Supplementary material. Quality assessment of the 12 studies, by study type (PCR studies, modelling studies and contact tracing studies).

PCR Studies				
Author	Asymptomatic Status	Testing Methods	Considerations relating to infectiousness profile	External Validity
Letizia et al, 2020 [11]	Participants were followed for 14 days following enrolment, including testing (and ascertainment of symptoms during the previous 7 days, based on self-reporting) on days 0, 7 and 14.	qPCR testing was conducted in a single laboratory using an authorised test.	Sampling was conducted at 7 day intervals, with the potential for some differences in the infectiousness profiles of individuals. Bias (between symptomatic and asymptomatic individuals) is unlikely	Conducted with Marine Corp recruits, which would limit generalisability
Uhm et al, 2020 [12]	A definition for asymptomatic patients is presented. There is some suggestion of a longitudinal component, including *'retrospective cohort study'* and *'throughout the disease course'*	There were differences in testing methods (kits, cut-offs) in different hospitals. Further, Ct values were presented as categorical data.	There is a focus on duration rather than magnitude of infectiousness. Equivalence across cohorts in terms of the infectiousness profile is uncertain, given that the first follow-up RT-PCR assay was performed 7 days after diagnosis for the asymptomatic patients and immediately after the disappearance of symptoms or improvement in pneumonia stage for symptomatic patients.	Among symptomatics, only includes those with mild symptoms, which would limit generalisability
Lavezzo et al, 2020 [1]	Epidemiological data were collected on 2 occasions, at sampling conducted 2 weeks apart. Symptomatic is defined, whereas asymptomatic and pre-symptomatic is not. However, as explained in the response to reviewers for that paper, the authors	A consistent approach to testing and laboratory work was undertaken	Sampling was conducted at 7 day intervals, for all participants. Bias (between symptomatic and asymptomatic individuals) is unlikely	The population under investigation includes the population of Vo' (that is, people of all age groups)

	accounted for follow up information on symptom occurrence during the period after sample collection of each positive subject. All identified asymptomatic infections at the time of swab sampling were contacted by phone after the second survey (i.e. at the end of March 2020) for clinical follow up.			
Danis et al, 2020 [13]	The asymptomatic case was under observation until 18 Feb when s/he returned to the UK. There was considerable medical intervention, including testing, throughout this period	Testing was conducted at the National Reference Center for Respiratory Viruses (Lyon)	Testing was conducted over sequential days between 7-12 (or 13) February. Given the chronology with respect to the index case, the likely exposure period is likely similar for all of the 6 cases under investigation	The cluster related to British citizens in the French Alps in February 2020
Long et al, 2020 [9]	Detailed investigations were conducted to confirm the appropriate classification of asymptomatic cases	Detailed testing methodology is described, which was common across all cases in the study	The schedule of testing is unclear, in terms of the timing of the initial test. The text states *'To identify asymptomatic individuals, the Wanzhou District Centers for Disease Control and Prevention (CDC) then conducted extensive RT–PCR screening for 2,088 close contacts under quarantine. Individuals with positive RT–PCR results then were screened by point prevalence surveys carried out by the local CDC and symptoms assessments reported by clinicians.'*	Among symptomatics, only includes those with mild symptoms, which would limit generalisability
Modelling Studies				

Author	Representativeness of the studied compartment	Consideration of the range of values within which the model estimate is confined	Model validation:
Khondoker Nazmoon Nabi, 2020 [2]	Low. Lambda is the relative infectiousness of undetected infected rather than asymptomatic per se.	Low.Lambda is confined within a tight range (0.4-0.6). Many estimates are at the upper edge of this range.	Medium. Model is applied to multiple regions independently. Estimates are broadly similar.
Li et al, 2020 [10]	Low. Mu is the relative infectiousness of undocumented infections	High. Prior range of 0.2 - 1.0 used	High. Use of synthetic data initially and application of the model separately to different time points in the outbreak

Contact Tracing Studies

Author	Asymptomatic Status	Identification of close contacts	Case ascertainment	Case attribution	External Validity
Park et al, 2020 [14]	Methodology to define asymptomatic cases is presented, including observation over a 14-day period. However, the authors admit *'not all clinical information was available for all confirmed cases, prohibiting detailed description of clinical syndromes'*.	The study was restricted to household members only, thereby minimising the potential for differential bias in the identification of contacts	The study team investigated, tested, and monitored household contacts of all confirmed case-patients for 14 days after discovery, regardless of symptoms.	Not directly address in this paper, however, attribution is likely less to be confused in a household setting	The index cases emerged in a call centre in Seoul. The study only considered household contacts of these index cases
Cheng et al, 2020 [15]	There is a longitudinal nature to the epidemiological investigation. For asymptomatics, it is stated *'For asymptomatic confirmed cases, the period of investigation was based on the date at confirmation (instead of date at onset) and was determined according to epidemiological investigation.'*	The paper clearly presents the period of investigation and definition of a close contact	All cases were followed up until 14 days after the last exposure to the index case, and details of observation and testing is outlined. The testing protocol may have missed asymptomatic secondary cases	The period of investigation for each primary case is defined, and all contacts during this period were investigated	The study focuses on the first 100 COVID-19 cases in Taiwan, identified between 15 January and 18 March 2020, and their close contacts

Taewon Han, 2020 [16]	An asymptomatic was defined as *'a patient who showed no symptoms from the time of contact until a COVID-19 diagnostic test where the patient tested positive for COVID-19'*. There is a longitudinal component to the assessment, although the possibility for misclassification is not eliminated.	The paper clearly presents the period of investigation and definition of a close contact	All cases were followed up until 14 days after the last exposure to the index case, and details of observation and testing is outlined.	Errors in attribution are very unlikely. As stated in the text *'Aside from two confirmed cases from Sinchonji Church in Daegu that occurred 40 days prior to the outbreak associated with Spa facility A, no other confirmed case was reported in Region A.'*	The study concerns an outbreak in a spa with the information that *'Approximately 250 people visit the spa facility every day, and many are regular users of the spa facility and the accompanying gym. Many people from other regions visit the facility on the weekends.'*
Plucinski et al, 2020 [3]	Not clearly addressed in this paper. In the discussion, the authors state 'nearly two-thirds of SARS-CoV-2-positive persons who were originally classified as asymptomatic at the time of specimen collection reported having symptoms while onboard the ship'. Further, they indicate that 'longitudinal follow-up of asymptomatic individuals can help determine the true asymptomatic rate'.	The study was restricted to household members only, avoiding the potential for differential bias in the identification of contacts	Substantial efforts were made to identify secondary cases: *'Anyone who had fever or respiratory symptoms was tested for SARS-CoV-2, along with their close contacts. Anyone testing positive was hospitalized regardless of illness severity. On February 11, testing was expanded to asymptomatic passengers, and eventually included everyone who remained on board.'*	Errors in attribution is unlikely given the focus on roommate contacts. Further, room-based quarantine commenced on 5 February. Symptoms were first observed on the ship on 23 January, but infection was not confirmed until 1 February.	The study individuals were mainly >60 years, which would limit generalisability
Luo et al, 2020 [17]	Each case was reviewed by the CDC. It is not clear whether there was a	A definition of close contacts is provided: *'Close contacts are individuals*	Considerable detail is provided, as follows: *'after*	In the investigation, care was taken to distinguish potential exposures, by *'household, public*	Index cases were identified through *'surveillance testing, screening*

	longitudinal component to this review, however, this is implied in Figure 1.	*who have had contact, without effective protection regardless of duration of exposure, with 1 or more persons with suspected or confirmed COVID-19 any time starting 2 days before onset of symptoms in persons with a suspected or confirmed case, or 2 days before sampling for laboratory testing of asymptomatic infected persons'*, and contact tracing was conducted by the county or district CDC.	*identification, close contacts were quarantined for 14 days from last contact with index cases and followed up clinically after quarantine until 6 April 2020.' 'During the quarantine period, monitoring of clinical symptoms and RT-PCR assay of SARS-CoV-2 nucleic acid was performed approximately every 24 hours.'*	*transportation, health care settings, entertainment venues or workplaces, and multiple settings'.* Some limitations during case attribution are inevitable	*individuals with symptoms who presented to a health care facility, or tracing and screening close contact'*