

Improving School Age Vaccination Data Quality

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Division of Immunization

Reasons for Measuring Virginia School Age Vaccine Coverage



Increase Public Health Monitoring



Find areas of Vaccination need



Improve Data Quality across school data sets



Help Public Health Planning and Decision-Making



Analyze Data Collection Methods



Execute Data-Driven Responses

Identify Vaccine Types required for School (K-12)

- MMR
- Varicella
- Polio
- DTaP
- TdaP
- Hep A
- Hep B
- MenACWY
- HPV

Primary Data Sources



**Virginia Immunization
Information System (VIIS)**



**Virginia Department of
Education (DOE) School
Student Roster Data**



**Virginia School
Immunization Status (SIS)
Survey Data**

School Immunization Status Survey Data

Improving SIS Survey Data Quality

Reported Virginia SIS Data on VDH Website

Virginia Student Immunization Status Survey

Click on a locality to view school specific vaccination coverage rates*

Virginia Public School Adequately Immunized Rate*
Fall 2024 (Kindergarten)
All Virginia
90.7%

County School Rate
63.5% 100.0%

VDH VIRGINIA DEPARTMENT OF HEALTH
To protect the health and promote the well-being of all people in Virginia.

Reporting Period: (K) (D)

Health District:

County:

School Type:
 Private
 Public

Grade:
 Kindergarten
 7th Grade
 12th Grade

Selected Measure Detail Chart
(Click a Measure Name Header in the table at the bottom of this dashboard to change the selection)

Vaccination Rate Detail Kindergarten

WOOLWINE ELEM.	100.0%
WALLER MILL ELEM.	100.0%
TWIN VALLEY ELEM/MIDDLE	100.0%
TEMPERANCE ELEM.	100.0%
T.C. MILLER ELEM. FOR INNOV.	100.0%
SUGAR GROVE ELEMENTARY	100.0%
SHERWOOD FOREST ELEM.	100.0%
SHARON ELEM.	100.0%
SALTVILLE ELEM.	100.0%
ROBERT S. PAYNE ELEM.	100.0%
RIVERLAWN ELEM.	100.0%
RICH VALLEY ELEM.	100.0%
RED OAK / STURGEON ELEMEN.	100.0%

Counties with no color have no schools that have reported for the selected year.

* Adequately immunized rate equals the number of students with all of the required doses of all of the required vaccines.

As of August 24, 2022, the State Adequately Immunized Rate has been updated to reflect individual grade-level adequately immunized rates.

	Total	Medical Exemptions Rate	Religious Exemptions Rate	Vaccination Rate	Two MMR Rate
A. G. RICHARDSON ELEMENTARY	80	0.0%	0.0%	97.5%	97.5%
A. HENDERSON ELEM.	117	0.0%	2.6%	95.7%	96.6%
A. M. DAVIS ELEM.	110	0.0%	3.6%	75.5%	88.2%
A. R. WARE, JR. ELEM.	61	0.0%	1.6%	98.4%	98.4%
A.W.E. BASSETTE ELEM.	71	0.0%	7.0%	90.1%	93.0%
ABBS VALLEY BOISSEVAIN EL	21	0.0%	0.0%	66.7%	85.7%
ABERDEEN ELEM.	79	0.0%	3.8%	89.9%	93.7%
ABINGDON ELEM. - ARLINGTON COUNTY PUBLIC SCHOOLS	110	0.0%	0.0%	77.3%	94.5%
ABINGDON ELEM. - GLOUCESTER COUNTY PUBLIC SCHOOL	97	1.0%	8.2%	81.4%	81.4%
ABINGDON ELEM. - WASHINGTON COUNTY PUBLIC SCHO..	57	0.0%	5.3%	93.0%	93.0%
ACCAWMACKE ELEM	70	0.0%	1.4%	90.0%	90.0%
ACHIEVABLE DREAM ACADEMY	106	4.7%	6.6%	84.0%	92.5%
ACHILLES ELEM.	77	2.6%	5.2%	79.2%	79.2%
ACOND... ELEM	78	0.0%	0.0%	89.7%	97.8%

Numbers are not shown for schools with 10 or fewer students.

School Year	Public KG	Private KG
2015	94.4%	94.6%
2016	94.1%	93.4%
2017	93.7%	95.1%
2018	93.3%	94.1%
2019	92.9%	93.2%
2020	90.6%	94.5%
2021	88.6%	89.7%
2022	89.4%	87.5%
2023	88.9%	86.1%
2024	90.7%	88.9%

SIS Survey Categories Reported by Schools

- **Number Adequately Immunized (7th)**
- Number Appropriately Immunized for Hep B (7th)
- Number with one dose of Tdap (7th)
- Number with 2 doses of MMR (7th)
- One dose of MenACWY (7th)

- **Total Number (7th)**

- Number With Medical Exemptions (7th)
- Number With Religious Exemptions (7th)
- Number Conditionally Enrolled (7th)
- Number Without Records (7th)



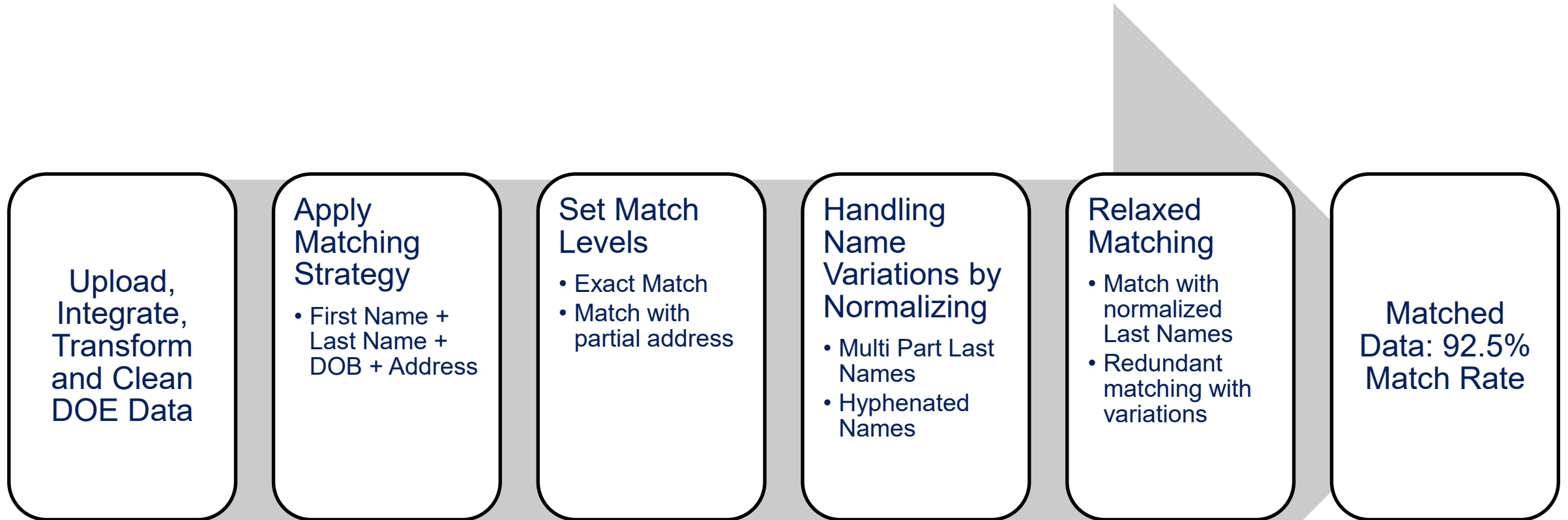
SIS Outliers: Reported vs Calculated

- We used individual antigen data to Calculate Adequately Immunized
- Some schools had large differences between what they reported and what we calculated

7th Grade Schools	Reported Adequately Immunized	Calculated Adequately Immunized	Difference
BROOKVILLE MIDDLE	91.4%	54.7%	36.7%
JACKSON P. BURLEY MIDDLE	52.9%	7.3%	45.5%
L. DOUGLAS WILDER MIDDLE	98.8%	68.4%	30.4%
OAK KNOLL MIDDLE	95.9%	0.0%	95.9%
Ridgeview Middle School	100.0%	60.8%	39.2%
Skyline Middle School	97.2%	52.0%	45.3%
VERNON JOHNS MIDDLE	72.4%	46.8%	25.6%

Matching DOE Roster Data and VIIS Data

DOE Student Roster Data and VIIS Data Matching Process



Sample of Matched Data Calculations vs Total Roster Data

	1 dose								
Total Match with a Dose	MMR	Varicella	Polio	DTaP	Hep A	Hep B	Men ACWY	HPV	TDaP
Matched Roster Data	223,165	223,636	226,156	223,900	210,898	216,145	164,353	122,193	150,995
Total Roster	276,312	276,312	276,313	276,313	276,313	276,313	191,634	191,634	191,634
rate	80.8%	80.9%	81.8%	81.0%	76.3%	78.2%	85.8%	63.8%	78.8%
KG	MMR	Varicella	Polio	DTaP	Hep A	Hep B			
Matched Roster Data	73,112	73,521	74,285	74,420	71,016	72,144			
Total Roster	84,678	84,678	84,679	84,679	84,679	84,679			
rate	86.3%	86.8%	87.7%	87.9%	83.9%	85.2%			
7th grade	MMR	Varicella	Polio	DTaP	Hep A	Hep B	Men ACWY	HPV	TDaP
Matched Roster Data	77,072	77,012	77,784	77,172	73,136	74,562	79,591	60,784	76,043
Total Roster	94,173	94,173	94,173	94,173	94,173	94,173	94,173	94,173	94,173
rate	81.8%	81.8%	82.6%	81.9%	77.7%	79.2%	84.5%	64.5%	80.7%
12th grade	MMR	Varicella	Polio	DTaP	Hep A	Hep B	Men ACWY	HPV	TDaP
Matched Roster Data	72,981	73,103	74,087	72,308	66,746	69,439	84,762	61,409	74,952
Total Roster	97,461	97,461	97,461	97,461	97,461	97,461	97,461	97,461	97,461
rate	74.9%	75.0%	76.0%	74.2%	68.5%	71.2%	87.0%	63.0%	76.9%

Sample of Kindergartens with Low Average Vaccination Rates

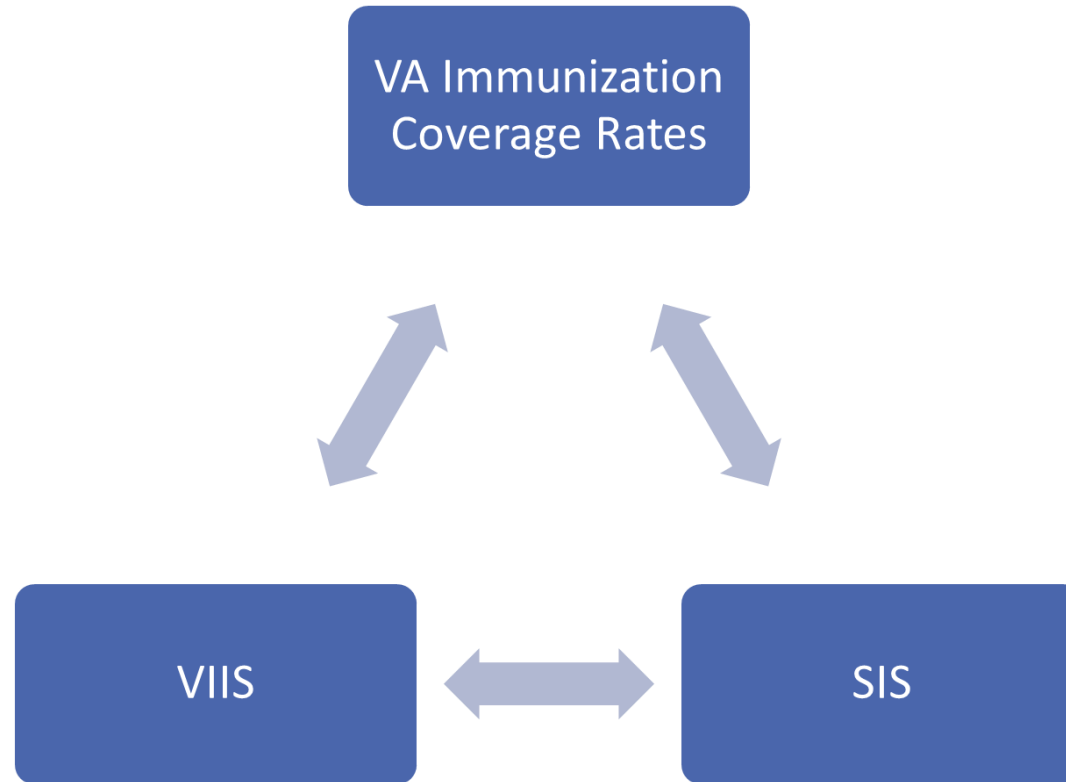
Kindergarten		87.9%	83.9%	85.2%	86.3%	87.7%	86.8%	86.3%
Division	School Name	DTAP	HEPA	HEPB	MMR	POLIO	VARICELLA	Average
FAIRFAX COUNTY PUBLIC SCHOOLS	FORT BELVOIR ELEMENTARY	20.9%	16.4%	16.4%	21.9%	20.9%	21.9%	19.7%
SCOTT COUNTY PUBLIC SCHOOLS	WEBER CITY ELEMENTARY	25.5%	23.4%	25.5%	23.4%	21.3%	19.1%	23.0%
NEWPORT NEWS CITY PUBLIC SCHOOLS	GENERAL STANFORD ELEMENTARY	26.8%	23.9%	21.1%	22.5%	25.4%	23.9%	23.9%
YORK COUNTY PUBLIC SCHOOLS	BETHEL MANOR ELEMENTARY	34.5%	25.5%	29.1%	30.9%	33.6%	30.9%	30.8%
SCOTT COUNTY PUBLIC SCHOOLS	YUMA ELEMENTARY	43.2%	37.8%	37.8%	40.5%	43.2%	37.8%	40.1%
NORFOLK CITY PUBLIC SCHOOLS	SEWELLS POINT ELEMENTARY	50.6%	42.5%	43.7%	48.3%	51.7%	48.3%	47.5%
SCOTT COUNTY PUBLIC SCHOOLS	SHOEMAKER ELEMENTARY	55.3%	44.7%	42.6%	46.8%	53.2%	51.1%	49.0%
PRINCE GEORGE COUNTY PUBLIC SCHOOLS	DAVID A. HARRISON ELEMENTARY	56.4%	52.1%	56.4%	55.3%	54.3%	55.3%	55.0%
SCOTT COUNTY PUBLIC SCHOOLS	NICKELSVILLE ELEMENTARY	61.3%	54.8%	48.4%	64.5%	58.1%	58.1%	57.5%
VIRGINIA BEACH CITY PUBLIC SCHOOLS	SHELTON PARK ELEMENTARY	63.2%	56.1%	50.9%	59.6%	61.4%	57.9%	58.2%
HENRICO COUNTY PUBLIC SCHOOLS	HENRICO VIRTUAL ACADEMY	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%
YORK COUNTY PUBLIC SCHOOLS	TABB ELEMENTARY	64.2%	56.8%	57.9%	60.0%	63.2%	58.9%	60.2%
NORFOLK CITY PUBLIC SCHOOLS	CAMP ALLEN ELEMENTARY	64.2%	58.2%	61.2%	61.2%	64.2%	61.2%	61.7%
NORFOLK CITY PUBLIC SCHOOLS	OCEAN VIEW ELEMENTARY	64.7%	61.2%	60.0%	63.5%	64.7%	63.5%	62.9%
WASHINGTON COUNTY PUBLIC SCHOOLS	HIGH POINT ELEMENTARY	67.8%	59.8%	69.0%	62.1%	67.8%	62.1%	64.8%
CARROLL COUNTY PUBLIC SCHOOLS	ST. PAUL	70.0%	66.7%	60.0%	63.3%	66.7%	63.3%	65.0%
PATRICK COUNTY PUBLIC SCHOOLS	STUART ELEMENTARY	69.0%	62.1%	62.1%	65.5%	69.0%	65.5%	65.5%
NEWPORT NEWS CITY PUBLIC SCHOOLS	HILTON ELEMENTARY	69.7%	63.6%	62.1%	66.7%	66.7%	65.2%	65.7%
WASHINGTON COUNTY PUBLIC SCHOOLS	VALLEY INSTITUTE ELEMENTARY	73.7%	47.4%	65.8%	68.4%	73.7%	68.4%	66.2%
PRINCE GEORGE COUNTY PUBLIC SCHOOLS	MIDDLE ROAD ELEMENTARY	68.2%	65.5%	67.3%	66.4%	68.2%	66.4%	67.0%

Source: VIIS Data

Using VIIS Data and SIS Survey Data to Find Potential Areas of Data Improvement

Utilize Multiple Data Sources to find areas of Improvement

- Continuously compare data sources to find strengths and weaknesses in each source
- Test each data source individually as well



Comparing Vaccination Rates across SIS Data and Matched VIIS Data

Matched DOE data
and VIIS data to see
vaccination rates in
each school

Calculated SIS
adequately immunized
and compared to SIS
reported

Compare Matched VIIS
Data vs Calculated SIS
data

Returned a list of
schools with lower
Matched Data than
Calculated SIS

Returned a list of
schools with
miscalculated SIS
Data

Additional Filtering to Account for Older Data

- Early Childhood vaccination records are more prone to inaccuracy due to being entered over 5 to 7 years ago
- To address the effect of older data, we filtered schools who had very low averages in the early childhood vaccine types relative to more current vaccinations

School Name	MMR	TDaP	VIIS	TDaP - MMR
GATE CITY MIDDLE	39.0%	30.5%	33.9%	-8.5%
WALLACE MIDDLE	53.4%	44.1%	49.7%	-9.3%
ST. PAUL	52.9%	47.1%	53.6%	-5.8%
NICKELSVILLE ELEMENTARY	61.8%	50.0%	56.2%	-11.8%
BLUE RIDGE ELEMENTARY	80.8%	34.6%	59.0%	-46.2%
GRAHAM MIDDLE	67.6%	62.2%	59.4%	-5.4%
BLUE RIDGE MIDDLE	58.2%	75.8%	62.4%	17.6%
J.E.J. MOORE MIDDLE	65.9%	68.3%	64.4%	2.4%
WHITMAN MIDDLE	63.7%	60.8%	64.4%	-2.9%
TABB MIDDLE	67.4%	59.9%	64.6%	-7.5%
RYE COVE INTERMEDIATE	76.9%	63.5%	65.0%	-13.4%
FOREST MIDDLE	65.1%	80.9%	66.6%	15.8%
RADFORD CITY VIRTUAL	50.0%	100.0%	66.7%	50.0%
ROBINSON SECONDARY	60.7%	77.5%	67.0%	16.8%
LONGFELLOW MIDDLE	62.1%	78.6%	68.3%	16.5%
MARY ELLEN HENDERSON MIDDLE	60.4%	83.1%	68.9%	22.7%

Comparison of SIS Survey Data vs Filtered VIIS Data

- Utilized a fuzzy matching algorithm to match school names in calculated SIS rates vs VIIS Data to identify schools with low VIIS rates vs SIS

Schools	SIS	VIIS	difference
FORT BELVOIR ELEMENTARY	80.9%	21.9%	59.0%
WEBER CITY ELEMENTARY	90.7%	23.4%	67.3%
GENERAL STANFORD ELEMENTARY	93.1%	22.5%	70.6%
BETHEL MANOR ELEMENTARY	91.4%	30.9%	60.5%
YUMA ELEMENTARY	95.8%	40.5%	55.3%
SEWELLS POINT ELEMENTARY	46.9%	48.3%	-1.4%
SHOEMAKER ELEMENTARY	84.5%	46.8%	37.7%
DAVID A. HARRISON ELEMENTARY	95.1%	55.3%	39.8%
NICKELSVILLE ELEMENTARY	100.0%	64.5%	35.5%
SHELTON PARK ELEMENTARY	93.2%	59.6%	33.6%
HENRICO VIRTUAL ACADEMY	99.0%	60.0%	39.0%

Identifying and Outreach Process



Analyzing various lists reveal potential mitigating circumstance, especially school geography or small datasets



After identifying schools through filtering and matching, coordinate with DOE liaison to reach schools



Coordinated with the SIS survey team to specify training needs for schools with miscalculations

Limitations

Matching process includes some basic fuzzy matching

School survey data in smaller schools often have no dedicated data entry

Older vaccination data often not recorded in VIIS

Vaccination occurring across State lines is not always reflected in VIIS

School Survey data is often miscalculated

Survey Data is self-reported by the responder

Potential Next Steps

Newer SIS data includes demographics for more comparison

Check for DOE data improvement over time

SIS Data can be compared before and after outreach

Add data from bordering states should help match rates

Compare vaccination over time to see if data is consistent

Acknowledgments

Christy Gray: Director of Division of Immunization

William Brannock: Vaccine Data Analytics Team

Piyush Patil: SQL Developer

Erica Hunter: Immunization Data & Outreach Manager