

Supplementary tables for:

Meta-analyses on SARS-CoV-2 Viral Titers in Wastewater and Their Correlations to Epidemiological Indicators

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Table S1. PRISMA Checklist for this study

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Yes
ABSTRACT			
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Yes
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Yes
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	2.2, 2.3
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	2.1
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	2.1
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	2.2
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	2.3
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	2.4
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	2.4

Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	NA
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	NA
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	2.4
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	2.5
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	2.4, 2.5, 2.6, 2.7
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	2.6, 2.7
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	2.7
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	2.7
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	NA
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	NA
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	3.1
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	3.1, 3.4
Study characteristics	17	Cite each included study and present its characteristics.	3.1
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	NA
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	3.2

Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	NA
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	3.2
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	3.3
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	3.3
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	NA
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	NA
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	4.1
	23b	Discuss any limitations of the evidence included in the review.	4.4
	23c	Discuss any limitations of the review processes used.	4.4
	23d	Discuss implications of the results for practice, policy, and future research.	4.3
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	NA
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	NA
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	NA
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Yes
Competing interests	26	Declare any competing interests of review authors.	Yes
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	NA

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more information, visit: <http://www.prisma-statement.org/>

Table S2. Inclusion/exclusion criteria for records recovered from web of science. Refer to Table 1 for description of inclusion criteria.

Author	Title	Inclusion/Exclusion	C1	C2	C3
Dada, AC; Gyawali, P	Quantitative microbial risk assessment (QMRA) of occupational exposure to SARS-CoV-2 in wastewater treatment plants	C1, C2, C3	N	N	N
Kitamura, K; Sadamasu, K; Muramatsu, M; Yoshida, H	Efficient detection of SARS-CoV-2 RNA in the solid fraction of wastewater	Include	Y	Y	Y
Ahmed, W; Tschärke, B; Bertsch, PM; Bibby, K; Bivins, A; Choi, P; Clarke, L; Dwyer, J; Edson, J; Nguyen, TMH; O'Brien, JW; Simpson, SL; Sherman, P; Thomas, KV; Verhagen, R; Zaugg, JL; Mueller, JF	SARS-CoV-2 RNA monitoring in wastewater as a potential early warning system for COVID-19 transmission in the community: A temporal case study	C1	N	Y	Y
Albastaki, A; Naji, M; Lootah, R; Almeheiri, R; Almulla, H; Almarri, I; Alreyami, A; Aden, A; Alghafri, R	First confirmed detection of SARS-COV-2 in untreated municipal and aircraft wastewater in Dubai, UAE: The use of wastewater based epidemiology as an early warning tool to monitor the prevalence of COVID-19	C3	Y	Y	N
Baldovin, T; Amoruso, I; Fonzo, M; Buja, A; Baldo, V; Cocchio, S; Bertonecello, C	SARS-CoV-2 RNA detection and persistence in wastewater samples: An experimental network for COVID-19 environmental surveillance in Padua, Veneto Region (NE Italy)	Include	Y	Y	Y
Espinosa, MF; Verbyla, ME; Vassalle, L; Rosa-Machado, AT; Zhao, F; Gaunin, A; Mota, CR	Reduction and partitioning of viral and bacterial indicators in a UASB reactor followed by high rate algal ponds treating domestic sewage	C1, C2, C3	N	N	N
Mathavarajah, S; Stoddart, AK; Gagnon, GA; Dellaire, G	Pandemic danger to the deep: The risk of marine mammals contracting SARS-CoV-2 from wastewater	C1, C2, C3	N	N	N
Philo, SE; Keim, EK; Swannstrom, R; Ong, AQW; Burnor, EA; Kossik, AL; Harrison, JC; Demeke, BA; Zhou, NA; Beck, NK; Shirai, JH; Meschke, JS	A comparison of SARS-CoV-2 wastewater concentration methods for environmental surveillance	C3	Y	Y	N

Author	Title	Inclusion/Exclusion	C1	C2	C3
Hata, A; Hara-Yamamura, H; Meuchi, Y; Imai, S; Honda, R	Detection of SARS-CoV-2 in wastewater in Japan during a COVID-19 outbreak	Include	Y	Y	Y
Perez-Cataluna, A; Cuevas-Ferrando, E; Randazzo, W; Falco, I; Allende, A; Sanchez, G	Comparing analytical methods to detect SARS-CoV-2 in wastewater	C1, C2, C3	N	N	N
Barril, PA; Pianciola, LA; Mazzeo, M; Ousset, MJ; Jaureguierry, MV; Alessandrello, M; Sanchez, G; Oteiza, JM	Evaluation of viral concentration methods for SARS-CoV-2 recovery from wastewaters	C3	Y	Y	N
Torii, S; Furumai, H; Katayama, H	Applicability of polyethylene glycol precipitation followed by acid guanidinium thiocyanate-phenol-chloroform extraction for the detection of SARS-CoV-2 RNA from municipal wastewater	C1, C3	N	Y	N
Goncalves, J; Koritnik, T; Mioc, V; Trkov, M; Boljesic, M; Berginc, N; Prosenec, K; Kotar, T; Paragi, M	Detection of SARS-CoV-2 RNA in hospital wastewater from a low COVID-19 disease prevalence area	Include	Y	Y	Y
Elsamadony, M; Fujii, M; Miura, T; Watanabe, T	Possible transmission of viruses from contaminated human feces and sewage: Implications for SARS-CoV-2	C1, C2, C3	N	N	N
Han, J; He, SS	Urban flooding events pose risks of virus spread during the novel coronavirus (COVID-19) pandemic	C1, C2, C3	N	N	N
Jafferli, MH; Khatami, K; Atasoy, M; Birgersson, M; Williams, C; Cetecioglu, Z	Benchmarking virus concentration methods for quantification of SARS-CoV-2 in raw wastewater	C3	Y	Y	N
Petala, M; Dafou, D; Kostoglou, M; Karapantsios, T; Kanata, E; Chatziefstathiou, A; Sakaveli, F; Kotoulas, K; Arsenakis, M; Roilides, E; Sklaviadis, T; Metallidis, S; Papa, A; Stylianidis, E; Papadopoulos, A; Papaioannou, N	A physicochemical model for rationalizing SARS-CoV-2 concentration in sewage. Case study: The city of Thessaloniki in Greece	C3	Y	Y	N

Author	Title	Inclusion/Exclusion	C1	C2	C3
Ihsanullah, I; Bilal, M; Naushad, M	Coronavirus 2 (SARS-CoV-2) in water environments: Current status, challenges and research opportunities	C1, C2, C3	N	N	N
Saguti, F; Magnil, E; Enache, L; Churqui, MP; Johansson, A; Lumley, D; Davidsson, F; Dotevall, L; Mattsson, A; Trybala, E; Lagging, M; Lindh, M; Gisslen, M; Brezicka, T; Nystrom, K; Norder, H	Surveillance of wastewater revealed peaks of SARS-CoV-2 preceding those of hospitalized patients with COVID-19	Include	Y	Y	Y
Kumar, M; Kuroda, K; Patel, AK; Patel, N; Bhattacharya, P; Joshi, M; Joshi, CG	Decay of SARS-CoV-2 RNA along the wastewater treatment outfitted with Upflow Anaerobic Sludge Blanket (UASB) system evaluated through two sample concentration techniques	C1, C3	N	Y	N
Zaneti, RN; Girardi, V; Spilki, FR; Mena, K; Westphalen, APC; Colares, ERD; Pozzebon, AG; Etchepare, RG	Quantitative microbial risk assessment of SARS-CoV-2 for workers in wastewater treatment plants	C1, C2, C3	N	N	N
Feng, BH; Xu, KJ; Gu, SL; Zheng, SF; Zou, QD; Xu, Y; Yu, L; Lou, FY; Yu, F; Jin, T; Li, YG; Sheng, JF; Yen, HL; Zhong, ZF; Wei, JJ; Chen, Y	Multi-route transmission potential of SARS-CoV-2 in healthcare facilities	C3	Y	Y	N
Westhaus, S; Weber, FA; Schiwy, S; Linnemann, V; Brinkmann, M; Widera, M; Greve, C; Janke, A; Hollert, H; Wintgens, T; Ciesek, S	Detection of SARS-CoV-2 in raw and treated wastewater in Germany - Suitability for COVID-19 surveillance and potential transmission risks	Include	Y	Y	Y
Zahedi, A; Monis, P; Deere, D; Ryan, U	Wastewater-based epidemiology-surveillance and early detection of waterborne pathogens with a focus on SARS-CoV-2, Cryptosporidium and Giardia	C1, C2, C3	N	N	N
Graham, KE; Loeb, SK; Wolfe, MK; Catoe, D; Sinnott-Armstrong, N; Kim, S; Yamahara, KM; Sassoubre, LM; Grijalva, LMM; Roldan-Hernandez, L; Langenfeld, K; Wigginton, KR; Boehm, AB	SARS-CoV-2 RNA in Wastewater Settled Solids Is Associated with COVID-19 Cases in a Large Urban Sewershed	Include	Y	Y	Y
Faleye, TOC; Driver, E; Bowes, D; Adhikari, S; Adams, D; Varsani, A; Halden, RU; Scotch, M	Pan-Enterovirus Amplicon-Based High-Throughput Sequencing Detects the Complete Capsid of a EVA71 Genotype C1 Variant via Wastewater-Based Epidemiology in Arizona	C1, C2, C3	N	N	N

Author	Title	Inclusion/Exclusion	C1	C2	C3
D'Aoust, PM; Mercier, E; Montpetit, D; Jia, JJ; Alexandrov, I; Neault, N; Baig, AT; Mayne, J; Zhang, X; Alain, T; Langlois, MA; Servos, MR; MacKenzie, M; Figeys, D; MacKenzie, AE; Graber, TE; Delatolla, R	Quantitative analysis of SARS-CoV-2 RNA from wastewater solids in communities with low COVID-19 incidence and prevalence	Include	Y	Y	Y
La Rosa, G; Mancini, P; Ferraro, GB; Veneri, C; Iaconelli, M; Bonadonna, L; Lucentini, L; Suffredini, E	SARS-CoV-2 has been circulating in northern Italy since December 2019: Evidence from environmental monitoring	C3	Y	Y	N
Volkoff, SJ; Carlson, TJ; Leik, K; Smith, JJ; Graves, D; Dennis, P; Aris, T; Cuthbertson, D; Holmes, A; Craig, K; Marvin, B; Nesbit, E	Demonstrated SARS-CoV-2 Surface Disinfection Using Ozone	C1, C2, C3	N	N	N
Jones, DL; Baluja, MQ; Graham, DW; Corbishley, A; McDonald, JE; Malham, SK; Hillary, LS; Connor, TR; Gaze, WH; Moura, IB; Wilcox, MH; Farkas, K	Shedding of SARS-CoV-2 in feces and urine and its potential role in person-to-person transmission and the environment-based spread of COVID-19	C1, C2, C3	N	N	N
Liu, DS; Thompson, JR; Carducci, A; Bi, XJ	Potential secondary transmission of SARS-CoV-2 via wastewater	C1, C2, C3	N	N	N
Pons, MN; Louis, P; Vignati, D	Effect of lockdown on wastewater characteristics: a comparison of two large urban areas	C1, C2, C3	N	N	N
Arora, S; Nag, A; Sethi, J; Rajvanshi, J; Saxena, S; Shrivastava, SK; Gupta, AB	Sewage surveillance for the presence of SARS-CoV-2 genome as a useful wastewater based epidemiology (WBE) tracking tool in India	C3	Y	Y	N
Lu, DN; Huang, ZR; Luo, JY; Zhang, XQ; Sha, S	Primary concentration - The critical step in implementing the wastewater based epidemiology for the COVID-19 pandemic: A mini-review	C1, C2, C3	N	N	N

Author	Title	Inclusion/Exclusion	C1	C2	C3
Bivins, A; Greaves, J; Fischer, R; Yinda, KC; Ahmed, W; Kitajima, M; Munster, VJ; Bibby, K	Persistence of SARS-CoV-2 in Water and Wastewater	C1, C2, C3	N	N	N
Lesimple, A; Jasim, SY; Johnson, DJ; Hilal, N	The role of wastewater treatment plants as tools for SARS-CoV-2 early detection and removal	C1, C2, C3	N	N	N
Olusola-Makinde, OO; Reuben, RC	Ticking bomb: Prolonged faecal shedding of novel coronavirus (2019-nCoV) and environmental implications	C1, C2, C3	N	N	N
Ahmed, W; Bertsch, PM; Bibby, K; Haramoto, E; Hewitt, J; Huygens, F; Gyawali, P; Korajkic, A; Riddell, S; Sherchan, SP; Simpson, SL; Sirikanchana, K; Symonds, EM; Verhagen, R; Vasana, SS; Kitajima, M; Bivins, A	Decay of SARS-CoV-2 and surrogate murine hepatitis virus RNA in untreated wastewater to inform application in wastewater-based epidemiology	C1, C3	N	Y	N
Trottier, J; Darques, R; Mouheb, NA; Partiot, E; Bakhache, W; Deffieu, MS; Gaudin, R	Post-lockdown detection of SARS-CoV-2 RNA in the wastewater of Montpellier, France	Include	Y	Y	Y
Mao, K; Zhang, H; Yang, ZG	An integrated biosensor system with mobile health and wastewater-based epidemiology (iBMW) for COVID-19 pandemic	C1, C2, C3	N	N	N
Kumar, M; Patel, AK; Shah, AV; Raval, J; Rajpara, N; Joshi, M; Joshi, CG	First proof of the capability of wastewater surveillance for COVID-19 in India through detection of genetic material of SARS-CoV-2	Include	Y	Y	Y
Sun, SY; Han, J	Open defecation and squat toilets, an overlooked risk of fecal transmission of COVID-19 and other pathogens in developing communities	C1, C2, C3	N	N	N

Author	Title	Inclusion/Exclusion	C1	C2	C3
Corpuz, MVA; Buonerba, A; Vigliotta, G; Zarra, T; Ballesteros, F; Campiglia, P; Belgiomo, V; Korshin, G; Naddeo, V	Viruses in wastewater: occurrence, abundance and detection methods	C1, C2, C3	N	N	N
Usman, M; Farooq, M; Hanna, K	Environmental side effects of the injudicious use of antimicrobials in the era of COVID-19	C1, C2, C3	N	N	N
Baj, A; Azzi, L; Dalla Gasperina, D; Genoni, A; Tamborini, A; Gambarini, C; Carcano, G; Grossi, P; Sessa, F	Pilot Study: Long-Term Shedding of SARS-CoV-2 in Urine: A Threat for Dispersal in Wastewater	C1, C2, C3	N	N	N
Patel, PP; Mondal, S; Ghosh, KG	Some respite for India's dirtiest river? Examining the Yamuna's water quality at Delhi during the COVID-19 lockdown period	C1, C2, C3	N	N	N
Arslan, M; Xu, B; El-Din, MG	Transmission of SARS-CoV-2 via fecal-oral and aerosols-borne routes: Environmental dynamics and implications for wastewater management in underprivileged societies	C1, C2, C3	N	N	N
Guerrero-Latorre, L; Ballesteros, I; Villacres-Granda, I; Granda, MG; Freire-Paspuel, B; Rios-Touma, B	SARS-CoV-2 in river water: Implications in low sanitation countries	C1, C2, C3	N	N	N
Street, R; Malema, S; Mahlangeni, N; Mathee, A	Wastewater surveillance for Covid-19: An African perspective	C1, C2, C3	N	N	N
Sherchan, SP; Shahin, S; Ward, LM; Tandukar, S; Aw, TG; Schmitz, B; Ahmed, W; Kitajima, M	First detection of SARS-CoV-2 RNA in wastewater in North America: A study in Louisiana, USA	Include	Y	Y	Y
Adelodun, B; Ajibade, FO; Ibrahim, RG; Bakare, HO; Choi, KS	Snowballing transmission of COVID-19 (SARS-CoV-2) through wastewater: Any sustainable preventive measures to curtail the scourge in low-income countries?	C1, C2, C3	N	N	N

Author	Title	Inclusion/Exclusion	C1	C2	C3
Miyani, B; Fonoll, X; Norton, J; Mehrotra, A; Xagorarakis, I	SARS-CoV-2 in Detroit Wastewater	Include	Y	Y	Y
Polo, D; Quintela-Baluja, M; Corbishley, A; Jones, DL; Singer, AC; Graham, DW; Romalde, JL	Making waves: Wastewater-based epidemiology for COVID-19-approaches and challenges for surveillance and prediction	C1, C2, C3	N	N	N
Collivignarelli, MC; Collivignarelli, C; Miino, MC; Abba, A; Pedrazzani, R; Bertanza, G	SARS-CoV-2 in sewer systems and connected facilities	C1, C2, C3	N	N	N
Capalbo, C; Bertamino, E; Zerbetto, A; Santino, I; Petrucca, A; Mancini, R; Bonfini, R; Alfonsi, V; Ferracuti, S; Marchetti, P; Simmaco, M; Orsi, GB; Napoli, C	No Evidence of SARS-CoV-2 Circulation in Rome (Italy) during the Pre-Pandemic Period: Results of a Retrospective Surveillance	C1, C2, C3	N	N	N
Wang, SR; Green, HC; Wilder, ML; Du, Q; Kmush, BL; Collins, MB; Larsen, DA; Zeng, T	High-throughput wastewater analysis for substance use assessment in central New York during the COVID-19 pandemic	C1, C2, C3	N	N	N
Gonzalez, R; Curtis, K; Bivins, A; Bibby, K; Weir, MH; Yetka, K; Thompson, H; Keeling, D; Mitchell, J; Gonzalez, D	COVID-19 surveillance in Southeastern Virginia using wastewater-based epidemiology	Include	Y	Y	Y
Zhang, DY; Ling, HB; Huang, X; Li, J; Li, WW; Yi, C; Zhang, T; Jiang, YZ; He, YN; Deng, SQ; Zhang, X; Wang, XZ; Liu, Y; Li, GH; Qu, JH	Potential spreading risks and disinfection challenges of medical wastewater by the presence of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) viral RNA in septic tanks of Fangcang Hospital	C3	Y	Y	N
Kaplan, EH; Wang, D; Wang, MK; Malik, AA; Zulli, A; Peccia, J	Aligning SARS-CoV-2 indicators via an epidemic model: application to hospital admissions and RNA detection in sewage sludge	C1	N	Y	Y

Author	Title	Inclusion/Exclusion	C1	C2	C3
Ul-Rahman, A; Shabbir, MA; Aziz, MW; Yaqub, S; Mehmood, A; Raza, MA; Shabbir, MZ	A comparative phylogenomic analysis of SARS-CoV-2 strains reported from non-human mammalian species and environmental samples	C1, C2, C3	N	N	N
Belhadi, A; Kamble, SS; Khan, SAR; Touriki, FE; Kumar, MD	Infectious Waste Management Strategy during COVID-19 Pandemic in Africa: an Integrated Decision-Making Framework for Selecting Sustainable Technologies	C1, C2, C3	N	N	N
Cazares, LH; Chaerkady, R; Weng, SHS; Boo, CC; Cimbrow, R; Hsu, HE; Rajan, S; Dall'Acqua, W; Clarke, L; Ren, KS; McTamney, P; Kallewaard-LeLay, N; Ghaedi, M; Ikeda, Y; Hess, S	Development of a Parallel Reaction Monitoring Mass Spectrometry Assay for the Detection of SARS-CoV-2 Spike Glycoprotein and Nucleoprotein	C1, C2, C3	N	N	N
Cahill, N; Morris, D	Recreational waters - A potential transmission route for SARS-CoV-2 to humans?	C1, C2, C3	N	N	N
Ahmed, W; Bertsch, PM; Bivins, A; Bibby, K; Farkas, K; Gathercole, A; Haramoto, E; Gyawali, P; Korajkic, A; McMinn, BR; Mueller, JF; Simpson, SL; Smith, WJM; Symonds, EM; Thomas, KV; Verhagen, R; Kitajima, M	Comparison of virus concentration methods for the RT-qPCR-based recovery of murine hepatitis virus, a surrogate for SARS-CoV-2 from untreated wastewater	C1, C2, C3	N	N	N
Maal-Bared, R; Brisolaro, K; Munakata, N; Bibby, K; Gerba, C; Sobsey, M; Schaefer, S; Swift, J; Gary, L; Sherchan, S; Babatola, A; Bastian, R; Olabode, L; Reimers, R; Rubin, A	Implications of SARS-CoV-2 on current and future operation and management of wastewater systems	C1, C2, C3	N	N	N
Larson, RC; Berman, O; Nourinejad, M	Sampling manholes to home in on SARS-CoV-2 infections	C1, C2, C3	N	N	N
Martinez-Hernandez, F; Isaak-Delgado, AB; Alfonso-Toledo, JA; Munoz-Garcia, CI; Villalobos, G; Arechiga-Ceballos, N; Rendon-Franco, E	Assessing the SARS-CoV-2 threat to wildlife: Potential risk to a broad range of mammals	C1, C2, C3	N	N	N

Author	Title	Inclusion/Exclusion	C1	C2	C3
Harries, AD; Berger, SD; Satyanarayana, S; Thekkur, P; Kumar, AMV	Testing wastewater to detect severe acute respiratory syndrome coronavirus 2 in communities	C1, C2, C3	N	N	N
Thompson, JR; Nancharaiah, YV; Gu, XQ; Lee, WL; Rajal, VB; Haines, MB; Girones, R; Ng, LC; Alm, EJ; Wuertz, S	Making waves: Wastewater surveillance of SARS-CoV-2 for population-based health management	C1, C2, C3	N	N	N
Martin, J; Klapsa, D; Wilton, T; Zambon, M; Bentley, E; Bujaki, E; Fritzsche, M; Mate, R; Majumdar, M	Tracking SARS-CoV-2 in Sewage: Evidence of Changes in Virus Variant Predominance during COVID-19 Pandemic	C1	N	Y	Y
Michael-Kordatou, I; Karaolia, P; Fatta-Kassinos, D	Sewage analysis as a tool for the COVID-19 pandemic response and management: the urgent need for optimised protocols for SARS-CoV-2 detection and quantification	C1, C2, C3	N	N	N
Carraturo, F; Del Giudice, C; Morelli, M; Cerullo, V; Libralato, G; Galdiero, E; Guida, M	Persistence of SARS-CoV-2 in the environment and COVID-19 transmission risk from environmental matrices and surfaces	C1, C2, C3	N	N	N
Haramoto, E; Malla, B; Thakali, O; Kitajima, M	First environmental surveillance for the presence of SARS-CoV-2 RNA in wastewater and river water in Japan	Include	Y	Y	Y
Fernandez-de-Mera, IG; Del-Rio, FRJ; de la Fuente, J; Perez-Sancho, M; Hervas, D; Moreno, I; Dominguez, M; Dominguez, L; Gortazar, C	Detection of environmental SARS-CoV-2 RNA in a high prevalence setting in Spain	C3	Y	Y	N
Peccia, J; Zulli, A; Brackney, DE; Grubaugh, ND; Kaplan, EH; Casanovas-Massana, A; Ko, AI; Malik, AA; Wang, D; Wang, MK; Warren, JL; Weinberger, DM; Arnold, W; Omer, SB	Measurement of SARS-CoV-2 RNA in wastewater tracks community infection dynamics	Include	Y	Y	Y
Kumar, M; Mohapatra, S; Mazumder, P; Singh, A; Honda, R; Lin, CX; Kumari, R; Goswami, R; Jha, PK; Vithanage, M; Kuroda, K	Making Waves Perspectives of Modelling and Monitoring of SARS-CoV-2 in Aquatic Environment for COVID-19 Pandemic	C1, C2, C3	N	N	N

Author	Title	Inclusion/Exclusion	C1	C2	C3
Mouchtouri, VA; Koureas, M; Kyritsi, M; Vontas, A; Kourentis, L; Sapounas, S; Rigakos, G; Petinaki, E; Tsiodras, S; Hadjichristodoulou, C	Environmental contamination of SARS-CoV-2 on surfaces, air-conditioner and ventilation systems	C1, C2, C3	N	N	N
Randazzo, W; Cuevas-Ferrando, E; Sanjuan, R; Domingo-Calap, P; Sanchez, G	Metropolitan wastewater analysis for COVID-19 epidemiological surveillance	Include	Y	Y	Y
Race, M; Ferraro, A; Galdiero, E; Guida, M; Nunez-Delgado, A; Pirozzi, F; Siciliano, A; Fabbicino, M	Current emerging SARS-CoV-2 pandemic: Potential direct/indirect negative impacts of virus persistence and related therapeutic drugs on the aquatic compartments	C1, C2, C3	N	N	N
Franklin, AB; Bevins, SN	Spillover of SARS-CoV-2 into novel wild hosts in North America: A conceptual model for perpetuation of the pathogen	C1, C2, C3	N	N	N
Orive, G; Lertxundi, U; Barcelo, D	Early SARS-CoV-2 outbreak detection by sewage -based epidemiology	C1, C2, C3	N	N	N
Randazzo, W; Truchado, P; Cuevas-Ferrando, E; Simon, P; Allende, A; Sanchez, G	SARS-CoV-2 RNA in wastewater anticipated COVID-19 occurrence in a low prevalence area	Include	Y	Y	Y
Hart, OE; Halden, RU	Computational analysis of SARS-CoV-2/COVID-19 surveillance by wastewater-based epidemiology locally and globally: Feasibility, economy, opportunities and challenges	C1, C2, C3	N	N	N
Heller, L; Mota, CR; Greco, DB	COVID-19 faecal-oral transmission: Are we asking the right questions?	C1, C2, C3	N	N	N

Author	Title	Inclusion/Exclusion	C1	C2	C3
Feng, W; Newbigging, AM; Le, C; Pang, B; Peng, HY; Cao, YR; Wu, JJ; Abbas, G; Song, J; Wang, DB; Cui, MM; Tao, J; Tyrrell, DL; Zhang, XE; Zhang, HQ; Le, XC	Molecular Diagnosis of COVID-19: Challenges and Research Needs	C1, C2, C3	N	N	N
Odi, EE; Afolayan, AO; Akintayo, I; Okeke, IN	Could Water and Sanitation Shortfalls Exacerbate SARS-CoV-2 Transmission Risks?	C1, C2, C3	N	N	N
Chaudhry, AK; Sachdeva, P	Coronavirus disease 2019 (COVID-19): a new challenge in untreated wastewater	C1, C2, C3	N	N	N
Mlejnkova, H; Sovova, K; Vasickova, P; Ocenaskova, V; Jasikova, L; Juranova, E	Preliminary Study of Sars-Cov-2 Occurrence in Wastewater in the Czech Republic	C3	Y	Y	N
Ahmed, W; Angel, N; Edson, J; Bibby, K; Bivins, A; O'Brien, JW; Choi, PM; Kitajima, M; Simpson, SL; Li, JY; Tschärke, B; Verhagen, R; Smith, WJM; Zaugg, JL; Dierens, L; Hugenholtz, P; Thomas, KV; Mueller, JF	First confirmed detection of SARS-CoV-2 in untreated wastewater in Australia: A proof of concept for the wastewater surveillance of COVID-19 in the community	Include	Y	Y	Y
Nunez-Delgado, A	What do we know about the SARS-CoV-2 coronavirus in the environment?	C1, C2, C3	N	N	N
Medema, G; Heijnen, L; Elsinga, G; Italiaander, R; Brouwer, A	Presence of SARS-Coronavirus-2 RNA in Sewage and Correlation with Reported COVID-19 Prevalence in the Early Stage of the Epidemic in The Netherlands	Include	Y	Y	Y
Aboubakr, HA; Sharafeldin, TA; Goyal, SM	Stability of SARS-CoV-2 and other coronaviruses in the environment and on common touch surfaces and the influence of climatic conditions: A review	C1, C2, C3	N	N	N

Author	Title	Inclusion/Exclusion	C1	C2	C3
Ahmed, W; Bertsch, PM; Angel, N; Bibby, K; Bivins, A; Dierens, L; Edson, J; Ehret, J; Gyawali, P; Hamilton, KA; Hosegood, I; Hugenholtz, P; Jiang, GM; Kitajima, M; Sichani, HT; Shi, JH; Shimko, KM; Simpson, SL; Smith, WJM; Symonds, EM; Thomas, KV; Verhagen, R; Zaugg, JL; Mueller, JF	Detection of SARS-CoV-2 RNA in commercial passenger aircraft and cruise ship wastewater: a surveillance tool for assessing the presence of COVID-19 infected travellers	C3	Y	Y	N
Wu, FQ; Zhang, JB; Xiao, A; Gu, XQ; Lee, WL; Armas, F; Kauffman, K; Hanage, W; Matus, M; Ghaeli, N; Endo, N; Duvallet, C; Poyet, M; Moniz, K; Washburne, AD; Erickson, T; Chai, P; Thompson, J; Alm, E	SARS-CoV-2 Titers in Wastewater Are Higher than Expected from Clinically Confirmed Cases	C3	Y	Y	N
Lancaster, K; Rhodes, T	Wastewater monitoring of SARS-CoV-2: lessons from illicit drug policy	C1, C2, C3	N	N	N
Ali, M; Zaid, M; Saqib, MAN; Ahmed, H; Afzal, MS	SARS-CoV-2 and the hidden carriers: Sewage, feline, and blood transfusion	C1, C2, C3	N	N	N
Almeida, A; Faustino, MAF; Neves, MGPMS	Antimicrobial Photodynamic Therapy in the Control of COVID-19	C1, C2, C3	N	N	N
Lodder, W; Husman, AMD	SARS-CoV-2 in wastewater: potential health risk, but also data source	C1, C2, C3	N	N	N
Wang, J; Feng, HT; Zhang, S; Ni, ZW; Ni, LM; Chen, Y; Zhuo, LX; Zhong, ZF; Qu, TT	SARS-CoV-2 RNA detection of hospital isolation wards hygiene monitoring during the Coronavirus Disease 2019 outbreak in a Chinese hospital	C1, C2, C3	N	N	N

Author	Title	Inclusion/Exclusion	C1	C2	C3
da Silva, RR; dos Santos, MB; dos Santos, AD; Tavares, DD; dos Santos, PL	Coronavirus disease and basic sanitation: too early to be worried?	C1, C2, C3	N	N	N
Prado, T; Fumian, TM; Mannarino, CF; Maranhao, AG; Siqueira, MM; Miagostovich, MP	Preliminary results of SARS-CoV-2 detection in sewerage system in Niteroi municipality, Rio de Janeiro, Brazil	C3	Y	Y	N

Table S3. Pearson's regression coefficients for individual and grouped studies correlating SARS-CoV-2 measurements in wastewater (copies / mL) with COVID-19 case data of associated locations.

Daily new COVID-19 cases per 100,000 inhabitants

Author	Coefficient	95%-CI
D'Aoust, P.M et al.	0.71	[0.52;0.84]
Graham, K et al.	0.59	[0.48;0.68]
Scherchan, S.P et al (S)	0.27	[-0.11;0.59]
Peccia, J et al.	0.40	[0.29;0.51]
Hata, A et al.	0.22	[0.01;0.41]
Miyani, B et al.	-0.11	[-0.44;0.23]
Haramoto, E et al	-0.06	[-0.38;0.27]
Trottier, J et al	0.05	[-0.49;0.56]
Nemudryi, A et al.	-0.05	[-0.38;0.29]
Random effects model	0.28	[0.01; 0.51]
Number of studies = 9		
Number of observations = 666		

Cumulative COVID-19 cases per 100,000 inhabitants

Author	Coefficient	95%-CI
Gonzalez, R et al.	0.78	[0.97;1.13]
Medema, G et al	0.63	[0.51;0.97]
Sherchan, S.P et al.	0.20	[-0.18;0.60]
Haramoto, E et al.	-0.28	[-0.63;0.05]
Hata, A et al.	0.17	[-0.04;0.38]
Westhaus, S et al.	-0.11	[-0.62;0.39]
Randazzo, W et al (b)	0.08	[-0.22;0.40]
Random effects model	0.29	[-0.15; 0.73]
Number of studies = 7		
Number of observations = 880		
