

COVID-19 CADTH REFERENCE LIST

SARS-CoV-2 Longevity on and Transmission via Materials: Evidence

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To produce this report, CADTH used a modified approach to the selection, appraisal, and synthesis of the evidence to meet decision-making needs during the COVID-19 pandemic. Care has been taken to ensure the information is accurate and complete, but it should be noted that international scientific evidence about COVID-19 is changing and growing rapidly.

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Questions or requests for information about this report can be directed to requests@cadth.ca

Research Questions

1. What is the lifespan of severe acute respiratory syndrome coronavirus 2 on different materials?
2. What is the evidence regarding severe acute respiratory syndrome coronavirus 2 transmission via materials?

Key Findings

One non-randomized study was identified regarding the lifespan of severe acute respiratory syndrome coronavirus 2 on different materials. No clinical evidence was identified regarding severe acute respiratory syndrome coronavirus 2 transmission via materials.

Methods

A limited literature search was conducted by information specialists on key resources including MEDLINE, the Cochrane Library, the University of York Centre for Reviews and Dissemination (CRD) databases, the websites of Canadian and major international health technology agencies, as well as a focused internet search. The search strategy was comprised of both controlled vocabulary, such as the National Library of Medicine’s MeSH (Medical Subject Headings), and keywords. The main search concepts were fomite materials and SARS-CoV-2. No filters were applied to limit the retrieval by study type. The search was also limited to English language documents published between January 1, 2019 and April 7, 2020. Internet links were provided, where available.

Selection Criteria

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.

Table 1: Selection Criteria

Population	Q1: Materials that may come into contact with severe acute respiratory syndrome coronavirus 2 (e.g., plastic, cardboard) Q2: People exposed to materials that may have come into contact with severe acute respiratory syndrome coronavirus 2 (particularly residents and staff in long-term care and residential care facilities)
Exposure	Q1: Exposure to severe acute respiratory syndrome coronavirus 2 Q2: Materials or objects that may have been exposed to severe acute respiratory syndrome coronavirus 2 (e.g., retail products such as groceries, cardboard, plastic)
Comparator	Not applicable
Outcomes	Q1: Laboratory outcomes (e.g., severe acute respiratory syndrome coronavirus 2 longevity) Q2: Clinical outcomes (e.g., transmission of severe acute respiratory syndrome coronavirus 2)
Study Designs	Randomized controlled trials and non-randomized studies

Results

One non-randomized study¹ was identified regarding the lifespan of severe acute respiratory syndrome coronavirus 2 on different materials. No relevant randomized controlled trials were identified.

Additional references of potential interest are provided in the appendix.

Overall Summary of Findings

One non-randomized study¹ was identified regarding the lifespan of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) on different materials. The authors of this non-randomized study¹ reported that SARS-CoV-2 was viable on plastic and stainless steel for up to 72 hours. Viable SARS-CoV-2 was also detected on copper for up to 4 hours and on cardboard for up to 24 hours.¹

References Summarized

Randomized Controlled Trials

No literature identified.

Non-Randomized Studies

1. van Doremalen N, Bushmaker T, Morris DH, et al. Aerosol and surface stability of SARS-CoV-2 as compared with SARS-CoV-1. *N Engl J Med*. 2020 Mar 17;17:17. [PubMed: PM32182409](https://pubmed.ncbi.nlm.nih.gov/32182409/)

Appendix — Further Information

Systematic Reviews

- Kampf G, Todt D, Pfaender S, Steinmann E. Persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents. *J Hosp Infect.* 2020 Mar;104(3):246-251.
[PubMed: PM32035997](#)

Non-Randomized Studies — Alternative Outcomes

- Ong SWX, Tan YK, Chia PY, et al. Air, surface environmental, and personal protective equipment contamination by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) from a symptomatic patient. *JAMA.* 2020 Mar 04;04:04.
[PubMed: PM32129805](#)

Preliminary Reports — Not Peer-Reviewed

Disclaimer from medRxiv: "Caution: Preprints are preliminary reports of work that have not been certified by peer review. They should not be relied on to guide clinical practice or health-related behavior and should not be reported in news media as established information."

- Chia PY, Coleman KK, Tan YK, et al. Detection of air and surface contamination by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in hospital rooms of infected patients **[non peer-reviewed preprint]**. medRxiv; 2020: doi: 10.1101/2020.03.29.20046557.
<https://www.medrxiv.org/content/10.1101/2020.03.29.20046557v1>. Accessed 2020 Apr 8.
- Jiang Y, Wang H, Chen Y, et al. Clinical data on hospital environmental hygiene monitoring and medical staff protection during the coronavirus disease 2019 outbreak **[non peer-reviewed preprint]**. medRxiv; 2020: doi: 10.1101/2020.02.25.20028043.
<https://www.medrxiv.org/content/10.1101/2020.02.25.20028043v2>. Accessed 2020 Apr 8.
- Ye G, Lin H, Chen L, et al. Environmental contamination of the SARS-CoV-2 in healthcare premises: An urgent call for protection for healthcare workers **[non peer-reviewed preprint]**. medRxiv; 2020: doi: 10.1101/2020.03.11.20034546.
<https://www.medrxiv.org/content/10.1101/2020.03.11.20034546v1>. Accessed 2020 Apr 8.

Additional References

- Bedford J, Enria D, Giesecke J, et al. COVID-19: towards controlling of a pandemic. *Lancet.* 2020 Mar 28;395(10229):1015-1018.
[https://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736\(20\)30673-5.pdf](https://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(20)30673-5.pdf). Accessed 2020 Apr 8.
[PubMed: PM32197103](#)
See: page 1016.

8. Bundesinstitut für Risikobewertung (German Federal Institute for Risk Assessment). Can the new type of coronavirus be transmitted via food and objects? 2020; https://www.bfr.bund.de/en/can_the_new_type_of_coronavirus_be_transmitted_via_food_and_objects_-244090.html. Accessed 2020 Apr 8.
9. Centers for Disease Control and Prevention. Coronavirus disease 2019 (COVID-19). Frequently asked questions. 2020; <https://www.cdc.gov/coronavirus/2019-ncov/faq.html>. Accessed 2020 Apr 8.
See: Can the virus that causes COVID-19 be spread through food, including restaurant take out, refrigerated or frozen packaged foods?; Can I get sick with COVID-19 if it is on food?
10. Coronavirus disease 2019 (COVID-19) Situation Report – 32. Geneva (CH): World Health Organization; 2020: https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200221-sitrep-32-covid-19.pdf?sfvrsn=4802d089_2. Accessed 2020 Apr 8.
See: Subject in Focus: Food related considerations, page 2.
11. COVID-19 FAQs – your questions answered. Plymouth Meeting (PA): ECRI Institute; 2020: <https://assets.ecri.org/PDF/COVID-19-Resource-Center/COVID-19-Clinical-Care/COVID-Member-Resource-FAQs.pdf>. Accessed 2020 Apr 8.
See: Have we been able to confirm the length of time that coronavirus lives on surfaces?, page 4.
12. COVID-19 – What we know so far about...routes of transmission. Toronto (ON): Public Health Ontario; 2020: <https://www.publichealthontario.ca/-/media/documents/ncov/wwksf-routes-transmission-mar-06-2020.pdf?la=en>. Accessed 2020 Apr 8.
See: Fomite Transmission, page 3.
13. ECDC Technical Report: Disinfection of environments in healthcare and nonhealthcare settings potentially contaminated with SARS-CoV-2. Stockholm (SE): European Center for Disease Prevention and Control; 2020: https://www.ecdc.europa.eu/sites/default/files/documents/Environmental-persistence-of-SARS_CoV_2-virus-Options-for-cleaning2020-03-26_0.pdf. Accessed 2020 Apr 8.
See: Background, page 1; Evidence of environmental persistence, page 1.
14. ECDC Technical Report: Interim guidance for environmental cleaning in non-healthcare facilities exposed to SARS-CoV-2. Stockholm (SE): European Center for Disease Prevention and Control; 2020: <https://www.ecdc.europa.eu/sites/default/files/documents/coronavirus-SARS-CoV-2-guidance-environmental-cleaning-non-healthcare-facilities.pdf>. Accessed 2020 Apr 8.
See: COVID-19, page 1.
15. European Food Safety Authority. Coronavirus: no evidence that food is a source or transmission route. 2020: <https://www.efsa.europa.eu/en/news/coronavirus-no-evidence-food-source-or-transmission-route>. Accessed 2020 Apr 8.

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See: How coronavirus spreads; Survival of coronaviruses on surfaces.

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See: Persistence of COVID-19.

18. Kampf G. Potential role of inanimate surfaces for the spread of coronaviruses and their inactivation with disinfectant agents. *Infection Prevention in Practice*. 2020;2;2(100044). <https://www.sciencedirect.com/science/article/pii/S2590088920300081>. Accessed 2020 Apr 8.

19. New Zealand Food Safety. COVID-19 and food safety. 2020: <https://www.mpi.govt.nz/protection-and-response/coronavirus/coronavirus-and-food-safety/>. Accessed 2020 Apr 8.
See: Can the virus be transmitted through food?

20. Public Health England. Guidance: Transmission characteristics and principles of infection prevention and control. 2020: <https://www.gov.uk/government/publications/wuhan-novel-coronavirus-infection-prevention-and-control/transmission-characteristics-and-principles-of-infection-prevention-and-control>. Accessed 2020 Apr 8.
See: 1. Routes of transmission; 3. Survival in the environment.

21. U.S. Food and Drug Administration. Coronavirus Disease 2019 (COVID-19) frequently asked questions. 2020: <https://www.fda.gov/emergency-preparedness-and-response/coronavirus-disease-2019-covid-19/coronavirus-disease-2019-covid-19-frequently-asked-questions>. Accessed 2020 Apr 8.
See: Can I get the coronavirus from food, food packaging, or food containers and preparation area?