Risk assessment of COVID-19 related research projects

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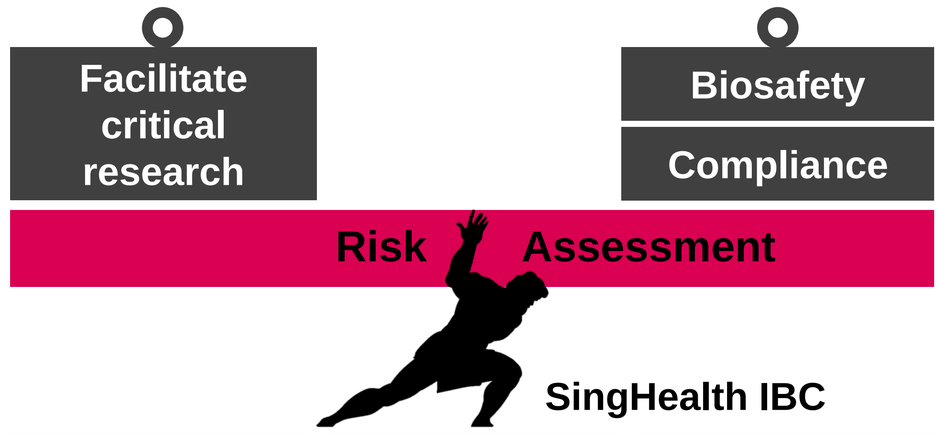
Introduction

In 2020, the SingHealth Institutional Biosafety Committee (IBC) reviewed 18 research project submissions related to COVID-19. The review of COVID-19 related projects were particularly challenging due to several factors:

- High individual and community risks
- Regulated by MOH with strict requirements
- Information on the virus at the early onset were limited
- Short window of opportunity to collect samples
- BSL3 — High containment labs prioritised for clinical activities

Objective

The aim of the SingHealth IBC review is to support critical research while ensuring that work is carried out under safe conditions and in compliance with regulatory requirements. At the heart of the review is a rigorous risk assessment that scrutinizes every step of the entire work process.



Method

SingHealth IBC sought advice from the Ministry of Health (MOH) Biosafety Branch for guidance to ensure compliance, while consulting subject experts in areas of safe handling of the materials, particularly on effective inactivation methods (to render the virus non-infectious). Reputable scientific literature were also used to support our evaluation.

- SingHealth IBC Subject experts
- MOH biosafety branch
- Reputable literature

Risk assessment

Below is a case study of one of the COVID-19 research projects that was reviewed for a non-BSL3 facility. SingHealth IBC evaluated the risks at each step of the process to identify potential hazards and ensure sufficient control measures were in place.

1. Collection of samples from COVID-19 patients

- Only medical professionals are allowed to collect from patients
- Samples must be kept secured until transferred

2. Transport samples to research facility

- Samples must be triple packaged to prevent leakage
- Samples must be labelled properly
- Courier must be HAZMAT trained; Public transport is strictly prohibited

3. Receipt and storage of patient samples

- Samples must undergo inactivation process that was approved by SingHealth IBC and accepted by MOH
- Samples must be locked under restricted access

4. Manipulation of patient samples

- Only authorized and trained person can handle samples
- Workers must follow procedures and risk control measures approved by SingHealth IBC
- Workers must monitor personal health for symptoms

Results

With the control measures derived based on the risk assessments, SingHealth IBC was able to obtain consent from MOH for all the research applications (where such consents are required). Most significantly, the review process were completed within a relatively short time frame:

TURNAROUND TIME OF REVIEW

Min	Average	Max
1 day	6 days	14 days

Discussion

The experience with the review of this novel pathogen highlighted a key advantage of the centralized review process by SingHealth IBC, as we were able to progressively accumulate related knowledge as we evaluated more of such similar activities. This created a positive feedback loop which greatly enhanced our ability to assess the risks to provide more comprehensive and robust recommendations.