Figure S1: Relationship Between COVID Effects on Parameters and Change in Cumulative Incidence 2020-2025

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| **Prolonged Barriers to Care Scenario** | **Rapid Resumption of Care Scenario** |
| a. Change in Incidence vs. Reduction in Sexual Transmission  C:\Users\Todd Fojo\CloudStation\Projects\Ending HIV\Manuscripts\covid_manuscript\CID submission\CID Revision\images\binned_boxplots\delayed_transmission.png | b. Change in Incidence vs. Reduction in Sexual Transmission  C:\Users\Todd Fojo\CloudStation\Projects\Ending HIV\Manuscripts\covid_manuscript\CID submission\CID Revision\images\binned_boxplots\base_transmission.png |
| c. Change in Incidence vs. Reduction in Viral Suppression C:\Users\Todd Fojo\CloudStation\Projects\Ending HIV\Manuscripts\covid_manuscript\CID submission\CID Revision\images\binned_boxplots\delayed_suppression.png | d. Change in Incidence vs. Reduction in Viral Suppression C:\Users\Todd Fojo\CloudStation\Projects\Ending HIV\Manuscripts\covid_manuscript\CID submission\CID Revision\images\binned_boxplots\base_suppression.png |
| e. Change in Incidence vs. Reduction in HIV Testing  C:\Users\Todd Fojo\CloudStation\Projects\Ending HIV\Manuscripts\covid_manuscript\CID submission\CID Revision\images\binned_boxplots\delayed_testing.png | f. Change in Incidence vs. Reduction in HIV Testing  C:\Users\Todd Fojo\CloudStation\Projects\Ending HIV\Manuscripts\covid_manuscript\CID submission\CID Revision\images\binned_boxplots\base_testing.png |
| g. Change in Incidence vs. Reduction in PrEP Use  C:\Users\Todd Fojo\CloudStation\Projects\Ending HIV\Manuscripts\covid_manuscript\CID submission\CID Revision\images\binned_boxplots\delayed_prep.png | h. Change in Incidence vs. Reduction in PrEP Use  C:\Users\Todd Fojo\CloudStation\Projects\Ending HIV\Manuscripts\covid_manuscript\CID submission\CID Revision\images\binned_boxplots\base_prep.png |

The dark horizontal lines represent the median across 1,000 simulations in each of the 32 metropolitan statistical areas of the change incident cases from 2020-2025, calculated as the projected incident infections from 2020-2025 under the COVID scenario minus the incident infections if COVID had not occurred, divided by the cumulative incident infections if COVID had not occurred. The boxes denote the interquartile interval, and the whiskers denote the 95% credible interval. Panels a, c, e, and g (blue) show projections from the Prolonged Barriers to Care scenario (sexual transmission normalized by July 4, 2021; HIV testing, viral suppression, and PrEP use do not normalize until Feb 4, 2022); Panels b, d, f, and g (orange) show the corresponding projections for the Rapid Resumption of Care scenario (sexual transmission, HIV testing, viral suppression, and PrEP use all normalize by July 4, 2021).

Figure S2: Strength of Association Between Cumulative HIV Incidence 2020-2025 and the Reduction in Transmission and Viral Suppression due to the COVID-19 Pandemic

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| **Prolonged Barriers to Care Scenario** | **Rapid Resumption of Care Scenario** |
| a. Relationship Between Pre-Pandemic Incidence/Prevalence Ratio and the Effect of Reduction in Sexual Transmission on HIV Incidence  C:\Users\Todd Fojo\CloudStation\Projects\Ending HIV\Manuscripts\covid_manuscript\CID submission\CID Revision\images\msa_scatter\labeled_delayed_transmission.png | b. Relationship Between Pre-Pandemic Incidence/Prevalence Ratio and the Effect of Reduction in Sexual Transmission on HIV Incidence  C:\Users\Todd Fojo\CloudStation\Projects\Ending HIV\Manuscripts\covid_manuscript\CID submission\CID Revision\images\msa_scatter\labeled_base_transmission.png |
| c. Relationship Between Pre-Pandemic Viral Suppression and the Effect of Reduction in Viral Suppression on HIV Incidence  C:\Users\Todd Fojo\CloudStation\Projects\Ending HIV\Manuscripts\covid_manuscript\CID submission\CID Revision\images\msa_scatter\labeled_delayed_suppression.png | d. Relationship Between Pre-Pandemic Viral Suppression and the Effect of Reduction in Viral Suppression on HIV Incidence  C:\Users\Todd Fojo\CloudStation\Projects\Ending HIV\Manuscripts\covid_manuscript\CID submission\CID Revision\images\msa_scatter\labeled_base_suppression.png |

Each circle represents one metropolitan statistical area (MSA). The value on the x-axis is the mean (across 1,000 simulations in each MSA) pre-pandemic epidemiological quantity: incidence/prevalence ratio in panels a and b; proportion of diagnosed PWH who are suppressed in panels c and d. The value on the y-axis is the correlation, across all 1,000 simulations in one MSA, between the reduction sexual transmission (panels a and b) or viral suppression (panels c and d) and the relative change in cumulative incidence (under COVID vs. no COVID). The size of each circle is proportional to the relative change in cumulative incidence. Panels a and c (blue) show relationships from the Prolonged Barriers to Care scenario (sexual transmission normalized by July 4, 2021; HIV testing, viral suppression, and PrEP use do not normalize until Feb 4, 2022); Panels b and d (orange) show the corresponding relationships for the Rapid Resumption of Care scenario (sexual transmission, HIV testing, viral suppression, and PrEP use all normalize by July 4, 2021).

**Figure 3: Impact of Reductions in Sexual Transmission and Viral Suppression on Cumulative HIV Incidence 2020-2025**

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| **Prolonged Barriers to Care Scenario** | **Rapid Resumption of Care Scenario** |
| a. Across All 32 MSAs  C:\Users\Todd Fojo\CloudStation\Projects\Ending HIV\Manuscripts\covid_manuscript\CID submission\CID Revision\images\heat_maps\finished\total delayed.png | b. Across All 32 MSAs C:\Users\Todd Fojo\CloudStation\Projects\Ending HIV\Manuscripts\covid_manuscript\CID submission\CID Revision\images\heat_maps\finished\total rapid.png |
| c. San Diego-Chula Vista-Carlsbad, CA  C:\Users\Todd Fojo\CloudStation\Projects\Ending HIV\Manuscripts\covid_manuscript\CID submission\CID Revision\images\heat_maps\raw\sd_delayed_sex_suppression_raw.png | d. San Diego-Chula Vista-Carlsbad, CA  C:\Users\Todd Fojo\CloudStation\Projects\Ending HIV\Manuscripts\covid_manuscript\CID submission\CID Revision\images\heat_maps\raw\sd_rapi_sex_suppression_raw.png |
| e. Boston-Cambridge-Newton, MA-NH  C:\Users\Todd Fojo\CloudStation\Projects\Ending HIV\Manuscripts\covid_manuscript\CID submission\CID Revision\images\heat_maps\raw\boston_delayed_sex_suppression_raw.png | f. Boston-Cambridge-Newton, MA-NH  C:\Users\Todd Fojo\CloudStation\Projects\Ending HIV\Manuscripts\covid_manuscript\CID submission\CID Revision\images\heat_maps\raw\boston_rapid_sex_suppression_raw.png |
| g. Chicago-Naperville-Elgin, IL-IN-WI  C:\Users\Todd Fojo\CloudStation\Projects\Ending HIV\Manuscripts\covid_manuscript\CID submission\CID Revision\images\heat_maps\raw\chicago_delayed_sex_suppression_raw.png | h. Chicago-Naperville-Elgin, IL-IN-WI  C:\Users\Todd Fojo\CloudStation\Projects\Ending HIV\Manuscripts\covid_manuscript\CID submission\CID Revision\images\heat_maps\raw\chicago_rapid_sex_suppression_raw.png |

Each cell is shaded according to the average change in cumulative incidence from 2020-2025 for simulations whose parameters fall within the corresponding ranges. \*The change in cumulative incidence is calculated as the cumulative projected incident infections from 2020-2025 under the COVID scenario minus the cumulative incident infections if COVID had not occurred, divided by the cumulative incident infections if COVID had not occurred. Panels a, c, e, and g show projections from the Prolonged Barriers to Care scenario (sexual transmission normalized by July 4, 2021; HIV testing, viral suppression, and PrEP use do not normalize until Feb 4, 2022); Panels b, d, f, and g show the corresponding projections for the Rapid Resumption of Care scenario (sexual transmission, HIV testing, viral suppression, and PrEP use all normalize by July 4, 2021).