

Text S1. Literature search and selection of manuscripts

Search question

For our research question we defined the study population as naive domestic cats exposed, experimentally or naturally within a household, to SARS-CoV-2. The intervention of interest was infection via experimental challenge or household infection and the outcomes of interest were cat-to-cat transmission and longitudinal monitoring of shedding in infected cats.

Search strategy

We searched the electronic databases PubMed, EMBASE, BioRxiv, and MedRxiv as indexed by the 'COVID Open Access Project'(1). We filtered the dataset of COVID-19 related research based on keywords in the title and or abstract: “((cats) OR (feline)) AND ((transmission) OR (transmissibility) OR (passage) OR (susceptibility))”. The search was performed on 10 May 2021. Additionally, we checked the reference lists of the included studies for relevant publications.

Study selection and data extraction

First screening and selection was made based on titles and abstracts. Only experimental studies and observational studies in line with the research question were included. The second step consisted of full text screening of the selected studies. For experimental studies, studies which included naive sentinels exposed directly or indirectly to infected (inoculated) cats to assess transmission were selected for data extraction. For observational studies, selected studies for data extraction were reports in which detailed information of infection of household cats were provided at household level. Studies with one cat or multiple cats per household were selected for data extraction.

Data was extracted either from the text, figures or the supplementary data files. For studies that did not provide the full data, we used WebPlotDigitizer (2) to extract the data from the figures. Data on the first and last time of positive RNA or virus detection during the infection process, peak virus concentration (units depended on the laboratory method used), the number of cats per experimental group or household and the number infected cats at the end of the study were extracted for analysis. Detailed description of data extraction and preparation is provided in Text S2.

Literature search and study selection results

The literature search provided 115 studies (111 identified for the searched databases and four by checking reference lists). Twenty nine (3-31) studies were then selected for full text screening and are listed below. Finally 13 studies, five experimental studies (4, 8, 14-16) and eight observational studies (5, 6, 10, 17-20, 31) were selected for data extraction and analysis.

References

1. Covid-19 Open Access Project. 2020. Living Evidence on COVID-19. <https://ispmbern.github.io/covid-19/living-review/>. Accessed 10-05-2021.
2. Rohatgi A. 2020. WebPlotDigitizer User Manual. <https://automeris.io/WebPlotDigitizer/userManual.pdf>. Accessed 20-05-2021.
3. Akhmetzhanov AR, Linton NM, Nishiura H. 2020. Rising evidence of COVID-19 transmission potential to and between animals: do we need to be concerned? *MedRxiv* doi:10.1101/2020.05.21.20109041.
4. Bao L, Song Z, Xue J, Gao H, Liu J, Wang J, Guo Q, Zhao B, Qu Y, Qi F, Gong S, Liu M, Qi L, Li D, Han Y, Zhao W, Deng S, Liu Y, Xiang Z, Yang B, Deng W, Yu H, Cong Z, Wei Q, Xu J, Gao GF, Qin C. 2021. Susceptibility and Attenuated Transmissibility of SARS-CoV-2 in Domestic Cats. *J Infect Dis* doi:10.1093/infdis/jiab104.
5. Barrs VR, Peiris M, Tam KWS, Law PYT, Brackman CJ, To EMW, Yu VYT, Chu DKW, Perera R, Sit THC. 2020. SARS-CoV-2 in Quarantined Domestic Cats from COVID-19 Households or Close Contacts, Hong Kong, China. *Emerging Infect Dis* 26.
6. Bessière P, Fusade-Boyer M, Walch M, Lèbre L, Brun J, Croville G, Boullier S, Cadiegues MC, Guérin JL. 2021. Household Cases Suggest That Cats Belonging to Owners with COVID-19 Have a Limited Role in Virus Transmission. *Viruses* 13.
7. Bonilla-Aldana DK, Ruiz-Saenz J, Martinez-Gutierrez M, Tiwari R, Dhama K, Jaimes JA, Rodriguez-Morales AJ. 2020. Concerns on the emerging research of sars-cov-2 on felines: Could they be significant hosts/reservoirs? *J Pure Appl Microbiol* 14:703-708.
8. Bosco-Lauth AM, Hartwig AE, Porter SM, Gordy PW, Nehring M, Byas AD, VandeWoude S, Ragan IK, Maison RM, Bowen RA. 2020. Experimental infection of domestic dogs and cats with SARS-CoV-2: Pathogenesis, transmission, and response to reexposure in cats. *Proc Natl Acad Sci U S A* 117:26382-26388.
9. Braun KM, Moreno GK, Halfmann PJ, Hodcroft EB, Baker DA, Boehm EC, Weiler AM, Haj AK, Hatta M, Chiba S, Maemura T, Kawaoka Y, Koelle K, O'Connor DH, Friedrich TC. 2021. Transmission of SARS-CoV-2 in domestic cats imposes a narrow bottleneck. *PLoS Pathog* 17:e1009373.
10. Chaintoutis SC, Siarkou VI, Mylonakis ME, Kazakos GM, Skeva PN, Bampali M, Dimitriou M, Dovrolis N, Polizopoulou ZS, Karakasiliotis I, Dovas CI. 2021. Limited cross-species transmission and absence of mutations associated with SARS-CoV-2 adaptation in cats: A case study of infection in a small household setting. *Transbound Emerg Dis* doi:10.1111/tbed.14132.
11. Ferasin L, Fritz M, Ferasin H, Becquart P, Legros V, Leroy EM. 2021. Myocarditis in naturally infected pets with the British variant of COVID-19. *BioRxiv* doi:10.1101/2021.03.18.435945.
12. Fritz M, Rosolen B, Krafft E, Becquart P, Elguero E, Vratskikh O, Denolly S, Boson B, Vanhomwegen J, Gouilh MA, Kodjo A, Chirouze C, Rosolen SG, Legros V, Leroy EM. 2020. High prevalence of SARS-CoV-2 antibodies in pets from COVID-19+ households. *One Health* 11:100192.
13. Gaudreault NN, Carossino M, Morozov I, Trujillo JD, Meekins DA, Madden DW, Cool K, Artiaga BL, McDowell C, Bold D, Balaraman V, Kwon T, Ma W, Henningson J, Wilson DW, Wilson WC, Balasuriya UBR, García-Sastre A, Richt JA. 2021. Experimental re-infected cats do not transmit SARS-CoV-2. *Emerg Microbes Infect* doi:10.1080/22221751.2021.1902753:1-38.

14. Gaudreault NN, Trujillo JD, Carossino M, Meekins DA, Morozov I, Madden DW, Indran SV, Bold D, Balaraman V, Kwon T, Artiaga BL, Cool K, García-Sastre A, Ma W, Wilson WC, Henningson J, Balasuriya UBR, Richt JA. 2020. SARS-CoV-2 infection, disease and transmission in domestic cats. *Emerg Microbes Infect* 9:2322-2332.
15. Shi J, Wen Z, Zhong G, Yang H, Wang C, Huang B, Liu R, He X, Shuai L, Sun Z, Zhao Y, Liu P, Liang L, Cui P, Wang J, Zhang X, Guan Y, Tan W, Wu G, Chen H, Bu Z. 2020. Susceptibility of ferrets, cats, dogs, and other domesticated animals to SARS-coronavirus 2. *Science* 368:1016-1020.
16. Halfmann PJ, Hatta M, Chiba S, Maemura T, Fan S, Takeda M, Kinoshita N, Hattori SI, Sakai-Tagawa Y, Iwatsuki-Horimoto K, Imai M, Kawaoka Y. 2020. Transmission of SARS-CoV-2 in Domestic Cats. *N Engl J Med* 383:592-594.
17. Hamer SA, Pauvolid-Correa A, Zecca IB, Davila E, Auckland LD, Roundy CM, Tang W, Torchetti MK, Killian ML, Jenkins-Moore M, Mozingo K, Akpalu Y, Ghai RR, Spengler JR, Barton Behravesh C, Fischer R, Hamer GL. 2020. Natural SARS-CoV-2 infections, including virus isolation, among serially tested cats and dogs in households with confirmed human COVID-19 cases in Texas, USA. *BioRxiv* doi:10.1101/2020.12.08.416339.
18. Neira V, Brito B, Agüero B, Berrios F, Valdés V, Gutierrez A, Ariyama N, Espinoza P, Retamal P, Holmes EC, Gonzalez-Reiche AS, Khan Z, Guchte AV, Dutta J, Miorin L, Kehrer T, Galarce N, Almonacid LI, Levican J, Bakel HV, García-Sastre A, Medina RA. 2020. A household case evidences shorter shedding of SARS-CoV-2 in naturally infected cats compared to their human owners. *Emerg Microbes Infect* doi:10.1080/22221751.2020.1863132:1-22.
19. Klaus J, Meli ML, Willi B, Nadeau S, Beisel C, Stadler T, Eth Sars-Co VST, Egberink H, Zhao S, Lutz H, Riond B, Rösinger N, Stalder H, Renzullo S, Hofmann-Lehmann R. 2021. Detection and Genome Sequencing of SARS-CoV-2 in a Domestic Cat with Respiratory Signs in Switzerland. *Viruses* 13.
20. Segalés J, Puig M, Rodon J, Avila-Nieto C, Carrillo J, Cantero G, Terrón MT, Cruz S, Parera M, Noguera-Julián M, Izquierdo-Useros N, Guallar V, Vidal E, Valencia A, Blanco I, Blanco J, Clotet B, Vergara-Alert J. 2020. Detection of SARS-CoV-2 in a cat owned by a COVID-19-affected patient in Spain. *Proceedings of the National Academy of Sciences* 117:24790-24793.
21. Hosie MJ, Epifano I, Herder V, Orton RJ, Stevenson A, Johnson N, MacDonald E, Dunbar D, McDonald M, Howie F, Tennant B, Herrity D, Da Silva Filipe A, Streicker DG, Willett BJ, Murcia PR, Jarrett RF, Robertson DL, Weir W. 2021. Detection of SARS-CoV-2 in respiratory samples from cats in the UK associated with human-to-cat transmission. *Vet Rec* 188:e247.
22. Klaus J, Palizzotto C, Zini E, Meli ML, Leo C, Egberink H, Zhao S, Hofmann-Lehmann R. 2021. SARS-CoV-2 Infection and Antibody Response in a Symptomatic Cat from Italy with Intestinal B-Cell Lymphoma. *Viruses* 13.
23. Langereis MA, Stachura K, Miller S, Bosco-Lauth AM, Albulescu IC, Hartwig AE, Porter SM, Stammen-Vogelzangs J, Mogler M, van Kuppeveld FJM, Bosch BJ, Vermeij P, de Groof A, Bowen RA, Davis R, Xu Z, Tarpey I. 2021. An alphavirus replicon-based vaccine expressing a stabilized Spike antigen induces sterile immunity and prevents transmission of SARS-CoV-2 between cats. *BioRxiv* doi:10.1101/2021.04.01.436305.
24. Michelitsch A, Hoffmann D, Wernike K, Beer M. 2020. Occurrence of Antibodies against SARS-CoV-2 in the Domestic Cat Population of Germany. *Vaccines (Basel)* 8.

25. Newman A, Smith D, Ghai RR, Wallace RM, Torchetti MK, Loiacono C, Murrell LS, Carpenter A, Moroff S, Rooney JA, Barton Behravesh C. 2020. First Reported Cases of SARS-CoV-2 Infection in Companion Animals - New York, March-April 2020. *MMWR Morb Mortal Wkly Rep* 69:710-713.
26. Pagani G, Lai A, Bergna A, Rizzo A, Stranieri A, Giordano A, Paltrinieri S, Lelli D, Decaro N, Rusconi S, Gismondo MR, Antinori S, Lauzi S, Galli M, Zehender G. 2021. Human-to-Cat SARS-CoV-2 Transmission: Case Report and Full-Genome Sequencing from an Infected Pet and Its Owner in Northern Italy. *Pathogens* 10.
27. Patterson EI, Elia G, Grassi A, Giordano A, Desario C, Medardo M, Smith SL, Anderson ER, Prince T, Patterson GT, Lorusso E, Lucente MS, Lanave G, Lauzi S, Bonfanti U, Stranieri A, Martella V, Solari Basano F, Barrs VR, Radford AD, Agrimi U, Hughes GL, Paltrinieri S, Decaro N. 2020. Evidence of exposure to SARS-CoV-2 in cats and dogs from households in Italy. *Nat Commun* 11:6231.
28. Stevanovic V, Vilibic-Cavlek T, Tabain I, Benven I, Kovac S, Hruskar Z, Mauric M, Milasincic L, Antolasic L, Skrinjaric A, Staresina V, Barbic L. 2020. Seroprevalence of SARS-CoV-2 infection among pet animals in Croatia and potential public health impact. *Transbound Emerg Dis* doi:10.1111/tbed.13924.
29. Villanueva-Saz S, Giner J, Tobajas AP, Pérez MD, González-Ramírez AM, Macías-León J, González A, Verde M, Yzuel A, Hurtado-Guerrero R, Pardo J, Santiago L, Paño-Pardo JR, Ruíz H, Lacasta D, Sánchez L, Marteles D, Gracia AP, Fernández A. 2021. Serological evidence of SARS-CoV-2 and co-infections in stray cats in Spain. *Transbound Emerg Dis* doi:10.1111/tbed.14062.
30. Zhang Q, Zhang H, Gao J, Huang K, Yang Y, Hui X, He X, Li C, Gong W, Zhang Y, Zhao Y, Peng C, Gao X, Chen H, Zou Z, Shi Z-L, Jin M. 2020. A serological survey of SARS-CoV-2 in cat in Wuhan. *Emerging Microbes & Infections* 9:2013-2019.
31. Goryoka GW, Cossaboom CM, Gharpure R, Dawson P, Tansey C, Rossow J, Mrotz V, Rooney J, Torchetti M, Loiacono CM, Killian ML, Jenkins-Moore M, Lim A, Poulsen K, Christensen D, Sweet E, Peterson D, Sangster AL, Young EL, Oakeson KF, Taylor D, Price A, Kiphibane T, Klos R, Konkole D, Bhattacharyya S, Dasu T, Chu VT, Lewis NM, Queen K, Zhang J, Uehara A, Dietrich EA, Tong S, Kirking HL, Doty JR, Murrell LS, Spengler JR, Straily A, Wallace R, Barton Behravesh C. 2021. One Health Investigation of SARS-CoV-2 Infection and Seropositivity among Pets in Households with Confirmed Human COVID-19 Cases - Utah and Wisconsin, 2020. *BioRxiv* doi:10.1101/2021.04.11.439379.