

<b>Table 2. Included Reviews.</b>				
Review ID	Full citation	Brief summary of relevant content	Exposure	Outcome investigated
Adedokun 2020	Adedokun KA, Olarinmoye AO, Mustapha JO, Kamorudeen RT. A close look at the biology of SARS-CoV-2, and the potential influence of weather conditions and seasons on COVID-19 case spread. <i>Infect Dis Poverty</i> . 2020 Jun 26;9(1):77. doi: 10.1186/s40249-020-00688-1	Highlights the potential influence of weather conditions, seasons and non-climatological factors on the geographical spread of cases of COVID-19	meteorological factors	SARS-CoV-2/COVID-19
Alaazi 2020	Alaazi DA, Aganah GAM. Understanding the slum-health conundrum in sub-Saharan Africa: a proposal for a rights-based approach to health promotion in slums. <i>Glob Health Promot</i> . 2020 Sep;27(3):65-72. doi: 10.1177/1757975919856273.	Narrative review looking at the impact of slums on health in Sub-Saharan Africa. Cites a study on indoor air pollution, linking biomass burning and respiratory deaths.	air pollution (indoor)	respiratory mortality
Alam S 2021	Alam MS, Sultana R. Influences of climatic and non-climatic factors on COVID-19 outbreak: A review of existing literature. <i>Environ Chall (Amst)</i> . 2021 Dec;5:100255. doi: 10.1016/j.envc.2021.100255.	Air temperature, humidity, wind speed, and air pollution accelerated COVID-19 transmission.	meteorological variables	SARS-CoV-2/COVID-19
Ali 2019	Ali MU, Liu G, Yousaf B, Ullah H, Abbas Q, Munir MAM. A systematic review on global pollution status of particulate matter-associated potential toxic elements and health perspectives in urban environment. <i>Environ Geochem Health</i> . 2019 Jun;41(3):1131-1162. doi: 10.1007/s10653-018-0203-z. Mortality	Review on global PM sources and levels and general overview of effects in urban environments. Cites 2 studies as stating that 1% respiratory infections deaths are a result of PM in air.	air pollution	respiratory mortality
Ali N 2020	Ali N, Islam F. The Effects of Air Pollution on COVID-19 Infection and Mortality-A Review on Recent Evidence. <i>Front Public Health</i> . 2020 Nov 26;8:580057. doi: 10.3389/fpubh.2020.580057.	A significant correlation has been found between air pollution and COVID-19 infections and mortality in some countries in the world. The available data also indicate that exposure to air pollution may influence COVID-19 transmission. Moreover, exposure to air pollution may increase vulnerability and have harmful effects on the prognosis of patients affected by COVID-19 infections.	air pollution	SARS-CoV-2/COVID-19
Ali N 2021	Ali N, Fariha KA, Islam F, Mishu MA, Mohanto NC, Hosen MJ, Hossain K. Exposure to air pollution and COVID-19 severity: A review of current insights, management, and challenges. <i>Integr Environ Assess Manag</i> . 2021 Nov;17(6):1114-1122. doi: 10.1002/ieam.4435.	Review of air pollution and COVID-19: exposure to air pollution, particularly to PM2.5 and NO2, is positively correlated with COVID-19 infections and mortality.	air pollution	SARS-CoV-2/COVID-19

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Audi A 2020	Audi A, Allbrahim M, Kaddoura M, Hijazi G, Yassine HM, Zaraket H. Seasonality of Respiratory Viral Infections: Will COVID-19 Follow Suit? Front Public Health. 2020 Sep 15;8:567184. doi: 10.3389/fpubh.2020.567184.	Reviews current knowledge regarding the seasonality of respiratory viruses including coronaviruses and the viral and host factors that govern their seasonal pattern. Discusses the properties of SARS-CoV-2 and the potential impact of meteorological factors on its spread.	season, temperature, humidity	respiratory viruses
Azuma 2020b	Azuma K, Yanagi U, Kagi N, Kim H, Ogata M, Hayashi M. Environmental factors involved in SARS-CoV-2 transmission: effect and role of indoor environmental quality in the strategy for COVID-19 infection control. Environ Health Prev Med. 2020 Nov 3;25(1):66. doi: 10.1186/s12199-020-00904-2.	SARS-CoV-2 is inactivated rapidly on surfaces with sunlight. Close-contact aerosol transmission through smaller aerosolized particles is likely to be combined with respiratory droplets and contact transmission in a confined, crowded, and poorly ventilated indoor environment, as suggested by some cluster cases.	UV radiation	SARS-CoV-2/COVID-19
Babin 2020	Babin S. Use of Weather Variables in SARS-CoV-2 Transmission Studies. Int J Infect Dis. 2020 Nov;100:333-336. doi: 10.1016/j.ijid.2020.09.032.	Review of factors that help explain some of the differing results of studies regarding the influence of environmental variables on transmissibility of SARS-CoV-2	environmental factors	SARS-CoV-2/COVID-19
Bakhtiyari S 2020	Bakhtiyari S, Mirzaei A, Jalilian M, Mazlomi S, Nourmoradi H, Kakaei H. The Effects of Personal, Environmental, and Genetic Factors on Epidemic of Coronavirus Disease-19: A Review of the Current Literature. Open Access Maced J Med Sci . 2020;8 (T1):250-7.	Numerous studies have been performed on the on the stability of COVID-19 virus in different environmental conditions including temperature and humidity. In this study, we aimed to discuss in detail the benefits and effects of these factors on COVID-19.	environmental conditions including temperature, humidity	SARS-CoV-2/COVID-19
Bloom-Feshbach K 2013	Bloom-Feshbach K, Alonso WJ, Charu V, Tamerius J, Simonsen L, Miller MA, Viboud C. Latitudinal variations in seasonal activity of influenza and respiratory syncytial virus (RSV): a global comparative review. PLoS One. 2013;8(2):e54445. doi: 10.1371/journal.pone.0054445.	Influenza and RSV activity consistently peaked during winter months in temperate locales, while there was greater diversity in the tropics. Several temperate locations experienced semi-annual influenza activity with peaks occurring in winter and summer. 80% of tropical locations experienced distinct RSV seasons lasting 6 months or less, while the percentage was 50% for influenza	season, seasonality	RSV, influenza
Brandt EB 2021	Brandt EB, Mersha TB. Environmental Determinants of Coronavirus Disease 2019 (COVID-19). Curr Allergy Asthma Rep. 2021 Mar 5;21(3):15. doi: 10.1007/s11882-021-00993-1	This review provides a critical assessment of COVID-19 risk factors, identifies gaps in knowledge (e.g., indoor air pollution), and discusses methodological challenges of association and causation and the impact lockdowns had on air quality.	air pollution	SARS-CoV-2/COVID-19

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Brunekreef 2005	Brunekreef B, Forsberg B. Epidemiological evidence of effects of coarse airborne particles on health. <i>Eur Respir J.</i> 2005 Aug;26(2):309-18. doi: 10.1183/09031936.05.00001805.	This review includes three studies that report some results for respiratory infections related to exposure to fine and coarse particulate matter (Bunnett et al 1999; Ito 2003; Lippman et al 2000).	air pollution	respiratory infections
Byun WS 2021	Byun WS, Heo SW, Jo G, Kim JW, Kim S, Lee S, Park HE, Baek JH. Is coronavirus disease (COVID-19) seasonal? A critical analysis of empirical and epidemiological studies at global and local scales. <i>Environ Res.</i> 2021 May;196:110972. doi: 10.1016/j.envres.2021.110972.	Temperature and humidity are the most significant factors affecting global SARS-CoV-2 transmission. Temperature and humidity inversely correlate with global SARS-CoV-2 transmission. Coronavirus disease (COVID-19) appears to be temperature-sensitive and, therefore, seasonal.	temperature, humidity	SARS-CoV-2/COVID-19
Chatziprodromidou I 2021	Chatziprodromidou I, Dimitrakopoulou ME, Apostolou T, Vantarakis A. COVID-19 and Environmental Factors. A PRISMA-Compliant Systematic Review. <i>Journal of Environmental Science and Public Health</i> 6 (2022): 001-014.	Analysis of 23 studies show evidence that high temperature and high humidity reduce the COVID-19 transmission. However, further studies concerning the role of other environmental (namely meteorological) factors should be conducted in order to prove this correlation.	temperature, humidity	SARS-CoV-2/COVID-19
Chen S 2022	Chen S, Huang L, Cai D, Li B, Yang J. Association between meteorological factors and COVID-19: a systematic review. <i>Int J Environ Health Res.</i> 2022 Jun 8;1-15. doi: 10.1080/09603123.2022.2083090	Review of the impact of temperature and humidity on the replication, morbidity, and mortality of COVID-19, Most but not all studies showed high temperature and high humidity reduced case numbers.	temperature, humidity	SARS-CoV-2/COVID-19
Coker 2018	Coker E, Kizito S. A narrative review on the human health effects of ambient air pollution in Sub-Saharan Africa: an urgent need for health effects studies. <i>Int J Environ Res Public Health.</i> 2018 Mar 1;15(3):427. doi: 10.3390/ijerph15030427.	Narrative review on air pollution in Sub-Saharan Africa; results on infectious disease not presented separately. Bronchitis appears as a data category in a figure showing the proportion of studies reporting which kinds of outcome, but no data for bronchitis outcomes are reported.	air pollution	bronchitis
Comunian S 2020	Comunian S, Dongo D, Milani C, Palestini P. Air Pollution and Covid-19: The Role of Particulate Matter in the Spread and Increase of Covid-19's Morbidity and Mortality. <i>Int J Environ Res Public Health.</i> 2020 Jun 22;17(12):4487. doi: 10.3390/ijerph17124487.	In this review, the potential role of PM in the spread of COVID-19 is reported, focusing on Italian cities whose PM daily concentrations were found to be higher than the annual average allowed during the months preceding the epidemic	air pollution	SARS-CoV-2/COVID-19

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Copat C 2020	Copat C, Cristaldi A, Fiore M, Grasso A, Zuccarello P, Signorelli SS, Conti GO, Ferrante M. The role of air pollution (PM and NO <sub>2</sub> ) in COVID-19 spread and lethality: A systematic review. <i>Environ Res.</i> 2020 Dec; 191:110129. doi: 10.1016/j.envres.2020.110129.	Major findings are consistent, highlighting the important contribution of PM <sub>2.5</sub> and NO <sub>2</sub> as triggering of the COVID-19 spread and lethality, and with a less extent also PM <sub>10</sub> , although the potential effect of airborne virus exposure it has not been still demonstrated	air pollution	SARS-CoV-2/COVID-19
da Silva 2021	da Silva PG, Mesquita JR, de São José Nascimento M, Ferreira VAM. Viral, host and environmental factors that favor anthroozoonotic spillover of coronaviruses: An opinionated review, focusing on SARS-CoV, MERS-CoV and SARS-CoV-2. <i>Sci Total Environ.</i> 2021 Jan 1;750:141483. doi: 10.1016/j.scitotenv.2020.141483.	Environmental factors and SARS-CoV, MERS-CoV and SARS-CoV-2: an overview of the zoonotic transmission of SARS, MERS and COVID-19, focusing on the viral, host and environmental factors that favor the spillover of these viruses into humans, as well as the biological and ecological factors that make bats the perfect animal reservoir of infection for these viruses.	environmental factors including population, geographical factors	SARS-CoV, MERS-CoV and SARS-CoV-2:
De Longueville 2010	De Longueville F, Hountondji YC, Henry S, Ozer P. What do we know about effects of desert dust on air quality and human health in West Africa compared to other regions? <i>Sci Total Environ.</i> 2010 Dec 1;409(1):1-8. doi: 10.1016/j.scitotenv.2010.09.025.	Narrative review; does not report any numerical results from included studies; it cites two studies whose titles indicate that they investigate respiratory infections and pollution. It also reports two studies that show an increase in pneumonia as one component of a combined respiratory outcome in relation to pollution exposure	air pollution	respiratory infections
Domingo JL 2020	Domingo JL, Rovira J. Effects of air pollutants on the transmission and severity of respiratory viral infections. <i>Environ Res.</i> 2020 Aug;187:109650. doi: 10.1016/j.envres.2020.109650	Evidence supports a clear association between air concentrations of some pollutants and human respiratory viruses interacting to adversely affect the respiratory system	air pollution	human respiratory viruses
Eslami H 2020	Eslami H, Jalili M. The role of environmental factors to transmission of SARS-CoV-2 (COVID-19). <i>AMB Express.</i> 2020 May 15;10(1):92. doi: 10.1186/s13568-020-01028-0	This review discussed the role of environmental factors and conditions such as temperature, humidity, wind speed in COVID-19 transmission	environmental conditions including temperature, humidity	SARS-CoV-2/COVID-19
Faruk MO 2022b	Faruk MO, Rahman MS, Jannat SN, Arafat Y, Islam K, Akhter S. A review of the impact of environmental factors and pollutants on covid-19 transmission. <i>Aerobiologia (Bologna).</i> 2022;38(3):277-286. doi: 10.1007/s10453-022-09748-5	Most but not all of the literature showed that temperature and humidity promote spread of COVID-19. Increasing COVID-19 incidence appeared to be associated with increased air pollution, particularly PM <sub>10</sub> , PM <sub>2.5</sub> , and O <sub>3</sub> concentrations	temperature, humidity, air pollution	SARS-CoV-2/COVID-19

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Fong FC 2022	Fong FC, Smith DR. Exposure-lag response of air temperature on COVID-19 incidence in twelve Italian cities: A meta-analysis. <i>Environ Res.</i> 2022 Sep;212(Pt A):113099. doi: 10.1016/j.envres.2022.113099.	Meta-analysis of studies on of air temperature on daily COVID-19 incidence: The cumulative exposure response curve was non-linear, with peak risk at 15.1 °C and declining risk at progressively lower and higher temperatures.	air temperature	SARS-CoV-2/COVID-19
Gessner BD 2011	Gessner BD, Shindo N, Briand S. Seasonal influenza epidemiology in sub-Saharan Africa: a systematic review. <i>Lancet Infect Dis.</i> 2011 Mar;11(3):223-35. doi: 10.1016/S1473-3099(11)70008-1.	Systematic review of seasonal influenza epidemiology in sub-Saharan Africa. Influenza was highly seasonal in southern Africa.	season, seasonality	influenza
Ghobakhloo S 2022	Ghobakhloo S, Miranzadeh M B, Ghaffari Y, Ghobakhloo Z, Mostafaii G R. Association Between Air Pollution, Climate Change, and COVID-19 Pandemic: A Review of the Recent Scientific Evidence. <i>Health Scope.</i> 2022;11(4):e122412. <a href="https://doi.org/10.5812/jhealthscope-122412">https://doi.org/10.5812/jhealthscope-122412</a>	Evidence from the included studies showed that exposure to air pollutants, particularly PM2.5 and NO2, is positively related to COVID-19 patients and mortality and air pollution could be essential in transmitting COVID-19. Temperature and humidity variables are negatively correlated with virus transmission.	air pollution, temperature, humidity	SARS-CoV-2/COVID-19
Gurung & Bell 2013	Gurung A & Bell ML. The state of scientific evidence on air pollution and human health in Nepal. <i>Environmental Research</i> 2013: 124, 54–64. <a href="https://doi.org/10.1016/j.envres.2013.03.007">https://doi.org/10.1016/j.envres.2013.03.007</a> .	Increased acute respiratory illness was associated with increase in time spent near domestic smoke, in rural Nepal.	air pollution (indoor)	respiratory disease
Icard 2021	Icard P, Simula L, Rei J, Fournel L, De Pauw V, Alifano M. On the footsteps of Hippocrates, Sanctorius and Harvey to better understand the influence of cold on the occurrence of COVID-19 in European countries in 2020. <i>Biochimie.</i> 2021 Dec;191:164-171. doi: 10.1016/j.biochi.2021.09.009.	Review of studies from January to April 2020 showed that lower temperature associated with higher case rates and mortality from COVID-19	temperature	SARS-CoV-2/COVID-19
Iribhogbe OI 2020	Iribhogbe, O. I., Samuel, S. O., & Ohaju-Obodo, J. O. (2020). Human influenza viruses in South-East and East Asia: a systematic review of seasonal patterns, viral types/subtypes, and antiviral susceptibility pattern in the past two decades. <i>International Journal of Basic &amp; Clinical Pharmacology</i> , 9(9), 1444–1453. <a href="https://doi.org/10.18203/2319-2003.ijbcp20203634">https://doi.org/10.18203/2319-2003.ijbcp20203634</a>	Seasonal peaks were reported more in the winter period with influenza A (H1N1) pdm09, seasonal influenza A (H1N1), A (H3N2), and influenza B Victoria/Yamagata being the predominant viral type/subtypes.	season, seasonality	influenza

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Jain M 2021	Jain M, Sharma GD, Goyal M, Kaushal R, Sethi M. Econometric analysis of COVID-19 cases, deaths, and meteorological factors in South Asia. <i>Environ Sci Pollut Res Int.</i> 2021 Jun;28(22):28518-28534. doi: 10.1007/s11356-021-12613-6.	It is evident that majority of the meteorological factors and air pollutant PM2.5 exhibit significant negative and positive effects on the number of COVID-19 confirmed cases and death cases.	meteorological variables and air pollution	SARS-CoV-2/COVID-19
Kronfeld-Schor 2021	Kronfeld-Schor N, Stevenson TJ, Nickbakhsh S, Schernhammer ES, Dopico XC, Dayan T, Martinez M, Helm B. Drivers of Infectious Disease Seasonality: Potential Implications for COVID-19. <i>J Biol Rhythms.</i> 2021 Feb;36(1):35-54. doi: 10.1177/0748730420987322.	Review: epidemiological evidence of environmental and behavioral drivers of infectious disease seasonality	environmental factors including season, meteorological factors	respiratory infections
Kumar 2021	Kumar S, Singh R, Kumari N, Karmakar S, Behera M, Siddiqui AJ, Rajput VD, Minkina T, Bauddh K, Kumar N. Current understanding of the influence of environmental factors on SARS-CoV-2 transmission, persistence, and infectivity. <i>Environ Sci Pollut Res Int.</i> 2021 Feb;28(6):6267-6288. doi: 10.1007/s11356-020-12165-1.	Summarizes topical and substantial observations made regarding the influences of abiotic environmental factors such as climate, temperature, humidity, wind speed, air, and water quality, solid surfaces/interfaces, frozen food, and biotic factors like age, sex, gender, blood type, population density, behavioural characteristics, etc. on the transmission, persistence, and infectivity of this newly recognized SARS-CoV-2 virus	climate, temperature, humidity, wind speed, air pollution.	SARS-CoV-2/COVID-19
Kumar S 2021	Kumar S, Singh R, Kumari N, Karmakar S, Behera M, Siddiqui AJ, Rajput VD, Minkina T, Bauddh K, Kumar N. Current understanding of the influence of environmental factors on SARS-CoV-2 transmission, persistence, and infectivity. <i>Environ Sci Pollut Res Int.</i> 2021 Feb;28(6):6267-6288. doi: 10.1007/s11356-020-12165-1.	Summarizes evidence on climate, temperature, humidity, wind speed, air, and water quality, etc. on the transmission, persistence, and infectivity of this newly recognized SARS-CoV-2 virus.	climate, temperature, humidity, wind speed, air, and water quality	SARS-CoV-2/COVID-19
Kurt 2016	Kurt OK, Zhang J, Pinkerton KE. Pulmonary health effects of air pollution. <i>Curr Opin Pulm Med.</i> 2016 Mar; 22(2):138-43. doi: 10.1097/MCP.000000000000248.	Narrative review of air pollutants and their impact on asthma, chronic obstructive pulmonary disease, lung cancer, and respiratory infection. Asthma, chronic obstructive pulmonary disease, lung cancer, and respiratory infections all seem to be exacerbated because of exposure to a variety of environmental air pollutants with the greatest effects because of particulate matter, ozone, and nitrogen oxides.	air pollution	respiratory infections

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Li H-L 2022	Li HL, Yang BY, Wang LJ, Liao K, Sun N, Liu YC, Ma RF, Yang XD. A meta-analysis result: Uneven influences of season, geo-spatial scale and latitude on relationship between meteorological factors and the COVID-19 transmission. <i>Environ Res.</i> 2022 Sep;212 (Pt B):113297. doi: 10.1016/j.envres.2022.113297.	Meta-analysis of studies on meteorological variables and SARS-CoV-2 infections: relative humidity significantly inhibited the COVID-19 transmission at the national scale, but no effect within cities. The negative impact of relative humidity, and the positive impacts of maximum temperatures and wind speed on the newly-confirmed COVID-19 cases increased with latitude. The relationship of maximum and minimum temperatures with the newly-confirmed COVID-19 cases were more susceptible to season, while relative humidity's relationship was more affected by latitude and geospatial scale.	meteorological variables include temperature, humidity	SARS-CoV-2/COVID-19
Li Y 2019	Li Y, Reeves RM, Wang X, Bassat Q, Brooks WA, Cohen C, et al. RSV Global Epidemiology Network; RESCEU investigators. Global patterns in monthly activity of influenza virus, respiratory syncytial virus, parainfluenza virus, and metapneumovirus: a systematic analysis. <i>Lancet Glob Health.</i> 2019 Aug;7 (8):e1031-e1045. doi: 10.1016/S2214-109X(19)30264-5	Compiled data via a systematic literature review of studies published between 1 Jan 2000, and 31 Dec 2017: Influenza virus had clear seasonal epidemics in winter months in most temperate sites but timing of epidemics was more variable and less seasonal with decreasing distance from the equator. Unlike influenza virus, respiratory syncytial virus had clear seasonal epidemics in both temperate and tropical regions, starting in late summer months in the tropics of each hemisphere, reaching most temperate sites in winter months.	season, seasonality	influenza, RSV
Li Y 2020	Li Y, Wang X, Nair H. Global Seasonality of Human Seasonal Coronaviruses: A Clue for Postpandemic Circulating Season of Severe Acute Respiratory Syndrome Coronavirus 2? <i>J Infect Dis.</i> 2020 Sep 1; 222(7):1090-1097. doi: 10.1093/infdis/jiaa436.	Systematic review. Compared seasonality of sCoVs with influenza virus and respiratory syncytial virus and assessed associations with weather: seasonal coronaviruses were prevalent in winter months in most temperate sites except for China; Low temperature combined with high relative humidity was associated with higher sCoV activity.	meteorological variables	respiratory viruses
Lipfert LW 2021	Lipfert FW, Wyzga RE. COVID-19 and the Environment, Review and Analysis. <i>Environments.</i> 2021; 8(5):42. <a href="https://doi.org/10.3390/environments8050042">https://doi.org/10.3390/environments8050042</a>	Reviewed studies linking COVID-19 cases and deaths with the environment, focusing on relationships with air pollution. We found both short- and long-term observational relationships with a range of regulated pollutants; most of these studies were limited to a few months of the pandemic period.	air pollution	SARS-CoV-2/COVID-19
Lofgren 2007	Lofgren E, Fefferman NH, Naumov YN, Gorski J, Naumova EN. Influenza seasonality: underlying causes and modeling theories. <i>J Virol.</i> 2007 Jun;81 (11):5429-36. doi: 10.1128/JVI.01680-06.	Theories to explain seasonality effects observed on COVID-19 put forward.	season	SARS-CoV-2/COVID-19

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Maheswari S 2020	Maheswari S, Pethannan R, Sabarimurugan S. Air pollution enhances susceptibility to novel coronavirus (COVID-19) infection - an impact study. <i>Environ Anal Health Toxicol.</i> 2020 Dec;35(4):e2020020-0. doi: 10.5620/eaht.2020020.	The health damage inflicted on people by long-standing air pollution in cities is likely to increase the death rate by COVID-19.	air pollution	SARS-CoV-2/COVID-19
Majidi S 2022	Majidi S, Feizi A, Hajizadeh Y. The Effect of Face Mask, Air Temperature, and Humidity on COVID-19 Transmission: A Systematic Review and Meta-analysis. <i>Health Scope.</i> 2022;11(4):e129121. <a href="https://doi.org/10.5812/jhealthscope-129121">https://doi.org/10.5812/jhealthscope-129121</a> .	PRISMA guidelines followed. Data from 6 included studies showed that temperature and humidity changes did not impact on rates COVID-19 cases.	temperature, humidity	SARS-CoV-2/COVID-19
Maleki M 2021	Maleki M, Anvari E, Hopke PK, Noorimotlagh Z, Mirzaee SA. An updated systematic review on the association between atmospheric particulate matter pollution and prevalence of SARS-CoV-2. <i>Environ Res.</i> 2021 Apr;195:110898. doi: 10.1016/j.envres.2021.110898.	There are suggestions that atmospheric particulate matter pollution plays a role in the SARS-CoV-2 spread, but the literature has not confirmed that it enhances the transmission although some studies have proposed that atmospheric particulate matter can operate as a virus carrier, promoting its spread.	air pollution	SARS-CoV-2/COVID-19
Marquès M 2022	Marquès M, Domingo JL. Positive association between outdoor air pollution and the incidence and severity of COVID-19. A review of the recent scientific evidences. <i>Environ Res.</i> 2022 Jan;203:111930. doi: 10.1016/j.envres.2021.111930	There is a significant association between chronic exposure to various outdoor air pollutants: PM2.5, PM10, O3, NO2, SO2 and CO, and the incidence/risk of COVID-19 cases, as well as the severity/mortality of the disease. Unfortunately, studies on the potential influence of other important air pollutants such as VOCs, dioxins and furans, or metals, are not available in the scientific literature.	air pollution	SARS-CoV-2/COVID-19
Mathur 2014	Mathur MB, Patel RB, Gould M, Uyeki TM, Bhattacharya J, Xiao Y, Gillaspie Y, Chae C, Khazeni N. Seasonal patterns in human A (H5N1) virus infection: analysis of global cases. <i>PLoS One.</i> 2014 Sep 12;9(9):e106171. doi: 10.1371/journal.pone.0106171	Across diverse climates, HPAI H5N1 virus infection in humans increases significantly in winter. This is consistent with increased poultry outbreaks and HPAI H5N1 virus transmission during cold and dry conditions	season, meteorological variables	influenza

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McClymont 2021	McClymont H, Hu W. Weather Variability and COVID-19 Transmission: A Review of Recent Research. <i>Int J Environ Res Public Health</i> . 2021 Jan 6;18(2):396. doi: 10.3390/ijerph18020396.	Review of weather and COVID-19: COVID-19 incidence increased as temperature decreased; highest incidence reported in temperature range of 0-17 °C. Humidity also associated with COVID-19 incidence, though the reported results were mixed, with studies reporting positive and negative correlation. A significant interaction between humidity and temperature was reported. Wind speed and rainfall results were not consistent across studies.	meteorological factors	SARS-CoV-2/COVID-19
Mecenas 2020	Mecenas P, Bastos RTDRM, Vallinoto ACR, Normando D. Effects of temperature and humidity on the spread of COVID-19: A systematic review. <i>PLoS One</i> . 2020 Sep 18;15(9):e0238339. doi: 10.1371/journal.pone.0238339.	Systematic review: High homogeneity was observed in the findings from 17 studies on temperature and humidity and transmissibility of COVID-19. Cold and dry conditions were potentiating factors on the spread of the virus.	temperature and humidity	SARS-CoV-2/COVID-19
Metz JA 2015	Metz JA, Finn A. Influenza and humidity--Why a bit more damp may be good for you! <i>J Infect</i> . 2015 Jun;71 Suppl 1:S54-8. doi: 10.1016/j.jinf.2015.04.013.	Reviews the evidence for a causal association between absolute humidity and 'flu transmission and outline how this could lead to a new approach to curbing this and perhaps other viral epidemics in the winter months.	humidity	influenza
Mirsaedi 2016	Mirsaedi M, Motahari H, Taghizadeh Khamesi M, Sharifi A, Campos M, Schraufnagel DE. Climate Change and Respiratory Infections. <i>Ann Am Thorac Soc</i> . 2016 Aug;13(8):1223-30. doi: 10.1513/AnnalsATS.201511-729PS. PMID: 27300144.	Extreme weather events, such as heat waves, floods, major storms, drought, and wildfires, are also believed to change the incidence of respiratory infections. Changes in temperature, precipitation, relative humidity, and air pollution influence viral activity and transmission.	meteorological variables	influenza
Mohammadi L 2022	Mohammadi L, Mehravaran A, Derakhshan Z, Gharehchahi E, Bontempi E, Golaki M et al. Investigating the Role of Environmental Factors on the Survival, Stability, and Transmission of SARS-CoV-2, and Their Contribution to COVID-19 Outbreak: A Review. <i>Sustainability</i> 2022, 14, 11135. <a href="https://doi.org/10.3390/su141811135">https://doi.org/10.3390/su141811135</a>	The outbreak of respiratory viruses is related mainly to temperature and humidity, and geographical locations (latitude). In SARS-CoV-2, mainly temperature and humidity seem to play a fundamental role	temperature, humidity, latitude	respiratory viruses

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Monto AS 2022	Monto AS. The seasonality of rhinovirus infections and its implications for clinical recognition. <i>Clin Ther.</i> 2002 Dec;24(12):1987-97. doi: 10.1016/s0149-2918(02)80093-5.	Rhinoviruses comprise more than three quarters of viruses circulating in early autumn. In some years and perhaps some geographic areas, spring is an even more important time for rhinovirus transmission. Although overall rates of respiratory illness are lower in summer, rhinoviruses are the most frequently isolated virus at this time of year. Other viral agents, including influenza viruses and respiratory syncytial virus (particularly with parainfluenza virus), predominate in the winter.	season, seasonality	respiratory viruses
Moriyama M 2020	Moriyama M, Hugentobler WJ, Iwasaki A. Seasonality of Respiratory Viral Infections. <i>Annu Rev Virol.</i> 2020 Sep 29;7(1):83-101. doi: 10.1146/annurev-virology-012420-022445.	Reviews evidence of how outdoor and indoor climates are linked to the seasonality of viral respiratory infections.	season, temperature, humidity	respiratory viruses
Mu Y 2021	Mu Y, Shao M, Zhong B, Zhao Y, Leung KMY, Giesy JP, Ma J, Wu F, Zeng F. Transmission of SARS-CoV-2 virus and ambient temperature: a critical review. <i>Environ Sci Pollut Res Int.</i> 2021 Jul;28(28):37051-37059. doi: 10.1007/s11356-021-14625-8	Confirmed COVID-19 cases in China and other countries associated with ambient temperature, warm and humid weather in Singapore and Thailand might have been a factor in the more moderate trajectories of epidemics, which is compared to the relatively severe viral transmission in Japan, South Korea, Europe, and Iran. (Mechanisms are explored.)	temperature, humidity	SARS-CoV-2/COVID-19
Mwiinde AM 2022	Mwiinde AM, Siankwilimba E, Sakala M, Banda F, Michelo C. Climatic and Environmental Factors Influencing COVID-19 Transmission-An African Perspective. <i>Trop Med Infect Dis.</i> 2022 Dec 12;7(12):433. doi: 10.3390/tropicalmed7120433.	Review exploring climatic and environmental elements influencing COVID-19 transmission in Africa. Evidence suggests an influence of climatic and environmental elements on the spread of COVID-19 in the continent of Africa.	climate	SARS-CoV-2/COVID-19
Obando-Pacheco P 2018	Obando-Pacheco P, Justicia-Grande AJ, Rivero-Calle I, Rodríguez-Tenreiro C, Sly P, Ramilo O, Mejías A, Baraldi E, Papadopoulos NG, Nair H, Nunes MC, Kragten-Tabatabaie L, Heikkinen T, Greenough A, Stein RT, Manzoni P, Bont L, Martín-Torres F. Respiratory Syncytial Virus Seasonality: A Global Overview. <i>J Infect Dis.</i> 2018 Apr 11;217(9):1356-1364. doi: 10.1093/infdis/jiy056	Although there were major differences among the 27 countries studied, seasonal RSV epidemics within each individual country were consistent over time. Respiratory syncytial virus usually travels from the south to the north, starting between March and June in most countries in the Southern Hemisphere and between September and December in countries in the Northern Hemisphere. Humid countries have their seasonal wave during the rainy season.	season, seasonality	RSV

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Oliveira 2011	Oliveira BF, Ignotti E, Hacon SS. A systematic review of the physical and chemical characteristics of pollutants from biomass burning and combustion of fossil fuels and health effects in Brazil. <i>Cad Saude Publica</i> . 2011 Sep;27(9):1678-98. doi: 10.1590/s0102-311x2011000900003.	Review of pollutants from biomass burning and combustion of fossil fuels and health effects in Brazil: Included one study on hospital admissions in Brazil among children for pneumonia.	air pollution	paediatric pneumonia
Paital B 2022	Paital B, Agrawal PK. Chapter 3 - Role of environmental factors in transmission of COVID-19, Editor(s): Rawtani D, Hussain CM, Khatri N, COVID-19 in the Environment, Elsevier, 2022, Pages 35-72, ISBN 9780323902724, <a href="https://doi.org/10.1016/B978-0-323-90272-4.00017-8">https://doi.org/10.1016/B978-0-323-90272-4.00017-8</a>	Multifactorial environmental implications especially controlling air quality is important for COVID-19 pandemic	air pollution	SARS-CoV-2/COVID-19
Paraskevis D 2021	Paraskevis D, Kostaki EG, Alygizakis N, Thomaidis NS, Cartalis C, Tsiodras S, Dimopoulos MA. A review of the impact of weather and climate variables to COVID-19: In the absence of public health measures high temperatures cannot probably mitigate outbreaks. <i>Sci Total Environ</i> . 2021 May 10;768:144578. doi: 10.1016/j.scitotenv.2020.144578.	Due to the inherent limitations in previously published studies, it remains unclear if the magnitude of the effect of temperature or humidity on COVID-19 is confounded by the public health measures implemented widely during the first pandemic wave	temperature, humidity	SARS-CoV-2/COVID-19
Park AW 2007	Park AW, Glass K. Dynamic patterns of avian and human influenza in east and southeast Asia. <i>Lancet Infect Dis</i> . 2007 Aug;7(8):543-8. doi: 10.1016/S1473-3099(07)70186-X.	The possibility of a human being becoming co-infected with both human and avian strains of influenza is not restricted to a short season, although the risks do appear to be greatest during the winter months.	season	influenza
Paynter S 2015	Paynter S. Humidity and respiratory virus transmission in tropical and temperate settings. <i>Epidemiol Infect</i> . 2015 Apr;143(6):1110-8. doi: 10.1017/S0950268814002702.	Tropical rainy seasons appear to encourage the transmission of RSV more than influenza. More research is required to examine the environmental survival of respiratory viruses in the high humidity and temperature of the tropics	meteorological variables	RSV, influenza
Pica 2012	Pica N, Bouvier NM. Environmental factors affecting the transmission of respiratory viruses. <i>Curr Opin Virol</i> . 2012 Feb;2(1):90-5. doi: 10.1016/j.coviro.2011.12.003.	Precipitation, humidity, temperature, and airflow can be determinants of virus infection and transmission; however, despite robust investigation of the effects of these environmental factors, inconsistencies and uncertainties in the data remain	precipitation, humidity, temperature, air flow	viral respiratory infections

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Pica N 2014	Pica N, Bouvier NM. Ambient temperature and respiratory virus infection. <i>Pediatr Infect Dis J.</i> 2014 Mar;33(3):311-3. doi: 10.1097/INF.0000000000000235	Summarizes the effect of temperature on the epidemicity of respiratory viruses, with an emphasis on epidemiological findings from large-scale metanalyses, laboratory-derived data using animal models and possible mechanisms to account for viral seasonality.	temperature	respiratory viruses
Piscitelli P 2022	Piscitelli P, Miani A, Setti L, De Gennaro G, Rodo X, Artinano B et al RESCOP Commission established by Environmental Research (Elsevier). The role of outdoor and indoor air quality in the spread of SARS-CoV-2: Overview and recommendations by the research group on COVID-19 and particulate matter (RESCOP commission). <i>Environ Res.</i> 2022 Aug;211:113038. doi: 10.1016/j.envres.2022.113038	Reviews the role of indoor and outdoor air quality and spread of SARS-CoV-2.	air pollution	SARS-CoV-2/COVID-19
Pun 2020	Pun M, Turner R, Strapazzon G, Brugger H, Swenson ER. Lower Incidence of COVID-19 at High Altitude: Facts and Confounders. <i>High Alt Med Biol.</i> 2020 Sep;21(3):217-222. doi: 10.1089/ham.2020.0114	Review: environmental factors such as pollution, ambient temperature, humidity, and seasonal weather patterns at different latitudes may influence how severe the pandemic of SARS-CoV-2.	pollution, ambient temperature, humidity, and seasonal weather	SARS-CoV-2/COVID-19
Quintana AV 2021	Quintana AV, Clemons M, Hoevemeyer K, Liu A, Balbus J. A Descriptive Analysis of the Scientific Literature on Meteorological and Air Quality Factors and COVID-19. <i>Geohealth.</i> 2021 Jul 20;5(7):e2020GH000367. doi: 10.1029/2020GH000367.	Narrative review on the role of meteorological and air quality factors in moderating the transmission of SARS-CoV-2 and severity of COVID-19.	meteorological factors, air pollution	SARS-CoV-2/COVID-19
Rahimi NR 2021	Rahimi NR, Fouladi-Fard R, Aali R, Shahryari A, Rezaali M, Ghafouri Y, Ghalhari MR, Asadi-Ghalhari M, Farzinnia B, Conti Gea O, Fiore M. Bidirectional association between COVID-19 and the environment: A systematic review. <i>Environ Res.</i> 2021 Mar;194:110692. doi: 10.1016/j.envres.2020.110692	The transmissibility of COVID-19 is affected by meteorological variables.	meteorological variables	SARS-CoV-2/COVID-19
Raina SK 2020	Raina SK, Kumar R, Bhota S, Gupta G, Kumar D, Chauhan R, Kumar P. Does temperature and humidity influence the spread of Covid-19?: A preliminary report. <i>J Family Med Prim Care.</i> 2020 Apr 30;9(4):1811-1814. doi: 10.4103/jfmprc.jfmprc_494_20.	The results though preliminary point to a pattern which favors the hypothesis that the extensive spread of COVID-19 maybe limited by temperature and humidity.	temperature, humidity	SARS-CoV-2/COVID-19

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Rojas-Rueda 2021	Rojas-Rueda D, Morales-Zamora E, Alsufyani WA, Herbst CH, AlBalawi SM, Alsukait R, Alomran M. Environmental risk factors and health: an umbrella review of meta-analyses. <i>Int J Environ Res Public Health</i> . 2021 Jan 15;18(2):704. doi: 10.3390/ijerph18020704. Respiratory issues - umbrella review of meta-analyses.	Umbrella review of meta-analyses; found 197 associations among 69 environmental exposures and 83 diseases and death causes reported in 103 publications. The environmental factors found in this review were air pollution, environmental tobacco smoke, heavy metals, chemicals, ambient temperature, noise, radiation, and urban residential surroundings	air pollution, environmental tobacco smoke, heavy metals, chemicals, ambient temperature,	respiratory infections, deaths
Romero Starke K 2021	Romero Starke K, Mauer R, Karskens E, Pretzsch A, Reissig D, Nienhaus A, Seidler AL, Seidler A. The Effect of Ambient Environmental Conditions on COVID-19 Mortality: A Systematic Review. <i>Int J Environ Res Public Health</i> . 2021 Jun 21;18(12):6665. doi: 10.3390/ijerph18126665	Systematic review of the effects of ambient environmental conditions on COVID-19 mortality; Although the results were inconsistent, most studies show that a decrease in temperature and humidity were associated with an increase in mortality	temperature, humidity	SARS-CoV-2/COVID-19
Salamanca-Fernández E 2021	Salamanca-Fernández E, Rodríguez Barranco M, Sánchez MJ. Influencia de la temperatura ambiental y la contaminación en la transmisión del SARS-CoV-2 [Influence of environmental temperature and air pollution on the transmission of SARS-CoV-2.]. <i>Rev Esp Salud Publica</i> . 2021 Jan 20;95:e202101003.	This article reviewed the scientific evidence to date regarding the possible influence of environmental temperature and air pollution on the transmission of SARS-CoV-2. It is concluded that the annual seasons and, therefore, the temperature do not seem to influence the spread of the virus. In addition, air pollutants facilitate infection and mortality from the virus.	environmental conditions, pollution	SARS-CoV-2/COVID-19
Saputra YA 2021	Saputra YA, Susanna D, Saki VY. Impact of Climate Variables on COVID-19 Pandemic in Asia: A Systematic Review. <i>Kesmas: Jurnal Kesehatan Masyarakat Nasional (National Public Health Journal)</i> , [S.l.], July 2021. ISSN 2460-0601. Available at: <a href="https://journal.fkm.ui.ac.id/kesmas/article/view/5211">https://journal.fkm.ui.ac.id/kesmas/article/view/5211</a> Date accessed: 10 apr. 2023. doi:http://dx.doi.org/10.21109/kesmas.v0i0.5211.	This paper aimed to critically assess and provide evidence-based on the impact of climate variables on COVID-19 cases in Asia. Average temperature, maximum temperature, minimum temperature, and humidity were significantly correlated with COVID-19 cases.	climate and weather variables	SARS-CoV-2/COVID-19

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Shaman 2011	Shaman J, Goldstein E, Lipsitch M. Absolute humidity and pandemic versus epidemic influenza. <i>Am J Epidemiol.</i> 2011 Jan 15;173(2):127-35. doi: 10.1093/aje/kwq347. Epub 2010 Nov 16	Review of absolute humidity variability and geographic pattern of a wintertime third wave of pandemic influenza in continental United States and hypotheses on transmission: here the authors show that variations of the basic and effective reproductive numbers for influenza, caused by seasonal changes in absolute humidity, are consistent with the general timing of pandemic influenza outbreaks observed for 2009 A/H1N1 in temperate regions	humidity and geographic pattern	influenza
Shao L 2021	Shao L, Ge S, Jones T, Santosh M, Silva LFO, Cao Y, Oliveira MLS, Zhang M, Bérubé K, The role of airborne particles and environmental considerations in the transmission of SARS-CoV-2, <i>Geoscience Frontiers</i> , 12 (5) 2021, 101189, <a href="https://doi.org/10.1016/j.gsf.2021.101189">https://doi.org/10.1016/j.gsf.2021.101189</a>	Transmission of COVID-19 is affected by different environmental conditions and pollution.	environmental conditions, pollution	SARS-CoV-2/COVID-19
Sharma GD 2021b	Sharma GD, Tiwari AK, Jain M, Yadav A, Srivastava M. COVID-19 and environmental concerns: A rapid review. <i>Renew Sustain Energy Rev.</i> 2021 Sep;148:111239. doi: 10.1016/j.rser.2021.111239	A rapid review of 117 papers synthesizing the evidence regarding the environmental concerns of Covid-19; evidence of air pollution associated with increased COVID-19 cases and deaths; high correlation between wind speed and temperature and spread of COVID-19.	air pollution, temperature, humidity	SARS-CoV-2/COVID-19
Sloan C 2011	Sloan C, Moore ML, Hartert T. Impact of pollution, climate, and sociodemographic factors on spatiotemporal dynamics of seasonal respiratory viruses. <i>Clin Transl Sci.</i> 2011 Feb;4(1):48-54. doi: 10.1111/j.1752-8062.2010.00257.x	Temperature is the primary predictor of what global region will have higher disease rates at different times of the year, with rates in temperate regions of the northern hemisphere higher in November to February and higher in the temperature regions of the southern hemisphere higher in June to August. Humidity also seems to play an important role, with lower absolute humidity associated with higher rates of infection.	temperature, humidity	respiratory viruses
Smit AJ 2020	Smit AJ, Fitchett JM, Engelbrecht FA, Scholes RJ, Dzihvhuho G, Sweijd NA. Winter Is Coming: A Southern Hemisphere Perspective of the Environmental Drivers of SARS-CoV-2 and the Potential Seasonality of COVID-19. <i>Int J Environ Res Public Health.</i> 2020 Aug 5;17(16):5634. doi: 10.3390/ijerph17165634.	Review of critically assessed 42 peer-reviewed and 80 preprint publications on SARS-CoV-2; failed to show convincing evidence for environmental modulation of COVID-19	environmental factors	SARS-CoV-2/COVID-19

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Tang JW 2013	Tang JW, Loh TP. Correlations between climate factors and incidence--a contributor to RSV seasonality. <i>Rev Med Virol.</i> 2014 Jan;24(1):15-34. doi: 10.1002/rmv.1771.	Correlations between RSV incidence and temperature and relative humidity are particularly variable and inconsistent amongst the tropical regions. In subtropical and temperate regions, RSV incidence is more consistently positively correlated with lower temperatures and higher relative humidity	temperature, humidity	RSV
Valsamatzi-Panagiotou A 2022	Valsamatzi-Panagiotou A, Penchovsky R. Environmental factors influencing the transmission of the coronavirus 2019: a review. <i>Environ Chem Lett.</i> 2022;20(3):1603-1610. doi: 10.1007/s10311-022-01418-9.	Reviews environmental factors that control SARS-CoV-2 transmission, such as air, temperature, humidity, food, water and sewage, insects, inanimate surfaces, hand hygiene, and social distancing.	temperature, humidity	SARS-CoV-2/COVID-19
Wang D 2022	Wang D, Wu X, Li C, Han J, Yin J. The impact of geo-environmental factors on global COVID-19 transmission: A review of evidence and methodology. <i>Sci Total Environ.</i> 2022 Jun 20;826:154182. doi: 10.1016/j.scitotenv.2022.154182.	Reviews 49 selected studies on the impact of geo-environmental factors (including the natural environment and human activity) on global COVID-19 transmission.	climate	SARS-CoV-2/COVID-19
Weaver AK 2022	Weaver AK, Head JR, Gould CF, Carlton EJ, Remais JV. Environmental Factors Influencing COVID-19 Incidence and Severity. <i>Annu Rev Public Health.</i> 2022 Apr 5;43:271-291. doi: 10.1146/annurev-publhealth-052120-101420	Climate, air pollution, and the built environment have long been recognized to influence viral respiratory infections, and studies have established similar associations with COVID-19 outcomes. Mechanistic data are reviewed.	air pollution	SARS-CoV-2/COVID-19
Wei Y 2022	Wei Y, Dong Z, Fan W, Xu K, Tang S, Wang Y, Wu F. A narrative review on the role of temperature and humidity in COVID-19: Transmission, persistence, and epidemiological evidence. <i>Eco-Environment &amp; Health.</i> 2022; 1 (2) 73-85,	The temperature and humidity influenced the trajectory of SARS-CoV-2 transmission via aerosols. More evidence may support that rising temperatures seem to be slightly and negatively associated with COVID-19 growth.	temperature, humidity	SARS-CoV-2/COVID-19
Yuan S 2020	Yuan S, Jiang SC, Li ZL. Do Humidity and Temperature Impact the Spread of the Novel Coronavirus? <i>Front Public Health.</i> 2020 May 27;8:240. doi: 10.3389/fpubh.2020.00240.	SARS-CoV-2 transmission may be mainly determined by the humidity, but the temperature may still impart a moderate influence on COVID-19 pandemic	temperature and humidity	SARS-CoV-2/COVID-19

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Zhang 2014	Zhang Y, Li M, Bravo MA, Jin L, Nori-Sarma A, Xu Y, Guan D, Wang C, Chen M, Wang X, Tao W, Qiu W, Zhang Y, Bell ML. Air Quality in Lanzhou, a Major Industrial City in China: Characteristics of Air Pollution and Review of Existing Evidence from Air Pollution and Health Studies. <i>Water Air Soil Pollut.</i> 2014 Oct;225(10):2187. doi: 10.1007/s11270-014-2187-3.	Air pollution in China; Includes 8 studies done in China, cross sectional, time series; titles include hospital admissions for respiratory disease (infectious/noninfectious not specified).	air pollution	respiratory morbidity and mortality
Zhao 2021	Zhao C, Fang X, Feng Y, Fang X, He J, Pan H. Emerging role of air pollution and meteorological parameters in COVID-19. <i>J Evid Based Med.</i> 2021 May;14(2):123-138. doi: 10.1111/jebm.12430.	Review: summarizes the biology of COVID-19 and the route of viral transmission, and outlines the relationship between air pollution and climate indicators and COVID-19.	air pollution	SARS-CoV-2/COVID-19
Zheng H-L 2021	Zheng HL, Guo ZL, Wang ML, Yang C, An SY, Wu W. Effects of climate variables on the transmission of COVID-19: a systematic review of 62 ecological studies. <i>Environ Sci Pollut Res Int.</i> 2021 Oct;28(39):54299-54316. doi: 10.1007/s11356-021-15929-5	This systematic review included a total of 62 publications. The certainty of evidence was graded as being low; higher temperatures may slow the progression of the COVID-19 epidemic.	temperature	SARS-CoV-2/COVID-19
Zhu C 2021	Zhu C, Maharajan K, Liu K, Zhang Y. Role of atmospheric particulate matter exposure in COVID-19 and other health risks in human: A review. <i>Environ Res.</i> 2021 Jul;198:111281. doi: 10.1016/j.envres.2021.111281	This review highlights the potential relationship of PM with the incidence of a range of respiratory diseases; Particulate matter is strongly associated with SARS-CoV-2 transmission.	air pollution	SARS-CoV-2/COVID-19