

DECLINE IN HIV TESTING AND CHANGES IN POSITIVITY RATES DURING THE COVID-19 PANDEMIC

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1. Introduction

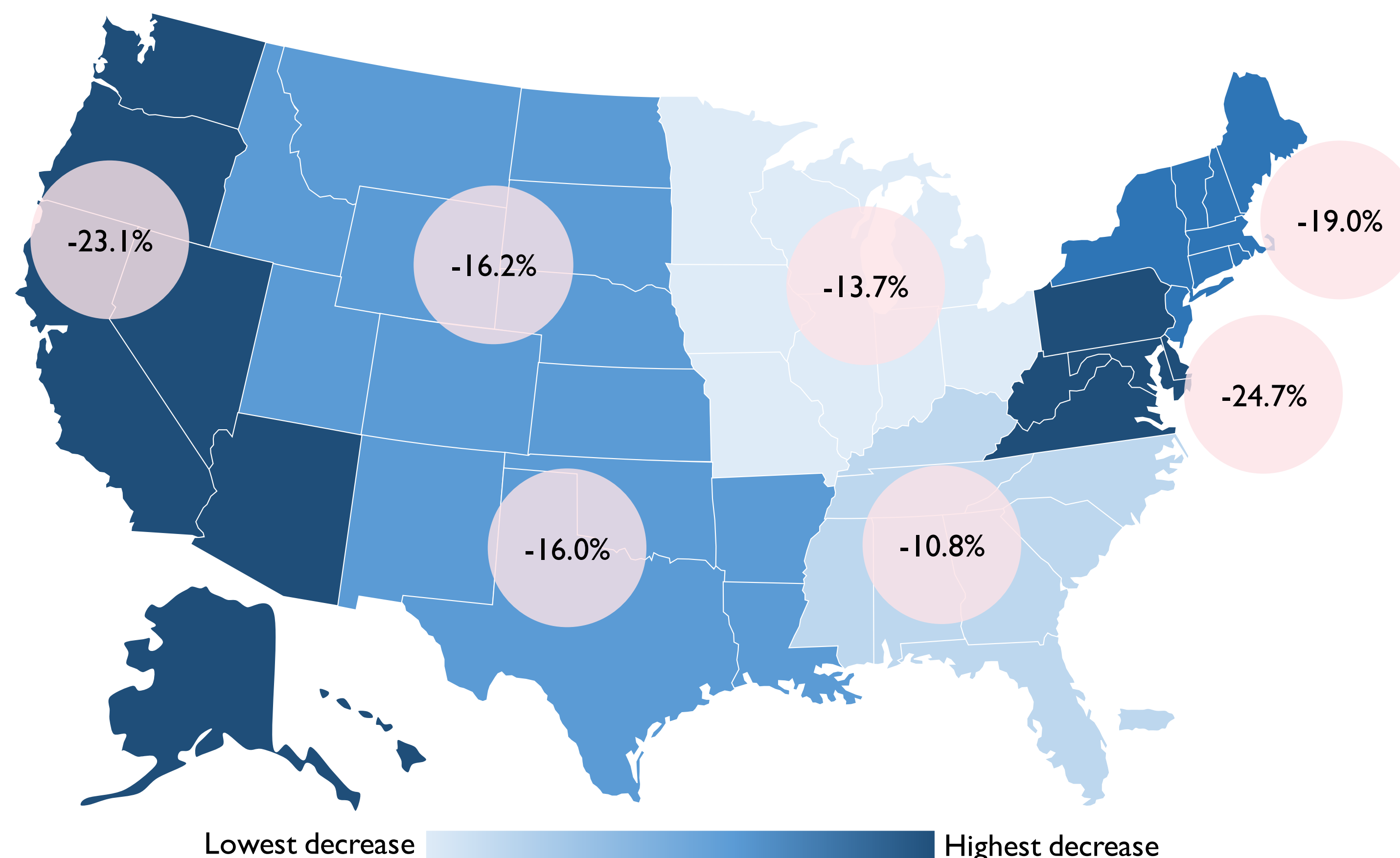
- Patient visits to ambulatory care centers declined during the COVID-19 pandemic,¹ which may affect HIV screening rates and hinder progress toward 90-90-90 targets
- We assessed if HIV diagnostic test volume and positivity rates have changed compared to the pre-pandemic period

2. Methods

- The volume of the HIV diagnostic test, 4th generation HIV-1/2 antigen/antibody with nucleic acid confirmation, ordered in the United States and Puerto Rico from March to October in 2020 was compared to test volume ordered from March to October in 2019
- Valid test results were interpreted per CDC guidelines² (Figure 1)
- HIV positivity and acute infection rates were assessed by geography, patient gender and age, and compared between the two time periods
- State/territory-level analyses were limited to the 48 with at least 1,000 valid test results in 2019
- The Z test for two population proportions was used to compare data from the two time periods; two-tailed p<0.05 was considered significant

3. Results

Figure 2. Percent change in HIV diagnostic test volume from 2019 to 2020 by region.



3. Results (continued)

Test Volume

- Nationally, test volume decreased 17.5% in 2020 from 4.46 million in 2019
- Test volume decrease was greatest in the Mid-Atlantic region and lowest in the Southeast region (Figure 2)
- On a state/territory level, the greatest decrease was in MT (-41%) followed by DC (-40%), and the lowest decrease was in SC (-0.93%) followed by MA (-1.12%)

State/Territory-level Positivity Rates

- The greatest increase in positivity occurred in PR, while the greatest decrease in positivity occurred in KY (p<0.01 for both)

State/Territory-level Acute Infection

- Statistically significant decrease in the proportion of positive tests reporting acute HIV infection was seen in FL, NC, LA, NV, and NY (p<0.05 for all), with the greatest decrease in FL (p=0.010)

Figure 1. CDC-Recommended 4th Generation HIV Diagnostic Algorithm and Interpretation.

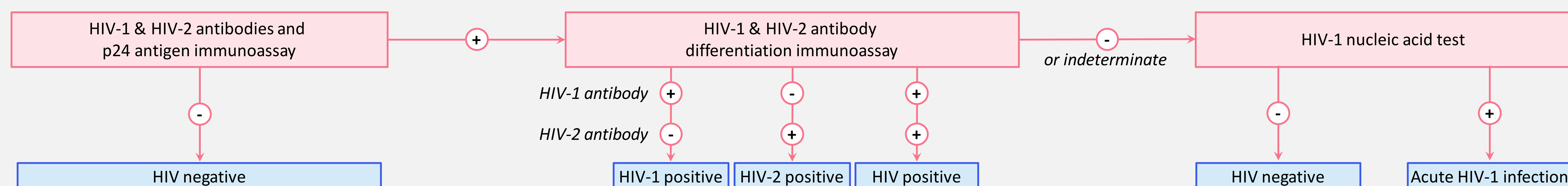


Table 1. HIV positivity and acute infection rates by region or demographic.

Region or Demographic	HIV Positivity			Acute HIV Proportion		
	2019	2020	p-value	2019	2020	p-value
United States and Puerto Rico	0.677%	0.662%	0.023	1.154%	0.910%	0.016
Northeast ¹	0.567%	0.547%	0.221	0.913%	0.487%	0.089
Mid-Atlantic ²	0.503%	0.507%	0.772	1.076%	1.152%	0.795
Midwest ³	0.486%	0.490%	0.816	1.059%	1.784%	0.112
South Central ⁴	0.948%	0.889%	0.004	0.780%	0.743%	0.848
Southeast ⁵	0.849%	0.764%	<0.0001	1.367%	0.811%	0.002
Mountain ⁶	0.360%	0.344%	0.621	1.068%	1.333%	0.784
West ⁷	0.574%	0.664%	<0.0001	1.536%	1.053%	0.111
Male	1.406%	1.479%	<0.0001	1.147%	0.220%	<0.0001
<25 years	0.820%	0.971%	<0.0001	2.848%	2.306%	0.344
25-40 years	1.504%	1.600%	0.0002	1.271%	0.897%	0.035
41-55 years	1.482%	1.505%	0.496	0.786%	0.732%	0.781
>55 years	1.570%	1.630%	0.138	0.580%	0.290%	0.091
Female	0.256%	0.229%	<0.0001	1.137%	0.971%	0.433
<25 years	0.070%	0.075%	0.401	2.105%	5.611%	0.028
25-40 years	0.164%	0.148%	0.003	1.812%	0.997%	0.055
41-55 years	0.492%	0.468%	0.169	0.637%	0.435%	0.442
>55 years	0.707%	0.689%	0.536	0.727%	0.290%	0.146

¹CT, MA, ME, NH, NJ, NY, RI, VT; ²DC, DE, MD, PA, VA, WV; ³IA, IL, IN, KS, MI, MN, MO, NE, OH, WI; ⁴AR, LA, NM, OK, TX; ⁵AL, FL, GA, KY, MS, NC, PR, SC, TN; ⁶CO, ID, MT, ND, SD, UT, WY; ⁷AK, AZ, CA, HI, NV, OR, WA.

Positivity Rate by Geography

- Although HIV positivity decreased on a national level (0.677% to 0.662%, p=0.023), regional variability was observed
- HIV positivity decreased in the South Central (0.948% to 0.889%, p=.004) and Southeast (0.849% to 0.764%, p<0.0001) regions, but increased in the West (0.574% to 0.664%, p<0.0001; Table 1)

Acute Infection by Geography

- Proportion of positive tests reporting acute HIV-1 infection decreased nationally (1.154% to 0.910%, p=0.016), with significant decline seen in the Southeast region (1.367% to 0.811%, p=0.002; Table 1)

Positivity Rates by Demographic

- An increase in HIV positivity was seen in males, while a decrease was seen in females (p<0.0001 for both; Table 1)
- The increase in HIV positivity among males was driven by age groups <25 years and 25-40 years, while the decrease in females was driven by the age group 25-40 years (Table 1)

State/Territory Level

- Among males, an increase in positivity was seen, in order of decreasing magnitude, in PR, MT, NH, IN, AZ, CA, MD, DC, WA, and NJ (p<0.05 for all), and a decrease in MO, KY, GA, SC, and UT (p<0.01 for all)
- Among females, an increase in positivity was seen in MN and WI (p<0.05 for both), and a decrease in SC, KY, NY, GA, and TX (p<0.05 for all)

Acute Infection by Demographic

- A decrease in the proportion of positive tests reporting acute HIV-1 infection was seen in males (p<0.0001), but not in females (Table 1)
- The decrease in acute infection among males was driven by age group 25-40 years (p=0.035), although a trend was also observed in age group >55 years (p=0.091; Table 1)
- Among females, a significant increase in acute infection was seen in age group <25 years (p=0.028; Table 1)
- Females in the remaining age groups experienced a decrease in acute infection nearing significance among those aged 25-40 years (p=0.055; Table 1)

State/Territory Level

- Among males, a significant decrease in acute HIV-1 infection was seen, in order of decreasing magnitude, in WA, LA, NC, DC, SC, MD, NJ, GA, CA, FL, NY, and TX (p<0.05 for all); an increase in acute HIV among males was not observed in any state
- Among females, a decrease in acute HIV-1 infection was seen in CA and FL, while an increase was seen in IL (p<0.05 for all)

4. Summary and Conclusions

- Diagnostic HIV test volume, positivity, and acute infection rates decreased during the COVID-19 pandemic, but regional and gender-based differences were noted
- An increase in HIV positivity and a concomitant decrease in acute infection seen in men suggest a delay in healthcare engagement
- State-specific restrictions in 2020 and SARS-CoV-2 transmission concerns may have affected healthcare engagement among those at high risk for HIV infection