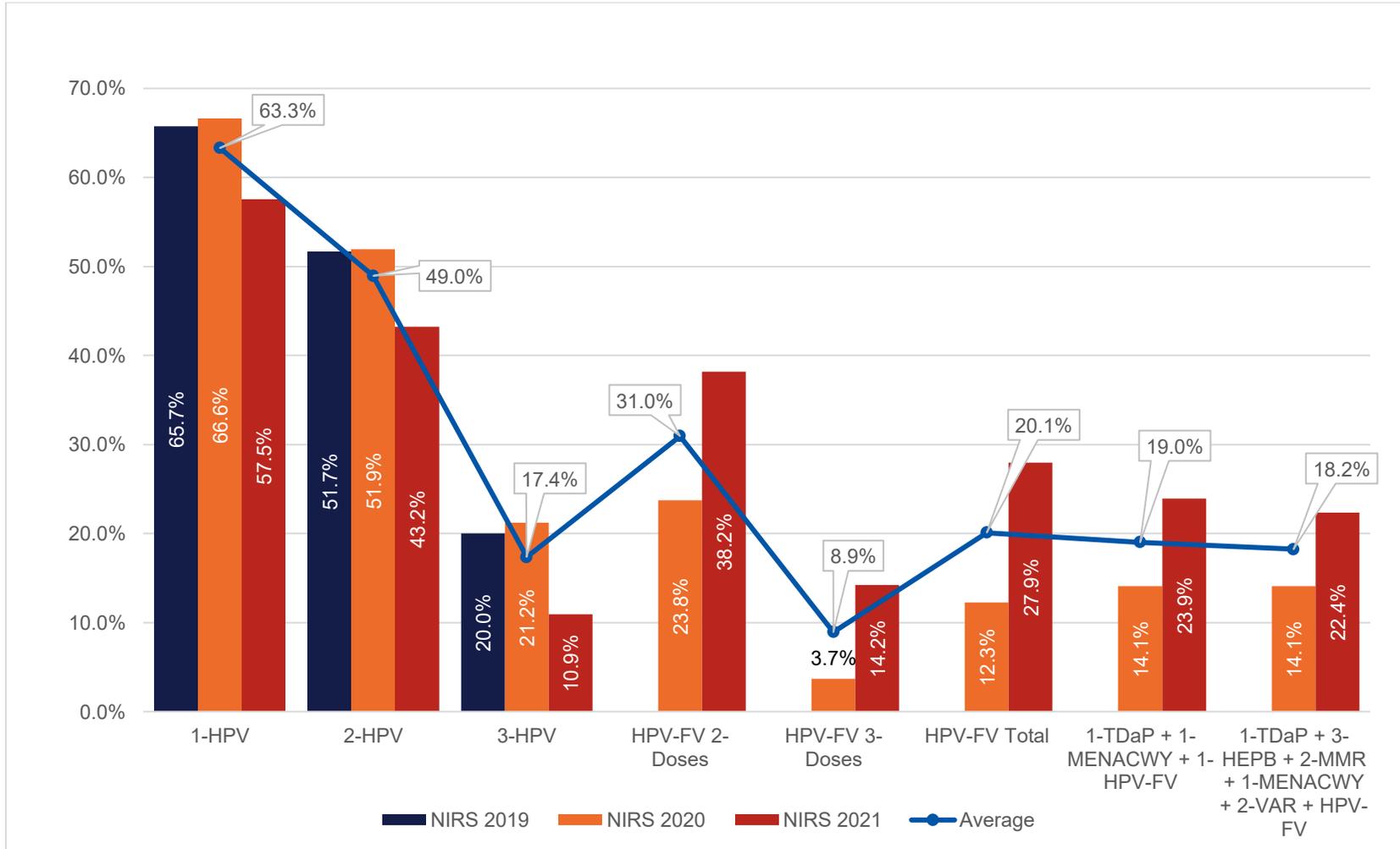


Figure 19: Adolescent Immunization Rates - 13- to 17-year-old Females (2019-2021 NIRS)

The average immunization rates for 13- to 17-year-old females over the 2020 to 2021 NIRS are provided in Table 11. Between the 2019 to 2021 NIRS, decreases in immunization rates 1-TDaP + 3-HEPB + 2-MMR + 1-MENACWY + 2-VAR + HPV-FV were observed in all three of the vaccine groups: 1-HPV (65.7% to 57.5%), 2- HPV (51.7% to 43.2%), and 3-HPV (20.0% to 10.9%). Over the 2020 and 2021 NIRS, immunization rates increased for all categories: HPV-FV 2-Doses (23.8% to 38.2%), HPV-FV 3-Doses (3.7% to 14.2%), HPV-FV Total (12.3% to 27.9%), 1-TDaP + 1-MENACWY + 1-HPV-FV (14.1% to 23.9%), and 1-TDaP + 3-HEPB + 2-MMR + 1-MENACWY + 2-VAR + HPV-FV (14.1% to 22.4%). Full details of reporting rates can be found in Appendix B, Table 28.

Table 11: Average Adolescent Immunization Rates, 13- to 17-year-old Females (2020-2021 NIRS)

| Immunization Group | Average Immunization Rate |
|---|---------------------------|
| HPV-FV 2-Doses: | 31.0% |
| HPV-FV 3-Doses: | 8.9% |
| HPV-FV Total: | 20.1% |
| 1-TDaP + 1-MENACWY + 1-HPV-FV: | 19.0% |
| 1-TDaP + 3-HEPB + 2-MMR + 1-MENACWY + 2-VAR + HPV-FV: | 18.2% |

In Figure 20, the immunization rates for 13- to 17-year-old males for each program year (2019-2021 NIRS) are displayed. Only the three HPV doses had data collected for each year of the 2019-2021 NIRS. Immunization rates for the five other vaccine groups were limited to the 2020 and 2021 NIRS only. Across the 2019 to 2021 NIRS data, the average immunization rates were:

- 1-HPV: 61.9%
- 2-HPV: 44.7%
- 3-HPV: 15.4%

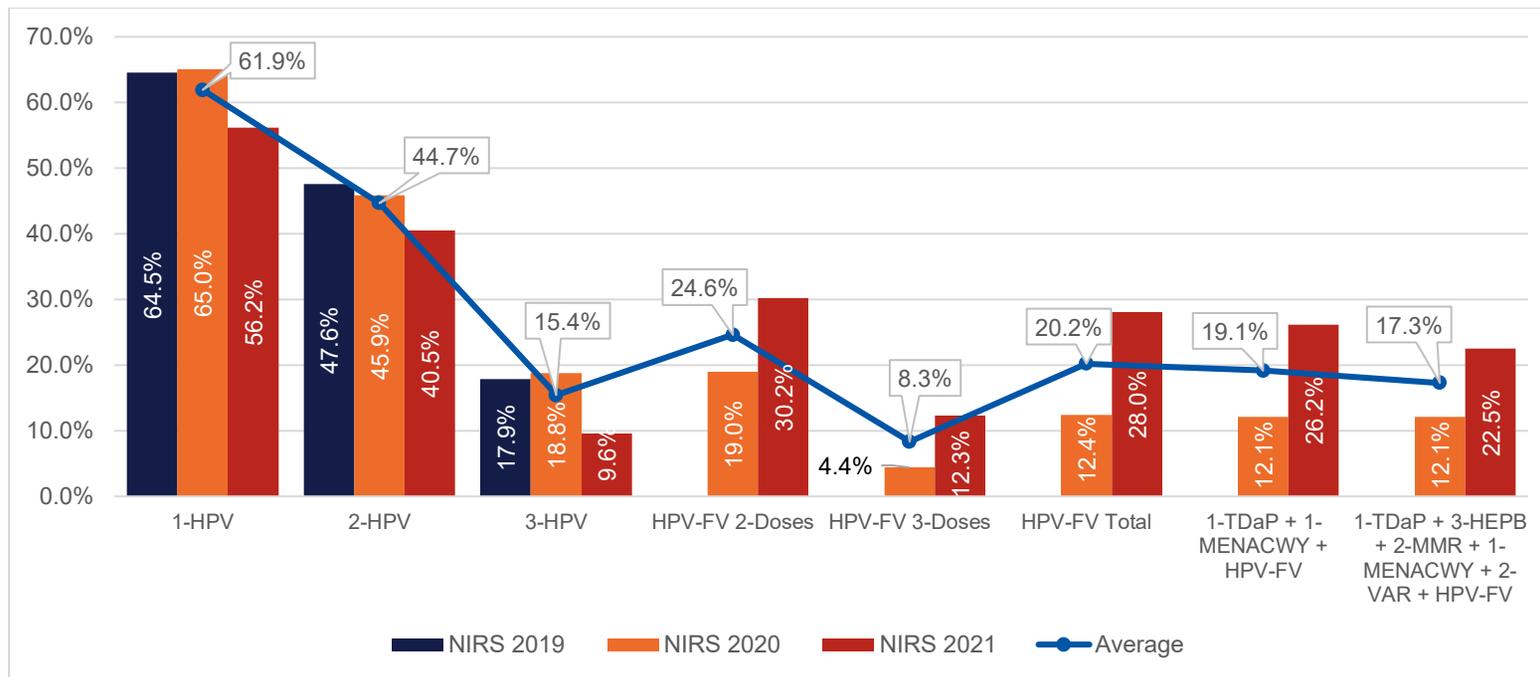


Figure 20: Adolescent Immunization Rates – 13- to 17-year-old Males (2019-2021 NIRS)

The average immunization rates for 13 to 17-year-old males over the 2020 to 2021 NIRS are provided in Table 12. Between the 2019 to 2021 NIRS, immunization rates for all three HPV doses decreased: 1-HPV (64.5% to 56.2%), 2-HPV (47.6% to 40.5%), and 3-HPV (17.9% to 9.6%). However, over the 2020 to 2021 NIRS data, increases in immunization rates were observed for all vaccine groups: HPV-FV 2-Doses (19.0% to 30.2%), HPV-FV 3-Doses (4.4% to 12.3%), HPV-FV Total (12.4% to 28.0%), 1-TDaP + 1-MENACWY + HPV-FV (12.1% to 26.2%), and 1-TDaP + 3-HEPB + 2-MMR + 1-MENACWY + 2-VAR + HPV-FV (12.1% to 22.5%). Full details of reporting rates can be found in Appendix B, Table 29.

Table 12: Average Immunization Rates for 13- to 17-year-old Males (2020-2021 NIRS)

| Immunization Group | Average Immunization Rate |
|---|---------------------------|
| HPV-FV 2-Doses: | 24.6% |
| HPV-FV 3-Doses: | 8.3% |
| HPV-FV Total: | 20.2% |
| 1-TDaP + 1-MENACWY + 1-HPV-FV: | 19.1% |
| 1-TDaP + 3-HEPB + 2-MMR + 1-MENACWY + 2-VAR + HPV-FV: | 17.3% |

Adult Immunization Findings

This section describes findings for NIRS immunization rates among adults. In Figure 21, reporting rates among adults 18 years and older for each quarter of the reporting period for the 2019, 2020 and 2021 NIRS data. Between 2019 and 2021, the reporting rate increased by 12.1%.

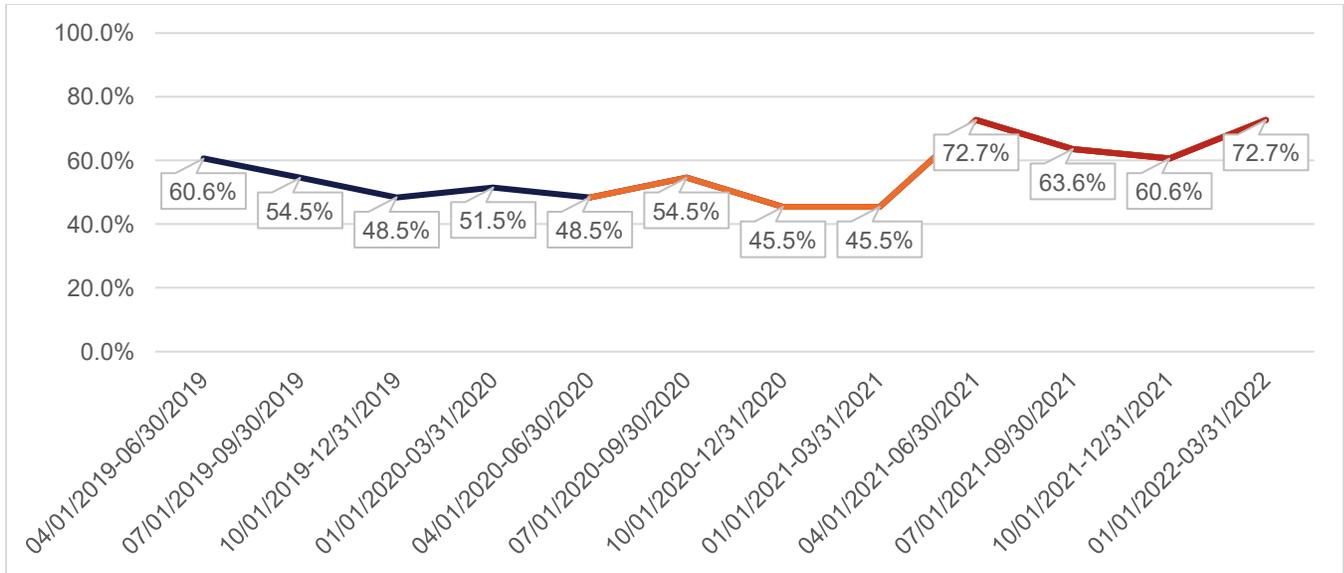


Figure 21: Reporting Rates for Adults per Quarter (2019 to 2021 NIRS)

Immunizations for certain diseases are recommended throughout adult life as immunity from some childhood vaccines reduces over time. In addition, some vaccines are recommended if they were not received in childhood (e.g., HPV) or due to age or other risk factors (e.g., Zostervax/Shingrix, Pneumovax). Similar to childhood immunizations, adults may follow a schedule based on age to determine what vaccines they should receive.

Note that there are other vaccines and boosters recommended for adults by the CDC that are not measured in the NIRS data and therefore will not be covered in this report. Similarly, the influenza vaccine is recommended on an annual basis, but will be addressed in a separate “flu” section of this report. Finally, the NIRS categories do not align perfectly with the recommended vaccine age categories for the CDC. Table 13 displays the NIRS immunization key and how it corresponds to the CDC recommended vaccination schedule.

Table 13: NIRS Adult Immunization Key

| Vaccine | CDC Recommended Schedule | NIRS Measure |
|--|---|--|
| Tetanus, Diphtheria, and Pertussis (Tdap) or Tetanus and Diphtheria (TD) | 1 dose Tdap + 1 booster (Tdap or TD) every 10 years | TD Booster <10 years (19+ years) Tdap Booster <10 years (19+ years) Tdap + Tdap/TD Booster <10 Years (19-59 years) Pneumovax (Ever) (19+ years) |
| Human papillomavirus (HPV) | 2-3 doses for males (19-21 years) and females (19-26 years) | HPV 1 (males, 19-21 years) HPV 1 (females (19-26 years) HPV 2 (males, 19-21 years) HPV 2 (females (19-26 years) HPV 3 (males, 19-21 years) HPV 3 (females (19-26 years) |
| Zoster recombinant (Was Zostavax, now Shingrix) | 2 doses for ages 50+ | Zostavax (60+ years) |
| Pneumococcal (Pneumovax) | 1 dose for those 65+ or at high risk | Pneumovax (65+ Years) |

In addition to individual recommendations, the NIRS data also includes categories for those who have received all recommended vaccines for their age group:

- Up to Date: All adults 19+ who have received all recommended vaccines for their age groups
- Tdap + Tdap/TD booster <10 years + Zostavax: All adults 60-64 years
- Tdap + Tdap/TD booster <10 years + Zostavax + Pneumovax: All adults 65+ years

Total Population Up to Date on Immunizations

In Figure 22, the aggregate immunization rate for each program year for all adults (19+) who are “up to date” on their vaccinations, meaning they have received all recommended vaccines for their age group. Based on the 2019 to 2021 NIRS data, the immunization rate among adults increased by 26.7%. The average immunization rate across all program years was 35.2%. In the 2019 NIRS, the rate was 32.2%, decreasing to 29.4% in the 2020 NIRS, before increasing to 43.9% in the NIRS data. Full details of reporting rates can be found in Appendix B, Table 30.

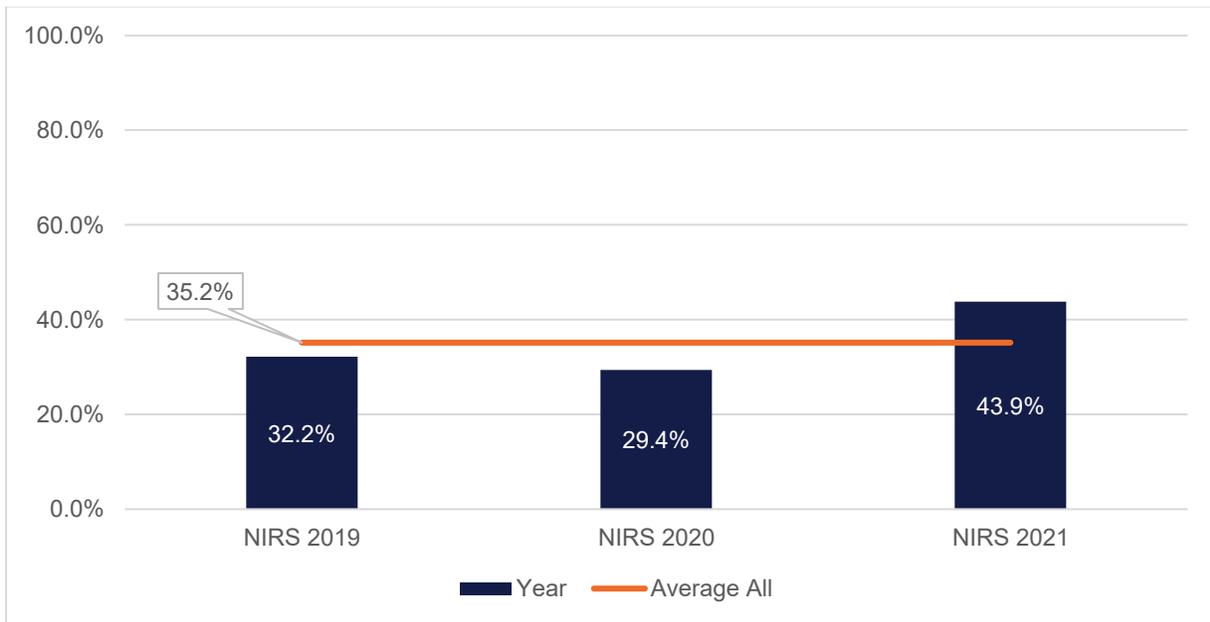


Figure 22: Adult Immunization Rate for Ages 19+ by Up-to-Date Vaccination Status (2019-2021 NIRS)

All Adults (19+) by Vaccine Group

Across the 2019, 2020, and 2021 NIRS data, the average immunization rates for each vaccine group were as follows:

- TD Booster: 25.6%
- Tdap Booster: 41.1%
- Pneumovax: 52.0%

For individual vaccines recommended for the total adult population, there were no increases seen in immunization rates over the reporting period (Figure 23). Decreases were observed for the TD booster (28.2% to 23.1%), Tdap booster (42.1% to 40.4%), and Pneumovax (57.3% to 44.1%).

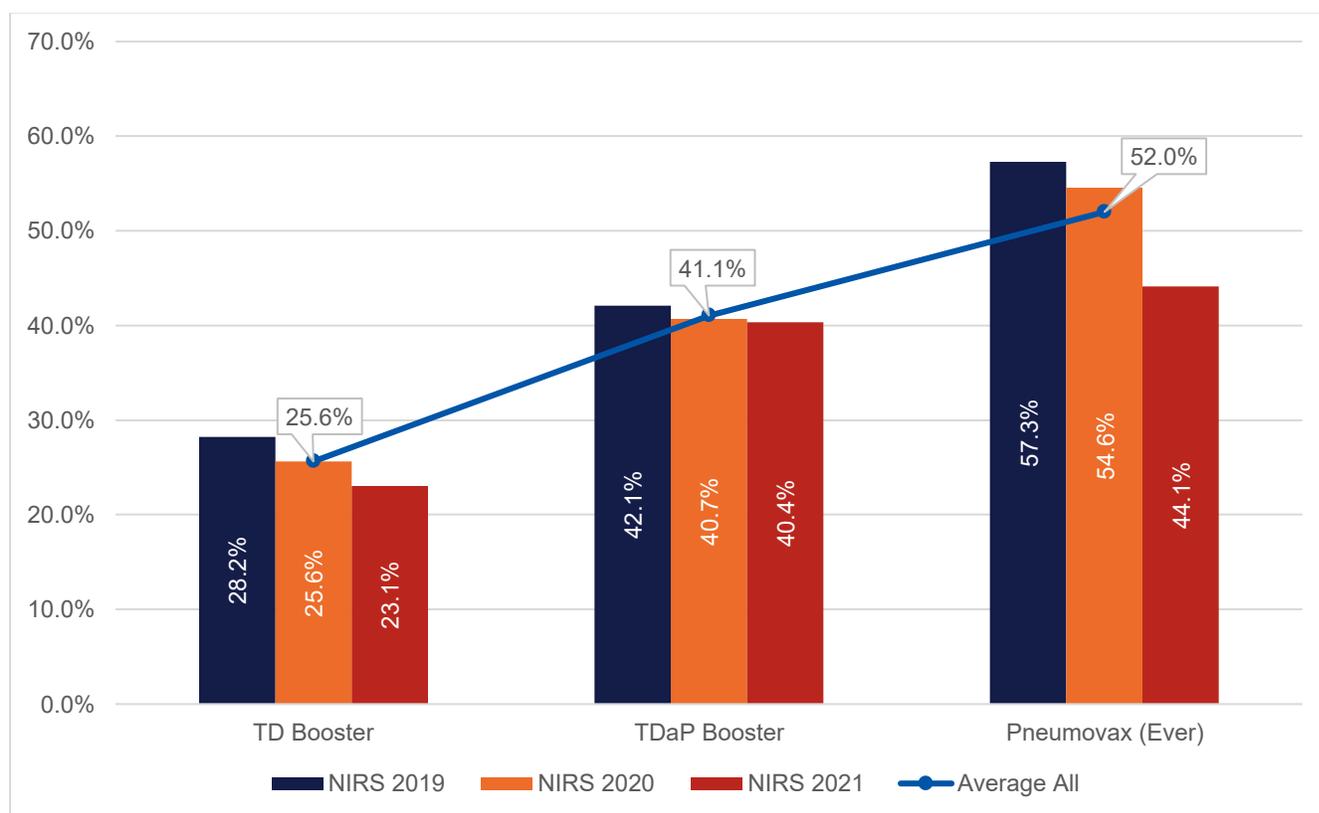


Figure 23: Adult Immunization Rate for Ages 19+ by Vaccine Type (2019-2021 NIRS)

HPV Vaccine (19-26 Years)

The HPV vaccine is administered as a 3-dose series, recommended for males between the ages of 19 and 21 and females between the ages of 19 and 26 (Figure 24). Across the 2019, 2020, and 2021 NIRS data, the average rates for HPV vaccination for the female and male population between 19-26 years old were:

- HPV Dose 1 (Female): 35.6%
- HPV Dose 1 (Male): 40.7%
- HPV Dose 2 (Female): 28.2%
- HPV Dose 2 (Male): 29.3%
- HPV Dose 3 (Female): 21.5%
- HPV Dose 3 (Male): 19.9%

In Figure 24, immunization rates for each group by dose number. For males, the immunization rate for each dose declined over the reporting period: 1-HPV (44.9% to 37.7%), 2-HPV (31.2% to 27.1%), and 3-HPV (23.2% to 16.9%). Similarly, for females, the immunization rate also declined for each dose from the 2019 NIRS to the 2021 NIRS: 1-HPV (36.0% to 32.9%), 2-HPV (28.6% to 26.6%), and 3-HPV (24.1% to 18.7%).

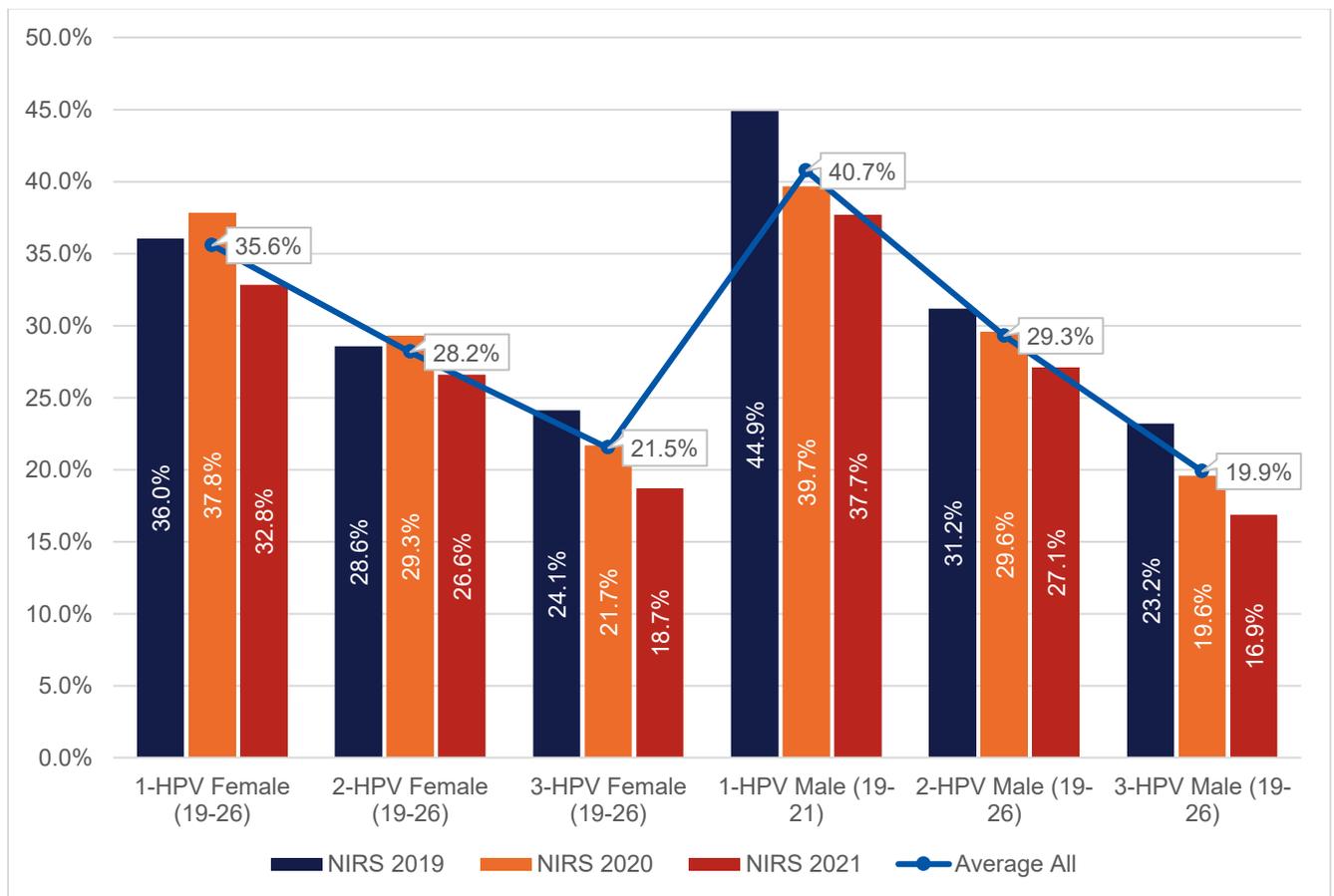


Figure 24: Adult HPV Immunization Rate by Gender/Age and Dose (2019-2021 NIRS)

Immunization Rates (19-64 Years)

The 19–64-year age group is broken down further into three vaccine categories: Tdap + Tdap/TD booster received <10 years ago (19-59 years), Zostavax (60+ years), Tdap + Tdap/TD booster <10 years + Zostavax (60-64 years). Across the 2019, 2020, and 2021 NIRS data, the average rates for HPV vaccination for the female and male population between 19-26 years old were:

- Tdap + Tdap/TD booster: 39.9%
- Zostavax: 23.2%
- Tdap + Tdap/TD booster + Zostavax: 15.2%

In this age group, the immunization rate for individuals between 60-64 years who had received Tdap + Tdap/TD booster + Zostavax increased from the 2019 NIRS rate (15.7%) to the NIRS 2021 rate (16.5%) (Figure 25).

There was a decrease in immunization rates observed for the other groups—the 2019 NIRS and the 2021 NIRS: Tdap + Tdap/TD booster (42.3% to 41.2%) and Zostavax (24.7% to 22.1%) (Figure 25).

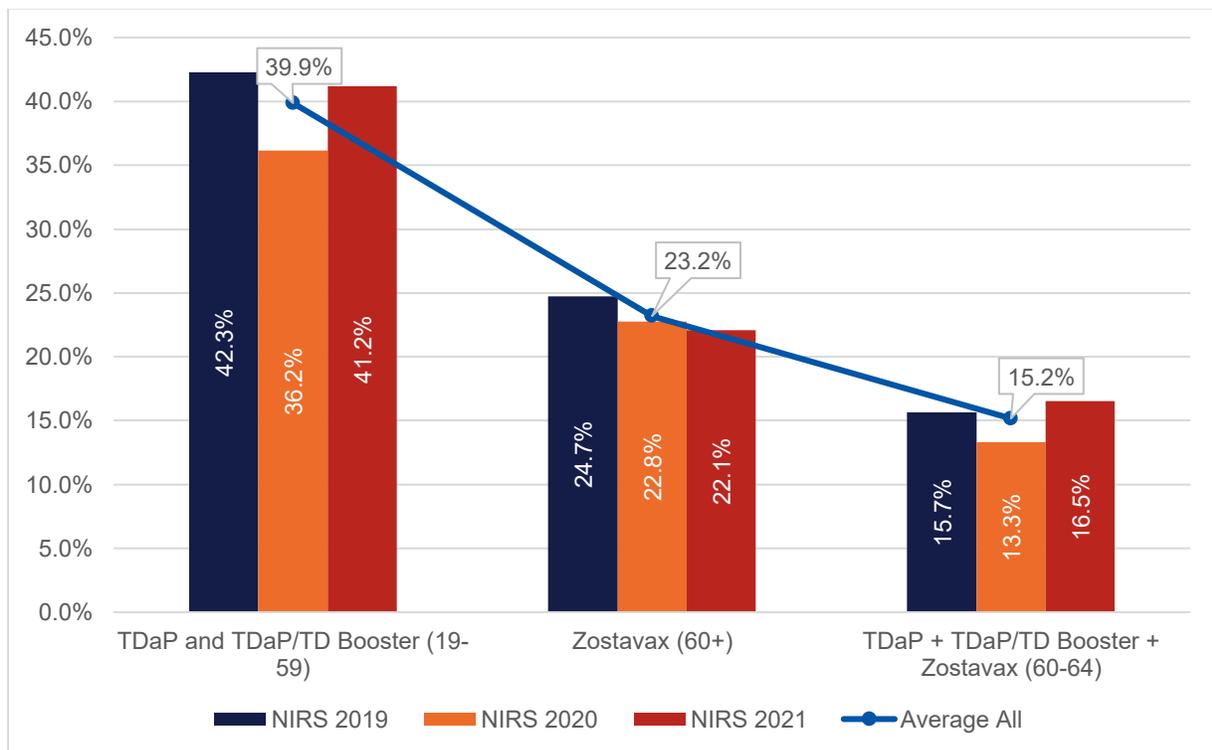


Figure 25: Adult Immunization Rate for Ages 19-64 by Vaccine Type (2019 to 2021 NIRS)

Adults Ages 65 and Older

In Figure 26, the 65 years old and up age group broken down by individual recommended vaccine type (TD and Pneumovax) as well as by those who have received all recommended vaccines for their age (Tdap + Tdap/TD booster + Zostavax + Pneumovax). Across the 2019, 2020, and 2021 NIRS data, the average immunization rates for each vaccine group were as follows:

- TD booster: 41.9%
- Pneumovax: 39.4%
- Tdap + Tdap/TD booster + Zostavax + Pneumovax: 21.9%

Over the 2019 NIRS to the 2021 NIRS reporting period, declines were observed for all vaccine groups: TD (47.1% to 38.0%), Pneumovax (43.4% to 39.1%), and Tdap + Tdap/TD booster + Zostavax + Pneumovax (26.4% to 21.1%).

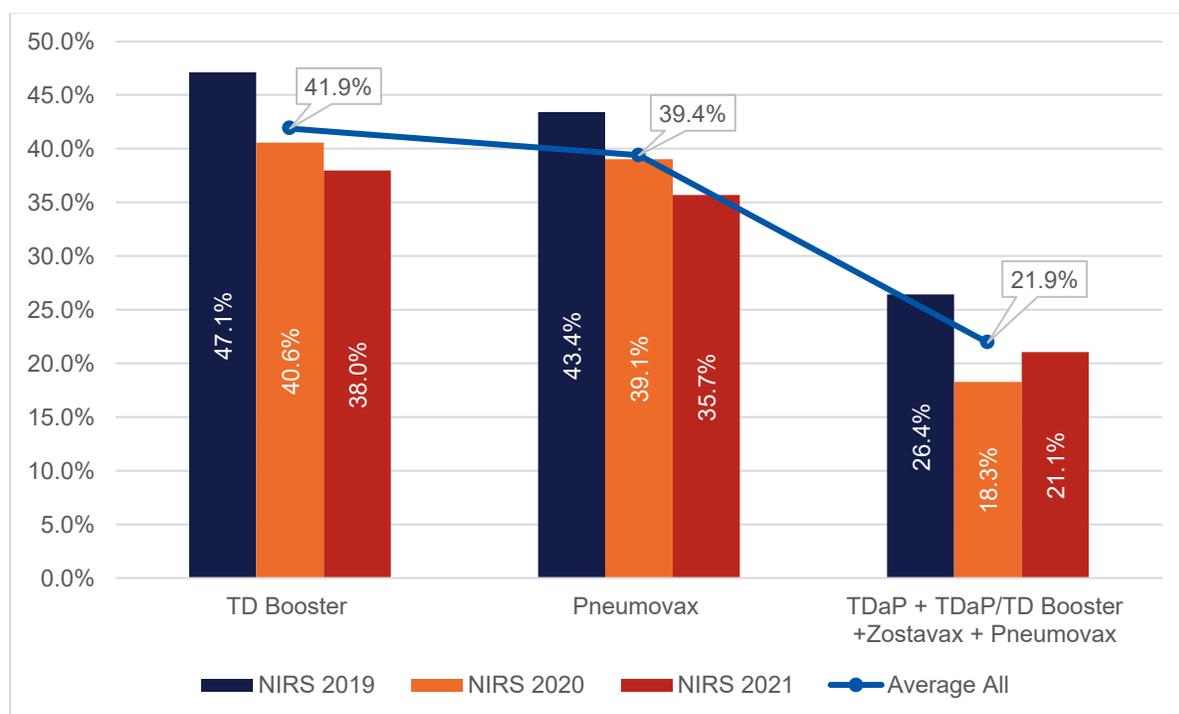


Figure 26: Adult Immunization Rate for Ages 65+ by Vaccine Type (2019 to 2021 NIRS)

Flu Immunization Findings

Flu data is reported to NIRS only during the two quarters that comprise flu season in the United States each year (October 1-December 31 and January 1-March 31). For the 2021 NIRS, only the first quarter of data was received (October 1, 2021-December 31, 2021). Figure 27 displays the aggregate flu immunization rate for each program year for the total population, ages 10 months and up. Based on the 2019 to 2021 NIRS data, the flu immunization rate, relative to the first program year (NIRS 2019) decreased by 12.4%. The average immunization rate across all program years was 17.0%. In the 2019 NIRS, the rate was 20.1%, decreasing to 13.0% in the 2020 NIRS, before increasing to 17.9% in the 2021 NIRS data. Full details of reporting rates can be found in Appendix B, Table 31.

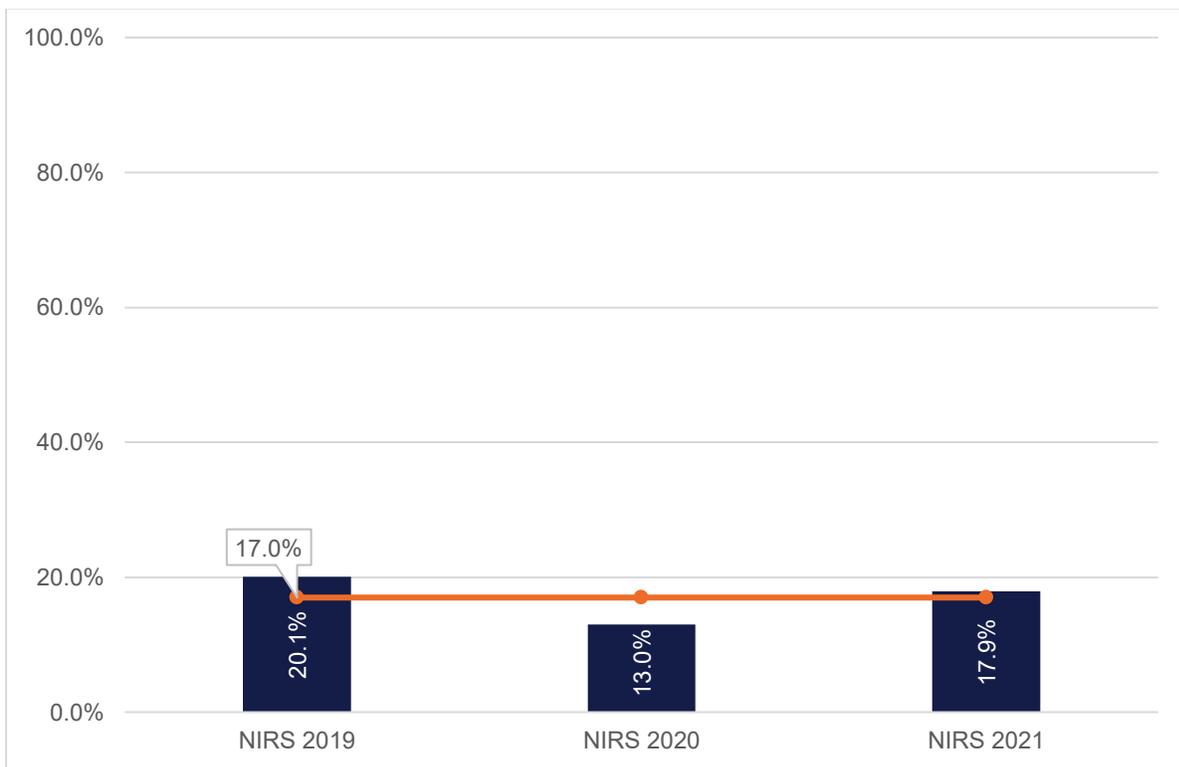


Figure 27: Aggregate Influenza Immunization Rates per Year (October 1, 2021-December 31, 2021)

1-Flu Immunization Rates

Figure 28 displays the average immunization rates per program year for 1-FLU by age group (10-23 months and 2-4 years). The average immunization rates for each group were:

- 10-23 months: 23.9%
- 2-4 years: 18.8%

There was an increase in the immunization rate between the 2019 NIRS and 2021 NIRS for 2–4-year-olds (17.0% to 24.6%). In contrast, the immunization rate for 10–23-month-olds decreased between the 2019 NIRS (29.9%) and the 2021 NIRS (22.5%).

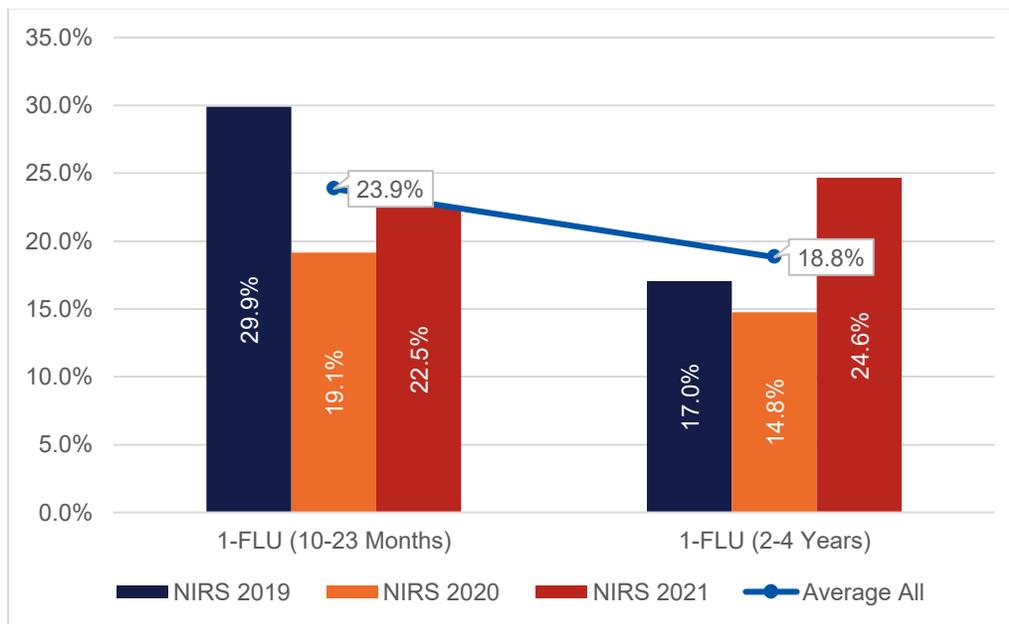


Figure 28: 1-FLU Immunizations per Year by Age Group

Flu – Children

In Figure 29, the average flu immunizations for children per year is broken down into the following age groups: 10-23 months, 2-4 years, and 5-17 years. Across the 2019, 2020, and 2021 NIRS data, the average immunization rates for each age group were as follows:

- 10-23 months: 10.7%
- 2-4 years: 6.4%
- 5-17 years: 19.4%

Across the reporting period from the NIRS 2019 to the NIRS 2021, immunization rates declined for both of the youngest age groups: 10-23 months (15.0% to 8.0%) and 2-4 years (8.5% to 2.4%). For 5-17 years, the immunization rate increased from 21.4% (2019 NIRS) to 22.1% (2021 NIRS).

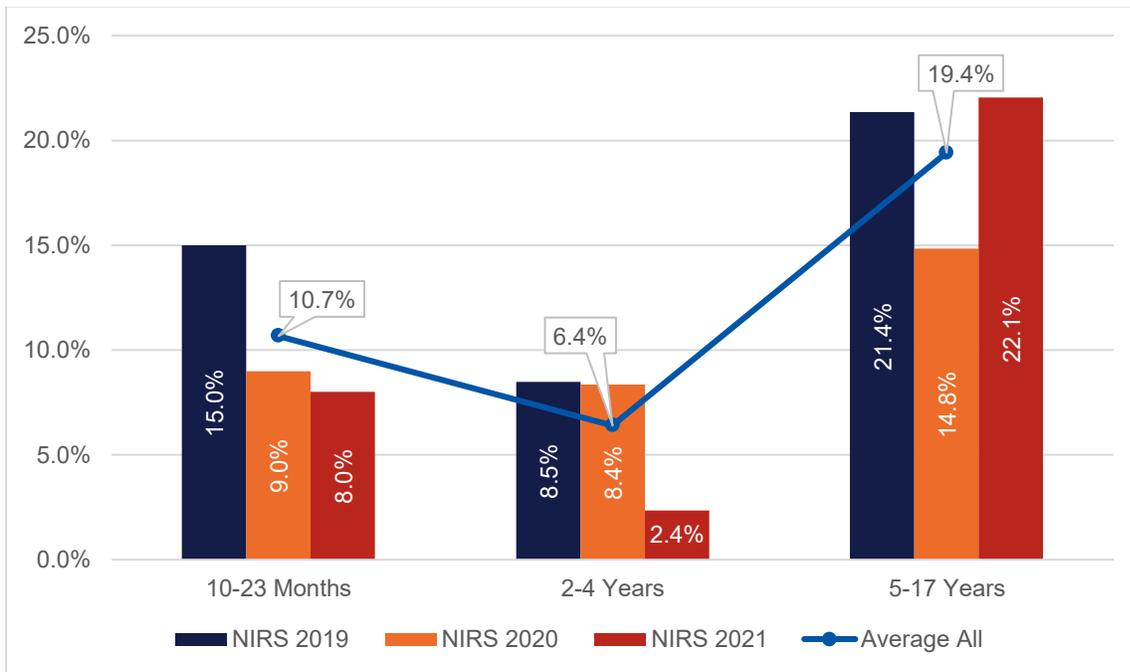


Figure 29: Child Flu Immunizations per Year by Age Group

Flu – Adults

In Figure 30, the average flu immunizations for adults per year is broken down into age groups for 18-49 years, 18-49 years (high risk), 50-64 years, and 65+ years. Across the 2019, 2020, and 2021 NIRS data, the average immunization rates were:

- 18-49 years: 13.6%
- 18-49 years (high risk): 18.9%
- 50-64 years: 22.1%
- 65+ years: 27.8%

Over the reporting period, only the immunization rate of the 65+ age group increased, from 28.7% (2019 NIRS) to 32.7% (2021 NIRS). For those 18-49 years, the immunization rate decreased between the 2019 NIRS (16.9%) and the 2021 NIRS (15.4%). For 18-49 high risk, the immunization rate decreased between the 2019 NIRS (24.6%) and the 2021 NIRS (20.8%). A decrease was also observed for the 50-64 years age group: from 25.8% (2019 NIRS) to 24.0% (2021 NIRS).

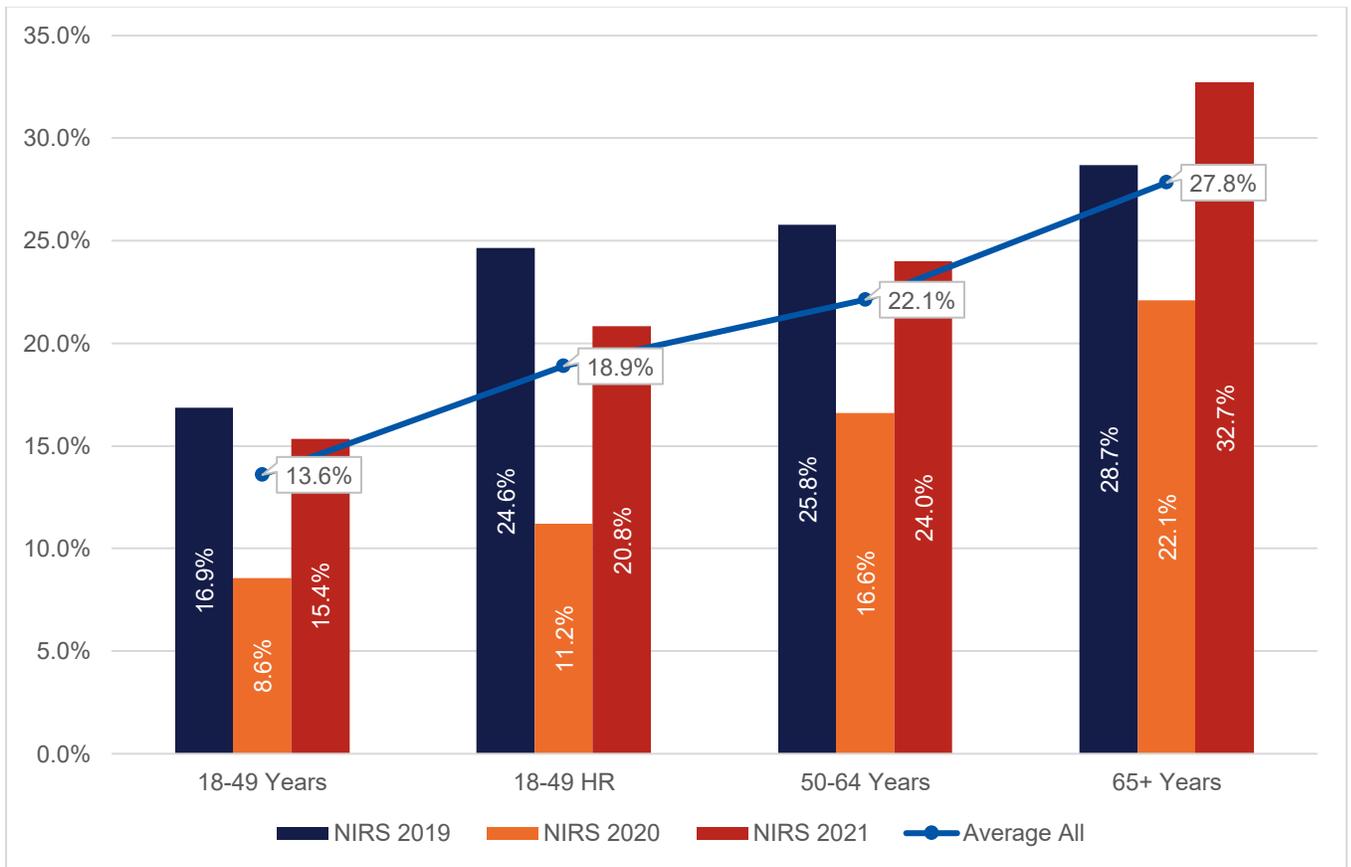


Figure 30: Adult Flu Immunization Rates per Year by Age Group

Government Performance Rating Act Immunization Findings

The GPRA data findings are organized to first, provide an overview of reporting rates across the 2016 to 2021 GPRA reporting periods and second, provide findings organized by the following GPRA immunization measures: Influenza Vaccination (6 months to 17 years old), Influenza Vaccination (18+ years old), Pneumococcal Vaccination (65+ years),⁶ Adult Composite Immunization,⁷ and Childhood Immunizations. Table 14 displays rates for GPRA immunization measures over the entire reporting period from 2016 to 2021. GPRA data is presented as an average rate per year, in comparison to the National Target rate, as well as the percentage change between years and total year over year change between 2016-2021.

It is important to note that the 2016-2021 GPRA data is limited to grantee GPRA data with denominators greater than 20 and excludes grantee GPRA measures equal to 0%. These data were excluded because small values can greatly shift GPRA measure percentages when additional individuals are added or removed. Data where grantees' GPRA percentages equaled 0% present notable effects on aggregate means. Moreover, GPRA data at 0% reflect services that were not provided, for which patients did not qualify, or that were provided but not reported. Removing these measures increased the reliability of the GPRA data analysis.

Government Performance Rating Act Reporting

In Table 14, an overview of grantees who reported through the GPRA data system from 2016 to 2021 is provided. In addition, the average grantee reporting rate across all program years is presented. Immunization measures include child and adult influenza immunizations, child immunization rates (6 months–17 years), adult immunization rates, and pneumococcal vaccinations (65+ years). Reporting rates per year were calculated as a simple binary (Reported: Yes/No) and average reporting rates were calculated across all years. A total of 10 grantees achieved a 100% reporting rate, submitting GPRA data for each year of the reporting period between 2016 and 2021:

1. Bakersfield American Indian Health Project
2. Fresno American Indian Health Project
3. Indian Health Center of Santa Clara Valley
4. Native American Health Center -Oakland
5. Native American Lifelines of Baltimore and Boston*
6. San Diego American Indian Health Center

⁷ New Measure replaces Pneumococcal Vaccine 65+ as of FY 2018

- 
7. South Dakota Urban Indian Health, Inc
 8. Tucson Indian Center
 9. United American Indian Involvement – Los Angeles
 10. Texas Native Health – Dallas

It is important to note that Native American Lifelines of Baltimore and Boston was a member of the cohort for Grant Program Year 2020 (April 1, 2020 – March 31, 2021) and Grant Program Year 2021 (April 1, 2021 – March 31, 2022).

Table 14: Summary of Grantees who use the GPRA system to report immunization data (2016 to 2021)

| Grantee Name | City | GPRA 2016 | GPRA 2017 | GPRA 2018 | GPRA 2019 | GPRA 2020 | GPRA 2021 | Grantee Reporting Rate |
|--|------------------|-----------|-----------|-----------|-----------|-----------|-----------|------------------------|
| All Nations Health Center | Missoula | • | • | X | • | • | X | 66.7% |
| American Indian Health & Family Services | Detroit | • | • | X | • | • | • | 83.3% |
| American Indian Health & Services | Santa Barbara | • | X | • | • | • | • | 83.3% |
| American Indian Health Service of Chicago, Inc. | Chicago | • | • | X | X | X | X | 33.3% |
| Bakersfield American Indian Health Project | Bakersfield | • | • | • | • | • | • | 100.0% |
| Denver Indian Health & Family Services, Inc. | Denver | • | • | X | • | • | X | 66.7% |
| First Nations Community Healthsource | Albuquerque | • | • | • | X | • | X | 66.7% |
| Fresno American Indian Health Project | Fresno | • | • | • | • | • | • | 100.0% |
| Gerald L. Ignace Indian Health Center | Milwaukee | • | • | X | X | X | X | 33.3% |
| Helena Indian Alliance - Leo Pocha Clinic | Helena | • | • | X | • | • | • | 83.3% |
| Hunter Health (Wichita) | Wichita | • | • | • | X | • | • | 83.3% |
| Indian Family Health Clinic of Great Falls, Inc. | Great Falls | • | • | X | • | • | • | 83.3% |
| Indian Health Board of Minneapolis, Inc. | Minneapolis | • | • | X | X | X | X | 33.3% |
| Indian Health Center of Santa Clara Valley | San Jose | • | • | • | • | • | • | 100.0% |
| Native American Connections (Phoenix)** | Phoenix | | | X | X | • | X | 25.0% |
| Billings Urban Indian Health and Wellness Center ** | Billings | | | X | X | X | X | 0.0% |
| Native American Health Center | Oakland | • | • | • | • | • | • | 100.0% |
| Native American Lifelines of Baltimore and Boston** | Baltimore | | | • | • | • | • | 100.0% |
| Native American Rehabilitation Association the Northwest, Inc. | Portland | • | • | • | X | X | X | 50.0% |
| Native Americans for Community Action, Inc. | Flagstaff | • | • | X | • | • | • | 83.3% |
| Native Health | Phoenix | • | • | X | • | • | X | 66.7% |
| Nebraska Urban Indian Health Coalition, Inc. | Omaha | • | • | X | X | X | X | 33.3% |
| Nevada Urban Indians Inc. | Reno | • | • | X | • | • | X | 66.7% |
| New York Indian Council Inc.** | Long Island City | | | X | X | • | • | 50.0% |
| Sacramento Native American Health Center | Sacramento | • | • | X | X | • | • | 66.7% |

| Grantee Name | City | GPR 2016 | GPR 2017 | GPR 2018 | GPR 2019 | GPR 2020 | GPR 2021 | Grantee Reporting Rate |
|--|----------------|-------------|-------------|-------------|-------------|-------------|-------------|------------------------------|
| San Diego American Indian Health Center | San Diego | • | • | • | • | • | • | 100.0% |
| Seattle Indian Health Board | Seattle | • | • | X | X | • | • | 66.7% |
| South Dakota Urban Indian Health, Inc. | Sioux Falls | • | • | • | • | • | • | 100.0% |
| The NATIVE Project | Spokane | • | • | • | X | • | X | 66.7% |
| Tucson Indian Center | Tucson | • | • | • | • | • | • | 100.0% |
| United American Indian Involvement, Inc. | Los Angeles | • | • | • | • | • | • | 100.0% |
| Urban Indian Center of Salt Lake | Salt Lake City | • | • | X | X | • | X | 50.0% |
| Texas Native Health | Dallas | • | • | • | • | • | • | 100.0% |
| Total Grantees Reported | | 29 | 28 | 16 | 20 | 27 | 19 | |
| Reporting Rate | | 100% | 96.5% | 48.5% | 60.6% | 81.8% | 57.6% | |
| Total Number of Grantees in Cohort | | 29 | 29 | 33 | 33 | 33 | 33 | |
| <ul style="list-style-type: none"> • Reported GPR data X Did not report GPR data **Empty cells denotes that the grantee was not part of the cohort in that year | | | | | | | | |

Table 15 to Table 17 display the 2016-2021 GPRA immunization measure reporting rates by year for each grantee. The majority of grantees reported on all GPRA immunization measures, however, a few reported for none or only some of the measures.

Grantees and the measures they did not report on are listed by year below:

- American Indian Health & Family Services – Influenza (2021 GPRA)
- American Indian Health & Services – All measures (2017 GPRA)
- Fresno American Indian Health Project – Influenza Vaccination for Children Ages 6 mos-17 y (2019 GPRA)
- Indian Health Board of Minneapolis, Inc. – Influenza Vaccination for Children Ages 6 mos-17 y (2019 GPRA)
- Indian Health Center of Santa Clara Valley – Adult Composite Immunization (2018 GPRA)
- New York Indian Council Inc. – Childhood Immunizations (2021 GPRA)
- South Dakota Urban Indian Health, Inc. – Childhood Immunizations (2021 GPRA)
- Tucson Indian Center – Childhood Immunizations (2021 GPRA), All measures for 2018 GPRA, and Influenza (2016 GPRA)

The most common measure that grantees did not report on was childhood immunizations, specifically in the 2021 GPRA year, while all other categories varied. Only one grantee (Tucson Indian Center) did not report for multiple measures over multiple years; other grantees did not report on one or more specific measures within one year. It is important to note that adult composite immunization replaced the pneumococcal immunization in the 2018 GPRA.

Table 15: The 2016 to 2017 GPRA Grantee Reporting Rates by Year

| Grantee Name | GPRA 2016 | | | | | GPRA 2017 | | | | |
|--|---------------|---------------------------------|---------------------------|------------------------------|------------------------|---------------------------------|---------------------------|------------------------------|------------------------|------------------------------------|
| | City | Influenza Vaccination 6mo-17yrs | Influenza Vaccination 18+ | Pneumococcal Vaccination 65+ | Childhood Immunization | Influenza Vaccination 6mo-17yrs | Influenza Vaccination 18+ | Pneumococcal Vaccination 65+ | Childhood Immunization | GPRA Reporting Rate (2016 to 2017) |
| All Nations Health Center | Missoula | • | • | • | • | • | • | • | • | 100% |
| American Indian Health & Family Services | Detroit | • | • | • | • | • | • | • | • | 100% |
| American Indian Health & Services | Santa Barbara | • | • | • | • | X | X | X | X | 50% |
| American Indian Health Service of Chicago, Inc. | Chicago | • | • | • | • | • | • | • | • | 100% |
| Bakersfield American Indian Health Project | Bakersfield | • | • | • | • | • | • | • | • | 100% |
| Denver Indian Health & Family Services, Inc. | Denver | • | • | • | • | • | • | • | • | 100% |
| First Nations Community Healthsource | Albuquerque | • | • | • | • | • | • | • | • | 100% |
| Fresno American Indian Health Project | Fresno | • | • | • | • | • | • | • | • | 100% |
| Gerald L. Ignace Indian Health Center | Milwaukee | • | • | • | • | • | • | • | • | 100% |
| Helena Indian Alliance - Leo Pocha Clinic | Helena | • | • | • | • | • | • | • | • | 100% |
| Hunter Health | Wichita | • | • | • | • | • | • | • | • | 100% |
| Indian Family Health Clinic of Great Falls, Inc. | Great Falls | • | • | • | X | • | • | • | • | 87.5% |
| Indian Health Board of Minneapolis, Inc. | Minneapolis | • | • | • | • | • | • | • | • | 100% |
| Indian Health Center of Santa Clara Valley | San Jose | • | • | • | • | • | • | • | • | 100% |
| Native American Connections | Phoenix | • | • | • | • | • | • | • | • | 100% |
| Billings Urban Indian Health & Wellness Center | Billings | • | • | • | • | • | • | • | • | 100% |
| Native American Health Center | Oakland | • | • | • | • | • | • | • | • | 100% |
| Native American Lifelines of Baltimore and Boston | Baltimore | • | • | • | • | • | • | • | • | 100% |
| Native American Rehabilitation Association the Northwest, Inc. | Portland | • | • | • | • | • | • | • | • | 100% |
| Native Americans for Community Action, Inc. | Flagstaff | • | • | • | • | • | • | • | • | 100% |
| Native Health | Phoenix | • | • | • | • | • | • | • | • | 100% |
| Nebraska Urban Indian Health Coalition, Inc. | Omaha | • | • | • | • | • | • | • | • | 100% |

| Grantee Name | GPRA 2016 | | | | | GPRA 2017 | | | | |
|--|------------------|---------------------------------|---------------------------|------------------------------|------------------------|---------------------------------|---------------------------|------------------------------|------------------------|------------------------------------|
| | City | Influenza Vaccination 6mo-17yrs | Influenza Vaccination 18+ | Pneumococcal Vaccination 65+ | Childhood Immunization | Influenza Vaccination 6mo-17yrs | Influenza Vaccination 18+ | Pneumococcal Vaccination 65+ | Childhood Immunization | GPRA Reporting Rate (2016 to 2017) |
| Nevada Urban Indians Inc. | Reno | • | • | • | • | • | • | • | • | 100% |
| New York Indian Council Inc. | Long Island City | • | • | • | • | • | • | • | • | 100% |
| Sacramento Native American Health Center | Sacramento | • | • | • | • | • | • | • | • | 100% |
| San Diego American Indian Health Center | San Diego | • | • | • | • | • | • | • | • | 100% |
| Seattle Indian Health Board | Seattle | • | • | • | • | • | • | • | • | 100% |
| South Dakota Urban Indian Health, Inc. | Sioux Falls | • | • | • | • | • | • | • | • | 100% |
| The NATIVE Project | Spokane | • | • | • | • | • | • | • | • | 100% |
| Tucson Indian Center | Tucson | • | • | • | X | • | • | • | • | 87.5% |
| United American Indian Involvement, Inc. | Los Angeles | • | • | • | • | • | • | • | • | 100% |
| Urban Indian Center of Salt Lake | Salt Lake City | • | • | • | • | • | • | • | • | 100% |
| Texas Native Health | Dallas | • | • | • | • | • | • | • | • | 100% |
| •- Reported GPRA data X- Did not report GPRA data | | | | | | | | | | |

Table 16: The 2018 to 2019 GPRA Grantee Reporting Rates by Year

| Grantee Name | City | GPRA 2018 | | | | GPRA 2019 | | | | |
|--|---------------|---------------------------------|---------------------------|------------------------------|------------------------|---------------------------------|---------------------------|------------------------------|------------------------|---------------------------------|
| | | Influenza Vaccination 6mo-17yrs | Influenza Vaccination 18+ | Adult Composite Immunization | Childhood Immunization | Influenza Vaccination 6mo-17yrs | Influenza Vaccination 18+ | Adult Composite Immunization | Childhood Immunization | GPRA Reporting Rate (2018-2019) |
| All Nations Health Center | Missoula | X | X | X | X | • | • | • | • | 50% |
| American Indian Health & Family Services | Detroit | X | X | X | X | • | • | • | • | 50% |
| American Indian Health & Services | Santa Barbara | • | • | • | • | • | • | • | • | 100% |
| American Indian Health Service of Chicago, Inc. | Chicago | X | X | X | X | X | X | X | X | 0% |
| Bakersfield American Indian Health Project | Bakersfield | • | • | • | • | • | • | • | • | 100% |
| Denver Indian Health & Family Services, Inc. | Denver | X | X | X | X | • | • | • | • | 50% |
| First Nations Community Healthsource | Albuquerque | • | • | • | • | X | X | X | X | 50% |
| Fresno American Indian Health Project | Fresno | • | • | • | • | • | • | • | • | 100% |
| Gerald L. Ignace Indian Health Center | Milwaukee | X | X | X | X | X | X | X | X | 0% |
| Helena Indian Alliance - Leo Pocha Clinic | Helena | X | X | X | X | • | • | • | • | 50% |
| Hunter Health | Wichita | • | • | • | • | X | X | X | X | 50% |
| Indian Family Health Clinic of Great Falls, Inc. | Great Falls | X | X | X | X | • | • | • | • | 50% |
| Indian Health Board of Minneapolis, Inc. | Minneapolis | X | X | X | X | X | X | X | X | 0% |
| Indian Health Center of Santa Clara Valley | San Jose | • | • | • | X | • | • | • | • | 87.5% |
| Native American Connections | Phoenix | X | X | X | X | X | X | X | X | 0% |
| Billings Urban Indian Health & Wellness Center | Billings | X | X | X | X | X | X | X | X | 0% |
| Native American Health Center | Oakland | • | • | • | • | • | • | • | • | 100% |
| Native American Lifelines of Baltimore and Boston | Baltimore | • | • | • | • | • | • | • | • | 100% |
| Native American Rehabilitation Association the Northwest, Inc. | Portland | • | • | • | • | X | X | X | X | 50% |
| Native Americans for Community Action, Inc. | Flagstaff | X | X | X | X | • | • | • | • | 100% |
| Native Health | Phoenix | X | X | X | X | • | • | • | • | 100% |

| Grantee Name | City | GPRA 2018 | | | | GPRA 2019 | | | | |
|--|------------------|---------------------------------|---------------------------|------------------------------|------------------------|---------------------------------|---------------------------|------------------------------|------------------------|---------------------------------|
| | | Influenza Vaccination 6mo-17yrs | Influenza Vaccination 18+ | Adult Composite Immunization | Childhood Immunization | Influenza Vaccination 6mo-17yrs | Influenza Vaccination 18+ | Adult Composite Immunization | Childhood Immunization | GPRA Reporting Rate (2018-2019) |
| Nebraska Urban Indian Health Coalition, Inc. | Omaha | X | X | X | X | X | X | X | X | 0% |
| Nevada Urban Indians Inc. | Reno | X | X | X | X | • | • | • | • | 50% |
| New York Indian Council Inc. | Long Island City | X | X | X | X | X | X | X | X | 0% |
| Sacramento Native American Health Center | Sacramento | X | X | X | X | X | X | X | X | 0% |
| San Diego American Indian Health Center | San Diego | • | • | • | • | • | • | • | • | 100% |
| Seattle Indian Health Board | Seattle | X | X | X | X | X | X | X | X | 0% |
| South Dakota Urban Indian Health, Inc. | Sioux Falls | • | • | • | • | • | • | • | • | 100% |
| The NATIVE Project | Spokane | • | • | • | • | X | X | X | X | 50% |
| Tucson Indian Center | Tucson | X | X | X | X | • | • | • | • | 50% |
| United American Indian Involvement, Inc. | Los Angeles | • | • | • | • | • | • | • | • | 100% |
| Urban Indian Center of Salt Lake | Salt Lake City | X | X | X | X | X | X | X | X | 0% |
| Texas Native Health | Dallas | • | • | • | • | • | • | • | • | 100% |
| •- Reported GPRA data X- Did not report GPRA data | | | | | | | | | | |

Table 17: The 2020 to 2021 GPRA Grantee Reporting Rates by Year

| Grantee Name | City | GPRA 2020 | | | | GPRA 2021 | | | | |
|--|---------------|---------------------------------|---------------------------|------------------------------|------------------------|---------------------------------|---------------------------|------------------------------|------------------------|---------------------------------|
| | | Influenza Vaccination 6mo-17yrs | Influenza Vaccination 18+ | Adult Composite Immunization | Childhood Immunization | Influenza Vaccination 6mo-17yrs | Influenza Vaccination 18+ | Adult Composite Immunization | Childhood Immunization | GPRA Reporting Rate (2020-2021) |
| All Nations Health Center | Missoula | • | • | • | • | X | X | X | X | 50% |
| American Indian Health & Family Services | Detroit | • | • | • | • | X | • | • | X | 75% |
| American Indian Health & Services | Santa Barbara | • | • | • | • | • | • | • | • | 100% |
| American Indian Health Service of Chicago, Inc. | Chicago | X | X | X | X | X | X | X | X | 0% |
| Bakersfield American Indian Health Project | Bakersfield | • | • | • | • | • | • | • | • | 100% |
| Denver Indian Health & Family Services, Inc. | Denver | • | • | • | • | X | X | X | X | 50% |
| First Nations Community Healthsource | Albuquerque | • | • | • | • | X | X | X | X | 50% |
| Fresno American Indian Health Project | Fresno | • | • | • | • | • | • | • | • | 100% |
| Gerald L. Ignace Indian Health Center | Milwaukee | X | X | X | X | X | X | X | X | 0% |
| Helena Indian Alliance - Leo Pocha Clinic | Helena | • | • | • | • | • | • | • | • | 100% |
| Hunter Health | Wichita | • | • | • | • | • | • | • | • | 100% |
| Indian Family Health Clinic of Great Falls, Inc. | Great Falls | • | • | • | • | • | • | • | • | 100% |
| Indian Health Board of Minneapolis, Inc. | Minneapolis | X | X | X | X | X | X | X | X | 0% |
| Indian Health Center of Santa Clara Valley | San Jose | • | • | • | • | • | • | • | • | 100% |
| Native American Connections | Phoenix | • | • | • | • | X | X | X | X | 50% |
| Billings Urban Indian Health & Wellness Center | Billings | X | X | X | X | X | X | X | X | 0% |
| Native American Health Center | Oakland | • | • | • | • | • | • | • | • | 100% |
| Native American Lifelines of Baltimore and Boston | Baltimore | • | • | • | • | • | • | • | • | 100% |
| Native American Rehabilitation Association the Northwest, Inc. | Portland | X | X | X | X | X | X | X | X | 0% |
| Native Americans for Community Action, Inc. | Flagstaff | • | • | • | • | • | • | • | • | 100% |
| Native Health | Phoenix | • | • | • | • | X | X | X | X | 50% |
| Nebraska Urban Indian Health Coalition, Inc. | Omaha | X | X | X | X | X | X | X | X | 0% |

| Grantee Name | City | GPRA 2020 | | | | GPRA 2021 | | | | |
|--|------------------|---------------------------------|---------------------------|------------------------------|------------------------|---------------------------------|---------------------------|------------------------------|------------------------|---------------------------------|
| | | Influenza Vaccination 6mo-17yrs | Influenza Vaccination 18+ | Adult Composite Immunization | Childhood Immunization | Influenza Vaccination 6mo-17yrs | Influenza Vaccination 18+ | Adult Composite Immunization | Childhood Immunization | GPRA Reporting Rate (2020-2021) |
| Nevada Urban Indians Inc. | Reno | • | • | • | • | X | X | X | X | 50% |
| New York Indian Council Inc. | Long Island City | • | • | • | • | • | • | • | X | 87.5% |
| Sacramento Native American Health Center | Sacramento | • | • | • | • | • | • | • | • | 100% |
| San Diego American Indian Health Center | San Diego | • | • | • | • | • | • | • | • | 100% |
| Seattle Indian Health Board | Seattle | • | • | • | • | • | • | • | • | 100% |
| South Dakota Urban Indian Health, Inc. | Sioux Falls | • | • | • | • | • | • | • | X | 87.5% |
| The NATIVE Project | Spokane | • | • | • | • | X | X | X | X | 50% |
| Tucson Indian Center | Tucson | • | • | • | • | X | • | • | X | 75% |
| United American Indian Involvement, Inc. | Los Angeles | • | • | • | • | • | • | • | • | 100% |
| Urban Indian Center of Salt Lake | Salt Lake City | • | • | • | • | X | X | X | X | 50% |
| Texas Native Health | Dallas | • | • | • | • | • | • | • | • | 100% |
| •- Reported GPRA data X- Did not report GPRA data | | | | | | | | | | |

Childhood Influenza Immunizations

Across the 2016 to 2021 GPRA data, no reported rate for childhood (months-17 years) influenza immunizations achieved its national target (Figure 31). However, this immunization measure was introduced in 2016, so there was no national target established for that year. The average immunization rates for childhood influenza vaccines per year are as follows:

- 2016 GPRA: 28.4%
- 2017 GPRA: 27.0%
- 2018 GPRA: 16.2%
- 2019 GPRA: 18.7%
- 2020 GPRA: 16.4%
- 2021 GPRA: 10.7%

The immunization rate for across all years decreased by 17.7% between the 2016 and 2021 GPRA (see Appendix B, Table 32).

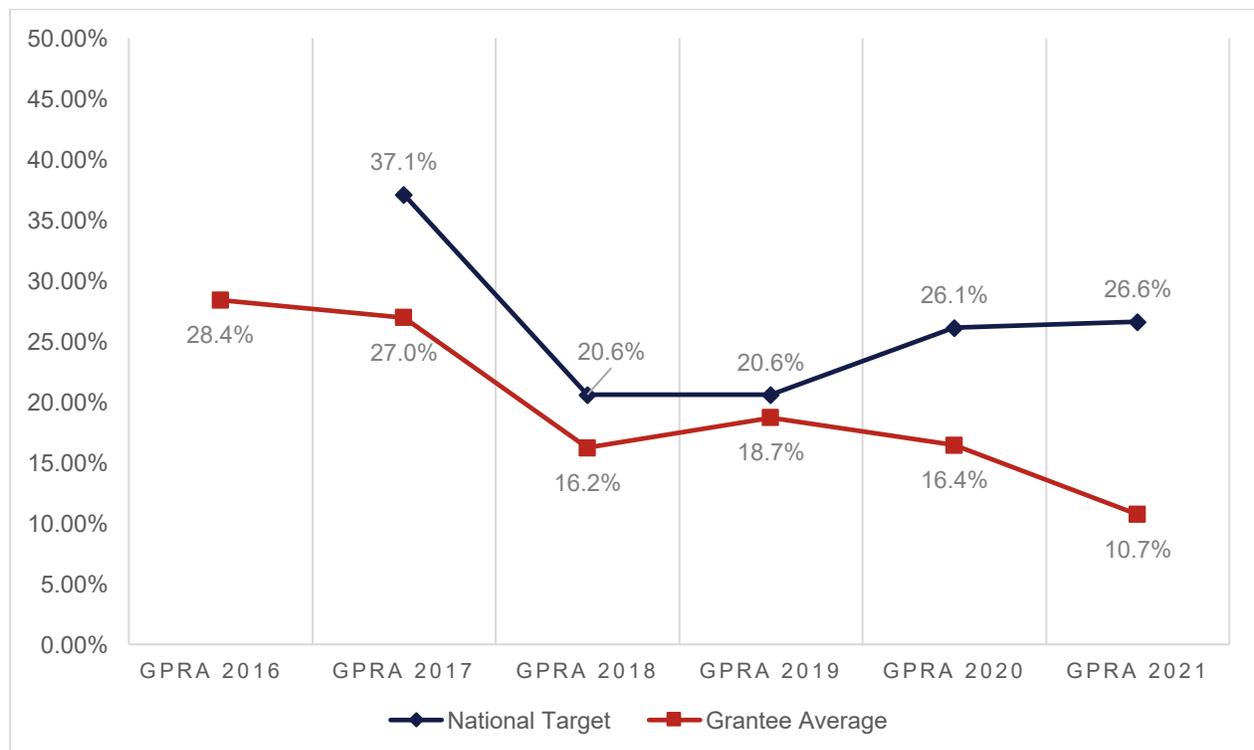


Figure 31: Influenza Immunization Rate per Year Among Children 6 Months-17 Years: Grantee Average vs National Target (2016-2021 GPRA)

Adult Influenza Immunizations

While the National Target for influenza immunization rates among adults was not quite met over the reporting period from 2016 to 2021, the target was nearly reached in two out of the six years: the 2018 GPRA (18.0% grantee rate; 18.8% National Target) and the 2019 GPRA (18.3% grantee rate; 18.8% National Target) (Figure 32). In addition, this immunization measure was introduced in 2016, so there was no national target established for that year. Across all years, the average immunization rate per year was:

- 2016 GPRA: 25.0%
- 2017 GPRA: 25.2%
- 2018 GPRA: 18.0%
- 2019 GPRA: 18.3%
- 2020 GPRA: 16.4%
- 2021 GPRA: 12.8%

Between the 2016 and 2021 GPRA, the influenza immunization rate decreased by 12.2% for adults (see Appendix C, Table 32).

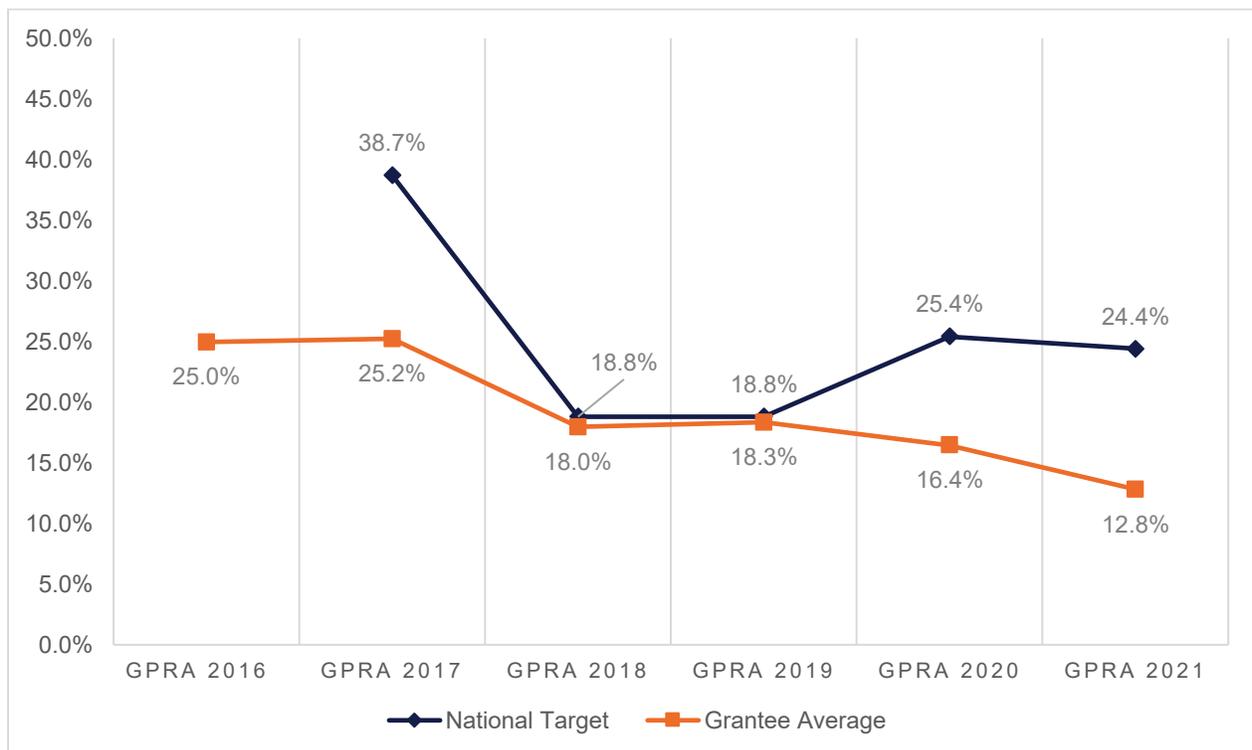


Figure 32: Influenza Immunization Rate per Year among Adults: Grantee Average vs National Target (2016-2021 GPRA)

Childhood Immunizations

Childhood immunization rates were reported over the entire 2016 to 2021 GPRA data. While the National Target for each year was not met during any one year of the reporting period, the immunization rate during the 2018 GPRA was within 5.2% of meeting its target (40.4% grantee rate; 45.6% National Target) (Figure 33). Over the entire reporting period, the average rate of childhood immunizations decreased by 19.0%. On average, the immunization rates per year were:

- 2016 GPRA: 41.2%
- 2017 GPRA: 42.4%
- 2018 GPRA: 40.4%
- 2019 GPRA: 35.3%
- 2020 GPRA: 25.3%
- 2021 GPRA: 22.2%

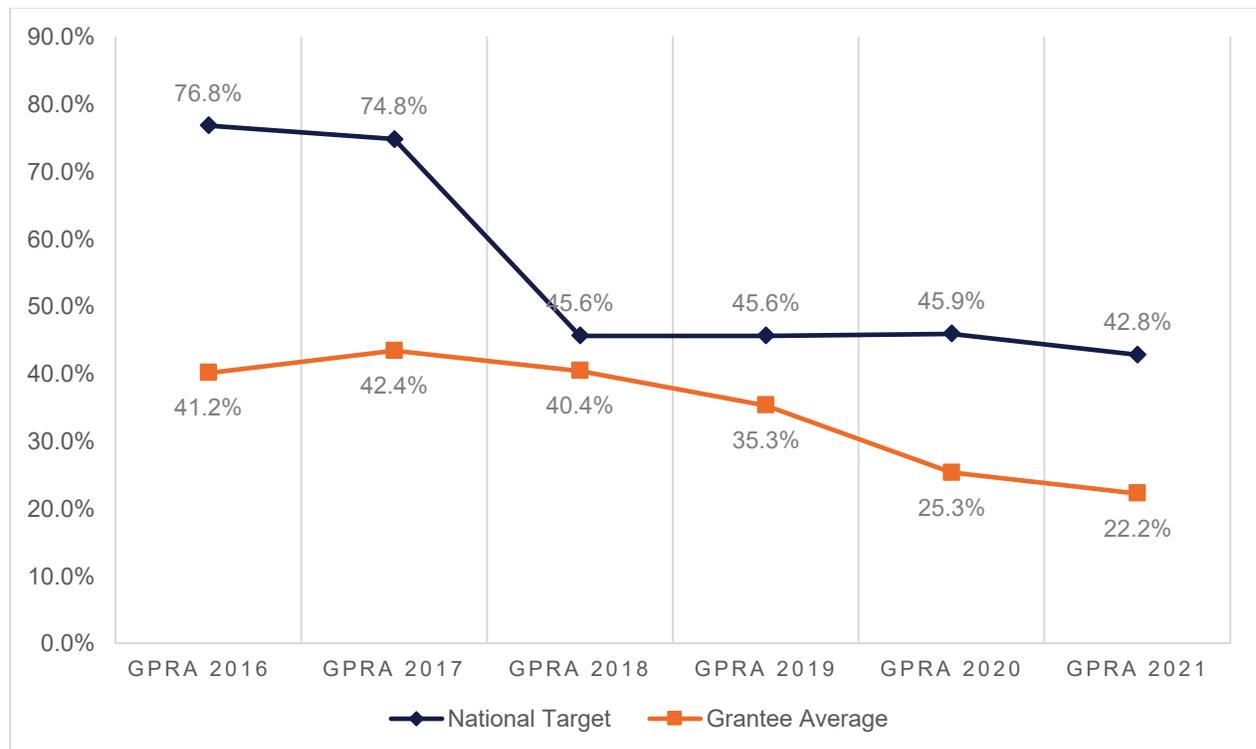


Figure 33: Childhood Immunization Rate per Year: Grantee Average vs National Target (2016-2021 GPRA)

Pneumococcal Immunizations

Data on the immunization rate for pneumococcal vaccination, recommended for adults 65 years and older, was only collected during the 2016 and 2017 GPRA years (Figure 34). Over this period, the rate stayed essentially stable at 56.0% in 2016 GPRA, and 56.9% in 2017 GPRA. It fell short of the National Target in each year (see Appendix B, Table 32).

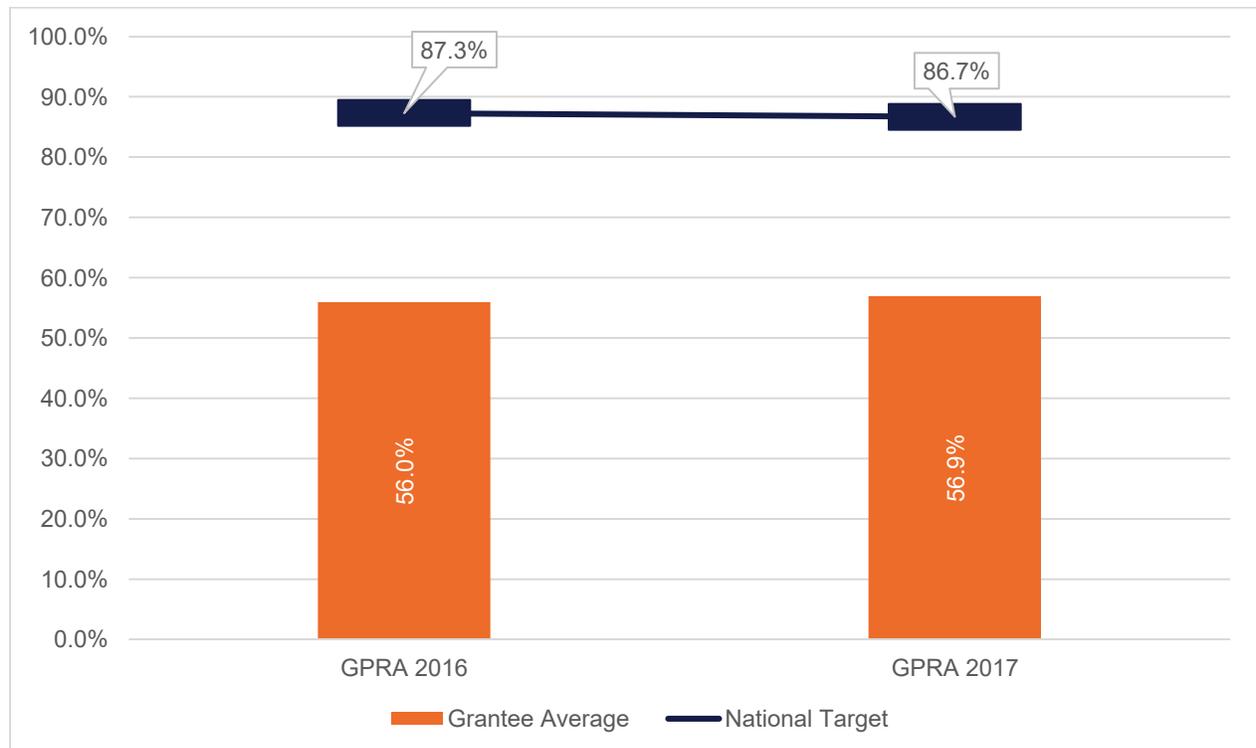


Figure 34: Pneumococcal Immunization Rate among Adults 65+ per Year: Grantee Average vs National Target (2016-2017 GPRA)

Adult Composite Immunizations

Data on adult composite immunizations was collected during the 2018 to 2021 GPRA reporting period and average yearly immunization rates are displayed in Figure 35. Over this period, the immunization rate decreased by 6.8%. The national target was not met for any of the above listed years (see Appendix B, Table 32). However, note that this immunization measure was introduced in 2018 to replace the previous pneumococcal vaccination measure, so there was no national target established for that year. On average, during each year of the reporting rate, the adult composite immunization rates were:

- 2018 GPRA: 32.8%
- 2019 GPRA: 20.9%
- 2020 GPRA: 25.0%
- 2021 GPRA: 26.0%

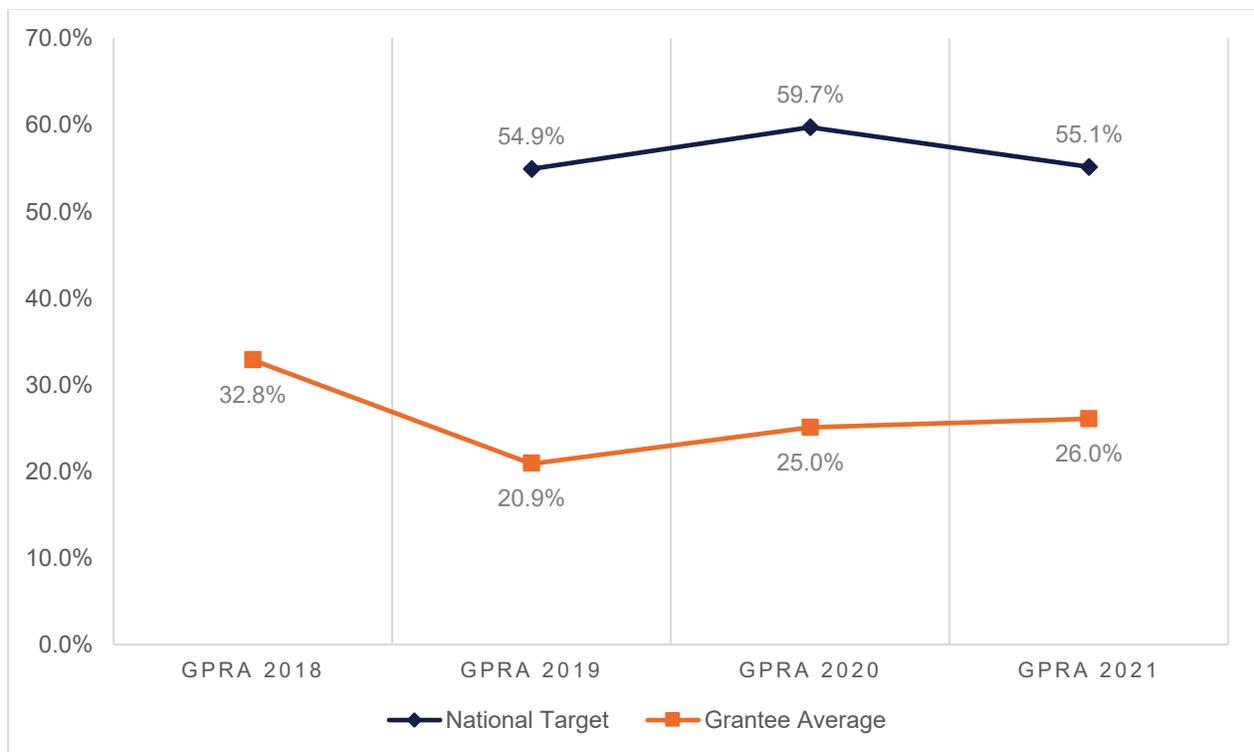


Figure 35: Adult Composite Immunization Rate per Year: Grantee Average vs National Target

4-in-1 Grant Quarterly Report & Unmet Needs Findings

The quarterly report and unmet needs findings are organized to provide an overview of reporting rates across Grant Program Year 2019 to Grant Program Year 2021 as well as the 2019 Unmet Needs, which was a stand-alone reporting form in Grant Program Year 2019, and has since been embedded into the quarterly reports in Grant Program Year 2020 and 2021. This is followed by a summary of qualitative findings related to strengths, challenges, barriers and unmet needs, as well as next steps and future planning of grantees' immunization program.

The frequency of quarterly reports submitted by IHS Areas are displayed as counts in Table 18. Reporting rate counts were evaluated for each quarter of the grant reporting period (2019-2021) and reflect the number of reports received in that quarter. The number of grantees in each IHS Area is also displayed. A 100% reporting rate means that all grantees in that IHS Area submitted quarterly reports for every quarter of that grant year. In Grant Program Year 2019, no grantees achieved a 100% reporting rate, as no quarterly reports were submitted for the first quarter. Similarly, in Grant Program Year 2020, no grantees achieved a 100% reporting rate, although the Bemidji, Billings, Great Plains, Oklahoma City and Portland Areas were all close. In contrast, all grantees achieve a 100% reporting rate in Grant Program Year 2021.

Table 18: Frequency of Quarterly Report Submission by IHS Area

| | Grant Program Year 2019 (April 1, 2019 – March 31, 2020) | | | | | Grant Program Year 2020 (April 1, 2020 – March 31, 2021) | | | | | Grant Program Year 2021 (April 1, 2021 – March 31, 2022) | | | | |
|---------------|---|--------------|-----------------|-----------------|--------------|---|--------------|-----------------|-----------------|--------------|---|--------------|-----------------|-----------------|--------------|
| | April 1, 2019 | July 1, 2019 | October 1, 2019 | January 1, 2020 | Total | April 1, 2020 | July 1, 2020 | October 1, 2020 | January 1, 2021 | Total | April 1, 2019 | July 1, 2019 | October 1, 2019 | January 1, 2020 | Total |
| IHS Area | Quarter 1 | Quarter 2 | Quarter 3 | Quarter 4 | All Quarters | Quarter 1 | Quarter 2 | Quarter 3 | Quarter 4 | All Quarters | Quarter 1 | Quarter 2 | Quarter 3 | Quarter 4 | All Quarters |
| ALBUQUERQUE | 0 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 1 | 4 | 2 | 2 | 2 | 2 | 8 |
| BEMIDJI | 0 | 2 | 2 | 3 | 7 | 2 | 4 | 3 | 4 | 13 | 4 | 4 | 4 | 4 | 16 |
| BILLINGS | 0 | 2 | 2 | 2 | 6 | 3 | 4 | 2 | 4 | 13 | 4 | 4 | 4 | 4 | 16 |
| CALIFORNIA | 0 | 3 | 3 | 1 | 7 | 7 | 6 | 6 | 4 | 23 | 8 | 8 | 8 | 8 | 32 |
| GREAT PLAINS | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 2 | 2 | 7 | 2 | 2 | 2 | 2 | 8 |
| NASHVILLE | 0 | 1 | 0 | 0 | 1 | 2 | 3 | 1 | 0 | 6 | 2 | 2 | 2 | 2 | 8 |
| NAVAJO | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 1 | 1 | 1 | 1 | 4 |
| OKLAHOMA CITY | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 1 | 2 | 7 | 2 | 2 | 2 | 2 | 8 |
| PHOENIX | 0 | 1 | 1 | 1 | 3 | 5 | 5 | 5 | 4 | 19 | 4 | 4 | 4 | 4 | 16 |
| PORTLAND | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 2 | 3 | 11 | 3 | 3 | 3 | 3 | 12 |
| TUCSON | 0 | 0 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 1 | 1 | 4 |
| Total | 0 | 10 | 10 | 8 | 28 | 29 | 30 | 24 | 26 | 109 | 33 | 33 | 33 | 33 | 132 |

During Grant Program Year 2019 (April 1, 2019 – March 31, 2020), grantees reported their immunization unmet needs in a separate reporting form (Table 19). A total of 15 grantees reported at all, with six reporting for every quarter. Two grantees reported for three of the four quarters, while four grantees reported for two quarters. The remaining three grantees reported for only one quarter.

Table 19: 2019 Immunization Unmet Needs Report Reporting Rate

| Grantee | Q1 | Q2 | Q3 | Q4 | Reporting Rate |
|---|----|----|----|----|----------------|
| American Indian Health & Services | • | | | | 25% |
| American Indian Health & Family Services | | • | • | | 50% |
| Bakersfield American Indian Health Project | • | | | | 25% |
| First Nations Community Healthsource | • | • | • | • | 100% |
| Fresno American Indian Health Project | • | • | • | • | 100% |
| Gerald L. Ignace Indian Health Center | • | • | • | | 75% |
| Indian Family Health Clinic of Great Falls, Inc | | | • | • | 50% |
| Native American Health Center | • | | | | 25% |
| The NATIVE Project | • | • | | • | 75% |
| Nebraska Urban Indian Health Coalition, Inc | • | • | • | • | 100% |
| New York Indian Council, Inc | • | • | • | • | 100% |
| San Diego American Indian Health Center | • | | • | | 50% |
| Seattle Indian Health Board | • | • | • | • | 100% |
| Tucson Indian Center | | • | | • | 50% |
| United American Indian Involvement, Inc | • | • | • | • | 100% |
| TOTAL | 12 | 10 | 10 | 9 | |

Strengths

Various strengths in grantees programs emerged over Grant Program Year 2019 (April 1, 2019-March 31, 2020) to Grant Program Year 2021 (April 1, 2021-March 31, 2022). During Grant Program Year 2019, a grantee successfully negotiated an agreement to become a certified Vaccines for Children (VFC) with the staffing capabilities of the Medical Director and practitioner licensed to administer pediatric vaccines. A few grantees partnered with their States' Vaccines for Children program to obtain pediatric vaccines. Other grantees worked to transition and implement new EHR systems. For example, a grantee transitioned from RPMS to the Greenway Health EHR system, providing the necessary training and developing a training protocol for immunization delivery and reporting instructions to their staff. Similarly, another grantee successfully used the eClinicalWorks Electronic Health Record (EHR) software patient reminder and notification systems to determine when children are due for their vaccinations and to update immunization records. During Quarter 4 in Grant Program Year 2019, some grantees reported the impact of COVID-19 with reduced routine patient care and vaccinations.

For immunization services, grantees planned to continue promoting both routine immunizations and COVID-19 vaccines. Although opportunities to vaccinate may have been missed due to concerns about COVID-19 exposure, grantees intended to address this by encouraging patients to make up for any missed vaccines upon returning to the clinic. Some grantees also began introducing the Shingrix vaccine to patients. Accordingly, grantees requested immunization records from new patients and screened the state registry during patient visits to obtain accurate information about which vaccinations may be due. For similar reasons, it was important for grantees to reduce the backlog of data entry into the state's immunization-information system.

Grantees developed new methods of outreach to continue working toward their targeted outcomes on a range of immunization measures. Strong partnerships with public health agencies and other productive collaborations increased uptake rates. Many grantees leveraged telehealth to combat COVID-19 vaccine hesitancy and misinformation, while others offered in-clinic or mobile vaccination units to make immunization services more available to traditionally underserved populations.

With the on-going pandemic throughout Grant Program Year 2021 (April 1, 2021-March 31, 2022), a prominent resource for grantees was their partners from different sectors in the community including local public health departments, school districts, community organizations, tribes, local and state health departments, healthcare providers, medical and nursing programs, and private companies. Such partnerships supported efforts to:

- Reduce vaccine hesitancy
- Increase COVID-19 vaccination rates among adults

- Vaccinate young children (ages 5–11 years) against COVID-19
- Offer COVID-19 boosters and influenza vaccines

Across the 33 grantees, the number of registered vaccine sites for children increased, as COVID-19 vaccinations expanded for this age group. Grantees also worked to encourage families to schedule appointments for previously missed routine immunizations and offer back-to-school childhood immunizations. Grantees expanded service offerings to include influenza vaccinations, routine immunizations, and vaccinations against pneumococcal disease and shingles.

Grantees used social media to help decrease vaccine hesitancy and increase awareness of the need for COVID-19 vaccines, influenza vaccines, and routine pediatric immunizations. Grantees developed culturally specific immunization promotion materials for their members to increase vaccination rates.

Immunization Challenges, Barriers, and Unmet Needs

During Grant Program Year 2019 (April 1, 2019-March 31, 2020), it is important to note that the COVID-19 pandemic emerged in the United States of America as early as January 2020 (Quarter 4). Prior to Quarter 4 in Grant Program Year 2019, challenges faced by grantees included a decline in both pediatric and adult immunizations.

Grantees provided possible explanations, including vaccine hesitancy, client refusals, a decrease in immunization reminders, and inadequate data management for recording immunizations. Another area of concern was funding support of vaccines that require multiple doses. Even though the 4-in-1 grant funded the purchase of adult vaccines, the challenge was for adult vaccines requiring more than one dose, such as Zoster. Another challenge and unmet need was grantees' limited capacity to support electronic reporting systems (e.g., training, capacity and time to conduct data entry, differences in EHR systems).

In Grant Program Year 2020 (April 1, 2020 – March 31, 2021), a frequently mentioned barrier to service was limited opportunities to meet in-person because of concerns about COVID-19 exposure. This was a particular barrier for immunizations, as there were no telehealth alternatives to in-person visits. In addition, logistical barriers were mentioned, including difficulty accessing and pulling patient electronic health records, causing bottlenecks in the data-entry workflow to keep up with the COVID -19 vaccinations. At the same time, there were challenges among staff including concerns about exposure to COVID-19 from clients, staff turn-over and/or burnout resulting in reduced capacity to support immunization services, and difficulty hiring and onboarding new staff. In addition, some grantees were limited in their physical capacity to support social distancing.

To overcome the pandemic's unique challenges with serving patients, grantees

engaged in outreach efforts to build awareness of available services and vaccines, and ever changing COVID-19 updates. Many efforts focused on meeting elders' needs during cold and flu season (e.g., distributing a flyer online about supplying elders with firewood). As in-person visits resumed in the latter half of the grant year, grantees attempted to find different pathways to reduce vaccine misinformation and hesitancy such as providing current information on COVID-19 vaccines and physicians providing information about COVID-19 vaccines directly to patients rather than from non-medical staff.

By Grant Program Year 2021 (April 1, 2021 – March 31, 2022), challenges, barriers, and unmet needs were related to staffing, vaccine and supply shortages, patients, and technology (e.g., EHR systems and Telehealth equipment and technology). For staffing, grantees expressed high turnover rates and difficulty hiring new staff leading to staffing shortages to support the program, especially among pediatric providers. Supply shortages led to grantees experiencing challenges in obtaining influenza vaccines and in obtaining Moderna COVID-19 booster vaccines. Related to supplies, COVID-19 tests became increasingly difficult to procure during surges in variants (e.g., the COVID-19 Omicron variant).

Among patients, grantees faced vaccine hesitancy for recommended vaccinations across all age groups. Particularly among pediatric patients, grantees experienced the following:

- Children missed routine wellness visits and vaccinations
- Decrease in demand for regular doctor appointments for families and young children due to fear of exposure to COVID-19

Hesitancy was increasingly challenging for COVID-19 vaccinations in the face of increased circulation of disinformation and misinformation about the vaccines. Grantees also experienced many missed appointments for COVID-19 vaccines impacting staff availability and appointment available for other patients. Grantees learned that many patients continued to have safety concerns about being exposed to COVID-19 and did not want an in-person clinic visit.

Finally, technology was another challenge, barrier, and unmet need faced by grantees. Internet/broadband access was limited or highly variable across populations, affecting patients' ability to engage with telehealth services. Internet/broadband access limited grantees ability to reach their patients to keep them informed on changing clinic hours and services and COVID-19 updates, particularly for vaccine availability. Grantees saw varied levels of digital literacy among patients, especially among those who have limited technology skills (e.g., unable to navigate a web browser, send emails, or use a web camera). During COVID-19 surges (e.g., Delta and Omicron variants), outdated tools



and technology impeded grantees' ability to manage, update, and add new electronic health records.

Next Steps and Future Planning for Immunization Programming

To give a sense of grantees' next steps and future planning into the next program year, this section primarily focused on Grant Program Year 2021 (April 1, 2021 – March 31, 2022) findings. Key next steps and future planning primarily focused on outreach, partnerships and collaboration, culture, and communication. For outreach, partnerships, and collaboration, grantees are looking forward to increasing health education outreach to address vaccine hesitancy in support of increasing vaccination rates in the communities they serve. As some grantees work to increase inter-service collaborations, such as combining wellness visits and vaccine promotion efforts with the health promotion/disease prevention service team, others are looking outwards to promote vaccines with community organizations, tribes, local and state health departments, school districts, health care providers, and private companies. To increase access across their communities, some grantees plan to use mobile vans to deliver immunizations.

Grantees also plan to increase communication to build awareness about vaccines in their communities through social media, print mail, and follow-up phone calls. At the same time, grantees are working to ensure messaging is culturally appropriate and is relevant for people of all ages.

Summary & Recommendations

This evaluation report provides insights into grantees' immunization program efforts and achievements utilizing data obtained through IHS Grant Program Year 2019 (April 1, 2019 – March 31, 2020) to Grant Program Year 2021 (April 1, 2021 – March 31, 2022). This section of the report is organized to provide overall recommendations based on evaluation findings identified in the previous section. The overall series of recommendations are meant to support three broad evaluation questions:

1. Have immunization rates improved over time?
2. If rates have changed over time, to what degree have the rates changed?
3. Which grantees are meeting the immunization reporting requirements and which ones are not?

A summary of findings and recommendations by data source are provided below:

National Immunization Reporting System

The analysis of the 2019 to 2021 NIRS data revealed, that in general, immunization rates decreased among most age groups and vaccine types. This is likely at least partially the result of the COVID-19 pandemic; despite challenges due to the pandemic, the decrease in rates was not substantial. Decreases were not observed among all groups: for the youngest (3-27 months), rates stayed the same or increased, while among adults, the rate for all adults (19+ years) increased as well. In addition, more grantees were reporting to NIRS on average at the end of Grant Program Year 2021, than were reporting at the beginning of Grant Program Year 2019. This is consistent across all age groups (3-27 months, 2 years, adolescents, and adults). The more grantees reporting to NIRS consistently increases the confidence in the quality and accuracy of the data being analyzed.

Recommendations:

- Emphasize routine vaccinations for youngest (3 months-3 years) age groups, and importance of receiving additional appropriate vaccines
- Among adolescents and adults, emphasize importance of completing the entire series of a recommended vaccine, particularly the HPV vaccine. In addition, significant work is needed towards improving adult immunization rates, particularly among the older age group (60+).
- Influenza vaccination rates have historically had low uptake rates across the country. With the circulation of COVID-19, there is even more reason to encourage influenza vaccination. At the same time, there may be more opportunity to give influenza vaccines when patients come in for COVID-19 vaccines or boosters as there is no contraindication for giving both vaccines at the same time.

- Create more detailed program guidance for grantees and the program team on immunization indicators and examples of grantee program activities to enhance the quality and increase the quantity of immunization data reported
- Continue analyzing the NIRS data over a longer period of time to track relevant trends
- Compare adult vaccination rates with other grantee demographic data to assess the extent to which vaccine program is reaching its eligible adult population as the vaccination rates themselves remain low (less than a third of most adult vaccines)

Government Performance Rating Act

Across the 2016-2021 GPRA data, decreases were observed for most of the immunization metrics, including child and adult influenza immunizations, childhood immunizations, and adult composite immunizations. The only immunization rate that did not decrease was that of pneumococcal immunizations, a metric that was only collected until 2017 when it was replaced with the adult composite immunization metric. No immunization measure reached its national target during the reporting period. While reporting rates varied across the years, the vast majority of grantees reported at least partially, with 10 grantees even achieving a 100% reporting rate. It is also important to note that like tribal programs, urban programs are not required to use the Resource Patient Management System (RPMS) as their patient data management system. Prior to fiscal year 2018, official GPRA/GPRAMA results were reported via RPMS and the Clinical Reporting System (CRS), a software application that runs off of RPMS. The use of CRS to collect GPRA data prevented non-RPMS health programs from having their GPRA data included in national totals. To enable non-RPMS health programs to report for GPRA, IHS switched from utilizing CRS for GPRA data collection to the Integrated Data Collection System (IDCS) Data Mart at the National Data Warehouse (NDW). The switch in systems may have impacted grantees reporting, which can explain the reduction in reporting rates in that year.

Recommendations

- Provide grantees with technical assistance to support the process of entering and exporting visit and registration data from their electronic health records (EHR) to the NDW to complement GPRA reporting
- Perform follow up with grantees who have a history of low reporting rates, to better understand the factors that may be contributing to this issue
- Emphasize the importance of routine vaccinations, for all age groups, as well as the season vaccinations (influenza)
- Compare adult vaccination rates with other grantee demographic data to assess the extent to which vaccine program is reaching its eligible adult population as the vaccination rates themselves remain low (less than a third of most adult vaccines)

- Continue to analyze GPRA data over a longer period (5+ years) to better observe trends in immunization rates

Grantee Quarterly Reports and Unmet Needs

The analysis of the grantee quarterly reports highlighted contextual emerging themes in strengths and barriers/challenges across the immunization service program area. In terms of strengths, many program reported developing new methods of outreach, such as through social media, to encourage individuals to receive both routine vaccinations and the COVID-19 vaccine. More registered vaccines sites for children were opened, with grantees working with families to help their children receive routine vaccines they had missed due to the pandemic. Many grantees relayed the importance of their partnerships with community organizations, tribes, local and state health departments, and schools in helping them reach their immunization goals. The use of culturally-appropriate messaging was employed by many grantees in communications, particularly those around immunizations, and COVID-19 information.

Grantees still faced challenges, barriers, and unmet needs, often due to the constraints of the COVID-19 pandemic. Grantees experienced difficulty reaching their immunization goals, especially as staffing issues persisted. Many explanations were offered, including vaccine hesitancy, client refusals, a decrease in immunization reminders, inadequate data management for recording immunizations, and difficulty obtaining funding for vaccines. In addition, the inability to meet in-person due to the pandemic was a particular barrier as there is no telehealth alternative for immunizations. Patients access to technology, including internet, and technological literacy was another barrier grantees faced when ensuring the most up-to-date immunization is distributed to their community, especially among elders.

Regardless, grantees continued to be innovative and plan to improve immunization rates through increasing health education outreach that address vaccine hesitancy in their communities. They also aim to improve joint efforts between immunization and HP/DP program areas to capitalize on the overlap between the services offered across these areas.

Recommendations

- Provide grantees with technical assistance to support the process of entering data into the grantee quarterly reports and help grantees understand what has changed in reporting from year to year.
- Add a field to the reporting template to allow grantees to report data from their service-providing partners.
- Add a field to the reporting template that allows grantees to report vaccine hesitancy outreach efforts

- Provide technical assistance to grantees wishing to consolidate program aims across immunizations and HP/DP service areas

Additional recommendations across NIRS, GPRA, and grantee progress reports in terms of quality, capacity, relevance for evaluation of process and output, relevance to evaluation outcome, gaps, integration, and overall recommendations are summarized below.

Quality: *What percentage of grantees report to NIRS, GPRA, and grantee progress reports, and how complete (across multiple reporting periods) and accurate are the reported data?*

The percentage of grantees reporting to NIRS, GPRA, and completing progress reports varied across the different reporting periods. For NIRS, the number of grantees reporting for each quarter increased over the three years, although less than three quarters of grantees reported data for any quarter, so there is still room for improvement. GPRA reporting rates were highly variable across the six years in which data were collected. The rates decreased overall, with just over half of grantees reporting in the 2021 GPRA. As previously indicated, a change in the GPRA reporting system may have contributed to the decrease in reporting rates in 2018 GPRA. However, most grantees reported for at least one year of the six, while only one did not report at all. In contrast, reporting rates for quarterly reports increased over the three years to a 100% reporting rate across all grantees in Grant Program Year 2021 (April 1, 2021-March 31, 2022).

With more grantees reporting to NIRS and completing quarterly reports, the completeness of the data increased, which increases confidence that it reflects an accurate picture of immunization rates in the population. Similarly, with the steep decline in GPRA reporting, confidence in the accuracy and completeness of the data is similarly reduced.

Capacity: *What is grantees' capacity to provide the information needed for a meaningful evaluation? Does capacity vary by grantee and or IHS Area (targeting immunization)?*

As no individual metric captured grantees' capacity, KAI could not provide a comprehensive evaluation of this item as it relates to immunization rates. However, from the quarterly and unmet needs reports, it is clear that grantees are struggling with staffing issues, which may impact their ability to collect and report immunization data. IHS can consider other data collection opportunities, such as interviews or focus groups to further understand grantees' capacity to support immunization reporting.

Relevance for Evaluation of Process and Output: *Which immunization indicators describe programmatic outputs, including number and demographics of patients served and types of*

services provided, percentage of screenings performed, clinical GPRA measures documented, and increased use of third-party payments?

At the programmatic level, the number of patients served and the number of recommended immunizations provided will be further examined across the data sources.

Based on the available data, the following could not be assessed: demographics of patients served, percentage of screenings performed, and increased use of third-party payments. There is opportunity for the IHS to explore other methods to gather data to support answering these questions.

Relevance to Evaluation Outcome: Can immunization indicators be used to assess safety, affordability, access, and quality?

Based on the data sources provided, the immunization indicators could not be used to assess safety, affordability, access, and quality of services. There is opportunity for the IHS to explore other methods to gather data to support answering these questions.

Gaps: What are the gaps in the data required to meet immunization reporting requirements? Do gaps differ by grantee and or health service area?

At this time, there are differences in the use of data reporting systems by grantees. Some grantees submit their immunization data using the NIRS data system, some submit their immunization data using the GPRA data system, and some grantees use both systems. Further, within each immunization data reporting system, there are inconsistencies with reporting across measures for each program year. For example, while most grantees reported data for at least one of the measures each quarter, the majority of grantees did not report for each category consistently. Therefore, the completeness of the data was severely lacking. These inconsistencies across both reporting systems and their use make it difficult to understand a comprehensive and accurate picture of immunization rates in the population served.

Finally, with regards to the quarterly reports submitted by grantees, there are differences in the type and breadth of information grantees provide as updates for their immunization program. Re-evaluation of the form and its use, perhaps through interviews with grantee users, would help improve the accuracy of the data collected.

Integration: *How can the reporting and collection of these immunization data be better integrated?*

There is opportunity to support consistency in data collection systems. At this time, different data collection systems are being used across grantees (e.g., Resource and Patient Management System (RPMS), Clinical Reporting System (CRS), Integrated Data Collection System (IDCS), Manual). To reduce the need for grantees to report across multiple systems the IHS could consider areas to streamline and consolidate efforts into one main reporting system.

Recommendations: *What are the recommendations for an improved quantitative reporting system that includes immunization data?*

See recommendations under each data reporting system above.

Conclusion

The results of this evaluation support the ongoing investment in this highly valuable grant program that supports important, needed services for AI/AN people residing in urban areas. Data from the NIRS and GPRA were analyzed to understand immunization rates in the community across age groups, evaluate trends in data reporting, and identify areas in need of improvement. In addition, information from the grantee quarterly reports were analyzed alongside these key data sets to help understand the scope of immunization services provided by each grantee, and identify challenges, strengths and unmet needs, and future planning. While the COVID-19 pandemic significantly impacted the ability of grantees to provide their regular immunization services, they were able to respond with innovation and agility to address the challenges that arose. Most importantly, this evaluation provides a detailed view of immunization trends and an exploration of impactful factors that can help inform future funding and policy decisions. Ongoing evaluation of this grant program will continue to provide valuable knowledge about demonstrated and promising practices to address the immunization needs of urban AI/AN people.

Appendix

Appendix A: Grantee Information

Table 20: List of Grantees by City, State, and IHS Area

| Grantee Name | City | State | Area Office |
|--|------------------|-------|---------------|
| All Nations Health Center- (formerly Missoula Urban Indian Health) | Missoula | MT | BILLINGS |
| American Indian Health & Family Services | Detroit | MI | BEMIDJI |
| American Indian Health & Services | Santa Barbara | CA | CALIFORNIA |
| American Indian Health Service of Chicago, Inc. | Chicago | IL | BEMIDJI |
| Bakersfield American Indian Health Project | Bakersfield | CA | CALIFORNIA |
| Billings Urban Indian Health and Wellness Center | Billings | MT | BILLINGS |
| Denver Indian Health & Family Services, Inc. | Denver | CO | ALBUQUERQUE |
| First Nations Community Healthsource | Albuquerque | NM | ALBUQUERQUE |
| Fresno American Indian Health Project | Fresno | CA | CALIFORNIA |
| Gerald L. Ignace Indian Health Center | Milwaukee | WI | BEMIDJI |
| Helena Indian Alliance - Leo Pocha Clinic | Helena | MT | BILLINGS |
| Hunter Health | Wichita | KS | OKLAHOMA CITY |
| Indian Family Health Clinic of Great Falls | Great Falls | MT | BILLINGS |
| Indian Health Board of Minneapolis | Minneapolis | MN | BEMIDJI |
| Indian Health Center of Santa Clara Valley | San Jose | CA | CALIFORNIA |
| Native American Connections | Phoenix | AZ | PHOENIX |
| Native American Health Center | Oakland | CA | CALIFORNIA |
| Native American Lifelines of Baltimore and Boston | Baltimore | MD | NASHVILLE |
| Native American Rehabilitation Association the Northwest | Portland | OR | PORTLAND |
| Native Americans for Community Action | Flagstaff | AZ | NAVAJO |
| Native Health | Phoenix | AZ | PHOENIX |
| Nebraska Urban Indian Health Coalition, Inc. | Omaha | NB | GREAT PLAINS |
| Nevada Urban Indians Inc. | Reno | NV | PHOENIX |
| New York Indian Council Inc.* | Long Island City | NY | NASHVILLE |
| Sacramento Native American Health Center | Sacramento | CA | CALIFORNIA |

| Grantee Name | City | State | Area Office |
|---|----------------|-------|---------------|
| San Diego American Indian Health Center | San Diego | CA | CALIFORNIA |
| Seattle Indian Health Board | Seattle | WA | PORTLAND |
| South Dakota Urban Indian Health, Inc. | Sioux Falls | SD | GREAT PLAINS |
| The NATIVE Project | Spokane | WA | PORTLAND |
| Tucson Indian Center | Tucson | AZ | TUCSON |
| United American Indian Involvement, Inc. | Los Angeles | CA | CALIFORNIA |
| Urban Indian Center of Salt Lake | Salt Lake City | UT | PHOENIX |
| Texas Native Health | Dallas | TX | OKLAHOMA CITY |
| *In Grant Program Year 2021, New York Indian Council replaced American Indian Community House | | | |

Appendix B: NIRS Data Tables (2019-2021) and GPRA Data Tables (2016-2021)

Table 21: 3–27-Month-Old Minimum Needs Immunization Rates (2019-2021 NIRS)

| | Immunizations | NIRS 2019 | NIRS 2020 | NIRS 2021 | Average Immunization Rate - All Years | Gross Change NIRS 2019- NIRS 2020 | Gross Change NIRS 2020- NIRS 2021 | Percentage Change - All Years |
|--------------|---|-------------|-------------|-------------|---------------------------------------|-----------------------------------|-----------------------------------|-------------------------------|
| | | Avg. n = 18 | Avg. n = 16 | Avg. n = 19 | | | | |
| | Aggregate | 46.7% | 49.2% | 48.0% | 48.0% | 2.4% | -1.1% | 2.7% |
| Age 3-4mos | 1-DTaP + 1-POLIO + 1-HIB + 1-HEPB + 1-PCV | 75.1% | 67.7% | 68.0% | 70.3% | -7.4% | 0.3% | -10.4% |
| Age 5-6mos | 2-DTaP + 2-POLIO + 2-HIB + 2-HEPB + 2-PCV | 27.9% | 57.5% | 48.3% | 44.6% | 29.5% | -9.1% | 42.2% |
| Age 7-15mos | 3-DtaP + 2-POLIO + 2-HIB + 2-HEPB + 3-PCV | 44.7% | 39.6% | 54.3% | 46.2% | -5.1% | 14.6% | 17.6% |
| Age 16-18mos | 3-DTaP + 2-POLIO + 3-HIB + 2-HEPB + 4-PCV + 1-MMR + 1-VAR | 55.2% | 39.2% | 41.1% | 45.2% | -15.9% | 1.9% | -34.3% |
| Age 19-23mos | 4-DTaP + 3-POLIO + 3-HIB + 3-HEPB + 4-PCV + 1-MMR + 1-VAR | 38.2% | 42.5% | 39.6% | 40.1% | 4.3% | -2.8% | 3.7% |

| | | | | | | | | |
|--------------|---|-------|-------|-------|-------|------|--------|-------|
| Age 24-27mos | 4-DTaP + 3-POLIO + 3-HIB + 3-HEPB + 4-PCV + 1-MMR + 1-VAR | 39.4% | 48.5% | 36.9% | 41.6% | 9.0% | -11.5% | -6.8% |
|--------------|---|-------|-------|-------|-------|------|--------|-------|

Table 22: 3–27-Month-Old Appropriate Needs Immunization Rates (2019-2021 NIRS)

| Age Group | Immunizations | NIRS 2019 | NIRS 2020 | NIRS 2021 | Average Immunization Rate – All Years | Gross Change NIRS 2019- NIRS 2020 | Gross Change NIRS 2020- NIRS 2021 | Percentage Change - All Years |
|--------------|--|-------------|-------------|-------------|---------------------------------------|-----------------------------------|-----------------------------------|-------------------------------|
| | | Avg. n = 17 | Avg. n = 16 | Avg. n = 19 | | | | |
| | Aggregate | 31.2% | 32.0% | 37.6% | 33.6% | 0.8% | 5.6% | 17% |
| Age 3-4mos | 1-DTaP + 1-POLIO + 1-HIB + 1-HEPB + 1-PCV + 1-ROTA | 70.1% | 57.0% | 61.0% | 62.7% | -13.14% | 4.0% | -14.9% |
| Age 5-6mos | 2-DTaP + 2-POLIO + 2-HIB + 2-HEPB + 2-PCV + 2-ROTA | 16.5% | 47.3% | 40.9% | 34.9% | 30.8% | -6.4% | 59.6% |
| Age 7-15mos | 3-DtaP + 2-POLIO + 2-HIB + 2-HEPB + 3-PCV + 3-ROTA | 26.7% | 24.4% | 44.6% | 31.9% | -2.3% | 20.2% | 40.1% |
| Age 16-18mos | 3-DTaP + 2-POLIO + 3-HIB + 2-HEPB + 4-PCV + 1-MMR + 1-VAR + 3-ROTA | 31.1% | 21.9% | 25.8% | 26.3% | -9.3% | 3.9% | -20.7% |
| Age 19-23mos | 4-DTaP + 3-POLIO + 3-HIB + 3-HEPB + 4-PCV + 1-MMR + 1-VAR + 3-ROTA | 17.8% | 19.8% | 28.0% | 21.9% | 2.0% | 8.2% | 36.4% |

| | | | | | | | | |
|--------------|---|-------|-------|-------|-------|-------|------|------|
| Age 24-27mos | 4-DTaP + 3-POLIO + 3-HIB + 3-HEPB + 4-PCV + 1-MMR + 1-VAR + 1-HEPA + 3-ROTA | 25.0% | 21.7% | 25.4% | 24.1% | -3.2% | 3.7% | 1.8% |
|--------------|---|-------|-------|-------|-------|-------|------|------|

Table 23: 2-Year-Old Immunization Rates Table (2019-2021 NIRS)

| Immunizations | NIRS 2019 | NIRS 2020 | NIRS 2021 | Average Immunization Rate - All Years | Gross Change NIRS 2019- NIRS 2020 | Gross Change NIRS 2020- NIRS 2021 | Percentage Change - All Years |
|--|------------|------------|------------|---------------------------------------|-----------------------------------|-----------------------------------|-------------------------------|
| | Avg n = 14 | Avg n = 16 | Avg n = 13 | | | | |
| Aggregate | 36.6% | 44.6% | 34.0% | 38.4% | 8.0% | -10.5% | -7.4% |
| Vaccine Type | | | | | | | |
| 4-DtaP | 35.0% | 37.8% | 31.8% | 34.8% | 2.8% | -6.0% | -10.1% |
| 3-POLIO | 50.4% | 55.0% | 44.3% | 49.9% | 4.6% | -10.7% | -13.8% |
| 3-HIB | 45.1% | 54.0% | 38.7% | 46.0% | 8.9% | -15.3% | -16.5% |
| 4-HIB | 25.5% | 22.0% | 20.5% | 22.7% | -3.4% | -1.5% | -24.1% |
| 3-HEPB | 51.2% | 59.3% | 46.1% | 52.2% | 8.1% | -13.2% | -10.9% |
| 1-MMR | 45.5% | 58.3% | 41.5% | 48.4% | 12.9% | -16.9% | -9.6% |
| 1-VAR | 45.0% | 58.5% | 40.7% | 48.1% | 13.5% | -17.8% | -10.6% |
| 1-HEPA | 35.6% | 50.1% | 39.8% | 41.8% | 14.5% | -10.3% | 10.6% |
| 2-HEPA | 18.9% | 25.4% | 24.8% | 23.1% | 6.5% | -0.6% | 23.7% |
| 2-FLU | 20.7% | 29.8% | 20.1% | 23.6% | 9.1% | -9.7% | -2.9% |
| 3-PCV | 45.7% | 55.7% | 35.3% | 45.6% | 9.9% | -20.3% | -29.4% |
| 4-PCV | 29.0% | 35.1% | 28.1% | 30.7% | 6.1% | -7.1% | -3.3% |
| 3-ROTA | 27.6% | 38.3% | 30.8% | 32.3% | 10.8% | -7.5% | 10.5% |
| Cumulative Vaccine Group | | | | | | | |
| 4-DtaP + 3- POLIO +1- MMR (Baseline)* | 31.4% | 32.1% | 27.8% | 30.4% | 0.8% | -4.4% | -13.0% |
| Baseline + 3- HIB + 3-HEPB | 27.8% | 27.1% | 25.4% | 26.8% | -0.7% | -1.7% | -9.7% |
| Baseline + 3- HIB + 3-HEPB + 1-VAR | 27.5% | 26.7% | 23.5% | 25.9% | -0.8% | -3.1% | -16.8% |

| Immunizations | NIRS 2019 | NIRS 2020 | NIRS 2021 | Average Immunization Rate - All Years | Gross Change NIRS 2019- NIRS 2020 | Gross Change NIRS 2020- NIRS 2021 | Percentage Change - All Years |
|--|-----------|-----------|-----------|---------------------------------------|-----------------------------------|-----------------------------------|-------------------------------|
| Baseline + 3- HIB + 3-HEPB + 1-VAR + 3-PCV | 26.5% | 26.5% | 20.1% | 24.3% | 0.0% | -6.4% | -32.0% |
| Baseline + 3- HIB + 3-HEPB + 1-VAR + 4-PCV | 23.0% | 24.6% | 19.6% | 22.4% | 1.6% | -5.0% | -17.2% |
| Baseline + 3- HIB + 3-HEPB + 1-VAR + 4-PCV + 2-HEPA + 3-ROTA | 8.4% | 11.2% | 8.5% | 9.4% | 2.8% | -2.8% | 0.4% |
| Baseline + 3- HIB + 3-HEPB + 1-VAR + 4-PCV + 2-HEPA + 3-ROTA + 2-FLU | 4.0% | 6.7% | 5.7% | 5.5% | 2.7% | -1.0% | 29.2% |

Table 24: Adolescent Immunization Rates - Females, 13 Years (2019-2021 NIRS)

| Immunizations Female 13- year-olds | NIRS 2019 | NIRS 2020 | NIRS 2021 | Average Immunization Rate – All Years | Gross Change NIRS 2019 - NIRS 2020 | Gross Change NIRS 2020 - NIRS 2021 | Percentage Change All 3 Years |
|--|-----------|-----------|-----------|---|--|--|-------------------------------------|
| | N = 18 | N= 16 | N = 21 | | | | |
| 1-HPV | 60.9% | 66.6% | 50.5% | 59.3% | 5.7% | -16.1% | -17% |
| 2-HPV | 39.8% | 38.3% | 26.7% | 34.9% | -1.5% | -11.6% | -33% |
| 3-HPV | 4.5% | 9.3% | 2.2% | 5.3% | 4.9% | -7.2% | -51% |
| HPV-FV 2- Doses* | | 19.0% | 28.4% | 23.7% | | 9.4% | |
| HPV-FV 3- Doses* | | | 8.2% | | | 8.2% | |
| 1-TDAP + 1- MENACWY + HPV-FV* | | 8.9% | 13.8% | 11.3% | | 5.0% | |
| 1-TDAP + 3- HEPB + 2-MMR + 1-MENACWY + 2VAR + HPV- FV* | | 8.9% | 10.3% | 9.6% | | 1.5% | |
| *Data was not collected in 2019, so not all measures could be calculated | | | | | | | |

Table 25: Adolescent Immunization Rates - Males, 13 Years (2019-2021 NIRS)

| Immunizations: Age Group: Male 13-year-olds | NIRS 2019 | NIRS 2020 | NIRS 2021 | Average Immunization Rate – All Years | Gross Change NIRS 2019 - NIRS 2020 | Gross Change NIRS 2020 - NIRS 2021 | Percentage Change All 3 Years |
|--|-----------|-----------|-----------|---------------------------------------|------------------------------------|------------------------------------|-------------------------------|
| | N = 18 | N = 16 | N = 21 | | | | |
| 1-HPV | 61.1% | 66.7% | 58.3% | 62.0% | -8.4% | -8.4% | -28% |
| 2-HPV | 33.4% | 38.5% | 34.1% | 35.3% | -4.4% | -4.4% | -26% |
| 3-HPV | 3.4% | 9.6% | 2.8% | 5.3% | -6.7% | -6.7% | -392% |
| HPV-FV 2-Doses* | | 20.5% | 23.2% | 21.9% | | 2.7% | |
| HPV-FV 3-Doses* | | 0.0% | 7.2% | | | | |
| HPV-FV Total* | | 11.5% | 18.1% | 14.8% | | 6.6% | |
| 1-TDaP + 1-MENACWY + HPV-FV* | | 11.5% | 18.5% | 15.0% | | 7.0% | |
| 1-TDaP + 3-HEPB + 2-MMR + 1-MENACWY + 2-VAR + HPV-FV* | | 11.5% | 14.6% | 13.1% | | 3.1% | |
| *Data was not collected in 2019, so not all measures could be calculated | | | | | | | |

Table 26: Adolescent Immunization Rates – 13-years-old, Female and Male (2019-2021 NIRS)

| Age Group: Female/Male 13-year-olds | NIRS 2019 | NIRS 2020 | NIRS 2021 | Average | Absolute Change NIRS 2019 - NIRS 2020 | Absolute Change NIRS 2020 - NIRS 2021 | Gross Change Across All 3 Years | Percent Change All 3 Years |
|---|-----------|-----------|-----------|---------|--|--|---------------------------------------|-------------------------------|
| 1-HPV | X | 42.9% | 46.9% | 44.9% | | 4.1% | | |
| 2-HPV | X | 29.5% | 28.1% | 28.8% | | -1.4% | | |
| 3-HPV | X | 0.0% | 3.2% | 1.6% | | 3.2% | | |
| HPV-FV 2-Doses | X | 29.5% | 23.2% | 26.4% | | -6.3% | | |
| HPV-FV 3-Doses | X | 0.0% | 3.4% | 1.7% | | 3.4% | | |
| HPV-FV 2-3 Doses | | 0.0% | 0.0% | 0.0% | | 0.0% | | |
| These fields (for females and males combined), were introduced in 2020, so not all measures could be calculated | | | | | | | | |

Table 27: Adolescent Immunization Rates, 13- to 17-year-olds, All Genders (2019-2021 NIRS)

| Immunizations All 13-17 year-old | NIRS 2019 | NIRS 2020 | NIRS 2021 | Average Immunization Rate – All Years | Gross Change NIRS 2019 - NIRS 2020 | Gross Change NIRS 2020 - NIRS 2021 | Percent Change All 3 Years |
|----------------------------------|-----------|-----------|-----------|---------------------------------------|------------------------------------|------------------------------------|----------------------------|
| | N = 18 | N = 16 | N = 21 | | | | |
| 3-HEPB | 74.0% | 71.8% | 61.0% | 68.9% | -2.1% | -10.9% | -17.6% |
| 2-MMR | 73.4% | 72.0% | 61.3% | 68.9% | -1.4% | -10.7% | -16.5% |
| 1-VAR | 72.5% | 72.6% | 62.3% | 69.1% | 0.1% | -10.3% | -14.1% |
| 2-VAR | 71.8% | 71.3% | 60.3% | 67.8% | -0.5% | -11.1% | -16.1% |
| 1-TDaP | 71.4% | 69.6% | 62.0% | 67.7% | -1.8% | -7.6% | -13.2% |
| 1-HEPA | 70.0% | 72.5% | 60.0% | 67.5% | 2.5% | -12.5% | -14.3% |
| 2-HEPA | 68.8% | 70.4% | 59.6% | 66.2% | 1.5% | -10.8% | -13.5% |
| 1-FLU | 34.4% | 29.7% | 30.4% | 18.2% | -4.7% | 0.7% | -11.6% |
| HX OF CHICKENPOX | 5.5% | 5.7% | 3.7% | 5.0% | 0.2% | -2.0% | -33.2% |
| 1-MENACWY* | | 52.3% | 55.3% | 53.8% | | 3.0% | |
| 1TDaP + 1-MENACWY* | | 38.3% | 48.8% | 43.5% | | 10.5% | |
| 1-TDaP + 1-MENACWY + HPV-FV* | | 12.4% | 21.6% | 17.0% | | 9.1% | |
| 1-TDaP + 3-HEPB + 2-MMR + 1-VAR* | | 48.7% | 47.0% | 47.9% | | -1.7% | |
| 1-TDaP + 3-HEPB + 2-MMR + 1- | | 47.9% | 43.5% | 45.7% | | -4.5% | |

| | | | | | | | |
|----------------------|--|--|--|--|--|--|--|
| MENACWY + 2- VAR* | | | | | | | |
|----------------------|--|--|--|--|--|--|--|

*Data was not collected in 2019, so not all measures could be calculated

Table 28: Adolescent Immunization Rates - 13- to 17-year-old Females (2019-2021 NIRS)

| Immunizations Female, Age 13 to 17-year-old | NIRS 2019 | NIRS 2020 | NIRS 2021 | Average | Absolute Change NIRS 2019 - NIRS 2020 | Absolute Change NIRS 2020 - NIRS 2021 | Gross Change Across All 3 Years | Percent Change All 3 Years |
|---|-----------|-----------|-----------|---------|--|--|--|----------------------------------|
| 1-HPV | 65.7% | 66.6% | 57.5% | 63.3% | 0.9% | -9.1% | -8.2% | -12.4% |
| 2-HPV | 51.7% | 51.9% | 43.2% | 49.0% | 0.2% | -8.7% | -8.5% | -16.4% |
| 3-HPV | 20.0% | 21.2% | 10.9% | 17.4% | 1.2% | -10.3% | -9.1% | -45.4% |
| HPV-FV 2-Doses* | | 23.8% | 38.2% | 31.0% | | 14.4% | | |
| HPV-FV 3-Doses* | | 3.7% | 14.2% | 8.9% | | 10.6% | | |
| HPV-FV Total* | | 12.3% | 27.9% | 20.1% | | 15.7% | | |
| 1-TDaP + 1- MENACWY + 1-HPV- FV* | | 14.1% | 23.9% | 19.0% | | 9.8% | | |
| 1-TDaP + 3-HEPB + 2-MMR + 1- MENACWY + 2-VAR + HPV-FV* | | 14.1% | 22.4% | 18.2% | | 8.3% | | |

*Data was not collected in 2019, so not all measures could be calculated

Table 29: Adolescent Immunization Rates - 13- to 17-year-old Males (2019-2021 NIRS)

| Age Group: Male 13-17-year-olds | NIRS 2019 | NIRS 2020 | NIRS 2021 | Average Immunization Rate – All Years | Gross Change NIRS 2019 - NIRS 2020 | Gross Change NIRS 2020 - NIRS 2021 | Percentage Change All 3 Years |
|--|-----------|-----------|-----------|---------------------------------------|------------------------------------|------------------------------------|-------------------------------|
| 1-HPV | 64.5% | 65.0% | 56.2% | 61.9% | 0.5% | -8.9% | -14.9% |
| 2-HPV | 47.6% | 45.9% | 40.5% | 44.7% | -1.7% | -5.3% | -17.4% |
| 3-HPV | 17.9% | 18.8% | 9.6% | 15.4% | 0.9% | -9.2% | -85.9% |
| HPV-FV 2-Doses* | | 19.0% | 30.2% | 24.6% | | 11.3% | |
| HPV-FV 3-Doses* | | 4.4% | 12.3% | 8.3% | | 7.9% | |
| HPV-FV Total* | | 12.4% | 28.0% | 20.2% | | 15.7% | |
| 1-TDaP + 1-MENACWY + HPV-FV* | | 12.1% | 26.2% | 19.1% | | 14.1% | |
| 1-TDaP + 3-HEPB + 2-MMR + 1-MENACWY + 2-VAR + HPV-FV* | | 12.1% | 22.5% | 17.3% | | 10.4% | |
| *Data was not collected in 2019, so not all measures were calculated | | | | | | | |

Table 30: Adult Immunization Rates Table (2019-2021 NIRS)

| Immunizations | NIRS 2019 | NIRS 2020 | NIRS 2021 | Average Immunization Rate - All Years | Gross Change NIRS 2019- NIRS 2020 | Gross Change NIRS 2020- NIRS 2021 | Percentage Change - All Years |
|---|------------|------------|------------|---------------------------------------|-----------------------------------|-----------------------------------|-------------------------------|
| | Avg n = 18 | Avg n = 16 | Avg n = 22 | | | | |
| Total Population (19+ Years) | | | | | | | |
| Up to Date | 32.2% | 29.4% | 43.9% | 35.2% | -2.7% | 14.4% | 26.7% |
| TD Booster | 28.2% | 25.6% | 23.1% | 25.6% | -2.6% | -2.5% | -22.3% |
| Tdap Booster | 42.1% | 40.7% | 40.4% | 41.1% | -1.4% | -0.3% | -4.3% |
| Pneumovax (Ever) | 57.3% | 54.6% | 44.1% | 52.0% | -2.7% | -10.4% | -29.8% |
| Male (19-21 Years) | | | | | | | |
| HPV 1 | 44.9% | 39.7% | 37.7% | 40.7% | -5.2% | -2.0% | -9.8% |
| HPV 2 | 31.2% | 29.6% | 27.1% | 29.3% | -1.6% | -2.5% | -7.4% |
| HPV 3 | 23.2% | 19.6% | 16.9% | 19.9% | -3.7% | -2.7% | -28.8% |
| Female (19-26 Years) | | | | | | | |
| HPV 1 | 36.0% | 37.8% | 32.8% | 35.6% | 1.8% | -5.0% | -19.1% |
| HPV 2 | 28.6% | 29.3% | 26.6% | 28.2% | 0.7% | -2.7% | -14.9% |
| HPV 3 | 24.1% | 21.7% | 18.7% | 21.5% | -2.5% | -2.9% | -37.7% |
| All Genders (19-59 Years) | | | | | | | |
| Tdap and Tdap/TD booster <10 Years | 42.3% | 36.2% | 41.2% | 39.9% | -6.1% | 5.0% | -2.6% |
| All Genders (60+ Years) | | | | | | | |
| Zostavax | 24.7% | 22.8% | 22.1% | 23.2% | -2.0% | -0.6% | -11.8% |
| All Genders (60-64 Years) | | | | | | | |
| Tdap + Tdap/TD <10 years + Zostavax | 15.7% | 13.3% | 16.5% | 15.2% | -2.3% | 3.2% | 5.1% |
| All Genders 65+ Years | | | | | | | |
| TD (65+ Years) | 47.1% | 40.6% | 38.0% | 41.9% | -6.6% | -2.6% | -24.2% |
| Pneumovax (65 + Years) | 43.4% | 39.1% | 35.7% | 39.4% | -4.4% | -3.4% | -21.7% |
| Tdap + Tdap/TD booster + Zostavax + Pneumovax (65+ Years) | 26.4% | 18.3% | 21.1% | 21.9% | -8.1% | 2.8% | -25.3% |

Table 31: Influenza Immunization Rates Table (2019-2021 NIRS)

| | NIRS 2019 | NIRS 2020 | NIRS 2021 | Average Immunization Rate – All Years | Gross Change NIRS 2019- NIRS 2020 | Gross Change NIRS 2020- NIRS 2021 | Percentage Change - All Years |
|----------------------|-----------|-----------|-----------|---------------------------------------|-----------------------------------|-----------------------------------|-------------------------------|
| Aggregate | 20.1% | 13.0% | 17.9% | 17.0% | -7.2% | 4.9% | -12.4% |
| 1-FLU | | | | | | | |
| 1-FLU (10-23 Months) | 29.9% | 19.1% | 22.5% | 23.9% | -10.8% | 3.4% | -32.7% |
| 1-FLU (2-4 Years) | 17.0% | 14.8% | 24.6% | 18.8% | -2.3% | 9.9% | 30.9% |
| Age Group | | | | | | | |
| 10-23 Months | 15.0% | 9.0% | 8.0% | 10.7% | -6.0% | -1.0% | -87.5% |
| 2-4 Years | 8.5% | 8.4% | 2.4% | 6.4% | -0.1% | -6.0% | -260.1% |
| 5-17 Years | 21.4% | 14.8% | 22.1% | 19.4% | -6.5% | 7.2% | 3.2% |
| 18-49 Years | 16.9% | 8.6% | 15.4% | 13.6% | -8.3% | 6.8% | -9.8% |
| 18-49 HR | 24.6% | 11.2% | 20.8% | 18.9% | -13.4% | 9.6% | -18.3% |
| 50-64 Years | 25.8% | 16.6% | 24.0% | 22.1% | -9.2% | 7.4% | -7.4% |
| 65+ Years | 18.7% | 22.1% | 32.7% | 27.8% | -6.6% | 10.6% | 12.3% |

GPRA Data Tables

Table 32: GPRA Immunization Rates per Year (2016-2017 GPRA)

| Immunization Measures | GPRA Year (n) | National Target | Average | Gross Change Between Years | Percentage Change Between Years | Overall Percentage Change from 2016 to 2021 |
|---|--------------------|-----------------|---------|----------------------------|---------------------------------|---|
| Influenza Vaccination for Children Ages 6 mo-17 y | GPRA 2016 (n = 27) | Baseline | 28.4% | - | - | -17.7% |
| | GPRA 2017 (n = 27) | 37.1% | 27.0% | -1.4% | -5.1% | |
| | GPRA 2018 (n = 11) | 20.6% | 16.2% | -10.7% | -39.8% | |
| | GPRA 2019 (n = 14) | 20.6% | 18.7% | 2.5% | 15.4% | |
| | GPRA 2020 (n = 19) | 26.1% | 16.4% | -2.3% | -12.2% | |
| | GPRA 2021 (n = 15) | 26.6% | 10.7% | -5.7% | -34.8% | |
| Influenza Vaccination for Adults Ages 18 and Older | GPRA 2016 (n = 29) | Baseline | 25.0% | - | - | -12.2% |
| | GPRA 2017 (n = 27) | 38.7% | 25.2% | 0.3% | 1.1% | |
| | GPRA 2018 (n = 12) | 18.8% | 18.0% | -7.3% | -28.8% | |
| | GPRA 2019 (n = 15) | 18.8% | 18.3% | 0.4% | 2.1% | |
| | GPRA 2020 (n = 19) | 25.4% | 16.4% | -1.9% | -10.3% | |
| | GPRA 2021 (n = 14) | 24.4% | 12.8% | -3.6% | -22.1% | |
| | GPRA 2016 (n = 20) | 76.8% | 41.2% | - | - | -20.0% |

| Immunization Measures | GPRA Year (n) | National Target | Average | Gross Change Between Years | Percentage Change Between Years | Overall Percentage Change from 2016 to 2021 |
|---|--------------------|--------------------------|---------|----------------------------|---------------------------------|---|
| Childhood Immunizations | GPRA 2017 (n = 22) | 74.8% | 42.4% | 1.2% | 2.9% | |
| | GPRA 2018 (n = 5) | 45.6% | 40.4% | -2.1% | -4.9% | |
| | GPRA 2019 (n = 3) | 45.6% | 35.3% | -5.1% | -12.6% | |
| | GPRA 2020 (n = 20) | 45.9% | 25.3% | -10.0% | -28.4% | |
| | GPRA 2021 (n = 3) | 42.8% | 22.2% | -3.1% | -12.1% | |
| Pneumococcal Vaccination 65+ | GPRA 2016 (n = 29) | 87.3% | 56.0% | | - | 0.9% |
| | GPRA 2017 (n = 28) | 86.7% | 56.9% | 0.9% | 1.6% | |
| Adult Composite Immunization⁸ | GPRA 2018 (n = 12) | Baseline National Target | 32.8% | - | - | -6.8% |
| | GPRA 2019 (n = 15) | 54.9% | 20.9% | -12.0% | -35.4% | |
| | GPRA 2020 (n = 20) | 59.7% | 25.0% | 4.2% | 20.0% | |
| | GPRA 2021 (n = 17) | 55.1% | 26.0% | 1.0% | 3.9% | |

⁸ New Measure replaces Pneumococcal Vaccine 65+ as of FY 2018

Appendix C: Formulas

Table 33: Immunization Report Statistical Analysis - Formulas Used

| Name | Formula |
|--|---|
| Quarterly reporting rate | Number of grantees who reported by quarter/total number of grantees (N=33) |
| Average immunization rate | Sum of annual immunization rate*/total number of years for which immunization rate data were available |
| GPRA average | Sum of each grantee's rate/total number of grantees for which immunization rate data was available |
| Gross change between years | Annual immunization rate in given year – annual immunization rate of the prior year |
| Percentage change between years | (Annual immunization rate for the first year in the reporting period – annual immunization rate for the last year of the reporting period)/annual immunization rate for the last year of the reporting period |
| Overall percentage change from 2016-2021 | Annual immunization for the first year in the reporting period – annual immunization rate for the last year of the reporting period |
| <p>*Annual immunization rate is the aggregate rate over all grantees who reported data for that measure in any given year of the reporting period. For example, the annual immunization rate for the NIRS 2019 65+ years influenza immunization is 18.7% (Table 31).</p> | |