Please review the Data Access Guidelines and the Data Transfer Agreement before completing this form. A complete application should address all the Review Considerations outlined in the Data Access Guidelines. Note that the details of all approved applications will be made publicly available on the COVID-19 Data Platform website.

Complete all sections of this form fully and return to covid19@iddo.org.

<table>
<thead>
<tr>
<th>SECTION A: RESEARCHER / RESEARCH TEAM INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lead Applicant Details</strong></td>
</tr>
<tr>
<td>Title</td>
</tr>
<tr>
<td>First name (given name)</td>
</tr>
<tr>
<td>Surname (family name)</td>
</tr>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>Position at employing organisation/ institution</td>
</tr>
</tbody>
</table>
| ORCID ID ([https://orcid.org](https://orcid.org)) or URL to academic profile | [https://orcid.org/0000-0001-5688-6443](https://orcid.org/0000-0001-5688-6443)  
  [www.linkedin.com/in/david-s-y-ong-5a1171a](www.linkedin.com/in/david-s-y-ong-5a1171a) |
| Email                                          | davidsyong@gmail.com / d.ong@franciscus.nl       |

**Employing Organisation/Institution**
Institution with a remit including health, research or academic pursuit, and with legal status which includes the scope to sign the Data Transfer Agreement.

<table>
<thead>
<tr>
<th>Institution name</th>
<th>Franciscus Gasthuis &amp; Vlietland</th>
</tr>
</thead>
<tbody>
<tr>
<td>City, Country</td>
<td>Rotterdam, The Netherlands</td>
</tr>
</tbody>
</table>

Does your institution agree to execute the Data Transfer Agreement? (if your application is approved)  
**YES**  
(delete as appropriate)

**Co-applicants**
ALL individuals accessing the data must be listed. Any additions must be notified to the COVID-19 Data Access Committee. Add rows as necessary.

<table>
<thead>
<tr>
<th>1. Name</th>
<th>Evert-Jan Wils</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Position / Role in analysis</td>
<td>Staff member, internist-intensivist</td>
</tr>
<tr>
<td>1. Organisation/Institution</td>
<td>Franciscus Gasthuis &amp; Vlietland, Rotterdam, The Netherlands</td>
</tr>
<tr>
<td>2. Name</td>
<td>Jarne van Hattem</td>
</tr>
<tr>
<td>2. Position / Role in analysis</td>
<td>Clinical Microbiologist</td>
</tr>
<tr>
<td>2. Organisation/Institution</td>
<td>Tergooi Hospital / Amsterdam UMC, Amsterdam, The Netherlands</td>
</tr>
</tbody>
</table>

**Conflicts of Interest**
List details of any existing or perceived conflicts of interest (financial or non-financial) that exist relating to the use of the requested data by the data requestor and/or co-applicants (see [ICMJE.org for the definition of conflicts of interest](https://cmaj.org/content/181/6/605.full))

None
## SECTION B: RESEARCH PLAN

<table>
<thead>
<tr>
<th>Title of Proposed Research</th>
<th>Clinical presentation and outcome of hospitalised Dutch patients with COVID-19</th>
</tr>
</thead>
</table>

Is this a re-submission of a previous application to the COVID-19 DAC? If yes, provide the submission date of the previous application.  
No

### Summary of Research in Lay Language *(suggested ~ 100 words)*

The emergence of COVID-19 has tremendous impact on global health and international society. In a Dutch multicentre collaboration, we describe the clinical characteristics of patients who were admitted to Dutch hospitals with COVID-19 and we assess the clinical outcomes of these patients.

### Summary of Research Objectives and Scientific Value *(suggested maximum 400 words)*

- To describe the clinical features of patients who were admitted to Dutch hospitals with COVID-19, including demographics, admission characteristics (symptoms, signs, and laboratory), treatment-related variables and complications.
- To assess patient outcomes and determine associations between demographic (including age, gender, ethnicity, comorbidity), admission characteristics (including inclusion O₂ saturation, GCS, creatinine, CRP) and patient outcomes.
- If feasible, to externally validate the 4C mortality score as established by ISARIC4C investigators (Knight et al. BMJ 2020;370:m3339) in the Dutch cohort.

### Primary and Secondary Outcome Measures *(suggested maximum 200 words)*

- **Primary:** Hospital mortality
- **Secondary:** ICU/critical care admission, initiation of mechanical ventilation, case fatality (with > 14 days and/or 30 days follow-up), hospital length of stay, ICU length of stay.

### Proposed Methodology and Statistical Analysis Plan *(suggested maximum 400 words)*

For descriptive statistics we will use means with standard deviation or medians with interquartile range as appropriate. We will compare groups using non-parametric tests for continuous variables and Chi-square test for categorical variables. P-values <0.05 will be considered statistically significant.

For multivariable models with mortality as outcome we will use regression analyses (logistic or cox proportional hazards as appropriate) with adjustment for a priori selected patient characteristics.

### Ethics *(suggested maximum 300 words)*

Provide details of any ethical considerations relating to the research proposal. Additionally, list any approvals required by your institution to undertake this work, list reference numbers of any approved proposals, or explain why no approvals are required.

The study will be conducted in accordance with Helsinki Declaration as revised in 2013. All ISARIC participating Dutch centres have obtained local approval by their Institutional Review Boards.
Publication and Dissemination Plan (suggested maximum 300 words)
Provide details of plans for authorship/acknowledgement of data contributors.
Provide details of timelines for publication and dissemination of research findings.

Findings will be published in a Dutch scientific general medical journal or an international scientific medical journal in the field of infectious diseases or microbiology. A core group of Dutch researchers will lead the analytical and writing process, whereas other Dutch collaborators will be co-author or acknowledged as collaborator. When a representative from the UK ISARIC group actively helps with the analysis, this person will be invited as co-author.

Research Priorities Addressed (suggested maximum 300 words)
Provide details of how this research aligns with nationally or internationally set research priorities.

It is highly informative to share country-specific information regarding the characteristics and outcomes of COVID-19 patients who were admitted to hospitals in the Netherlands. Furthermore, it is crucial to validate prediction scores in external cohorts and determine how these prediction scores perform before implementation in clinical practice.

Collaboration and Knowledge Sharing (suggested maximum 300 words)
Provide details of how this research will collaborate, support and/or share knowledge with appropriate partners. The platform is particularly interested in research that builds capacity in low-resource settings.

The lead investigators have contacted all participating Dutch centres for collaboration, promoted data verification to ensure data quality and received permission to analyse the data as a Dutch initiative.

Funding (suggested maximum 100 words)
Provide details of how this research will be funded/resourced. Please name the source of funding.

Not applicable for this specific analysis, all data have been collected by the individual centres and the core group of Dutch researchers who will conduct this analysis do not receive any funding for this project.

Scientific Review (suggested maximum 200 words)
If the project has been scientifically reviewed, please provide details. This could be by your institution, a funder/donor or review committee.

Before participation to this ISARIC research initiative all institutions have separately reviewed the protocol and only after approval data collection was initiated.

SECTION C: DATA

Data Variables
Provide a list of the data variables required to achieve the research objectives.
Note: Please go to www.iddo.cognitive.city to explore the interactive COVID-19 data inventory and to identify the variables, populations and data volumes required for your analysis. You can select the data variables from this inventory and copy it to this section.

Day 1:
Inclusion criteria
- Patient identification number
- Enrolment date / first COVID-19 assessment date
- Clinical centre name

Demographics
- History of travel
- Close contact with confirmed or probable case of COVID-19
- Presence in a healthcare facility
- Direct contact with animals
- Ethnic group
- Employed as healthcare worker
- Sex of birth
- Age
- Age unit
- Pregnant
- Transfer from other facility
- Travel in the 14 days prior to first symptom onset, if yes, state location and return date
- Close contact with animals

Onset & Admission
- Onset date of first/earliest symptom
- Most recent presentation/admission date at this facility:
- Was the patient admitted previously or transferred from any other facility during this illness episode?

Admission sign and symptoms
- Temperature on admission available?
- Heart rate on admission available?
- Systolic blood pressure on admission available?
- Diastolic blood pressure on admission available?
- Oxygen saturation on admission available?
- Oxygen saturation on:
  - Sternal capillary refill time on admission available?
  - Sternal capillary refill time >2 seconds?
- Height on admission available?
- Weight on admission available?
- History of fever
- Cough
- Sore throat
- Runny nose
- Ear pain
- Wheezing
- Shortness of breath
- Lower chest wall indrawing
- Chest pain
- Conjunctivitis
- Lymphadenopathy
- Headache
- Seizures
- Fatigue/malaise
- Anorexia
- Altered consciousness/confusion
- Muscle aches
- Joint pain
- Inability to walk
- Abdominal pain
- Diarrhoea
- Vomiting/nausea
- Skin rash
- Bleeding
- Other sign and symptoms

**Comorbidities**
- Chronic cardiac disease
- Hypertension
- Chronic pulmonary disease
- Asthma
- Renal failure
- Obesity
- Moderate liver disease
- Mild liver disease
- Chronic neurological disease
- Malignant neoplasm
- Chronic haematological disease
- AIDS/HIV
- Diabetes without complications
- Diabetes with complications
- Reumatology
- Dementia
- Tuberculosis
- Malnutrition
- Other relevant risk factor(s)
- Smoking

**Daily Form (day 1)**
- Temperature available?
- Temperature
- Heart rate available?
- Heart rate
- Systolic blood pressure available?
- Systolic blood pressure
- Diastolic blood pressure available?
- Diastolic blood pressure
- Oxygen saturation available?
- Oxygen saturation
- Any supplemental oxygen: FiO2
- FiO2
- FiO2 L/min
- Sternal capillary refill time on admission available?
- Sternal capillary refill time >2 seconds?
- AVPU
- Glasgow Coma Score available?
- Glasgow Coma Score (GCS / 15)

- PaO2 available?
- PaO2 (at time nearest to the FiO2 recorded at top of page)
- PaO2 unit:
- PCO2 available? (from same blood gas record as PaO2)
- PCO2
- PCO2 Unit
- Are any laboratory results available on this day?
- Date of assessment
- Haemoglobin available?
  - Haemoglobin
  - Haemoglobin unit
- WBC count available?
  - WBC count
  - WBC unit
- Lymphocyte count available?
  - Lymphocyte count
  - Lymphocyte unit
- Neutrophil count available?
  - Neutrophil count
  - Neutrophil unit?
- Platelets available?
  - Platelets count
  - Platelets unit
- Total Bilirubin available?
  - Total Bilirubin
  - Total Bilirubin unit
- Urea (BUN) available?
  - Urea (BUN)
  - Urea (BUN) unit
- Serum Creatinine available?
  - Serum Creatinine
  - Serum Creatinine unit
- Procalcitonin available?
  - Procalcitonin
  - Procalcitonin unit
- CRP available?
  - CRP
  - CRP Unit
- Ferritin available?
  - Ferritin
  - Ferritin Unit

**Discharge/Outcome**

**Treatment:**
- Any Oxygen therapy?
- Non-invasive ventilation? (Any)
- Non-invasive ventilation, if yes total duration
- Invasive ventilation? (any)
- Invasive ventilation, if yes total duration
- Prone positioning
- Prone positioning, if yes, total duration
- Inhaled nitric oxide
- Tracheostomy
- Extracorporeal support (ECMO)?
- Extracorporeal (ECMO) support - if YES, total duration:
- Renal replacement therapy (RRT) or dialysis?
- Inotropes/vasopressors
- Inotropes/vasopressors, if yes total duration
- ICU or High Dependency Unit admission?
- ICU or High Dependency Unit admission - If YES, total duration
- If YES, date of ICU admission:
- Date of ICU discharge:
- Other interventions

**Complications:**
- Viral pneumonia
- Bacterial pneumonia
- ARDS, if yes specify severity (mild, moderate, severe)
- Pneumothorax
- Pleural effusion
- Cryptogenic organizing pneumonia (COP)
- Bronchiolitis
- Cardiac arrest
- Myocardial infarction
- Cardiac ischemia
- Cardiac arrhythmia
- Myocarditis/pericarditis
- Endocarditis
- Cardiomyopathy
- Congestive heart failure
- Seizure
- Stroke/cerebrovascular accident
- Meningitis/encephalitis
- Bacteraemia
- Coagulation disorder/DIC
- Pulmonary embolism
- Anaemia
- Rhabdomyolysis/myositis
- Acute renal injury/Acute renal failure
- Gastrointestinal hemorrhage
- Pancreatitis
- Liver disfunction
- Hyperglycaemia
- Hypoglycaemia
- Other

**Infectious respiratory diagnosis:**
- Was patient clinically diagnoses with COVID-19?
- Was pathogen testing done during this illness episode??
- Coronavirus, if positive specify (nCoV, MERS, SARS)
- Influenza, is positive specify (A, B, H3N2 etc)
- RSV
- Adenovirus
- Bacteria, if positive, specify
- Other pathogens detected?
- Clinical pneumonia diagnosed
- X-ray performed?
- X-ray performed, if yes, infiltrates?
- CT-scan performed?
- CT-scan performed, if yes infiltrates?

**Treatment**
- Antiviral or COVID-19 targeted therapy, if yes, choose agent and specify date commenced and duration
- Antibiotics, if yes, state name, date commenced and duration
- Corticosteroid, if yes, route, agent, dose and duration
- Heparin, if yes, choose route, type, max daily dose, date commenced and duration
- Other treatment, if yes, specify
**Outcome:**
- Outcome (discharge alive, death, palliative discharge etc.)
- Outcome date?
- Ability to self-care at discharge versus before illness:
- Other interventions/procedures, if yes specify
- Is patient transferred, if yes, specify facility name

**Core Additional Information**
- Additional information