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CONTAGIOUS COMMENTS

Department of Epidemiology

The Vaccine-Preventable Diseases Report

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Highlights:

- COVID, influenza, RSV, and pneumococcal disease were the top causes of ED visits and hospitalizations with a vaccine preventable disease (VPD) in Colorado 2024 (Tables 1, 2).
- ED visits and hospitalizations for VPDs among Coloradans led to $4.4 billion in health care charges in 2024.

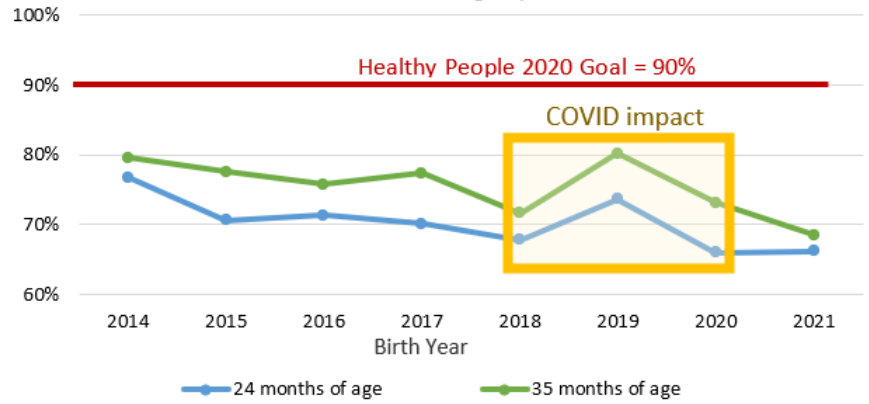
Colorado Children:

In 2024, vaccine-preventable diseases resulted in over 27,000 hospitalizations and emergency department visits for Colorado children and over $422 million in health care charges.

Children: RSV, COVID, and influenza remained the three most common reasons for hospitalization or an ED visit with a VPD among Colorado children in 2024 (Table 1). RSV was the most common VPD among hospitalized children and influenza was the most common for ED visits. The total number of pediatric hospitalizations and ED visits with VPDs were similar in 2024 compared to 2023. The number of pediatric hospitalizations with COVID remained higher than hospitalizations with influenza in 2024 as pediatric and maternal COVID immunization continue to lag. The number of pediatric ED visits with pertussis or varicella increased slightly from 2023 to 2024.

Young Children: Only 66% of Coloradans born in 2021 received the recommended 7 vaccine series by 24 months of age, and only 69% had completed this series by 35 months.[1] The American Academy of Pediatrics (AAP) recommends series completion by 18 months, and it includes vaccinations to protect against measles, mumps, rubella, tetanus, diphtheria, pertussis, polio, *Haemophilus influenzae* B, hepatitis B, varicella, and pneumococcus. Children who receive these vaccinations late or not at all, are more vulnerable to diseases like sepsis, meningitis, or pneumonia from infections with pathogens like pneumococcus, *Haemophilus influenzae*, and pertussis.

Figure 1: Percentage of Coloradans Who Completed Recommended 7 Vaccine Series at 24 and 35 Months of Age by Birth Year



Among all 50 states, CO ranks
37th for 3-year-olds
and
30th for 2-year-olds
Colorado kids deserve better

Summary: *On-time vaccination among pre-school aged children is dropping. About 1 in 3 young children in Colorado are missing vaccines.*

Table 1: Cases, rates, and charges for Colorado children < 20 years of age with vaccine-preventable diseases, 2024.

Vaccine Preventable Disease	Hospitalized Cases	Rate per 100,000	Hospital charges	ED Cases	Rate per 100,000	ED charges	Total charges
RSV	1,758	125.4	$158,902,574	4,379	312.4	$24,777,493	$183,680,067
COVID (incl. Long COVID, MIS-C)	666	47.5	$81,868,679	7,639	544.9	$37,947,073	$119,815,752
Influenza	503	35.9	$35,409,179	11,503	820.5	$48,328,409	$83,737,588
Multiple viral respiratory VPDs[a]	105	7.5	$5,667,628	482	34.4	$2,536,168	$8,203,796
Pneumococcal disease	90	6.4	$18,514,756	59	4.2	$173,946	$18,688,702
Pertussis	18	1.3	$1,528,816	203	14.5	$1,659,550	$3,188,366
Varicella/Zoster	12	0.9	$464,675	284	20.3	$645,365	$1,110,040
Hepatitis B	9	0.6	$932,337	66	4.7	$71,596	$1,003,933
HPV	6	0.4	$244,808	65	4.6	$143,376	$388,184
H. influenzae	3	0.2	$2,517,072	2	0.1	$649	$2,517,721
Meningococcal disease	2	0.1	$282,225	1	0.1	$214	$282,439
All other VPDs[b]	3	0.2	$26,580	19	1.4	$61,455	$88,035
Total Vaccine Preventable Diseases	3,175	226.5	$306,359,329	24,702	1762.0	$116,345,294	$422,704,623

[a]Hospitalizations or ED visits with ≥ 2 VPD codes for RSV, COVID, or Influenza

[b]Diphtheria, hepatitis A, measles, mpox, mumps, polio/post-polio syndrome, rubella, and tetanus.

Table 1 shows hospitalizations and emergency department (ED) visits associated with vaccine-preventable disease (VPDs) in Colorado in 2024, and hospital-associated charges for these cases [Colorado Hospital Association data]. Diagnoses identified using ICD-10 codes. Population estimates from the Colorado Department of Local Affairs State Demography Office are used to calculate incidence rates. Data from cases with ≥2 VPD codes were reviewed to identify the more relevant VPD code to avoid double-counting ED visits and hospitalizations; considerations included primary diagnosis code, acuity of conditions, frequency of diagnoses in the overall dataset, and accompanying ICD-10 codes.

Diphtheria, measles, polio, rubella, and tetanus: The mode and accuracy of these diagnoses were unable to be confirmed and these may not align with cases reported to the Colorado Department of Public Health and Environment (CDPHE).

Colorado Adults:

In 2024, Colorado adults had over 136,000 hospitalizations and ED visits with vaccine-preventable diseases (VPDs), resulting in over $3.9 billion in health care charges.

Adults: COVID, influenza, and pneumococcal disease were the three most common reasons for hospitalization with a VPD among Colorado adults in 2024 (Table 2). The most common reasons for ED visits with a VPD among Colorado adults were COVID, influenza, and HPV in 2024. The number of ED visits and hospitalizations for Colorado adults with influenza were slightly higher and visits with COVID were slightly lower in 2024 compared to 2023.

Specific Vaccine Preventable Diseases: RSV hospitalizations and ED visits were stable among Colorado children and slightly increased among Colorado adults in 2024 compared to 2023, despite the availability of immunizations to protect infants and older adults. These 2024 data from CHA include the end of the 2023-24 season, when nirsevimab (monoclonal RSV antibody for infants) availability was limited, and the beginning of the 2024-25 season when nirsevimab was more widely available. We anticipate that pediatric hospitalizations with RSV will decrease more in future years.

Among Colorado residents during 2024, there were no hospitalizations with a primary diagnosis of a vaccine adverse event.

Table 2: Cases, rates, and charges for Colorado adults > 20 years of age with vaccine-preventable diseases, 2024.

Vaccine Preventable Disease	Hospitalized Cases	Rate per 100,000	Hospital charges	ED Cases	Rate per 100,000	ED charges	Total charges
COVID (incl. Long COVID, MIS-C)	13,174	291.6	$1,525,821,189	72,103	1596.2	$1,077,420,185	$2,603,241,374
Influenza	2,878	63.7	$313,646,970	13,730	303.9	$116,524,943	$430,171,913
Pneumococcal disease	1,060	23.5	$196,026,922	199	4.4	$3,819,146	$199,846,068
Varicella/Zoster	976	21.6	$120,466,532	6,554	145.1	$41,065,107	$161,531,639
RSV	947	21.0	$97,531,613	1,870	41.4	$19,396,501	$116,928,114
HPV	537	11.9	$59,087,568	15,611	345.6	$165,946,588	$225,034,156
Hepatitis B	490	10.8	$93,295,036	3,918	86.7	$21,067,669	$114,362,705
Multiple viral respiratory VPDs	220	4.9	$26,654,901	620	13.7	$6,860,693	$33,515,594
Polio/post-polio syndrome	205	4.5	$19,488,341	544	12.0	$8,129,247	$27,617,588
Hepatitis A	80	1.8	$27,049,486	98	2.2	$1,956,392	$29,005,878
H. influenzae	63	1.4	$23,037,164	7	0.2	$55,804	$23,092,968
All other VPDs[b]	64	1.4	$11,975,494	192	4.3	$1,366,664	$13,342,158
Total Vaccine Preventable Diseases	20,694	458.1	$2,514,081,216	115,446	2555.7	$1,463,608,939	$3,977,690,155

[a]Hospitalizations or ED visits with ≥ 2 VPD codes for RSV, COVID, or Influenza

[b]Diphtheria, measles, meningococcal disease, mpox, mumps, pertussis, rubella, and tetanus.

Table 2 shows hospitalizations and emergency department (ED) visits associated with vaccine-preventable disease (VPDs) in Colorado during in 2024, and hospital-associated charges for these cases [Colorado Hospital Association data]. Diagnoses identified using ICD-10 codes. Population estimates from the Colorado Department of Local Affairs State Demography Office are used to calculate incidence rates. Data from cases with ≥2 VPD codes were reviewed to identify the more relevant VPD code to avoid double-counting ED visits and hospitalizations; considerations included primary diagnosis code, acuity of conditions, frequency of diagnoses in the overall dataset, and accompanying ICD-10 codes.

Diphtheria, measles, and tetanus: The mode and accuracy of these diagnoses were unable to be confirmed and these may not align with cases reported to the Colorado Department of Public Health and Environment (CDPHE).

Polio/post-polio syndrome: Most adult encounters with polio/post-polio syndrome were among people born before polio elimination in the United States, demonstrating the long-term impacts of VPDs.

Rubella: Some adult rubella encounters were among older adults with history of congenital rubella and associated comorbidities, demonstrating the long-term impacts of a VPD. Some adult rubella encounters were among pregnant people who could have rubella disease or have an indication for rubella immunity testing; the mode and accuracy of rubella diagnoses were unable to confirmed.

References

1. Centers for Disease Control and Prevention. ChildVaxView: Vaccination Coverage among Young Children (0 – 35 Months); https://www.cdc.gov/vaccines/imz-managers/coverage/childvaxview/interactive-reports/index.html.

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