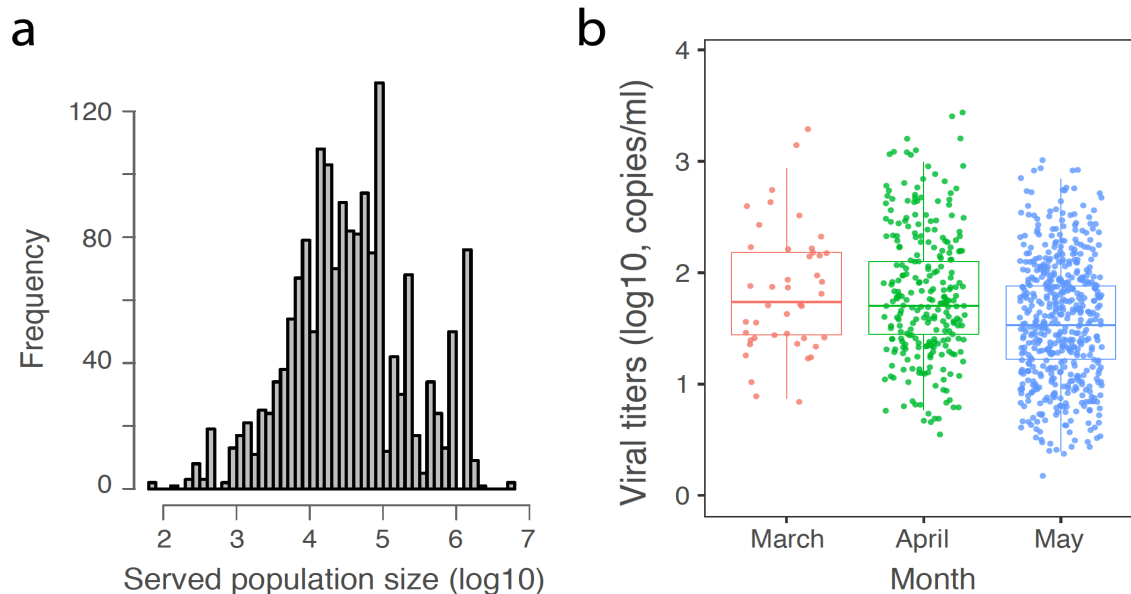


536
537
538
539
540
541
542

Supplemental figures



543
544
545
546
547
548
549
550
551
552
553
554

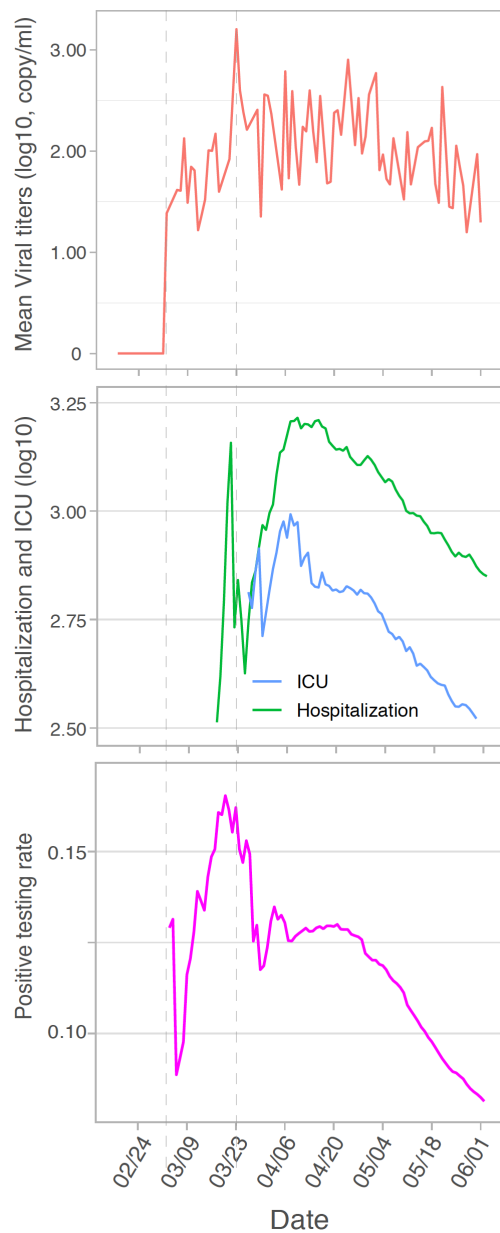
Fig. S1. Distribution of the wastewater treatment plant serving population size, and viral titers in positive wastewater samples by month. (a) Histogram of population sizes served by the sampled wastewater treatment plants. The median served population size is 31,745. (b) Viral titers in positive wastewater samples by month. The box represents the interquartile range of viral titers for each month, the horizontal line inside the box is the median. Significant difference was found between the mean viral titers in April and May (Welch's t-test, p-value = 0.025).

555
556
557
558
559
560
561

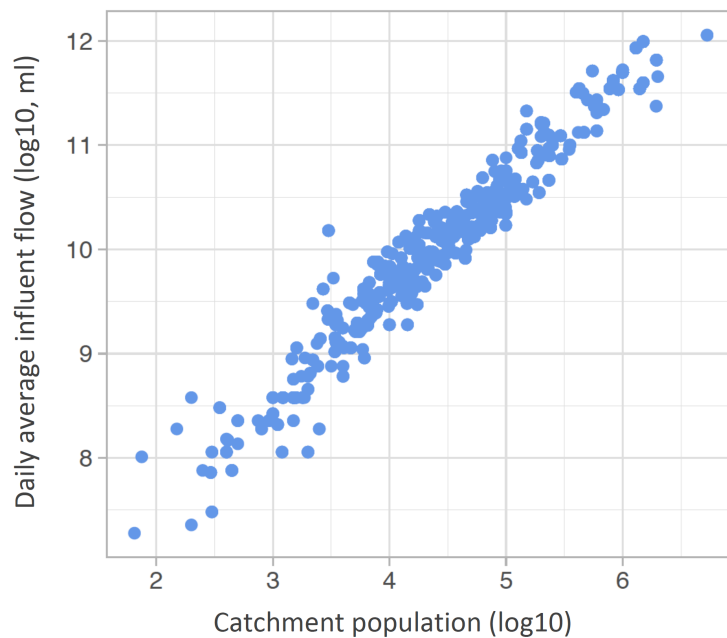


563
564
565
566
567
568
569
570
571
572
573
574
575
576
577
578

Fig. S2. Temporal SARS-CoV-2 titers at the county level and catchment level. (a) Temporal viral titers in 12 representative counties. Each dot is a sample, and colored by the sampling catchments in the county. Red lines represent the daily new cases in the corresponding counties during the sampling period. (b) Temporal viral titers for samples collected in six different locations in the New Castle County of Delaware. Red lines represent the weighted daily new cases (daily new cases in the county multiplying the catchment served population size and divided by the county population size) during the sampling period.

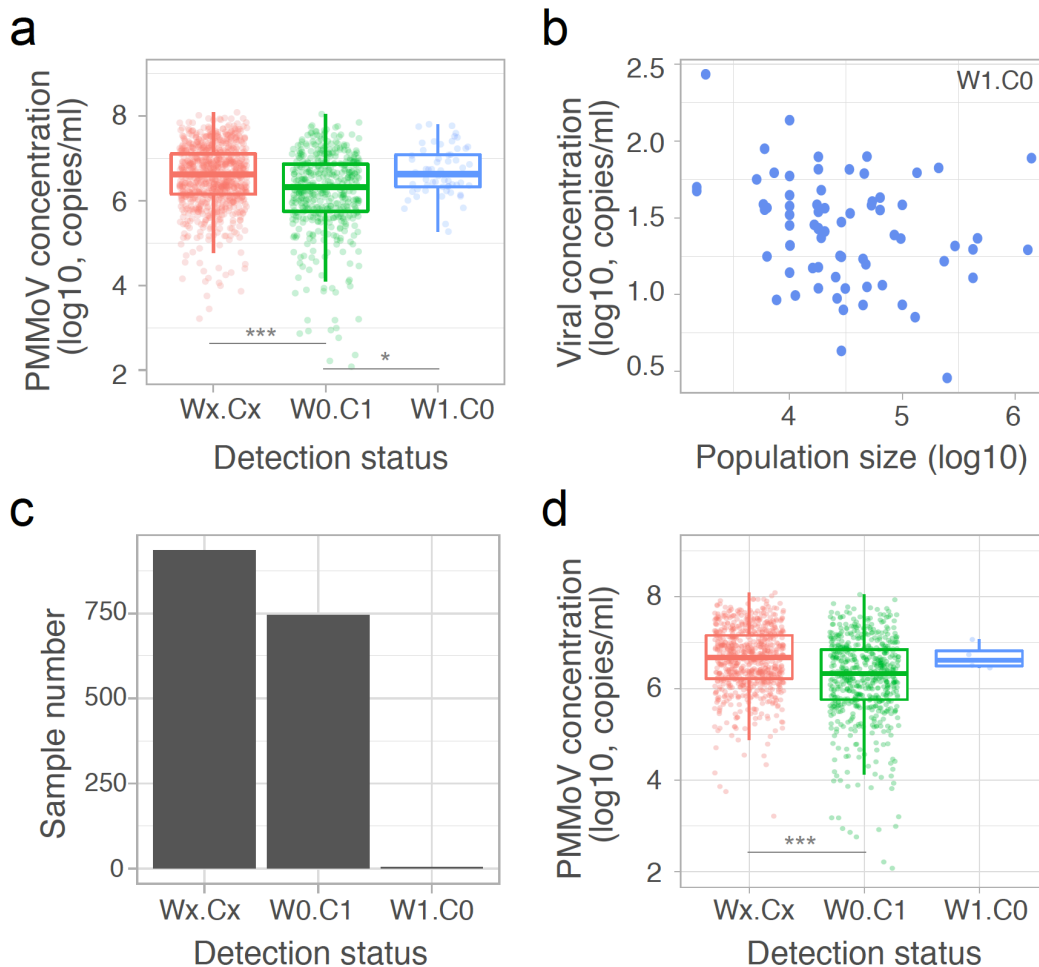


579
580 **Fig. S3.** Wastewater viral titers (top) and clinical COVID-19 surveillance
581 indicators including hospitalization and intensive care unit admissions (middle),
582 and the testing positive rates (bottom) from February to June. Positive
583 wastewater data from all the sampling locations were aggregated by date using
584 the mean function. Clinical data from the 40 sampled states were aggregated in
585 the same way.
586
587
588



589
590
591
592
593
594
595

Fig. S4. Daily average influent flow at the wastewater treatment plant is correlated with catchment population size.



596
597

598 **Fig. S5.** PMMoV concentrations in wastewater samples, and detection status
599 with 7-day averages of new COVID-19 cases. (a) PMMoV concentrations in the
600 Wx.Cx (x = 0 or 1), W0.C1, and W1.C0 groups. W1.C1: SARS-CoV-2 detected in
601 Wastewater and new Clinical cases reported; W0.C0: no Wastewater detection
602 and no new Clinical cases reported; W0.C1: no Wastewater detection but new
603 Clinical cases reported; W1.C0: Wastewater detection but no new Clinical cases
604 reported. Significant differences of PMMoV concentrations were found between
605 W0.C1 and Wx.Cx or W1.C0 groups (Welch's t-test, and symbol *: p-value <
606 0.05; ***: p-value < 0.001). (b) Viral titers and the served population size for the
607 W1.C0 samples. Most of these samples were from catchments serving 10,000 ~
608 100,000 population, with viral titers ranging from 10 to 100 copies per ml of
609 wastewater. (c-d) Detection status for wastewater data against 7-day averages of
610 new clinical cases (c), and PMMoV concentrations in the Wx.Cx, W0.C1, and
611 W1.C0 groups (d). Significant difference was found between Wx.Cx and W0.C1
612 groups (Welch's t-test, and symbol ***: p-value < 0.001).