

## Supplementary Materials

# Wastewater-Based Epidemiology for Viral Surveillance from an Endemic Perspective: Evidence and Challenges

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**Table S1.** Occurrence and viral load of HAdV according to WWTPs and seasons.

Season	WWTP type	Positive samples (n°, %)	Viral load Log <sub>10</sub> (GC/100,000 inh/day)
Autumn 2021	WWTP1	9/12, 75.0%	8.8 ± 2.7
	WWTP2	9/12, 75.0%	8.6 ± 2.6
	WWTP3	9/13, 69.2%	8.3 ± 2.8
	WWTP4	7/12, 58.3%	7.7 ± 2.9
	<b>Total of WWTPs</b>	<b>34/49, 69.4%</b>	<b>8.4 ± 2.7</b>
Winter 2022	WWTP1	8/10, 80.0%	9.4 ± 2.7
	WWTP2	10/10, 100%	10.5 ± 0.5
	WWTP3	5/12, 41.7%	6.8 ± 3.2
	WWTP4	3/12, 33.3%	5.8 ± 2.7
	<b>Total of WWTPs</b>	<b>26/44, 19.1%</b>	<b>8.0 ± 3.1</b>
Spring 2022	WWTP1	12/13, 92.3%	10.9 ± 2.0
	WWTP2	13/13, 100%	11.2 ± 0.4
	WWTP3	10/13, 76.9%	8.8 ± 2.7
	WWTP4	12/13, 92.3%	9.9 ± 1.7
	<b>Total of WWTPs</b>	<b>47/52, 90.4%</b>	<b>9.5 ± 2.7</b>
Summer 2022	WWTP1	13/13, 100%	11.7 ± 0.4
	WWTP2	13/13, 100%	10.9 ± 0.3
	WWTP3	12/13, 92.3%	9.8 ± 1.8
	WWTP4	13/13, 100%	10.7 ± 0.6
	<b>Total of WWTPs</b>	<b>51/52, 98.0%</b>	<b>10.8 ± 1.2</b>
One year	WWTP1	42/48, 87.5%	10.3 ± 2.3
	WWTP2	45/48, 93.7%	10.3 ± 1.6
	WWTP3	36/51, 78.6%	8.5 ± 2.8
	WWTP4	35/50, 70.0%	8.6 ± 2.9
	<b>Total of WWTPs</b>	<b>158/197, 80.2%</b>	<b>9.4 ± 2.6</b>

**Table S2.** Occurrence and viral load of enterovirus (EV) according to WWTPs and seasons.

Season	WWTP type	Positive samples (n°, %)	Viral load Log <sub>10</sub> (GC/100,000 inh/day)
<b>Autumn</b>	WWTP1	6/12, 50.0%	6.5 ± 2.5
	WWTP2	0/12, 0%	4.0 ± 0.1
	WWTP3	2/13, 15.4%	4.7 ± 1.6
	WWTP4	7/12, 58.3%	6.4 ± 2.3
	<b>Total of WWTPs</b>	<b>15/49, 30.6%</b>	<b>5.4 ± 2.1</b>
<b>Winter</b>	WWTP1	3/10, 30.0%	5.5 ± 2.2
	WWTP2	0/10, 0%	4.0 ± 0.0
	WWTP3	1/12, 8.3%	4.3 ± 1.4
	WWTP4	2/12, 16.7%	3.9 ± 0.0
	<b>Total of WWTPs</b>	<b>6/44, 13.6%</b>	<b>4.6 ± 1.6</b>
<b>Spring</b>	WWTP1	9/13, 69.2%	7.5 ± 2.4
	WWTP2	2/13, 15.4%	4.5 ± 1.4
	WWTP3	10/13, 76.9%	7.1 ± 1.9
	WWTP4	10/13, 76.9%	7.6 ± 2.1
	<b>Total of WWTPs</b>	<b>31/52, 59.6%</b>	<b>6.7 ± 2.3</b>
<b>Summer</b>	WWTP1	12/13, 92.3%	8.0 ± 1.4
	WWTP2	2/13, 15.4%	4.5 ± 1.3
	WWTP3	11/13, 84.6%	7.4 ± 1.7
	WWTP4	10/13, 76.9%	7.2 ± 1.9
	<b>Total of WWTPs</b>	<b>35/52, 67.3%</b>	<b>6.8 ± 2.1</b>
<b>One year</b>	WWTP1	30/48, 62.5%	7.0 ± 2.3
	WWTP2	4/48, 8.3%	4.3 ± 1
	WWTP3	24/51, 47%	5.9 ± 2.1
	WWTP4	29/50, 58.0%	6.6 ± 2.2
	<b>Total of WWTPs</b>	<b>87/197, 44.2%</b>	<b>5.9 ± 2.2</b>

**Table S3.** Occurrence and viral load of norovirus genogroup II (NoVgII) according to WWTPs and seasons.

Season	WWTP type	Positive samples (n°, %)	Viral load Log <sub>10</sub> (GC/100,000 inh/day)
Autumn	WWTP1	11/12, 91.7%	9.1 ± 1.6
	WWTP2	8/12, 66.7%	7.5 ± 2.6
	WWTP3	13/13, 100%	8.4 ± 2.2
	WWTP4	12/12, 100%	9.5 ± 0.4
	<b>Total of WWTPs</b>	<b>44/49, 89.8%</b>	<b>8.6 ± 2.0</b>
Winter	WWTP1	10/10, 100%	9.7 ± 0.6
	WWTP2	8/10, 80.0%	8.0 ± 2.2
	WWTP3	9/12, 75.0%	7.4 ± 2.5
	WWTP4	11/12, 91.7%	9.2 ± 1.9
	<b>Total of WWTPs</b>	<b>38/44, 86.4%</b>	<b>8.7 ± 2.0</b>
Spring	WWTP1	11/13, 84.6%	8.6 ± 2.0
	WWTP2	9/13, 69.2%	7.5 ± 2.5
	WWTP3	11/13, 84.6%	8.1 ± 2.0
	WWTP4	11/13, 84.6%	8.4 ± 2.0
	<b>Total of WWTPs</b>	<b>42/52, 80.8%</b>	<b>8.2 ± 2.1</b>
Summer	WWTP1	12/13, 92.3%	9.2 ± 1.7
	WWTP2	8/13, 61.5%	6.7 ± 2.3
	WWTP3	11/13, 84.6%	8.6 ± 2.2
	WWTP4	13/13, 100%	9.1 ± 0.7
	<b>Total of WWTPs</b>	<b>44/52, 84.6%</b>	<b>8.4 ± 2.1</b>
One year	WWTP1	44/48, 91.7%	9.1 ± 1.6
	WWTP2	33/48, 68.7%	7.4 ± 2.4
	WWTP3	42/51, 82.3%	8.2 ± 2.1
	WWTP4	47/50, 94%	9.1 ± 1.4
	<b>Total of WWTPs</b>	<b>166/197, 84.3%</b>	<b>8.5 ± 2.0</b>

**Table S4.** Occurrence and viral load of SARS-CoV-2 according to WWTPs and seasons.

Season	WWTP type	Positive samples (n°, %)	Viral load Log <sub>10</sub> (GC/100,000 inh/day)
<b>Autumn</b>	WWTP1	6/12, 50.0%	6.4 ± 1.9
	WWTP2	5/12, 41.7%	6.0 ± 1.8
	WWTP3	8/13, 61.5%	6.8 ± 1.8
	WWTP4	9/12, 75.0%	7.2 ± 1.8
	Total of WWTPs	28/49, 57.1%	6.6 ± 1.8
<b>Winter</b>	WWTP1	8/10, 80.0%	8.1 ± 1.9
	WWTP2	4/10, 40.0%	6.0 ± 2.1
	WWTP3	5/12, 41.7%	6.5 ± 2.3
	WWTP4	7/12, 58.3%	6.6 ± 2.3
	<b>Total of WWTPs</b>	<b>24/44, 54.5%</b>	<b>6.8 ± 2.2</b>
<b>Spring</b>	WWTP1	10/13, 76.9%	7.8 ± 1.9
	WWTP2	7/13, 53.8%	6.6 ± 2.1
	WWTP3	5/13, 38.5%	6.1 ± 2.3
	WWTP4	6/13, 46.1%	6.3 ± 2.1
	<b>Total of WWTPs</b>	<b>28/52, 53.8%</b>	<b>6.7 ± 2.1</b>
<b>Summer</b>	WWTP1	6/13, 46.1%	6.5 ± 2.3
	WWTP2	5/13, 38.5%	5.9 ± 1.9
	WWTP3	4/13, 30.8%	5.7 ± 2.2
	WWTP4	5/13, 38.5%	6.1 ± 2.1
	<b>Total of WWTPs</b>	<b>20/52, 38.5%</b>	<b>6.0 ± 2.1</b>
<b>One year</b>	WWTP1	30/48, 62.5%	7.2 ± 2.1
	WWTP2	21/48, 43.7%	6.1 ± 1.9
	WWTP3	22/51, 43.1%	6.2 ± 2.1
	WWTP4	27/50, 54%	6.6 ± 2.1
	<b>Total of WWTPs</b>	<b>100/197, 50.8%</b>	<b>6.5 ± 2.1</b>