Supplemental Online Content

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This supplemental material has been provided by the authors to give readers additional information about their work.
**eTable 1.** Age- and race-specific outcome rates.

| Age Group | Race                   | Not hospitalized (N=1293) | Hospitalization only (N=200) | ICU and/or Ventilated (N=79) | Death (N=54) |
|-----------|------------------------|---------------------------|-----------------------------|-----------------------------|--------------|
|           |                        | Events/Total | Percentage (95% CI) | Events/Total | Percentage (95% CI) | Events/Total | Percentage (95% CI) | Events/Total | Percentage (95% CI) |
| 15–24 years | Non- Hispanic White     | 12/13        | 92.3 (64.0, 99.8) | 1/13        | 7.7 (0.2, 36.0) | 0/13        | -             | 0/13        | -             |
|           | Black or African American | 6/7          | 85.7 (42.1, 99.6) | 0/7          | -             | 1/7          | 14.3 (0.4, 57.9) | 0/7          | -             |
|           | Hispanic or Latinx      | 14/17        | 82.4 (56.6, 96.2) | 2/17        | 11.8 (1.5, 36.4) | 1/17        | 5.9 (0.1, 28.7) | 0/17        | -             |
|           | Other/Unknown           | 8/9          | 88.9 (51.8, 99.7) | 1/9          | 11.1 (0.3, 48.2) | 0/9          | -             | 0/9          | -             |
| 25–34 years | Non- Hispanic White     | 116/122      | 95.1 (89.6, 98.2) | 5/122        | 4.1 (1.3, 9.3) | 1/122        | 0.8 (0.0, 4.5) | 0/122        | -             |
|           | Black or African American | 40/48       | 83.3 (69.8, 92.5) | 6/48         | 12.5 (4.7, 25.2) | 2/48         | 4.2 (0.5, 14.3) | 0/48         | -             |
|           | Hispanic or Latinx      | 34/36        | 94.4 (81.3, 99.3) | 1/36         | 2.8 (0.1, 14.5) | 1/36         | 2.8 (0.1, 14.5) | 0/36         | -             |
|           | Other/Unknown           | 20/21        | 95.2 (76.2, 99.9) | 1/21         | 4.8 (0.1, 23.8) | 0/21         | -             | 0/21         | -             |
| 35–44 years | Non- Hispanic White     | 211/233      | 90.6 (86.1, 94.0) | 15/233       | 6.4 (3.6, 10.4) | 5/233        | 2.1 (0.7, 4.9) | 2/233        | 0.9 (0.1, 3.1) |
|           | Black or African American | 70/92       | 76.1 (66.1, 84.4) | 13/92        | 14.1 (7.7, 23.0) | 6/92         | 6.5 (2.4, 13.7) | 3/92         | 3.3 (0.7, 9.2) |
|           | Hispanic or Latinx      | 46/54        | 85.2 (72.9, 93.4) | 7/54         | 13.0 (5.4, 24.9) | 1/54         | 1.9 (0.0, 9.9) | 0/54         | -             |
|           | Other/Unknown           | 23/24        | 95.8 (78.9, 99.9) | 1/24         | 4.2 (0.1, 21.1) | 0/24         | -             | 0/24         | -             |
| 45–54 years | Non- Hispanic White     | 200/251      | 79.7 (74.2, 84.5) | 36/251       | 14.3 (10.3, 19.3) | 10/251       | 4.0 (1.9, 7.2) | 5/251        | 2.0 (0.6, 4.6) |
|           | Black or African American | 64/92       | 69.6 (59.1, 78.7) | 16/92        | 17.4 (10.3, 26.7) | 10/92        | 10.9 (5.3, 19.1) | 2/92         | 2.2 (0.3, 7.6) |
|           | Hispanic or Latinx      | 43/53        | 81.1 (68.0, 90.6) | 4/53         | 7.5 (2.1, 18.2) | 5/53         | 9.4 (3.1, 20.7) | 1/53         | 1.9 (0.0, 10.1) |
|           | Other/Unknown           | 24/28        | 85.7 (67.3, 96.0) | 1/28         | 3.6 (0.1, 18.3) | 2/28         | 7.1 (0.9, 23.5) | 1/28         | 3.6 (0.1, 18.3) |
| Age Group | Race/Ethnicity                      | Count | Median (CI) |
|-----------|------------------------------------|-------|-------------|
| 55–64 years | Non-Hispanic White                 | 175/235 | 74.5 (68.4, 79.9) |
|           | Black or African American          | 47/64  | 73.4 (60.9, 83.7) |
|           | Hispanic or Latinx                 | 15/19  | 78.9 (54.4, 93.9) |
|           | Other/Unknown                      | 5/9    | 55.6 (21.2, 86.3) |
| 65–74 years | Non-Hispanic White                 | 68/113 | 60.2 (50.5, 69.3) |
|           | Black or African American          | 9/23   | 39.1 (19.7, 61.5) |
|           | Hispanic or Latinx                 | 4/6    | 66.7 (22.3, 95.7) |
|           | Other/Unknown                      | 1/3    | 33.3 (0.8, 90.6)  |
| ≥75 years | Non-Hispanic White                 | 15/24  | 62.5 (40.6, 81.2) |
|           | Black or African American          | 0/6    | -            |
|           | Hispanic or Latinx                 | 0/0    | -            |
|           | Other/Unknown                      | 1/1    | 100.0 (2.5, 100) |
| Overall   | Non-Hispanic White                 | 802/996| 80.5 (77.9, 82.9) |
|           | Black or African American          | 240/337| 71.2 (66.1, 76.0) |
|           | Hispanic or Latinx                 | 161/190| 84.7 (78.8, 89.5) |
|           | Other/Unknown                      | 83/96  | 86.5 (78.0, 92.6) |

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| eTable 2. Demographic and Clinical Characteristics By Diagnostic Method.                                                                 |
|-------------------------------------------------------------------------------------------------|
|                                                                                                 |
|                                                                                                 |
| **Laboratory Positive** (N=1345)                                                                 |
| **Suspected COVID-19** (N=281)                                                                  |
| **p-value**                                                                                      |
|                                                                                                 |
| **Female**                                                                                       |
| 988(73.6)                                                                                        |
| 214(76.2)                                                                                        |
| 0.61<sup>c</sup>                                                                                  |
|                                                                                                 |
| **Age (years), mean (SD)**                                                                       |
| 48.2(13.2)                                                                                       |
| 45.1(12.8)                                                                                       |
| <0.001<sup>a</sup>                                                                                |
|                                                                                                 |
| **Race**                                                                                         |
| Non-Hispanic White                                831(62.1)                                                                                        |
| 165(58.7)                                                                                        |
| <0.001<sup>c</sup>                                                                                |
| Black or African American                        290(21.7)                                                                                        |
| 47(16.7)                                                                                        |
| Hispanic or Latinx                                153(11.4)                                                                                        |
| 37(13.2)                                                                                        |
| Other/Unknown                                     64(4.8)                                                                                           |
| 32(11.4)                                                                                        |
|                                                                                                 |
| **Country at time of COVID-19 onset**                                                             |
| United States                                     1277(96.7)                                                                                       |
| 270(98.2)                                                                                        |
| 0.16<sup>c</sup>                                                                                  |
| Canada                                            29(2.2)                                                                                           |
| 1(0.36)                                                                                          |
| Mexico                                            2(0.15)                                                                                          |
| 0(0.0)                                                                                           |
| Other                                              12(0.91)                                                                                         |
| 4(1.5)                                                                                           |
|                                                                                                 |
| **US Census region**                                                                             |
| Northeast                                         300(23.6)                                                                                       |
| 65(24.2)                                                                                        |
| <0.001<sup>c</sup>                                                                                |
| Midwest                                           354(27.9)                                                                                       |
| 13(4.8)                                                                                          |
| South                                             488(38.4)                                                                                       |
| 183(68.0)                                                                                       |
| West                                              129(10.1)                                                                                       |
| 8(3.0)                                                                                           |
|                                                                                                 |
| **Disease Duration (years), mean (SD)**                                                          |
| 13.2(10.0)                                                                                       |
| 12.6(9.5)                                                                                       |
| 0.42<sup>a</sup>                                                                                  |
|                                                                                                 |
| **MS Clinical Course**                            |
| RRMS/CIS                                          1041(81.4)                                                                                       |
| 234(84.8)                                                                                        |
| 0.18<sup>c</sup>                                                                                  |
| Progressive MS                                    238(18.6)                                                                                       |
| 42(15.2)                                                                                         |
|                                                                                                 |
| **Ambulatory Status**                             |
| Fully ambulatory                                  964(74.4)                                                                                       |
| 220(79.1)                                                                                        |
| 0.092<sup>c</sup>                                                                                 |
| Walk with Assistance                              200(15.4)                                                                                       |
| 41(14.7)                                                                                         |
| Non-ambulatory                                     132(10.2)                                                                                       |
| 17(6.1)                                                                                          |
|                                                                                                 |
| **DMT at Time of COVID-19**                                                                     |
| Alemtuzumab                                        8(0.62)                                                                                          |
| 1(0.36)                                                                                          |
| Cladribine                                        12(0.93)                                                                                         |
| 2(0.72)                                                                                          |
| Dimethyl fumarate                                 177(13.7)                                                                                       |
| 31(11.1)                                                                                         |
| Diroximel fumarate                                2(0.16)                                                                                         |
| 1(0.36)                                                                                          |
| Fingolimod                                        88(6.8)                                                                                         |
| 18(6.5)                                                                                          |
| Glatiramer acetate                                76(5.9)                                                                                         |
| 8(2.9)                                                                                           |
| Interferon-beta                                   47(3.6)                                                                                         |
| 6(2.2)                                                                                           |
| IVIG                                               4(0.31)                                                                                         |
| 2(0.72)                                                                                          |
| Methotrexate                                      2(0.16)                                                                                         |
| 0(0.0)                                                                                           |
| Mycophenolate                                     2(0.16)                                                                                         |
| 0(0.0)                                                                                           |
**eTable 2. Demographic and Clinical Characteristics By Diagnostic Method.**

|                         | Laboratory Positive (N=1345) | Suspected COVID-19 (N=281) | p-value |
|-------------------------|-----------------------------|-----------------------------|---------|
| Natalizumab             | 144(11.2)                   | 26(9.3)                     |         |
| Ocrelizumab             | 400(31.0)                   | 84(30.1)                    |         |
| Ofatumumab              | 3(0.23)                     | 0(0.0)                      |         |
| Ozanimod                | 1(0.08)                     | 0(0.0)                      |         |
| Rituximab               | 46(3.6)                     | 31(11.1)                    |         |
| Siponimod               | 14(1.1)                     | 3(1.1)                      |         |
| Teriflunomide            | 71(5.5)                     | 11(3.9)                     |         |
| Other                   | 7(0.54)                     | 3(1.1)                      |         |
| None                    | 185(14.4)                   | 52(18.6)                    |         |

**Glucocorticoid during the last 2 months?**

|                        | Laboratory Positive (N=1345) | Suspected COVID-19 (N=281) | p-value  |
|------------------------|-----------------------------|-----------------------------|----------|
| No                     | 1138(90.4)                  | 195(81.9)                   | <0.001^c |
| Yes                    | 48(3.8)                     | 15(6.3)                     |          |
| Unknown                | 73(5.8)                     | 28(11.8)                    |          |

**Have comorbidities??**

|                         | Laboratory Positive (N=1345) | Suspected COVID-19 (N=281) | p-value |
|-------------------------|-----------------------------|-----------------------------|---------|
| No                      | 651(48.8)                   | 118(42.8)                   | 0.19^c  |
| Yes                     | 648(48.5)                   | 149(54.0)                   |         |
| Unknown                 | 36(2.7)                     | 9(3.3)                      |         |

**Cancer**

|                        | Laboratory Positive (N=1345) | Suspected COVID-19 (N=281) | p-value |
|------------------------|-----------------------------|-----------------------------|---------|
| Cardiovascular disease | 87(6.5)                     | 5(1.8)                      | 0.002^c |
| Cerebrovascular disease | 24(1.8)                    | 1(0.36)                     | 0.077^c |
| Chronic kidney disease | 16(1.2)                     | 3(1.1)                      | 0.86^c  |
| Chronic liver disease  | 11(0.82)                    | 1(0.36)                     | 0.41^c  |
| Chronic lung disease   | 92(6.8)                     | 24(8.5)                     | 0.31^c  |
| Chronic neurological disease | 68(5.1)               | 11(3.9)                     | 0.42^c  |
| Diabetes               | 126(9.4)                    | 22(7.8)                     | 0.41^c  |
| Hypertension           | 309(23.0)                   | 49(17.4)                    | 0.042^c |
| Immunodeficiency disease | 30(2.2)                   | 4(1.4)                      | 0.39^c  |
| Morbid obesity         | 161(12.0)                   | 18(6.4)                     | 0.007^c |
| Other                  | 158(11.7)                   | 87(31.0)                    | <0.001^c |

*Data not available for all subjects. Missing values: Gender = 2, Age = 16, Race = 7, Country at time of COVID-19 onset: = 31, Census region = 7, Disease Duration = 96, MS Clinical Course = 65, Ambulatory Status = 52, Glucocorticoid during the last 2 mo, DMT at Time of COVID-19 = 58, Have comorbidities? = 15
Values presented as Mean ± SD, Median [P25, P75] or N (column %).
p-values: a=ANOVA, b=Kruskal-Wallis test, c=Pearson's chi-square test, d=Fisher's Exact test.
### eTable 3. Multivariable logistic regression for COVID-19 laboratory positive MS patients only.

| Factor                        | Level                                | Hospitalization only | ICU and/or Ventilated | Death |
|-------------------------------|--------------------------------------|-----------------------|------------------------|--------|
|                               |                                      | OR        | LCL   | UCL   | OR        | LCL   | UCL   | OR        | LCL   | UCL   |
| Age                           | (10 years)                           | 1.358     | 1.143 | 1.613 | 1.355     | 1.038 | 1.769 | 2.149     | 1.412 | 3.27  |
| Sex                           | Male vs Female                       | 1.458     | 0.991 | 2.143 | 1.121     | 0.601 | 2.089 | 3.578     | 1.563 | 8.195 |
| Race                          | Black/African American vs Non-Hispanic White | 1.631    | 1.06  | 2.51  | 2.185     | 1.142 | 4.178 | 1.345     | 0.491 | 3.682 |
|                               | Hispanic or Latinx vs Non-Hispanic White | 0.766    | 0.393 | 1.493 | 1.727     | 0.707 | 4.218 | 0.621     | 0.101 | 3.816 |
|                               | Other/Unknown vs Non-Hispanic White   | 1.08      | 0.383 | 3.044 | 0.679     | 0.083 | 5.535 | 2.819     | 0.283 | 28.121 |
| Ambulation                    | Non-ambulatory vs Fully ambulatory    | 2.341     | 1.487 | 3.686 | 2.345     | 1.169 | 4.702 | 3.468     | 1.018 | 11.813 |
|                               | Walk with Assistance vs Fully ambulatory | 2.555   | 1.442 | 4.528 | 3.139     | 1.398 | 7.048 | 18.102    | 6.199 | 52.861 |
| Smoking status                | Current vs Never                     | 0.972     | 0.437 | 2.164 | -         | -      | -     | 1.584     | 0.25  | 10.02 |
|                               | Past vs Never                        | 0.996     | 0.65  | 1.526 | 1.096     | 0.59  | 2.037 | 1.363     | 0.587 | 3.16  |
|                               | Unknown vs Never                     | 1.25      | 0.583 | 2.681 | 1.58      | 0.512 | 4.882 | 1.7       | 0.318 | 9.09  |
| Cardiovascular disease        | Yes vs No                            | 1.842     | 0.955 | 3.554 | 1.398     | 0.507 | 3.851 | 3.468     | 1.213 | 9.914 |
| Chronic lung disease          | Yes vs No                            | 1.447     | 0.761 | 2.751 | 1.926     | 0.8    | 4.64  | 1.209     | 0.302 | 4.844 |
| Diabetes                      | Yes vs No                            | 2.523     | 1.469 | 4.334 | 1.893     | 0.842 | 4.259 | 1.008     | 0.339 | 2.993 |
| Outcome                                      | Yes vs No | 1.184 | 0.718 | 1.723 | 1.025 | 0.53 | 1.982 | 2.465 | 1.036 | 5.867 |
|----------------------------------------------|-----------|-------|-------|-------|-------|------|-------|-------|-------|-------|
| Hypertension                                 | Yes vs No | 1.485 | 0.885 | 2.49  | 2.435 | 1.205| 4.923 | 3.354 | 1.177 | 9.553 |
| Morbid obesity                               | Yes vs No |       |       |       |       |      |       |       |       |       |
| Disease Modifying Therapy                    | Fumarates vs None | 0.836 | 0.425 | 1.645 | 0.237 | 0.074| 0.754 | 0.292 | 0.065 | 1.315 |
|                                              | S1PR vs None | 0.499 | 0.187 | 1.328 | 0.61  | 0.202| 1.845 | 0.655 | 0.106 | 4.052 |
|                                              | Glatiramer acetate vs None | 0.921 | 0.392 | 2.162 |       |      |       | 0.304 | 0.034 | 2.74  |
|                                              | Injectables vs None | 0.292 | 0.063 | 1.355 | 0.237 | 0.029| 1.924 | 0.413 | 0.041 | 4.176 |
|                                              | Natalizumab vs None | 0.545 | 0.243 | 1.222 | 0.081 | 0.01 | 0.637 | 0.643 | 0.144 | 2.863 |
|                                              | Ocrelizumab vs None | 1.441 | 0.831 | 2.497 | 0.8   | 0.393| 1.63  | 0.366 | 0.121 | 1.106 |
|                                              | Other vs None | 0.866 | 0.295 | 2.539 | 0.437 | 0.09 | 2.129 | 0.637 | 0.116 | 3.487 |
|                                              | Rituximab vs None | 4.885 | 1.984 | 12.028| 2.718 | 0.808| 9.142 | 1.205 | 0.087 | 16.621|
|                                              | Teriflunomide vs None | 0.827 | 0.332 | 2.061 | 0.267 | 0.057| 1.259 | 0.41  | 0.057 | 2.946 |
| Glucocorticoid use in the past 2 months      | Unknown vs No | 1.387 | 0.652 | 2.95  | 0.345 | 0.045| 2.652 | 2.99  | 0.762 | 11.73 |
|                                              | Yes vs No | 3.818 | 1.758 | 8.29  | 1.782 | 0.464| 6.845 | 7.882 | 1.905 | 32.612|

OR=Odds ratio; LCL=Lower 95% Confidence Interval; UCL=Upper 95% Confidence Interval
**eTable 4. Multivariable logistic regression with the number of comorbid conditions.**

| Factor                          | Level                              | Hospitalization only | ICU and/or Ventilated | Death   |
|---------------------------------|------------------------------------|----------------------|------------------------|---------|
|                                 |                                    | OR       | LCL       | UCL       | OR       | LCL       | UCL       | OR       | LCL       | UCL       |
| Age (10 years)                  |                                    | 1.298    | 1.108     | 1.52      | 1.177    | 0.915     | 1.512     | 1.619    | 1.11      | 2.362     |
| Sex Male vs Female              |                                    | 1.391    | 0.971     | 1.993     | 0.909    | 0.497     | 1.663     | 3.265    | 1.496     | 7.125     |
| Race Black/African American vs Non-Hispanic White |                     | 1.54     | 1.03      | 2.304     | 2.274    | 1.238     | 4.175     | 1.425    | 0.57      | 3.561     |
| Race Hispanic or Latinx vs Non-Hispanic White |                     | 0.797    | 0.429     | 1.479     | 1.737    | 0.756     | 3.989     | 0.604    | 0.111     | 3.285     |
| Race Other/Unknown vs Non-Hispanic White |                     | 0.854    | 0.343     | 2.126     | 0.813    | 0.177     | 3.743     | 1.621    | 0.219     | 11.989    |
| Ambulation Walk with Assistance vs Fully ambulatory |                     | 2.23     | 1.458     | 3.411     | 2.632    | 1.354     | 5.118     | 2.609    | 0.813     | 8.373     |
| Ambulation Non-ambulatory vs Fully ambulatory |                     | 2.938    | 1.722     | 5.012     | 3.72     | 1.691     | 8.184     | 24.184   | 8.756     | 66.799    |
| Smoking status Current vs Never |                                    | 1.144    | 0.551     | 2.379     | -        | -         | -         | 2.823    | 0.709     | 11.233    |
| Smoking status Past vs Never    |                                    | 1.085    | 0.734     | 1.603     | 1.1      | 0.611     | 1.98      | 1.238    | 0.551     | 2.784     |
| Smoking status Unknown vs Never |                                    | 1.201    | 0.573     | 2.52      | 1.487    | 0.492     | 4.496     | 1.833    | 0.363     | 9.266     |
| Number of comorbid conditions   | 1 vs 0                             | 1.344    | 0.89      | 2.029     | 0.883    | 0.439     | 1.774     | 1.726    | 0.54      | 5.52      |
| Number of comorbid conditions   | 2 vs 0                             | 1.936    | 1.213     | 3.089     | 1.442    | 0.683     | 3.044     | 7.318    | 2.341     | 22.877    |
| Number of comorbid conditions   | ≥3 vs 0                            | 2.353    | 1.309     | 4.229     | 4.354    | 1.985     | 9.552     | 18.501   | 5.791     | 59.107    |
| Disease Modifying Therapy       | Fumarates vs None                  | 0.992    | 0.524     | 1.877     | 0.223    | 0.07      | 0.707     | 0.342    | 0.079      | 1.485     |
|                       | S1PR vs None | Glatiramer acetate vs None | Injectables vs None | Natalizumab vs None | Ocrelizumab vs None | Other vs None | Rituximab vs None | Teriflunomide vs None | Glucocorticoid use in the past 2 months |
|-----------------------|--------------|-----------------------------|---------------------|---------------------|--------------------|---------------|------------------|----------------------|----------------------------------------|
|                       | 0.651        | 1.056                       | 0.35                | 0.688               | 1.597              | 1.189         | 4.253            | 0.825                | Unknown vs No                        |
|                       | 0.266        | 0.467                       | 0.078              | 0.318               | 0.961              | 0.452         | 1.977            | 0.34                 | 0.914                               |
|                       | 1.595        | 2.387                       | 1.576              | 1.486               | 2.654              | 3.13          | 9.153            | 2.004                | 1.854                               |
|                       | 0.76         | -                           | 0.289              | 0.08                | 0.838              | 0.496         | 1.672            | 0.281                | 0.398                               |
|                       | 0.276        | -                           | 0.036              | 0.01                | 0.426              | 0.105         | 0.537            | 0.061                | 0.09                                |
|                       | 2.096        | -                           | 2.32               | 0.631               | 1.646              | 2.348         | 5.204            | 1.301                | 1.757                               |
|                       | 0.911        | 0.601                       | -                  | 0.898               | 0.399              | 0.642         | 2.018            | 0.437                | 2.165                               |
|                       | 0.166        | 0.104                       | -                  | 0.209               | 0.14               | 0.114         | 0.371            | 0.071                | 0.667                               |
|                       | 5.002        | 3.48                        | -                  | 3.866               | 1.134              | 3.614         | 10.973           | -                    | -                                    |

OR=Odds ratio; LCL=Lower 95% Confidence Interval; UCL=Upper 95% Confidence Interval
**eFigure.** North American distribution of MS patients reported in COViMS Registry, A) Canada, B) United States.
Note: Mexico had 2 patients reported.