**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

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

**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 GuineaDemocratic Republic of the Congo, Costa RicaColombia, Ethiopia, Ecuador, Gabon, GhanaGuinea, Guyana, Indonesia, Kenya, LiberiaSri Lanka, Malaysia, Nigeria, Panama, PeruPapua New Guinea, Rwanda, South SudanSolomon Islands, Sierra Leone, Timor-LesteSomalia, Suriname, Togo, Sao Tome and PrincipeVenezuela (Bolivarian Republic of), UgandaUnited Republic of Tanzania, Marshall IslandsMicronesia (Federated States of), SingaporeKiribati, Nauru, Seychelles, Maldives, PalauCote d'Ivoire, Tuvalu, Tokelau |
| 10 - 20 |
|  | Angola, Burkina Faso, Belize, Dominican RepublicBolivia (Plurinational State of), Brazil, DjiboutiEritrea, Fiji, Gambia, Guinea-Bissau, GuatemalaHonduras, Haiti, Jamaica, Cambodia, MaliLao People's Democratic Republic, MalawiMadagascar, Myanmar, Mozambique, NigerNicaragua, Philippines, Puerto Rico, SudanSenegal, El Salvador, Chad, ThailandTrinidad and Tobago, Viet Nam, VanuatuYemen, Zambia, Zimbabwe, Cook IslandsUnited States Virgin Islands, Saint LuciaSaint Vincent and the Grenadines, ComorosGuam, Mauritius, Antigua and BarbudaSamoa, Niue, Northern Mariana IslandsBarbados, Cabo Verde, Dominica, TongaSaint Kitts and Nevis, Grenada, American Samoa |
| 20 - 30 |
|  | United Arab Emirates, Australia, BangladeshBahamas, Bhutan, Botswana, Cuba, AlgeriaEgypt, France, India, Kuwait, Libya, LesothoMorocco, Mexico, Mauritania, Namibia, NepalOman, Paraguay, Qatar, Saudi Arabia, South AfricaTaiwan (Province of China), Eswatini, Bahrain |
| 30 - 40 |
|  | Afghanistan, Argentina, Armenia, Chile, ChinaCyprus, Spain, Greece, Iran (Islamic Republic of)Iraq, Israel, Jordan, Japan, Republic of KoreaLebanon, Pakistan, Portugal, Palestine, TajikistanSyrian Arab Republic, Turkmenistan, TunisiaTurkey, Uruguay, Bermuda, Malta |
| 40 - 50 |
|  | Albania, Austria, Azerbaijan, Bulgaria, GeorgiaBosnia and Herzegovina, Switzerland, CzechiaCroatia, Hungary, Italy, Kazakhstan, KyrgyzstanLuxembourg, Republic of Moldova, MontenegroNorth Macedonia, Mongolia, New ZealandDemocratic People's Republic of Korea, RomaniaSerbia, Slovakia, Slovenia, Ukraine, MonacoUnited States of America, Uzbekistan, AndorraSan Marino |
| ＞50 |
|  | Belgium, Belarus, Canada, Germany, DenmarkEstonia, Finland, United Kingdom, GreenlandIreland, Iceland, Lithuania, Latvia, NetherlandsNorway, 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.