CERS Critical Appraisal Sheet

1. Date of appraisal: 23 March 2020

2. Name of appraiser: Prof Dr Liew Su May

3. Clinical Question: What is the accuracy of the COVID-19 RT PCR diagnostic test?

4. PICO:
   - P: Among COVID 19 patients
   - I: RT PCR diagnostic test
   - C: -
   - O: Accuracy

5. Article:
   - Title: Potential Rapid Diagnostics, Vaccine and Therapeutics for 2019 Novel Coronavirus (2019-nCoV): A Systematic Review
   - Published date: 26 February 2020
   - Source & Link: https://doi.org/10.3390/jcm9030623
   - Article Research Question:
     - P: not defined
     - O: To describe and assess the potential rapid diagnostics, vaccines and therapeutics for 2019-nCoV

Appraisal

Find:
3 major databases (PubMed, EMBASE, Cochrane)
Key words “SARS”, “coronavirus”, “MERS”, “2019 Novel coronavirus”, “Wuhan virus” used to identify the diseases in the search strategy. [Did not use COVID-19].
The systematic searches for diagnosis, therapeutic drugs and vaccines were carried out independently and the key words “drug”, “therapy”, “vaccine”, “diagnosis”, “point of care testing” and “rapid diagnostic test” were used in conjunction with the disease key words for the respective searches.

Studies limited by date [1st Dec-6 Feb] and language [English]

Supplementary search by first 5 Google pages on each search term and snowballing. Also press releases and grey literature from vaccine manufacturers’ websites. Also from one individual’s personal searches on websites and business news. And on clinicaltrials.gov
**Appraise:**
There was no quality appraisal for included studies

**Synthesis**
With the emergence of 2019-nCoV, real time RT-PCR remains the primary means for diagnosing the new virus strain among the many diagnostic platforms available ([10–19]; Table S3). Among the 16 diagnostics studies selected, one study discussed the use of RT-PCR in diagnosing patients with 2019-nCoV [11] (Table 1). The period and type of specimen collected for RT-PCR play an important role in the diagnosis of 2019-nCoV. It was found that the respiratory specimens were positive for the virus while serum was negative in the early period. It has also suggested that in the early days of illness, patients have high levels of virus despite the mild symptoms.

In addition, there are seven potential rapid diagnostic kits (as of 24 January 2020; Table 2) available on the market for 2019-nCoV. Six of these are only for research purposes. Only one kit from Beijing Genome Institute (BGI) is approved for use in the clinical setting for rapid diagnosis. Most of the kits are for RT-PCR. There were two kits (BGI, China and Veredus, Singapore) with the capability to detect multiple pathogens using sequencing and microarray technologies, respectively.

**Translation**
In terms of appraisal, this review will not get through strict criteria. It does not use all terms. The search is limited by date and language. Also there is no stated quality appraisal.

In my view, the authors could have carried out a full review. This is more like a rapid review for fast, quick results. However, this may be useful for the interim and they did find the one diagnostic validation study.

The discussion is a useful review of diagnostic tests for viruses.

**Evidence Summary:** This systematic review is limited by the lack of published studies and methodological issues but it identified one diagnostic validation study and potential rapid diagnostic tests in the offing.