

Home > Public Health > COVID-19

Article

Potential false-positive rate among the 'asymptomatic infected individuals' in close contacts of COVID-19 patients

March 2020 · *Zhonghua liu xing bing xue za zhi = Zhonghua liuxingbingxue zazhi* 41(4):485-488

DOI: [10.3760/cma.j.cn112338-20200221-00144](https://doi.org/10.3760/cma.j.cn112338-20200221-00144)

Authors:



Show all 9 authors

Request full-text Download citation Copy link

To read the full-text of this research, you can request a copy directly from the authors.

Citations (20)

This article is featured on the COVID-19 research community page View COVID-19 community

Discover the world's research

- 19+ million members 135+ million publications 700k+ projects Join for free

Abstract

Objective: As the prevention and control of COVID-19 continues to advance, the active nucleic acid test screening in the close contacts of the patients has been carrying out in many parts of China. However, the false-positive rate of positive results in the screening has not been reported up to now. But to clarify the false-positive rate during screening is important in COVID-19 control and prevention. Methods: Point values and reasonable ranges of the indicators which impact the false-positive rate of positive results were estimated based on the information available to us at present. The false-positive rate of positive results in the active screening was deduced, and univariate and multivariate-probabilistic sensitivity analyses were performed to understand the robustness of the findings. Results: When the infection rate of the close contacts and the sensitivity and specificity of reported results were taken as the point estimates, the positive predictive value of the active screening was only 19.67%, in contrast, the false-positive rate of positive results was 80.33%. The multivariate-probabilistic sensitivity analysis results supported the base-case findings, with a 75% probability for the false-positive rate of positive results over 47%. Conclusions: In the close contacts of COVID-19 patients, nearly half or even more of the 'asymptomatic infected individuals' reported in the active nucleic acid test screening might be false positives.

No full-text available



To read the full-text of this research, you can request a copy directly from the authors.

Request full-text PDF

Citations (20)

References (0)

... In an initial application of this test protocol in Bavaria, Germany, 60.7% unspecific signals were detected, but could be reduced to 5% and lower using different RT-PCR systems (Konrad et al. 2020). A Chinese validation study of the SARS-CoV-2 tests used in China revealed a false-positive rate of almost 50% or higher (Zhuang et al. 2020) -however, the study was retracted for unknown reasons soon after ahead-of-print publication. In clinical practice, false negative signals can be introduced by sample contamination and cross-reactions with other nucleic acids if the primer pairs selected are not highly specific for the target nucleic acid sequence. ...

... We found that for plausible assumptions about v and test sensitivities, positive tests would only provide weak to moderate evidence for the hypothesis that the symptoms in a given patient are caused solely by SARS-CoV-2 unless the tests have a high specificity. Unfortunately, the latter are currently unknown and may be insufficient (Zhuang et al. 2020). ...

The epistemology of the SARS-CoV-2 test

Preprint [Full-text available](#)

Apr 2020

Rainer J Klement · Prasanta S Bandyopadhyay

[View](#) [Show abstract](#)

... In an initial application of this test protocol in Bavaria, Germany, 60.7% unspecific signals were detected, but could be reduced to 5% and lower using different RT-PCR systems (Konrad et al. 2020). A Chinese validation study of the SARS-CoV-2 tests used in China revealed a false-positive rate of almost 50% or higher (Zhuang et al. 2020) -however, the study was retracted for unknown reasons soon after ahead-of-print publication. In clinical practice, false negative signals can be introduced by sample contamination and cross-reactions with other nucleic acids if the primer pairs selected are not highly specific for the target nucleic acid sequence. ...

... We found that for plausible assumptions about v and test sensitivities, positive tests would only provide weak to moderate evidence for the hypothesis that the symptoms in a given patient are caused solely by SARS-CoV-2 unless the tests have a high specificity. Unfortunately, the latter are currently unknown and may be insufficient (Zhuang et al. 2020). ...





The epistemology of the SARS-CoV-2 test[Preprint](#) [Full-text available](#)

Apr 2020

 Rainer J Klement ·  Prasanta S Bandyopadhyay[View](#) [Show abstract](#)

... The sensitivity rate is not clear, but is estimated to be around 66-80% [59]. Test validity in asymptomatic individuals who have been in close contact with symptomatic persons is even less clear; the rate of positivity could reach 50% without any evidence of symptoms or proven infection [60]. ...

... In one study, the time period from symptom onset to initial CT scan was evaluated and the authors found that 56% of patients who presented symptoms within 2 days had normal CT images [64]. CT sensitivity seems to be high in patients with positive RT-PCR (86-97% in different case studies) [60] and lower in patients with only constitutional and nonrespiratory symptoms (about 50%) [63]. ...

COVID-19 diagnosis and management: a comprehensive review[Article](#) [Full-text available](#)Apr 2020 · *J INTERN MED* Giuseppe Pascarella ·  Alessandro Strumia ·  Chiara Piliago ·  Felice Eugenio Agrò[View](#) [Show abstract](#)

... In addition, strategies to test for anosmia were clinically tested according to prior work by Russell (7) and Lechien (8). 9. Establishment of isolation facilities and a "traffic light zone concept": According to rising infection rates, one (formerly open) ward was transferred to an "isolation unit" with 12 rooms for the treatment of COVID-19positive patients with psychiatric diseases. ...

... The "green zone" was labeled as "sensitive" due to the "patients at risk" treated there (e.g., elderly patients in geriatrics), the "yellow zone" consisted of the "regular patients" and the "red zone" was formed by the isolation units described already above. tests are available as established lab-tests to confirm the infection in an individual, but also these tests have a considerably high false-positive and false-negative risk (9). Moreover, the availability of these tests was limited at the start of the pandemic, resulting in long delays between testing and information about results. ...

SARS-CoV-2 Risk Management in Clinical Psychiatry: A Few Considerations on How to Deal With an Unrivaled Threat[Article](#) [Full-text available](#)

Jun 2020

 Peter M Kreuzer ·  Thomas C Baghai ·  Rainer Rupprecht ·  Berthold Langguth[View](#) [Show abstract](#)

... Li et al. (2020a) reported a potentially high false negative rate of RT-PCR testing for SARS-CoV-2 in the 610 hospitalized patients they studied, from whom 241 (39.5%) patients were finally confirmed with COVID-19 with at least one positive RT-PCR test result. In asymptomatic individuals who have been in close contact with symptomatic persons, the rate of positivity could reach 50% without any evidence of symptoms or proven infection (Zhuang et al., 2020). Studies that give the amount of SARS-CoV-2 RNA in clinical specimens by reporting cycle threshold (Ct) values for RT-PCR are limited. ...

Relationship of the cycle threshold values of SARS-CoV-2 polymerase chain reaction and total severity score of...

Article

Nov 2020 · [INT J INFECT DIS](#)

● Aysegul Karahasan Yagci · ● Rabia Can Sarınoğlu · ● Huseyin Bilgin · ● Nuri Çagatay Çimşit

[View](#) [Show abstract](#)

... The positive rate in swabs samples varies by sample site [35][36][37][38] [39] [40] but since data are today controversial it is not possible to accurately assess sensitivity and the diagnostic impact of combining oropharyngeal and nasopharyngeal tests. However, one of the largest studies [37] reported that oropharyngeal swabs detected the SARS-CoV-2 less frequently than nasopharyngeal swabs and should not be used in place of nasopharyngeal swabs, particularly from day 8 of symptom onset. ...

Serological Assays for SARS-CoV-2 Infectious Disease: Benefits, Limitations and Perspectives

Article [Full-text available](#)

Apr 2020 · [ISR MED ASSOC J](#)

● Maria Infantino · ● Arianna Damiani · ● Francesca Li Gobbi · ●

[View](#)

... Further, the number of individuals that tested positive for COVID-19 may be dissuasive in understanding the disease, owing to compromised positive and negative predictive values 32, 33 . Falsepositivity in COVID-19 testing 32 may be proving costly, but it can be tolerated for effective epidemic control 19

Epidemiological Determinants of Acute Respiratory Syndrome Coronavirus-2 Disease Pandemic and The Role of the Bacille...

Article [Full-text available](#)

Apr 2020

● Bhoj R Singh · ● Richa Gandharva · ● Karthikeyan Ravichandran · ● Sumedha Gandharava

[View](#) [Show abstract](#)

... It is well established that there are no perfect test kits. [11] [12] [13][14] There is always a possibility that the test result might be false negative (failing to detect infection among infected) or false positive (showing infection among non-infected). [15][16][17] There is no threat if some false positive cases are referred for confirmation test and kept under isolation but if we fail to cover falsenegative cases then the outcomes can be catastrophic. ...

Tackling COVID-19 in Nepal: Opportunities and Challenges

Article [Full-text available](#)

Jun 2020

● Sujan Babu Marahatta · ● Shishir Paudel

[View](#) [Show abstract](#)

... Furthermore, the sensitivity and specificity of GGO for COVID-19 diagnoses were high (85% and 45%, respectively). Similar results were found in other studies, with a high sensitivity of CT in SARS-CoV-2-positive patients (86-97%) [22, 32]

Acute Clinical Syndromes and Suspicion of SARS-CoV-2

Infection: The Experience of a Single Romanian Center in th...Article [Full-text available](#)Jan 2021 · [MED LITH](#)

● Raluca Haliga · ● Victorita Sorodoc · ● Lionte Catalina · ● Laurentiu Sorodoc

[View](#) [Show abstract](#)

... This result gave a possibility of false positive rate of rapid rate. A study showed that the positive predictive value of the active screening was only 19.67%, and the false-positive rate was 80.33%, with a 75% probability for the false-positive rate [4]. ...

Family Medicine Specialist S' Opinions on COVID19 Active Screening and SurveillanceArticle [Full-text available](#)

Jul 2020

● Rawa Jaafar Kadhim Al-Ameri

[View](#) [Show abstract](#)

... Finally, one preprint shown in the retraction watch search was resubmitted without explanation (Daneshkhah et al. 2020). The characteristics of the remaining seventeen articles are discussed below (Pradhan et al. 2020;Yang et al. 2020;Wang et al. 2020a, b;Bae et al. 2020;Parves 2020;Chu et al. 2020;Mehra et al. 2020a, b;Karami et al. 2020;Davido et al. 2020;Nouvier et al. 2020;Gormley and Ngan 2020; Zhuang et al. 2020; Siyu et al. 2020;Zeng and Zhen 2020;Luo et al. 2020;Tofade and Daftary 2020). ...

Retracted COVID-19 articles: a side-effect of the hot race to publication

Preprint

Jul 2020 · [SCIENTOMETRICS](#)

● Parisa Soltani · ● Romeo Patini

[View](#) [Show abstract](#)

... Finally, one preprint shown in the retraction watch search was resubmitted without explanation (Daneshkhah et al. 2020). The characteristics of the remaining seventeen articles are discussed below (Pradhan et al. 2020;Yang et al. 2020;Wang et al. 2020a, b;Bae et al. 2020;Parves 2020;Chu et al. 2020;Mehra et al. 2020a, b;Karami et al. 2020;Davido et al. 2020;Nouvier et al. 2020;Gormley and Ngan 2020; Zhuang et al. 2020; Siyu et al. 2020;Zeng and Zhen 2020;Luo et al. 2020;Tofade and Daftary 2020). ...

Retracted COVID-19 articles: a side-effect of the hot race to publicationArticle [Full-text available](#)

Aug 2020

● Parisa Soltani · ● Romeo Patini

[View](#) [Show abstract](#)

... While some of these tests have shown 100% specificity in independent validation studies (Nalla et al. 2020), others have been found to yield a significant percentage of false-negative results. For example, an early validation study of Chinese SARS-CoV-2 RT-qPCR tests revealed a false positive rate of almost 50% or higher (Zhuang et al. 2020) - however, the study was retracted for unknown reasons soon after ahead-ofprint publication. In a German inter-laboratory validation study ("Ringversuch") of many commercially available and in-house RT-qPCR tests, a total of 67 out of

983 SARS-CoV-2-negative samples containing the human coronavirus HCoV 229E were classified as "positive", yielding an average false-positive rate of 6.8% (Zeichhardt and Kammel 2020). ...

The epistemology of a positive SARS-CoV-2 test

Article [Full-text available](#)

Sep 2020 · *ACTA BIOTHEOR*

● Rainer J Klement · ● Prasanta S Bandyopadhyay

[View](#) [Show abstract](#)

... The denominator is the total number of people diagnosed with the disease and it depends on the effort deployed to test the population (that varies among countries and it is the result of different prevention strategies), and on the accuracy of the test, which has been shown to be inaccurate (from the results of a recent study [11], false positives could be at least 50%). With these premises, fatality rate cannot be reliably computed at the moment. ...

Covid 19: How Really is the Epidemiological Curve? Epidemiological Curve Growth Rate is Less than One

Article

Sep 2020

Sergey Masyagin · ● Manuel Mazzara · ● Giancarlo Succi · Antonin Volni

[View](#) [Show abstract](#)

... Li et al. (2020a) reported a potentially high false negative rate of RT-PCR testing for SARS-CoV-2 in the 610 hospitalized patients they studied, from whom 241 (39.5%) patients were finally confirmed with COVID-19 with at least one positive RT-PCR test result. In asymptomatic individuals who have been in close contact with symptomatic persons, the rate of positivity could reach 50% without any evidence of symptoms or proven infection (Zhuang et al., 2020). Studies that give the amount of SARS-CoV-2 RNA in clinical specimens by reporting cycle threshold (Ct) values for RT-PCR are limited. ...

Relationship of the Cycle Threshold Values of SARS-CoV-2 Polymerase Chain Reaction and Total Severity Score of...

Article [Full-text available](#)

Oct 2020 · *INT J INFECT DIS*

● Aysegul Karahasan Yagci · ● Rabia Can Sarınoğlu · ● Huseyin Bilgin · ● Nuri Çagatay Çimşit

[View](#) [Show abstract](#)

... Furthermore, researchers working on other important diseases might feel that their work also deserves OA status, similar to COVID-19-related research, as well as fair peer review and editorial handling. 7 Separately, and unrelated to the retracted Mehra et al. (2020a, b) papers, Zhuang et al. (2020) was withdrawn (i.e., retracted) due to public criticism, and the public file was deleted. Despite this, the paper and its abstract are still listed at ResearchGate, 8 but the paper is not indicated as retracted, thus inviting academics to cite this paper, which has already accrued 28 citations according to GS. ...

Optimizing peer review to minimize the risk of retracting COVID-19-related literature

Article [Full-text available](#)

Nov 2020 · *Med Healthc Philos*

● Jaime A. Teixeira da Silva · ● Helmar Bornemann-Cimenti · ● Panagiotis Tsigaris

[View](#) [Show abstract](#)

PREVENCIÓN Y TRATAMIENTOS ANTE UNA NUEVA EPIDEMIA: EL CORONAVIRUS 20 DEBE DE RESEÑAR EL CRITERIO DE I

Article [Full-text available](#)

Jul 2020

● Pablo saz peiro

[View](#) [Show abstract](#)

Supplementary Materials for False positives in reverse transcription PCR testing for SARS-CoV-2

Preprint [Full-text available](#)

Jun 2020

● Andrew Cohen · Bruce Kessel

[View](#) [Show abstract](#)

Vantaggi, limiti e prospettive dei test sierologici nell'infezione da SARS-CoV-2 (COVID-19)

Article

May 2020

● Maria Infantino · Arianna Damiani · Francesca Li Gobbi · ● Mariangela Manfredi

[View](#)

Antibody tests for identification of current and past infection with SARS-CoV-2

Article [Full-text available](#)

Jun 2020

● Jonathan J Deeks · ● Jac Dinnes · Yemisi Takwoingi · Cochrane Diagnostic Test Accuracy Group

[View](#) [Show abstract](#)

Recommended publications Discover more about: [COVID-19](#)

Article

Clinical outcome of 55 asymptomatic cases at the time of hospital admission infected with SARS-Coron...

March 2020 · The Journal of Infectious Diseases

Yanrong Wang · Yingxia LIU · ● Lei Liu · [...] · Li Ling

An epidemic caused by SARS-Coronavirus-2 infection has spread unexpectedly in Wuhan, Hubei Province, China since December 2019. It is rarely reported about asymptomatic cases screened from close contacts. We study epidemiological and clinical outcome of 55 asymptomatic carriers who were laboratory-confirmed positive for the SARS-Coronavirus-2 by testing the nucleic acid of the pharyngeal swab ... [\[Show full abstract\]](#)

[Read more](#)



Company

[About us](#)
[News](#)
[Careers](#)

Support

[Help Center](#)

Business solutions

[Advertising](#)
[Recruiting](#)
