### Supplementary Table 2. Frequencies, sensitivity, specificity and odds ratios for lesions in NMOSD and MS

| Lesion                                                                 | NMOSD          | MS             | OR (95% CI)    |
|------------------------------------------------------------------------|----------------|----------------|----------------|
|                                                                        | Frequency | Sensitivity | Specificity | Frequency | Sensitivity | Specificity |                |
|                                                                        | n/N (%)    |             |             | n/N (%)    |             |             |                |
| Longitudinally Extensive Spinal Cord T2 Lesion (NMOSD)                  | 43/61 (70)  | 0.705       | 0.988       | 1/86 (1)   | 0.012       | 0.295       | 203.056 (26.223 - 1572.34) |
| Bright Spotty Spinal Cord T2 Lesion (NMOSD)                             | 32/61 (52)  | 0.525       | 0.988       | 1/86 (1)   | 0.012       | 0.475       | 93.793 (12.263 - 717.392) |
| Whole (Axial) Spinal Cord T2 Lesion (NMOSD)                             | 15/61 (25)  | 0.250       | 0.994       | 0/86 (0)   | 0.006       | 0.750       | 57.667 (3.374 - 985.702)  |
| Bilateral Optic Nerve T2 or Gd-enhancing T1 Lesions (NMOSD)            | 8/62 (13)   | 0.135       | 0.995       | 0/100 (0)  | 0.005       | 0.865       | 31.349 (1.775 - 553.567)  |
| Gd-enhancing Spinal Cord T1 Lesion                                     | 17/55 (31)  | 0.309       | 0.985       | 1/65 (2)   | 0.015       | 0.691       | 28.632 (3.662 - 223.831)  |
| Nucleus Tractus Solitarius T2 Lesion (NMOSD)                            | 5/62 (9)    | 0.087       | 0.995       | 0/100 (0)  | 0.005       | 0.913       | 19.226 (1.044 - 354.059)  |
| Leptomeningeal Gd-enhancing T1 Lesion (NMOSD)                           | 4/52 (8)    | 0.085       | 0.995       | 0/100 (0)  | 0.005       | 0.915       | 18.649 (0.984 - 353.414)  |
| Periaqueductal T2 Lesion (NMOSD)                                        | 9/62 (15)   | 0.145       | 0.990       | 1/100 (1)  | 0.010       | 0.855       | 16.811 (2.074 - 136.297)  |
| Optic Chiasm T2 or Gd-enhancing T1 Lesion (NMOSD)                       | 4/62 (7)    | 0.071       | 0.995       | 0/100 (0)  | 0.005       | 0.929       | 15.462 (0.818 - 292.328)  |
| Central Medullary T2 Lesion (NMOSD)                                     | 4/62 (7)    | 0.071       | 0.995       | 0/100 (0)  | 0.005       | 0.929       | 15.462 (0.818 - 292.328)  |
| Optic Nerve Gd-enhancing T1 Lesion                                     | 7/52 (13)   | 0.135       | 0.990       | 1/100 (1)  | 0.010       | 0.865       | 15.4 (1.84 - 128.911)     |
| Third Ventricular Periependymal T2 Lesion (NMOSD)                       | 7/62 (11)   | 0.113       | 0.990       | 1/100 (1)  | 0.010       | 0.887       | 12.6 (1.511 - 105.088)    |
| Spinal Cord Swelling (NMOSD)                                            | 13/61 (21)  | 0.213       | 0.977       | 2/86 (2)   | 0.023       | 0.787       | 11.375 (2.462 - 52.552)   |
| Cloud-like Gd-enhancing T1 Lesion (NMOSD)                              | 2/52 (5)    | 0.047       | 0.995       | 0/100 (0)  | 0.005       | 0.953       | 9.95 (0.469 - 211.2)      |
| Central Spinal Cord T2 Lesion (NMOSD)                                   | 43/58 (74)  | 0.741       | 0.772       | 18/79 (23) | 0.228       | 0.259       | 9.715 (4.415 - 21.375)    |
| Optic Nerve T2 Lesion                                                  | 20/62 (32)  | 0.323       | 0.950       | 5/100 (5)  | 0.050       | 0.677       | 9.048 (3.182 - 25.729)    |
| Area Postrema T2 Lesion (NMOSD)                                         | 2/62 (4)    | 0.040       | 0.995       | 0/100 (0)  | 0.005       | 0.960       | 8.306 (0.392 - 175.928)   |
| Lesion Description                                      | Count | Percent | MR/Number | t Value | Probability | CI (Lower) | CI (Upper) |
|--------------------------------------------------------|-------|---------|-----------|---------|-------------|------------|------------|
| Hypothalamic T2 Lesion (NMOSD)                         | 8/62 (13) | 0.129 | 0.980 | 2/100 (2) | 0.020 | 0.871 | 7.259 (1.488 - 35.41) |
| Initial Brain MRI Normal (NMOSD)                       | 10/62 (16) | 0.161 | 0.970 | 3/100 (3) | 0.030 | 0.839 | 6.218 (1.639 - 23.592) |
| Spinal Cord Atrophy (NMOSD)                            | 12/61 (20) | 0.197 | 0.953 | 4/86 (5) | 0.047 | 0.803 | 5.02 (1.534 - 16.431) |
| Longitudinal Corticospinal Tract T2 Lesion (NMOSD)     | 1/62 (2) | 0.024 | 0.995 | 0/100 (0) | 0.005 | 0.976 | 4.902 (0.197 - 122.253) |
| Longitudinal T2 Optic Nerve Lesion (NMOSD)             | 1/62 (2) | 0.024 | 0.995 | 0/100 (0) | 0.005 | 0.976 | 4.902 (0.197 - 122.253) |
| Cystic Brain Lesion (NMOSD)                            | 3/62 (5) | 0.048 | 0.980 | 2/100 (2) | 0.020 | 0.952 | 2.492 (0.404 - 15.349) |
| Cerebellar Gd-enhancing T1 Lesion                      | 1/52 (2) | 0.019 | 0.990 | 1/100 (1) | 0.010 | 0.981 | 1.941 (0.119 - 31.679) |
| Patch White Matter T2 Lesion (NMOSD)                   | 33/62 (53) | 0.532 | 0.620 | 38/100 (38) | 0.380 | 0.468 | 1.857 (0.977 - 3.527) |
| Tumefactive Brain T2 Lesion (NMOSD)                    | 1/62 (2) | 0.016 | 0.990 | 1/100 (1) | 0.010 | 0.984 | 1.623 (0.1 - 26.427) |
| Subcortical Gd-enhancing T1 Lesion                     | 3/52 (6) | 0.058 | 0.950 | 5/100 (5) | 0.050 | 0.942 | 1.163 (0.267 - 5.071) |
| Bridging Splenium T2 Lesion (NMOSD)                    | 2/62 (3) | 0.032 | 0.970 | 3/100 (3) | 0.030 | 0.968 | 1.078 (0.175 - 6.638) |
| Brainstem Periependymal T2 Lesion (NMOSD)              | 2/62 (3) | 0.032 | 0.970 | 3/100 (3) | 0.030 | 0.968 | 1.078 (0.175 - 6.638) |
| Linear Periventricular Periependymal T2 Lesion (NMOSD) | 8/62 (13) | 0.129 | 0.860 | 14/100 (14) | 0.140 | 0.871 | 0.91 (0.358 - 2.313) |
| Brainstem T2 Lesion (MS)                               | 13/62 (21) | 0.210 | 0.770 | 23/100 (23) | 0.230 | 0.790 | 0.888 (0.412 - 1.916) |
| Rounded Corpus Callosum T2 Lesion                      | 1/62 (2) | 0.016 | 0.980 | 2/100 (2) | 0.020 | 0.984 | 0.803 (0.071 - 9.049) |
| Heterogeneous Corpus Callosum T2 Lesion (NMOSD)        | 3/62 (5) | 0.048 | 0.940 | 6/100 (6) | 0.060 | 0.952 | 0.797 (0.192 - 3.308) |
| Large Infratentorial T2 Lesion                         | 8/62 (13) | 0.129 | 0.840 | 16/100 (16) | 0.160 | 0.871 | 0.778 (0.312 - 1.942) |
| Pencil-like Callosum T2 Lesion (NMOSD)                 | 8/62 (13) | 0.129 | 0.840 | 16/100 (16) | 0.160 | 0.871 | 0.778 (0.312 - 1.942) |
| Punctate White Matter T2 Lesion (NMOSD)                | 10/62 (16) | 0.161 | 0.800 | 20/100 (20) | 0.200 | 0.839 | 0.769 (0.334 - 1.774) |
| Cerebral Peduncle T2 Lesion (NMOSD)                    | 8/62 (13) | 0.129 | 0.830 | 17/100 (17) | 0.170 | 0.871 | 0.723 (0.292 - 1.792) |
| Thalamic T2 Lesion                                     | 2/62 (3) | 0.032 | 0.950 | 5/100 (5) | 0.050 | 0.968 | 0.633 (0.119 - 3.369) |
| Lesion Type                                      | Count | Percent | N/100 | P Value | OR Value | 95% CI Lower | 95% CI Upper |
|------------------------------------------------|-------|---------|-------|---------|----------|--------------|--------------|
| Cerebellar Peduncle Gd-enhancing T1 Lesion     | 0/52  | 0.009   | 1/100 | 0.015   | 0.991    | 0.632 (0.025 - 15.781) |
| Corpus Callosum Gd-enhancing T1 Lesion         | 0/52  | 0.009   | 1/100 | 0.015   | 0.991    | 0.632 (0.025 - 15.781) |
| Deep Grey Matter T2 Lesion                      | 7/62  | 0.113   | 19/100| 0.190   | 0.887    | 0.543 (0.214 - 1.378)  |
| Partial Spinal Cord T2 Lesion (MS)              | 29/58 | 0.500   | 54/79 | 0.684   | 0.500    | 0.463 (0.23 - 0.932)   |
| Cerebellar Peduncle T2 Lesion (MS)              | 8/62  | 0.129   | 26/100| 0.260   | 0.871    | 0.422 (0.177 - 1.003)  |
| Short Spinal Cord T2 Lesion (MS)                | 29/61 | 0.475   | 61/86 | 0.709   | 0.525    | 0.371 (0.187 - 0.737)  |
| Juxtacortical T2 Lesion (MS)                    | 35/62 | 0.565   | 78/100| 0.780   | 0.435    | 0.366 (0.183 - 0.729)  |
| Subcortical T2 Lesion                          | 37/62 | 0.597   | 81/100| 0.810   | 0.403    | 0.347 (0.17 - 0.708)   |
| Cortical T2 Lesion                             | 15/62 | 0.242   | 49/100| 0.490   | 0.758    | 0.332 (0.165 - 0.67)   |
| Any Brain Gd-enhancing T1 Lesion               | 3/52  | 0.058   | 17/100| 0.170   | 0.942    | 0.299 (0.083 - 1.072)  |
| Large T2 Brain Lesion (MS)                      | 27/62 | 0.435   | 73/100| 0.730   | 0.565    | 0.285 (0.146 - 0.557)  |
| Large Supratentorial T2 Lesion                 | 24/62 | 0.387   | 71/100| 0.710   | 0.613    | 0.258 (0.132 - 0.504)  |
| Cerebellar T2 Lesion (MS)                      | 4/62  | 0.065   | 24/100| 0.240   | 0.935    | 0.218 (0.072 - 0.664)  |
| Initial MRI Brain Meets Barkhof Criteria (MS)   | 15/62 | 0.242   | 60/100| 0.600   | 0.758    | 0.213 (0.105 - 0.431)  |
| Inferior Temporal Lobe T2 Lesion (MS)          | 6/62  | 0.097   | 35/100| 0.350   | 0.903    | 0.199 (0.078 - 0.508)  |
| New Brain T2 Lesion (MS)                       | 13/62 | 0.210   | 58/100| 0.580   | 0.790    | 0.192 (0.093 - 0.398)  |
| Splenium T2 Lesion                             | 2/62  | 0.032   | 15/100| 0.150   | 0.968    | 0.189 (0.042 - 0.857)  |
| Any Corpus Callosum T2 Lesion                  | 8/62  | 0.129   | 45/100| 0.450   | 0.871    | 0.181 (0.078 - 0.42)   |
| Hypodense T1 Brain Lesion (Black Hole)         | 6/62  | 0.097   | 41/100| 0.410   | 0.903    | 0.154 (0.061 - 0.391)  |
| New Brain Gd-enhancing T1 Lesion (MS)          | 0/52  | 0.009   | 6/100 | 0.064   | 0.991    | 0.138 (0.008 - 2.507)  |
| Any Temporal Lobe T2 Lesion                    | 8/62  | 0.129   | 52/100| 0.520   | 0.871    | 0.137 (0.059 - 0.317)  |
| Lesion Description                                      | Cases | OR   | CI    | Cases | OR   | CI    | Cases | OR   | CI    |
|---------------------------------------------------------|-------|------|-------|-------|------|-------|-------|------|-------|
| Periventricular T2 Lesion (MS)                          | 27/62 (44) | 0.435 | 0.150 | 85/100 (85) | 0.850 | 0.565 | 0.136 (0.065 - 0.286) |
| Initial MRI Brain Meets Paty Criteria (MS)              | 37/62 (60) | 0.597 | 0.080 | 92/100 (92) | 0.920 | 0.403 | 0.129 (0.053 - 0.311) |
| Juxtacortical Gd-enhancing T1 Lesion                    | 0/52 (0) | 0.009 | 0.926 | 7/100 (7) | 0.074 | 0.991 | 0.119 (0.007 - 2.121) |
| Other Corpus Callosum T2 Lesion                         | 1/62 (2) | 0.016 | 0.860 | 14/100 (14) | 0.140 | 0.984 | 0.101 (0.013 - 0.786) |
| Periventricular Gd-enhancing T1 Lesion                  | 0/52 (0) | 0.009 | 0.896 | 10/100 (10) | 0.104 | 0.991 | 0.082 (0.005 - 1.43) |
| Pyramidal Corpus Callosum T2 Lesion (MS)                | 1/62 (2) | 0.016 | 0.780 | 22/100 (22) | 0.220 | 0.984 | 0.058 (0.008 - 0.443) |
| Dawson's Finger T2 Lesion (MS)                          | 0/62 (0) | 0.008 | 0.797 | 20/100 (20) | 0.203 | 0.992 | 0.031 (0.002 - 0.53) |
| Ovoid T2 Lesion (MS)                                    | 1/62 (2) | 0.016 | 0.640 | 36/100 (36) | 0.360 | 0.984 | 0.029 (0.004 - 0.219) |

Entries in **bold** were significantly different

NMOSD = neuromyelitis optica; MS = multiple sclerosis; Gd = gadolinium, OR = odds ratios; CI = confidence interval