**Supplemental Tables**

**Relationship between global warming and autism spectrum disorder from 1990 to 2019: estimates from global datasets**

**Table S1**. The list of 204 countries and territories categorized by latitude

**Table S2**.The characteristics of meteorological elements and PM2.5 from 1990 to 2019

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**Table S4**. The associations between ASD incidence and temperature variation, soil moisture, precipitation, and wind speed

**Table S5**. The association between ASD incidence and temperature variation from 2010 to 2019

**Table S1**. The list of 204 countries and territories categorized by latitude

|  |  |
| --- | --- |
| Latitude (°) | Countries/Territories |
| 0 - 10 | |
|  | Burundi, Benin, Brunei Darussalam, Central African Republic, Cameroon, Congo, Equatorial Guinea  Democratic Republic of the Congo, Costa Rica  Colombia, Ethiopia, Ecuador, Gabon, Ghana  Guinea, Guyana, Indonesia, Kenya, Liberia  Sri Lanka, Malaysia, Nigeria, Panama, Peru  Papua New Guinea, Rwanda, South Sudan  Solomon Islands, Sierra Leone, Timor-Leste  Somalia, Suriname, Togo, Sao Tome and Principe  Venezuela (Bolivarian Republic of), Uganda  United Republic of Tanzania, Marshall Islands  Micronesia (Federated States of), Singapore  Kiribati, Nauru, Seychelles, Maldives, Palau  Cote d'Ivoire, Tuvalu, Tokelau |
| 10 - 20 | |
|  | Angola, Burkina Faso, Belize, Dominican Republic  Bolivia (Plurinational State of), Brazil, Djibouti  Eritrea, Fiji, Gambia, Guinea-Bissau, Guatemala  Honduras, Haiti, Jamaica, Cambodia, Mali  Lao People's Democratic Republic, Malawi  Madagascar, Myanmar, Mozambique, Niger  Nicaragua, Philippines, Puerto Rico, Sudan  Senegal, El Salvador, Chad, Thailand  Trinidad and Tobago, Viet Nam, Vanuatu  Yemen, Zambia, Zimbabwe, Cook Islands  United States Virgin Islands, Saint Lucia  Saint Vincent and the Grenadines, Comoros  Guam, Mauritius, Antigua and Barbuda  Samoa, Niue, Northern Mariana Islands  Barbados, Cabo Verde, Dominica, Tonga  Saint Kitts and Nevis, Grenada, American Samoa |
| 20 - 30 | |
|  | United Arab Emirates, Australia, Bangladesh  Bahamas, Bhutan, Botswana, Cuba, Algeria  Egypt, France, India, Kuwait, Libya, Lesotho  Morocco, Mexico, Mauritania, Namibia, Nepal  Oman, Paraguay, Qatar, Saudi Arabia, South Africa  Taiwan (Province of China), Eswatini, Bahrain |
| 30 - 40 | |
|  | Afghanistan, Argentina, Armenia, Chile, China  Cyprus, Spain, Greece, Iran (Islamic Republic of)  Iraq, Israel, Jordan, Japan, Republic of Korea  Lebanon, Pakistan, Portugal, Palestine, Tajikistan  Syrian Arab Republic, Turkmenistan, Tunisia  Turkey, Uruguay, Bermuda, Malta |
| 40 - 50 | |
|  | Albania, Austria, Azerbaijan, Bulgaria, Georgia  Bosnia and Herzegovina, Switzerland, Czechia  Croatia, Hungary, Italy, Kazakhstan, Kyrgyzstan  Luxembourg, Republic of Moldova, Montenegro  North Macedonia, Mongolia, New Zealand  Democratic People's Republic of Korea, Romania  Serbia, Slovakia, Slovenia, Ukraine, Monaco  United States of America, Uzbekistan, Andorra  San Marino |
| ＞50 | |
|  | Belgium, Belarus, Canada, Germany, Denmark  Estonia, Finland, United Kingdom, Greenland  Ireland, Iceland, Lithuania, Latvia, Netherlands  Norway, Poland, Russian Federation, Sweden |

**Table S2.** The characteristics of meteorological elements and PM2.5 from 1990 to 2019

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Max temperature  (°C) | Soil moisture (mm) | Precipitation  (mm) | Wind speed (m/s) | PM2.5  (µg/m3) |
| Global | 29.4 (6.4) | 66.7 (62.2) | 103.8 (75.6) | 2.9 (1.1) | 27.2 (16.9) |
| SDI |  |  |  |  |  |
| Low | 32.6 (4.4) | 84.7 (75.9) | 104.6 (73.2) | 2.9 (1.2) | 39.5 (13.7) |
| Low-middle | 30.6 (4.4) | 71.8 (69.6) | 117.4 (84.2) | 2.9 (1.0) | 26.3 (14.0) |
| Middle | 29.1 (6.4) | 57.6 (55.1) | 108.6 (82.8) | 2.9 (1.1) | 23.2 (13.7) |
| High-middle | 26.7 (7.1) | 48.9 (33.4) | 90.4 (69.3) | 2.9 (1.1) | 19.6 (13.6) |
| High | 22.6 (7.4) | 50.9 (25.4) | 86.5 (47.9) | 3.1 (1.2) | 14.9 (11.4) |
| Latitude (°) |  |  |  |  |  |
| 0 - 10 | 31.5 (2.6) | 101.6 (73.1) | 167.1 (77.6) | 2.8 (0.9) | 28.5 (16.1) |
| 10 - 20 | 32.1 (3.3) | 83.8 (72.5) | 129.2 (72.5) | 2.8 (1.1) | 26.7 (16.9) |
| 20 - 30 | 33.6 (6.3) | 31.3 (42.8) | 55.8 (57.3) | 3.0 (1.2) | 40.5 (21.5) |
| 30 - 40 | 29.8 (5.6) | 31.4 (22.9) | 50.2 (35.1) | 3.1 (1.2) | 27.9 (14.1) |
| 40 - 50 | 24.4 (3.7) | 49.6 (27.6) | 70.0 (32.6) | 3.1 (1.1) | 21.9 (8.9) |
| > 50 | 17.2 (6.3) | 54.4 (18.8) | 63.3 (19.3) | 3.0 (1.2) | 13.0 (5.9) |

Max temperature: The average temperature of the hottest 4 months of a year. SDI: Sociodemographic index. PM2.5: Particulate matter with aerodynamic diameter less than 2.5 µm. All results are presented as mean (SD).

**Table S3.** The distribution of the maximum temperature variation from 1990 to 2019

|  |  |
| --- | --- |
|  | Value |
| Global | 1.19 (0.81) |
| SDI |  |
| Low | 0.92 (0.59) |
| Low-middle | 1.08 (0.73) |
| Middle | 1.26 (0.87) |
| High-middle | 1.37 (0.90) |
| High | 1.77 (0.88) |
| Latitude (°) |  |
| 0 - 10 | 0.82 (0.57) |
| 10 - 20 | 0.85 (0.52) |
| 20 - 30 | 1.29 (0.74) |
| 30 - 40 | 1.54 (0.80) |
| 40 - 50 | 1.77 (0.96) |
| > 50 | 1.67 (0.90) |
| PM2.5 (µg/m3) |  |
| 5 - 15 | 1.18 (0.83) |
| 15 - 27 | 1.12 (0.86) |
| 27 - 35 | 1.28 (0.82) |
| > 35 | 1.19 (0.72) |
| Yeara |  |
| 1991 | 19/204 |
| 1992 | 38/204 |
| 1993 | 26/204 |
| 1996 | 29/204 |
| 1997 | 15/204 |

SDI: Sociodemographic index. PM2.5: Particulate matter with aerodynamic diameter less than 2.5 µm. The value of the maximum temperature variation was represented as mean with SD. PM2.5 was categorized in terms of quartiles.

a The top 5 years chosen as the reference year for calculating temperature variation.

**Table S4.** The associations between ASD incidence and temperature variation, soil moisture, precipitation, and wind speed.

|  |  |  |
| --- | --- | --- |
| Climate variables | OR (95% CI) | *P* value |
| Temperature variation | 1.03 (1.02, 1.04) | <0.001 |
| Soil moisture | 1.00 (1.00, 1.00) | <0.001 |
| Precipitation | 1.00 (1.00, 1.00) | <0.001 |
| Wind speed | 1.01 (1.00, 1.02) | <0.001 |

**Table S5.** The association between ASD incidence and temperature variation from 2010 to 2019

|  |  |
| --- | --- |
|  | OR (95% CI) |
| Global | 1.05 (1.04, 1.06) |
| Latitude (°) |  |
| 0 - 10 | 1.14 (1.11, 1.16) |
| 10 - 20 | 1.14 (1.11, 1.17) |
| 20 - 30 | 1.13 (1.10, 1.16) |
| 30 - 40 | 1.10 (1.08, 1.12) |
| 40 - 50 | 1.06 (1.04, 1.08) |
| > 50 | 0.98 (0.96, 1.00) |

The model was adjusted for sex, SDI, PM2.5, year, latitude, climate factors (soil moisture, precipitation and wind speed) and the mortality of children under five years. All results were represented with ORs and 95% confidence intervals.