**Supplementary material**

This appendix has been provided by the authors to give readers additional information about their work.

Supplement to: **Emergency airway management patients with COVID-19: a prospective international multicentre cohort study**

[Supplementary Tables 2](#_Toc62538596)

[Supplementary Table 1. Countries contributing intubation records (n) used in this analysis. OECD = Organisation for Economic Co-operation and Development; S. A. R. = Special Administrative Region. 2](#_Toc62538597)

[Supplementary Table 2. Tracheal Intubation characteristics, stratified by whether the attempts resulted in a difficult or failed intubation (defined as 4 or more attempts, emergency front of neck airway or use of a supraglottic device as the final airway device). Data are frequency (%). LMIC = Low- and middle-income countries; ODP = operating department practictioner. 3](#_Toc62538598)

[Supplementary Table 3. Sensitivity analysis. Fixed-effects only multivariable model of investigating the associations between successful first attempt at tracheal intubation and predictor variables, modelled in the subset of data from first recorded intubation. This analysis was performed to assess the effect of informative cluster size on the results of our main analysis. 4](#_Toc62538599)

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# Supplementary Tables

## Supplementary Table 1. Countries contributing intubation records (n) used in this analysis. OECD = Organisation for Economic Co-operation and Development; S. A. R. = Special Administrative Region.

|  |  |  |
| --- | --- | --- |
| Country | OECD Income Level | n |
| United Kingdom | High-income | 1566 |
| United States of America | High-income | 1170 |
| India | Low- and middle-income | 357 |
| Australia | High-income | 180 |
| South Africa | Low- and middle-income | 163 |
| Sweden | High-income | 146 |
| Pakistan | Low- and middle-income | 111 |
| Canada | High-income | 105 |
| Netherlands | High-income | 93 |
| Germany | High-income | 58 |
| Qatar | High-income | 46 |
| Ireland | High-income | 41 |
| Argentina | High-income | 41 |
| Panama | Low- and middle-income | 34 |
| Hong Kong S.A.R. | High-income | 26 |
| Mexico | Low- and middle-income | 24 |
| Chile | High-income | 23 |
| Argentina | High-income | 15 |
| Panama | Low- and middle-income | 11 |
| Spain | High-income | 11 |
| El Salvador | Low- and middle-income | 10 |
| Singapore | High-income | 8 |
| Honduras | Low- and middle-income | 6 |
| New Zealand | High-income | 4 |
| Bolivia | Low- and middle-income | 3 |
| Ecuador | Low- and middle-income | 3 |
| Peru | Low- and middle-income | 3 |
| Brazil | Low- and middle-income | 1 |
| Colombia | Low- and middle-income | 1 |
| Guatemala | Low- and middle-income | 1 |
| Paraguay | High-income | 1 |
| Uruguay | High-income | 1 |

## Supplementary Table 2. Tracheal Intubation characteristics, stratified by whether the attempts resulted in a difficult or failed intubation (defined as 4 or more attempts, emergency front of neck airway or use of a supraglottic device as the final airway device). Data are frequency (%). LMIC = Low- and middle-income countries; ODP = operating department practictioner.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Intubation Success | Difficult or Failed | p |
| **n** | 4440 | 36 |  |
| **Location (%)** |  |  | 0.067 |
| Intensive Care Unit (ICU) | 2800 (63.1) | 18 (50.0) |  |
| Emergency Department (ED) | 769 (17.3) | 12 (33.3) |  |
| Operating theatre suite | 118 ( 2.7) | 0 ( 0.0) |  |
| Other Hospital Location | 753 (17.0) | 6 (16.7) |  |
| **Indication (%)** |  |  | 0.001 |
| Deteriorating respiratory failure | 3971 (89.4) | 28 (77.8) |  |
| Cardiac arrest | 184 ( 4.1) | 6 (16.7) |  |
| Airway protection for low GCS | 285 ( 6.4) | 2 ( 5.6) |  |
| **Total number of staff intubation room (%)** |  |  | <0.001 |
| 1 | 33 ( 0.7) | 0 ( 0.0) |  |
| 2 | 285 ( 6.4) | 1 ( 2.8) |  |
| 3 | 2672 (60.2) | 9 (25.0) |  |
| 4 | 915 (20.6) | 10 (27.8) |  |
| 5+ | 535 (12.0) | 16 (44.4) |  |
| **Intubator/laryngoscopist (%)** |  |  | 0.507 |
| Anesthetic Doctor | 3620 (81.5) | 28 (77.8) |  |
| Intensive Care Doctor | 589 (13.3) | 6 (16.7) |  |
| Anesthetic nurse/ODP | 127 ( 2.9) | 0 ( 0.0) |  |
| Other Doctor | 66 ( 1.5) | 1 ( 2.8) |  |
| Others | 38 ( 0.9) | 1 ( 2.8) |  |
| **Airway assistant (%)** |  |  | 0.444 |
| Anesthetic nurse/ODP | 1803 (40.6) | 13 (36.1) |  |
| Anesthetic Doctor | 576 (13.0) | 8 (22.2) |  |
| Intensive Care Doctor | 469 (10.6) | 4 (11.1) |  |
| Other Doctor | 160 ( 3.6) | 2 ( 5.6) |  |
| Other Nurse | 930 (20.9) | 4 (11.1) |  |
| Others | 502 (11.3) | 5 (13.9) |  |
| **Rapid sequence induction (%)** | 3438 (77.4) | 19 (52.8) | 0.001 |
| **First attempt laryngoscopy device (%)** |  |  | 0.005 |
| Direct laryngoscope | 1092 (24.6) | 8 (22.2) |  |
| Videolaryngoscope | 3339 (75.2) | 27 (75.0) |  |
| Fibreoptic intubation | 9 ( 0.2) | 1 ( 2.8) |  |
| **Apneic oxygenation device used (%)** |  |  | 0.354 |
| Facemask oxygen | 1771 (39.9) | 19 (52.8) |  |
| Conventional nasal cannula | 272 ( 6.1) | 1 ( 2.8) |  |
| High flow nasal oxygenation | 491 (11.1) | 2 ( 5.6) |  |
| None of the above | 1906 (42.9) | 14 (38.9) |  |
| **Bag mask ventilation used (%)** | 860 (19.4) | 29 (80.6) | <0.001 |
| **Personal protective equipment mask (%)** |  |  | 0.475 |
| Non-powered respirator only | 3479 (78.4) | 31 (86.1) |  |
| Powered air-purifying respirator | 900 (20.3) | 5 (13.9) |  |
| No mask or surgical mask only | 61 ( 1.4) | 0 ( 0.0) |  |

## Supplementary Table 3. Sensitivity analysis. Fixed-effects only multivariable model of investigating the associations between successful first attempt at tracheal intubation and predictor variables, modelled in the subset of data from first recorded intubation. This analysis was performed to assess the effect of informative cluster size on the results of our main analysis.

|  |  |  |
| --- | --- | --- |
| Variable |  | Odds Ratio (95% CI, p) |
| Country income status | High-income  Low- and middle-income | -  0.55 (0.365-0.86, p=0.007) |
| Rapid Sequence Induction | No  Yes | -  2.05 (1.50-2.80, p<0.001) |
| First attempt device | Direct laryngoscope  Videolaryncoscope  Fibreoptic intubation | -  0.84 (0.57-1.21, p=0.355)  0.53 (0.065-11.0, p=0.592) |
| Seniority of operator | Non-consultant/attending  Consultant/attending | -  1.33 (0.92-1.90, p=0.122) |
| Mask | Non-powered respirator only  Powered air-purifying respirator  No mask or surgical mask only | -  1.77 (1.13-2.89, p=0.016)  0.43 (0.173-1.22, p=0.083) |
| Age (rescaled) |  | 1.03 (0.86-1.24, p=0.743) |

# Supplementary Figures

## Supplementary Figure 1. Direct Acyclic Graph depicting the proposed relationship between the modelled variables in the multivariable model.

Diagram

Description automatically generated

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| US | Matthew Wecksell | Westchester Medical Center |  |
| US | Robert B. Schonberger | Yale School of Medicine |  |
| US | Jinlei Li | Yale School of Medicine |  |
| US | Shannon Michel | Yale School of Medicine |  |
| US | Miriam Treggiari | Yale School of Medicine |  |
| US | Steven Berstein | Yale School of Medicine |  |
| US | Meir Dashevksy | Yale School of Medicine |  |
| Venezuela | Alfredo Vetecourt | Centro Medico de Caracas |  |