



Vaccine Coverage 2021

Vermont Immunization Registry Annual Report

October 2022

This annual report shows vaccination coverage, or vaccination rates, from 2019-2021 among Vermont children, based on data in the Vermont Immunization Registry (IMR). It highlights changes from year to year and helps the Immunization Program focus their efforts to improve the health of Vermonters. This report focuses on immunizations to children and teens.

Ages used in this report are calculated as of December 31, 2021 and rates are based on immunizations given through that date.

About the IMR

The Vermont Immunization Registry (IMR) is a secure health information system that contains immunization histories for persons living in Vermont. This provides easy and secure access to immunization histories – so medical providers know, for instance, whether you need a tetanus shot when you show up in the emergency room with a cut finger. It also helps the Immunization Program identify areas of need and evaluate the impact of strategies implemented to increase vaccination coverage.

Vermont law requires that all immunizations given in Vermont be reported to the IMR. While most of the data in the system is for immunizations administered after 1995, it is a valued resource, not only for what it contains in terms of individual records, but for its use in assessing vaccination needs across the state

KEY POINTS

- **Vaccine coverage remains steady in Vermont despite the COVID-19 pandemic.**
- **There are county-to-county differences in coverage – these are helpful in finding underserved populations and directing immunization resources.**

2021 IMR BASIC STATISTICS

As of December 31, 2021:

- Number of Patients with Immunization Records: 984,125 (increase of >105,000 since 2020)
- Number of Immunizations in the IMR: 12,199,767
- Number of Immunizations added in 2021: 2,207,810
- Hospitals reporting to the IMR: All VT Hospitals and Dartmouth Hitchcock Medical Center in NH.
- Percent of Chain Pharmacies reporting: 100%
- Number of Provider Sites (all types) reporting: 392
- Percent of Public Schools using the IMR: 99%

How to get more information about the IMR: 1-888-688-4667

Vaccine Coverage by the Age of Two

Traditionally, vaccine coverage is assessed in young children after the age of 18 months, by which time Centers for Disease Control and Prevention (CDC) recommends children should have received 4 doses of DTaP, 3 doses of Polio, 1 dose MMR (Measles, Mumps, Rubella), 4 doses of Hib (Haemophilus Influenza Type B), 3 doses of Hepatitis B, 1 dose Varicella, and 4 doses of Pneumococcal vaccine, otherwise termed “the Childhood Seven Series. In 2021, 75.2% of Vermont two-year olds were up to date for all seven vaccine series recommended “by the age of two.”

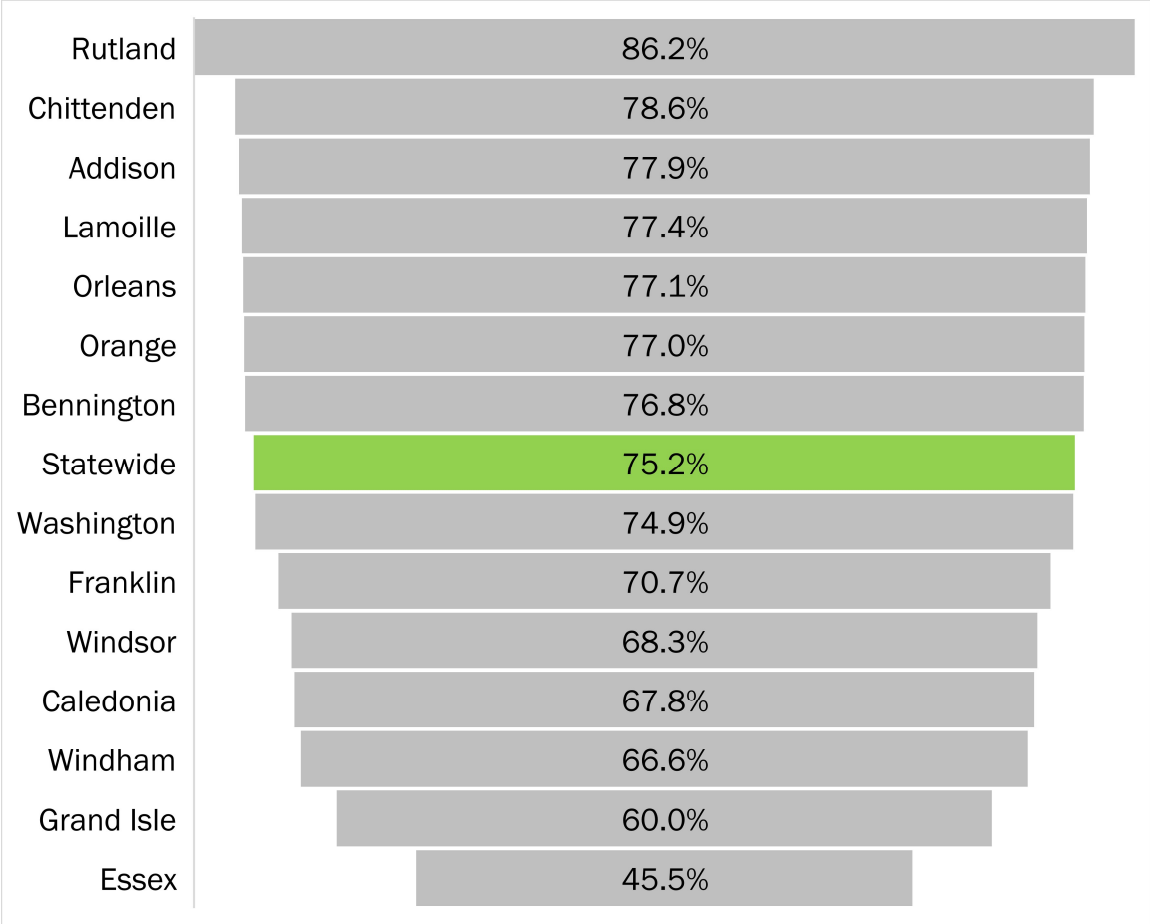
Despite the Covid-19 pandemic, vaccine coverage among the youngest Vermonters remained mostly the same. MMR coverage increased slightly from 2019 to 2020 and then decreased in 2021, to a value slightly lower than the 2019 rate. The rate for PCV decreased slightly between 2019 and 2020, and then again decreased between 2020 and 2021. Of note, the DTaP series and the PCV series – both of which require 4 doses – continue have the lowest rates. Raising coverage rates for DTaP and PCV would raise overall coverage rates among Vermont’s children.

Vaccination rates by vaccine series, by age two, 2019-2021

Vaccine Series	2019 Coverage: Children Born in 2017	2020 Coverage: Children Born in 2018	2021 Coverage: Children Born in 2019
DTaP	83.0%	81.9%	81.5%
Polio	92.3%	91.7%	91.9%
MMR	91.1%	92.1%	90.7%
Hib	92.7%	92.6%	92.7%
HepB	91.3%	91.4%	91.2%
Varicella	88.1%	88.6%	88.7%
PCV	84.1%	83.6%	82.6%
All Series Above (Childhood Seven Series)	76.4%	75.6%	75.2%

While the 2021 statewide coverage rate for the Childhood Seven Series (by age 2) was 75.2%, there was variability in the county level coverage. These ranged from a low of 45.5% in Essex County to a high of 86.2% in Rutland County. Values in other counties fell between 60% and 79%. Comparisons between 2020 and 2021 by county are on the following page.

**Childhood Seven Series Complete (by Age 2)
by County, 2021, Vermont Children Born in 2019**



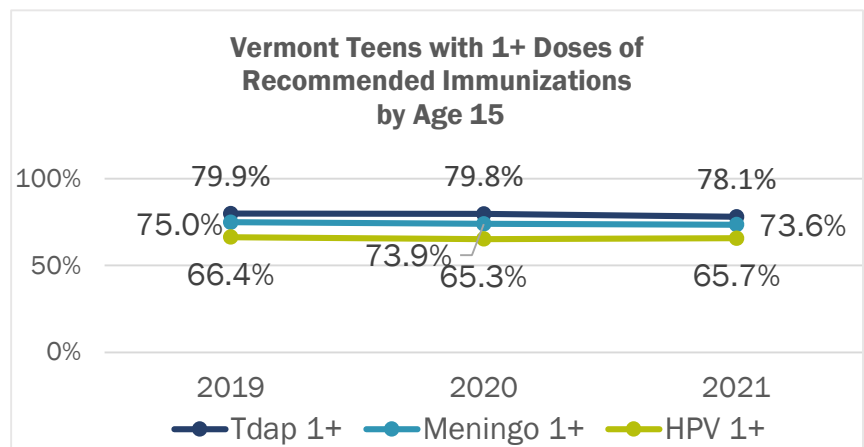
Comparing county Child Seven Series coverage rates from 2021 with those of 2020 demonstrates that some counties experienced changes in vaccination rates, which might not have been expected if only the statewide rate was considered. Grand Isle and Essex Counties showed significant decreases, 18.5% and 12.2%, respectively, those these changes are likely influenced by their small population sizes. For example, 5 fewer children vaccinated in Essex would change the percentage by more than 10 percent. Bennington and Windham counties experienced more moderate declines ($\geq 3\%$), while Lamoille, Rutland, and Orange counties had improved coverage rates ($\geq 3\%$).

Childhood Seven Series Complete by Age 2, 2020-2021

	2020 Full Series (population)	2021 Full Series (population)	Percent Difference 2020 to 2021
Addison	77.6% (322)	77.9% (299)	0.3%
Bennington	80.7% (326)	76.8% (315)	-3.9%
Caledonia	66.4% (247)	67.8% (276)	1.4%
Chittenden	79.4% (1,537)	78.6% (1,553)	-0.8%
Essex	57.7% (52)	45.5% (44)	-12.2%
Franklin	71.9% (577)	70.7% (550)	-1.2%
Grand Isle	78.5% (65)	60.0% (60)	-18.5%
Lamoille	71.3% (244)	77.4% (261)	6.1%
Orange	73.8% (256)	77.0% (234)	3.2%
Orleans	74.8% (274)	77.1% (280)	2.3%
Rutland	81.5% (502)	86.2% (491)	4.7%
Statewide	75.6% (5,828)	75.2% (5,768)	-0.4%
Washington	76.8% (564)	74.9% (530)	-1.9%
Windham	69.7% (350)	66.6% (377)	-3.1%
Windsor	70.1% (512)	68.3% (489)	-1.8%

Coverage Among Vermont Teens by Age 15

Measuring vaccine coverage in teens focuses on specific vaccines recommended from age 11 years forward: Human Papilloma Virus (HPV), Meningococcal vaccine, and Tdap (Tetanus, Diphtheria, Pertussis). Although nearly eight in ten (78.1%) teens received a dose of Tdap by the time they are 15 years old, fewer received the

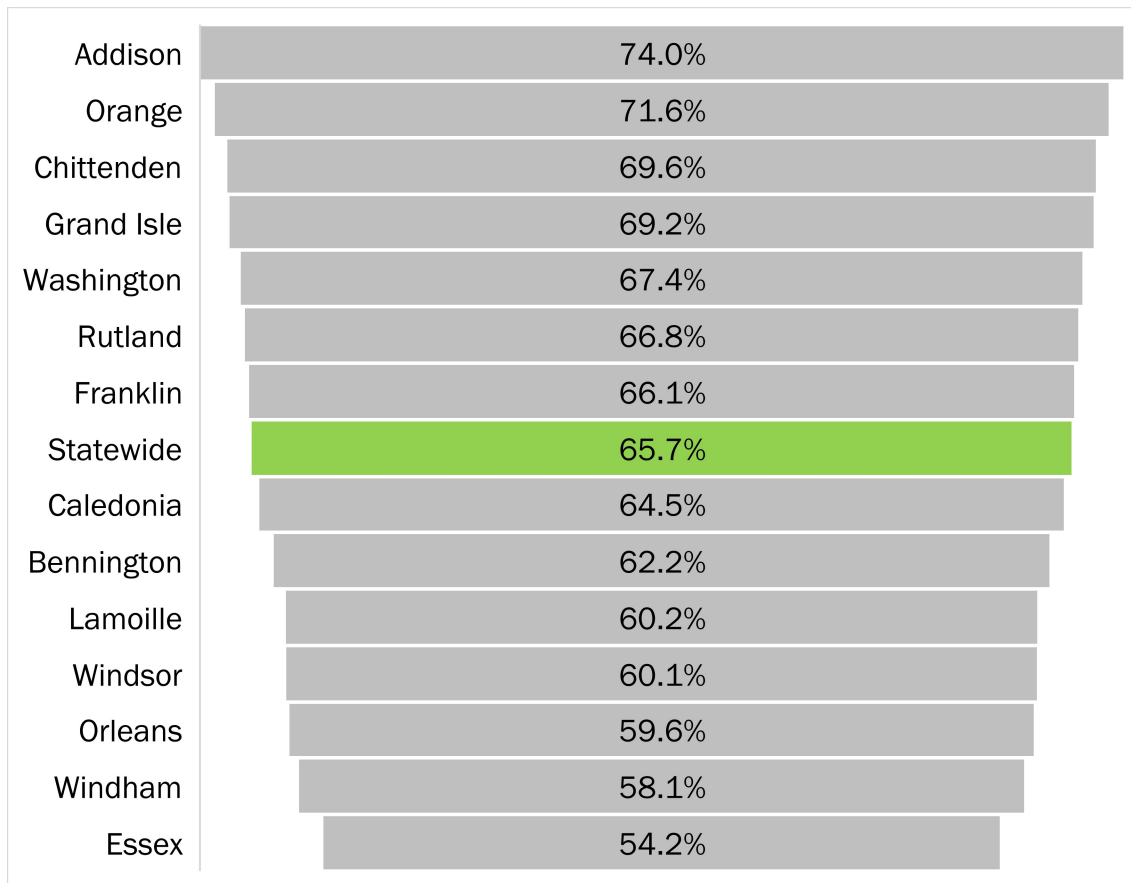


meningococcal vaccine (73.6%), and only 65.7% received their first dose of HPV by that age. These rates decreased slightly from 2019 to 2021 and are calculated for Vermont residents born in 2006.

Human Papilloma Virus Vaccine by age 15, by County – At least one dose

HPV vaccination is routinely recommended for teens at age 11-12. Teens who receive the first dose by the age of 15 need only one more dose to complete the series. Those who start after age 15 need a third dose to be protected. Two-thirds (65.7%) of Vermonters received at least one dose of HPV by age 15, with a low of 54.2% in Essex County and a high of 74.0% in Addison County.

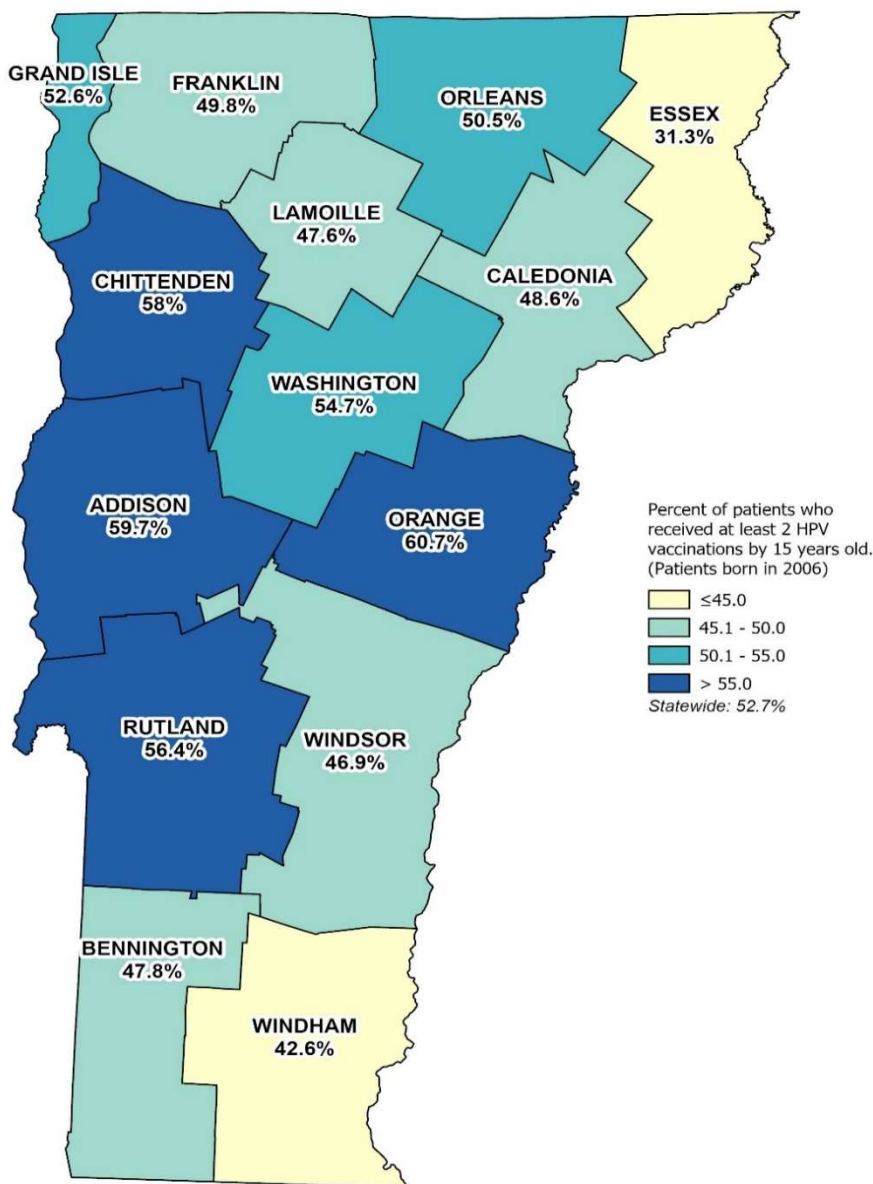
**HPV Series Initiation by Age 15 - by County, 2021
Vermont Teens Born in 2006**



Human Papilloma Virus Vaccine by age 15, by County – Series Completion

Statewide, 52.7% of Vermont youth aged 15 completed the Human Papilloma Virus (HPV) vaccine series, below the coverage goal of 80%. In four Vermont counties, more than 55% of 15-year-olds have completed the series. These include Addison, Chittenden, Orange, and Rutland Counties. Teens who are immunized with HPV vaccine are protected against cervical, oral, genital, and rectal cancers caused by this virus. In other areas of the state, vaccine coverage is lower: Bennington, Caledonia, Essex, Franklin, Lamoille, Windham, and Windsor are all below 50%.

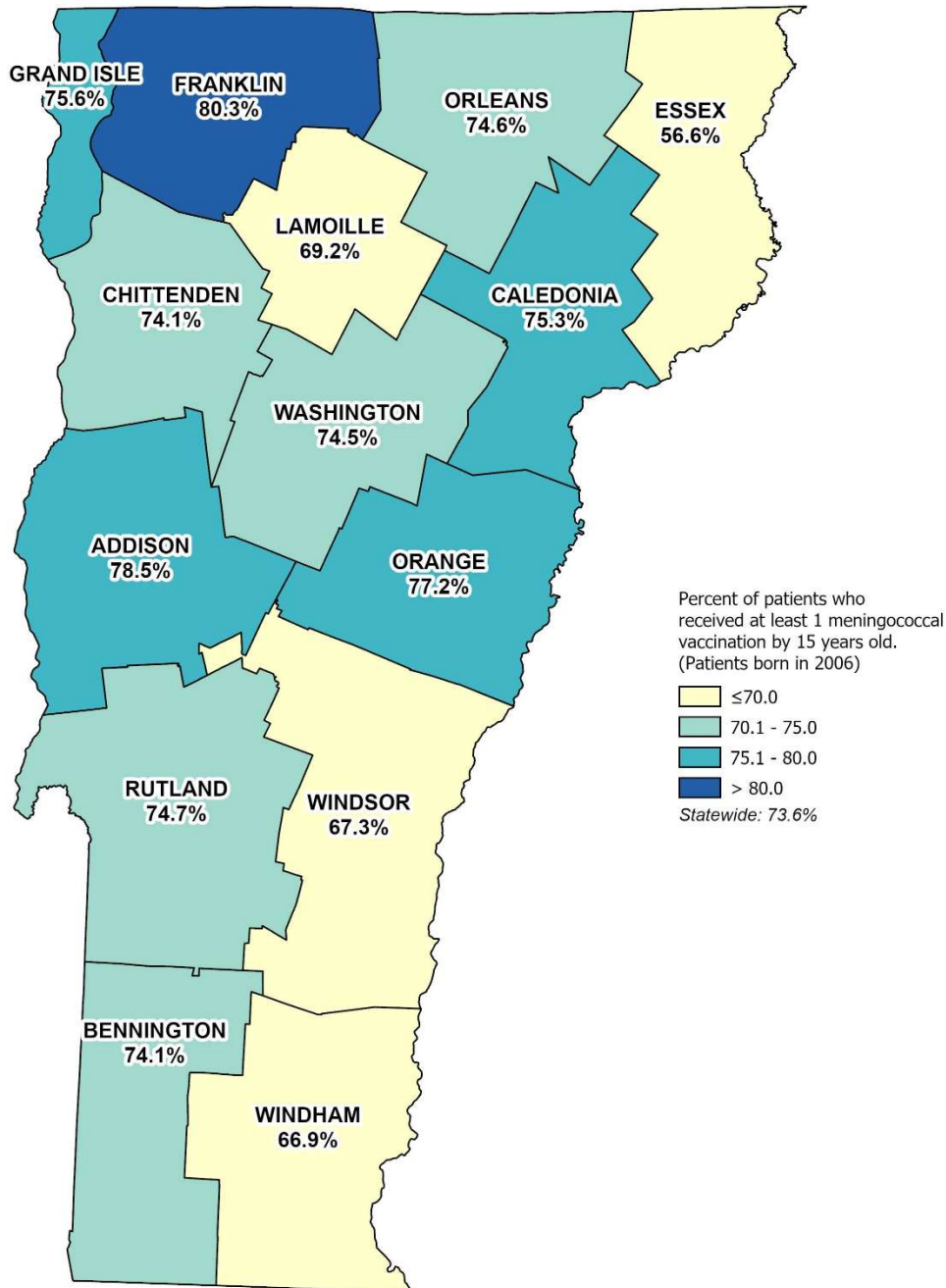
Percent of Vermont Teens who received at least two HPV vaccinations by 15 years old by county.



Meningococcal Vaccine - Vermont Teens by Age 15, by County

Teens are recommended to receive two doses of Meningococcal vaccine. The first dose between age 11-12 years and the second dose at age 16. Meningococcal coverage is assessed by measuring how many teens have received at least one dose of Meningococcal vaccine by age 15. Meningococcal vaccine coverage by age 15 in Vermont in 2021 was 73.6%. Coverage varies by county, with Franklin County achieving over 80% coverage. Essex, Lamoille, Windham, and Windsor counties have values of less than 70%.

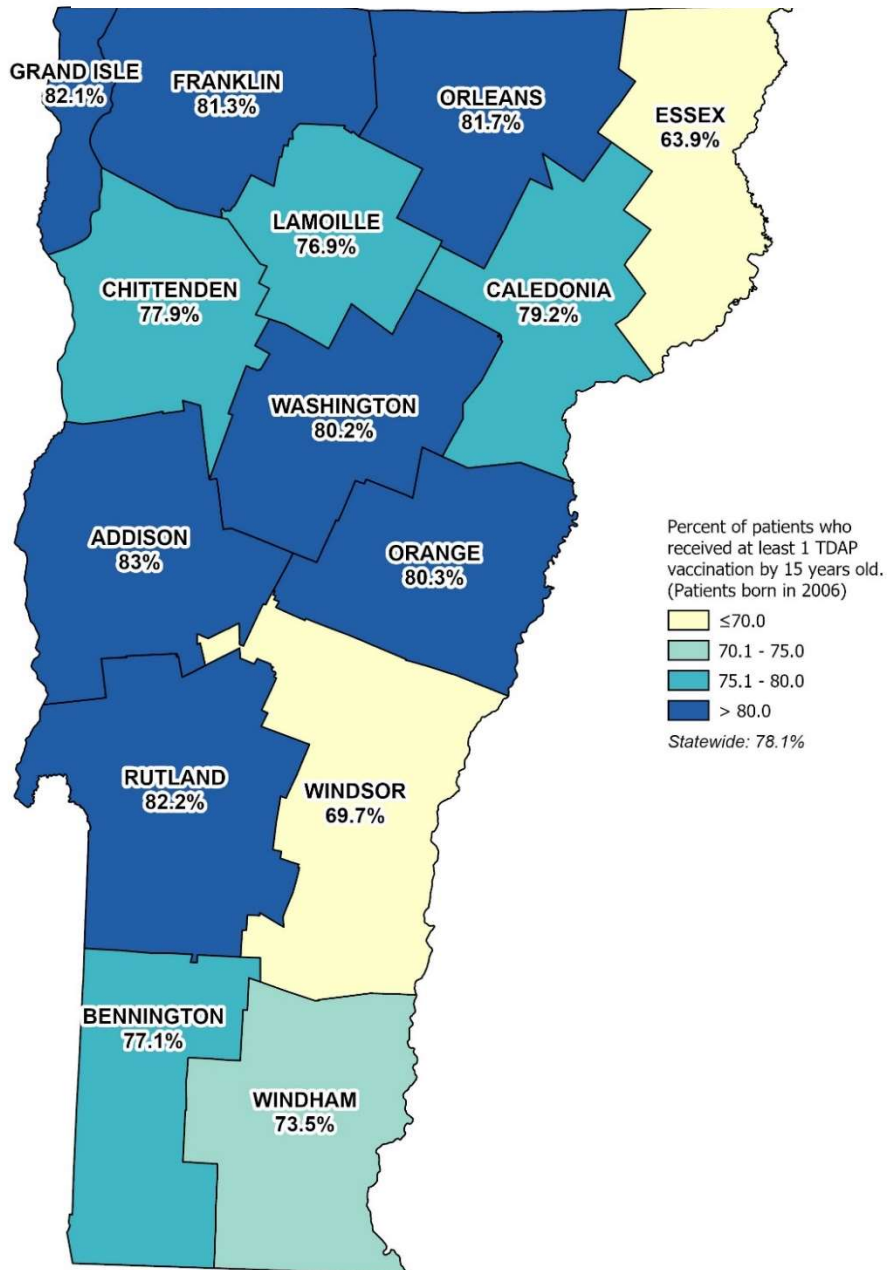
Percent of Vermont Teens who received at least one meningococcal vaccination by 15 years old by county.



Tdap Vaccine - Vermont Teens by Age 15, by County - At Least One Dose

Tdap coverage by age 15 is over 78%, but Essex and Windsor counties are more than five percentage points below the state rate (see *below*). Tdap, Meningococcal, and HPV vaccines are all recommended for teens in this age group by the Advisory Committee for Immunization Practices (ACIP).

Percent of Vermont Teens who received at least one TDAP vaccination by 15 years old by county.



Teen Vaccination Coverage by Age 15, by County

In summary, below are the rates discussed above, as well as the number of children receiving each vaccine by county.

Vaccine Series Rates by Age 15 for Children Born in 2006

	HPV 1+		HPV 2+		Meningococcal 1+		Tdap 1+		Total
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count
Addison	327	74.0%	264	59.7%	347	78.5%	367	83.0%	442
Bennington	350	62.2%	269	47.8%	417	74.1%	434	77.1%	563
Caledonia	292	64.5%	220	48.6%	341	75.3%	359	79.2%	453
Chittenden	1,581	69.6%	1,318	58.0%	1,682	74.1%	1,768	77.9%	2,271
Essex	45	54.2%	26	31.3%	47	56.6%	53	63.9%	83
Franklin	449	66.1%	338	49.8%	545	80.3%	552	81.3%	679
Grand Isle	54	69.2%	41	52.6%	59	75.6%	64	82.1%	78
Lamoille	248	60.2%	196	47.6%	285	69.2%	317	76.9%	412
Orange	255	71.6%	216	60.7%	275	77.2%	286	80.3%	356
Orleans	235	59.6%	199	50.5%	294	74.6%	322	81.7%	394
Rutland	488	66.8%	412	56.4%	546	74.7%	601	82.2%	731
Washington	503	67.4%	408	54.7%	556	74.5%	598	80.2%	746
Windham	344	58.1%	252	42.6%	396	66.9%	435	73.5%	592
Windsor	486	60.1%	379	46.9%	544	67.3%	563	69.7%	808
Statewide	5,657	65.7%	4,538	52.7%	6,334	73.6%	6,719	78.1%	8,608

Hepatitis A Vaccine Coverage, Various Age Groups

The vaccine for Hepatitis A is a two-dose series beginning at age 12 months, with a second dose at least 6 months after the first. Unvaccinated persons through 18 years should complete the 2-dose series.

Despite the COVID-19 pandemic, Hepatitis A uptake continues to improve in all age groups, with the largest increase among those 13 through 17 years, which increased from 64.8% in 2019, to 69.9% in 2020, and 74.5% in 2021. Younger age groups, those 2-4 years and 5-12 years of age had modest increases:

- 2-4 years: 80.2% in 2019, 80.6% in 2020, and 81.1% in 2021.
- 5-12 years: 78.6% in 2019, 80.4% in 2020, and 81.2% in 2021.

Conclusion

While the recent immunization conversation has focused on COVID-19, it is also important to measure the effect of the pandemic on routine immunizations. This annual report, reflecting the situation at the close of 2021, shows that routine immunization in Vermont did continue and statewide vaccination rates remained generally steady among both children and adolescents. However, individual county rates were impacted and there are new areas of concern. The Vermont Immunization Registry and Immunization Program will work together to understand and address these, while maintaining our goal of keeping all Vermonters safe from all vaccine preventable diseases.

Limitations

We are reporting these data using an IMR based denominator. We believe this is the most accurate way to report, since our numbers are based on actual individuals and not annual census estimates. We acknowledge this can make our denominators too large (and our rates, subsequently somewhat lower), as it is difficult to identify and exclude individuals who did live in Vermont but have now moved out of state. To control for this in the teen reporting only, we used the Ogive hybrid method recommended in the American Immunization Registry Association Analytic Guide for Assessing Vaccination Coverage and excluded individuals who have not received any immunizations in 10+ years.

For More Information:

Contact the Vermont Immunization Registry program: IMR@vermont.gov

Registry Data Sources:

As of January 1, 2021, there were 984,125 individuals, and over 12 million immunizations in the Vermont Immunization Registry.

Nearly 80% of the 2,207,810 immunizations added to the IMR in 2021 came directly from electronic health records in provider offices and hospitals. Another 16% were loaded as flat files – many of these came from health insurers and large chain pharmacies, and others were historical information that medical practices and health clinics were able to provide. It is also possible for immunizers to directly enter information into the IMR, and this accounted for 4% of 2021 data.

Thank you to Vermont health care providers, hospitals, pharmacies, and health insurers for their invaluable contributions to this health information system.