**Supplementary Table S2:** Calculation methods

A) Incidence values

|  |  |  |  |
| --- | --- | --- | --- |
| **Study** | **Overall incidence rate** | **Annual/period-specific incidence rates** | **Meta-analyses (21st century)** |
| Almallouhi 20171 | Provided | Extracted from graph | Provided |
| Angeli 20122 | 1. Back-calculated sex-specific person-year denominators for each year 2. Summed sex-specific cases and person-year denominators  | Provided | Calculated exact 95% CIs for females and males, respectively\* |
| Beitnes 20173 | 1. Back-calculated person-year denominators for respective time periods 2. Summed total cases and person-year denominators from both time periods  | Provided | Calculated exact 95% CIs\*  |
| Bode 19964 | Provided | Provided | N/A |
| Burger 20145 | 1. Back-calculated person-year denominators for each respective each year 2. Summed total cases and person-year denominators (for all ages, children, and adults, respectively) | Provided  | Calculated exact 95% CIs for females and males, and children and adults, respectively\* |
| Cilleruelo 20146 | Provided | - | Provided |
| Collin 19977 | Calculated mean from each incidence rate for respective time periods  | 1. Extracted from graph2. Divided by 5 years for respective time periods | N/A |
| Collin 20078 | Calculated mean from each incidence rate for respective time periods | Extracted from graph | Provided  |
| Cook 20049 | 1. Back-calculated person-year denominators for each respective each year2. Summed total cases and person-year denominators  | - | N/A |
| Corrao 199610 | Provided | - | N/A |
| Dydensborg 201211 | Calculated mean from each annual incidence rate  | Extracted from graph | Calculated means from each annual incidence rate, lower 95% CI, and upper 95% CI  |
| Fernandez 201012 | 1. Summed total cases and person-year denominators  | Calculated by using catchment population provided, assuming remained relatively stable | Calculated exact 95% CIs\* |
| Fowell 200613 | Provided  | Extracted from graph | N/A |
| Grode 2018º14 | Provided  | Provided  | Calculated exact 95% CIs for females and males, and children and adults, respectively\* |
| Gutschmidt 198715 | Provided | Provided | N/A |
| Hawkes 2000º16 | 1. Summed total cases and person-year denominators (for all ages, children, and adults, respectively) | 1. Calculated person-year denominators for respective time periods for children and adults, respectively 2. Divided respective time period person-year denominators by 5 to obtain annual person-year denominators3. Extracted total case values from graph for children and adults, respectively | N/A |
| Hurley 201217 | 1. Summed total cases and person-year denominators (for all ages, children, and adults, respectively) | 1. Calculated person-year denominators for respective time periods for children and adults, respectivelya2. Divided respective time period person-year denominators by 5 to obtain annual person-year denominators3. Extracted total case values from graph for children and adults, respectively | Calculated exact 95% CIs for children and adults, respectively\* |
| Jansen 199318 | Calculated mean from each annual incidence rate  | Extracted from graph | N/A |
| Kivela 201519 | Calculated mean from each annual incidence rate  | Extracted from graph | N/A^ |
| Lanzarotto 200420 | 1. Back-calculated person-year denominators for each respective each year 2. Summed total cases and person-year denominators  | Provided | N/A  |
| Lanzini 200521 | Provided | 1. Extracted total case values from graph for each year2. Divided overall person-year denominator by 3 to obtain annual person-year denominators | Calculated exact 95% CIs for females and males, respectively\* |
| Lister 201822 | Provided | Provided | Provided |
| Lopez-Rodriguez 200323 | 1. Back-calculated person-year denominators for respective time periods2. Summed total cases and person-year denominators from both time periods  | Provided | N/A |
| Ludvigsson 201324 | Provided | Extracted from graph | 1. Back-calculated person-year denominators for respective adult categoriesb2. Summed total cases and person-year denominators from each adult category3. Calculated exact 95% CIs for females and males, and adults, respectively\* |
| McGowan 200925 | 1. Back-calculated person-year denominators for respective time periods 2. Summed total cases and person-year denominators from both time periods  | 1. Divided respective time period person-year denominators by 7 to obtain annual person-year denominators° | Calculated exact 95% CIs\* |
| Midhagen 198826 | Provided | Calculated by using catchment population provided, assuming remained relatively stable | N/A |
| Murray 200327 | Provided | Provided | N/Ac |
| Namatovu 201428 | Calculated mean from each annual incidence rate | Extracted from graph | 1. Back-calculated person-year denominator for 2004-2009d 2. Calculated exact 95% CIs\* |
| Olsson 200929 | Provided | Provided | Calculated exact 95% CIs\* |
| Perminow 200030 | Provided in Beitnes 2017 | - | N/A |
| Rajani 201031 | 1. Back-calculated person-year denominators for each respective year2. Summed total cases and person-year denominators  | Providede | Calculated exact 95% CIs\* |
| Ress 201232 | Provided | Provided | Provided (restricted to time period 2006-2010 due to required data)f |
| Schosler 201633 | 1. Back-calculated person-year denominators for respective time periods 2. Summed total cases and person-year denominators from both time periods  | Provided | Calculated exact 95% CIs\* |
| Sher 199334 | 1. Back-calculated person-year denominator for respective time periods, age category, and ethnic group (multiplied population provided by 5)2. Summed total cases and person-year denominators for respective time periods, age categories, and ethnic groups  | 1. Summed total cases and person-year denominators from both age categories and all ethnic groups per time period  | N/A |
| Stewart 201135 | 1. Back-calculated person-year denominators for each respective each year 2. Summed total cases and person-year denominators  | Provided | 1. Extracted number of cases, by sex, from graphs±2. Calculated exact 95% CIs for females and males, respectively\* |
| Stewart 201336 | N/A | Provided | 1. Calculated mean from each child-specific annual incidence rate 2. Calculated person-year denominator for whole time period among children3. Subtracted child-specific person-year denominator from overall to determine adult-specific person-year denominator4. Calculated exact 95% CIs\* |
| Stroud 201937 | Summed total cases and person-year denominators  | Provided | N/A |
| Tapsas 201538 | Calculated mean from each annual incidence rate  | Extracted from graph | N/A  |
| Tosic 201339 | Provided | Provided | Provided |
| Ussher 199440 | Provided | - | N/A |
| Van Kalleveen 201841 | Provided | - | Provided |
| Virta 200942 | Provided | 1. Back-calculated person-year denominator for overall period2. Divided overall person-year denominator by 3 to obtain annual person-year denominators | Provided |
| Virta 201743 | 1. Summed total cases and person-year denominators from each adult category from respective time periods± | 1. Summed total cases and person-year denominators from each adult category for each specific time period  | Calculated exact 95% CIs\* |
| Vukavic 199544 | Provided | - | N/A |
| West 201445 | Provided | Provided | N/A |
| West 201946 | Provided | Extracted from graph | N/A |
| White 201347 | 1. Back-calculated person-year denominators for each respective time period 2. Summed total cases and person-year denominators  | 1. Divided respective time period person-year denominators by 5 to obtain annual person-year denominators° | Calculated exact 95% CIs\* |
| Whyte 201348 | 1. Utilized median of population provided as annual person-years at-risk2. Summed total cases and person-year denominators | 1. Utilized median of population provided as annual person-years at-risk  | Calculated exact 95% CIs\* |
| Zingone 2015a49 | Provided | Provided | 1. Summed total cases and person-year denominators from each age category to calculate child- and adult-specific incidence, respectively3. Calculated exact 95% CIs\* |
| Zingone 2015b50 | 1. Back-calculated person-year denominators for each respective time period 2. Summed total cases and person-year denominators  | Provided | Calculated exact 95% CIs\* |

\*calculated using the confidence interval calculator for Poisson data in STATA 15 ^insufficient data to calculate 95% CIs ºadditional data provided by authors used to calculate values ±additional data provided in supplementary material used to calculate values

a some person-year denominators calculated by using data from previous study in the same region
b only performed for adults as child-specific incidence in the 21st century was utilized from Almallouhi et al., 2017 (same geographic region)
c overlap with Ludvigsson 2013 (same geographic region)
d total number of cases diagnosed was not provided for years 2000 to 2003, therefore 95% CIs could not be calculated for the full time period studied in the 21st century (*i.e.,* 2000-2009). Olsson et al., 2009 was utilized for this time period instead
e multiplied by 10 as rates provided were per 10,000 person-years
f insufficient data to calculate 95% CIs for time period 2001-2005

Formula to calculate an incidence rate:

Formula to back-calculate person-year denominator:

B) Map values

|  |  |
| --- | --- |
| **Tercile** | **Incidence** |
| 1 | <4.6 |
| 2 | 4.6-12.7 |
| 3 | >12.7 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Country** | **Incidence Value(s)** | **Tercile** | **Studies used** | **Age group(s)** | **Time Period(s)**  |
| **Map A** |
| Canada | 1.7° | 1 | McGowan 2009, Rajani 2010 | Children only | 1990-1996, 1998-1999 |
| Denmark | 5.3±~ | 2 | Grode 2018 | All ages | 1980-1999 |
| Estonia | 0.8\* | 1 | Ress 2012 | Children only | 1976-1999 |
| Finland | 12.8~ | 3 | Collin 2007 | Adults only | 1980-1999 |
| Germany | 0.7\* | 1 | Gutschmidt 1987 | All ages | 1979-1984 |
| Italy | 2.8° | 1 | Corrao 1996, Lanzarotto 2004 | All ages | 1990-1991, 1996-1997 |
| Netherlands | 0.8°~ | 1 | Jansen 1993, Burger 2014 | All ages | 1975-1991, 1995 |
| New Zealand | 3.4° | 1 | Ussher 1994, Cook 2004 | All ages | 1985-1992, 1970-1999 |
| Norway | 16.9\* | 3 | Perminow 2000 | Children only | 1993-1998 |
| Serbia | 3.5\* | 1 | Vukavic 1995 | Children only | 1980-1993 |
| Spain | 4.7° | 1 | Lopez-Rodriguez 2003, Fernandez 2010 | Children, adults | 1981-1999, 1986-1999 |
| Sweden | 17.4° | 3 | Namatovu 2014, Midhagen 1988 | Children, adults | 1973-1999, 1976-1986 |
| United Kingdom | 8.5~ | 2 | West 2014 | All ages | 1990-1999 |
| United States of America | 1.4\* | 1 | Murray 2003 | All ages | 1950-1999 |
| **Map B** |
| Bosnia & Herzegovina | 2.6\* | 1 | Tosic 2013 | Adults only | 2007-2009 |
| Canada | 12.8± | 2 | Stewart 2013 | All ages | 2004-2008 |
| Denmark | 9.7±~ | 2 | Grode 2018 | All ages | 1980-1999 |
| Estonia | 2.4\* | 1 | Ress 2012 | Children only | 2000-2010 |
| Finland | 29.3, 39.3, 44.0, 33.1^ | 3 | Collin 2007, Virta 2009, Kivela 2015, Virta 2017 | Adults, adults, children, adults | 2000-2003, 2004-2006, 2001-2013, 2005-2014 |
| Italy | 12.9° | 3 | Lanzini 2005, Angeli 2012, Zingone 2015a | All ages | 2001-2003, 2002-2010, 2011-2013 |
| Netherlands | 5.5±~ | 2 | Burger 2014 | All ages | 2000-2010 |
| Norway | 31.5\* | 3 | Beitnes 2017 | Children only | 2000-2010 |
| Spain | 28.4° | 3 | Fernandez 2010, Cilleruelo 2014 | Adults, children | 2000-2008, 2006-2007 |
| Sweden | 39.3~ | 3 | Namatovu 2014 | Children only | 2000-2009 |
| United Kingdom | 16.4°~ | 3 | West 2014, West 2019 | All ages | 2000-2004, 2005-2015 |
| United States of America | 17.4± | 3 | Ludvigsson 2013 | All ages | 2000-2010 |

°took weighted average of incidence rates ±only study in country evaluating all ages ~nationwide data \*only study from country included during time period ^all studies in same tercile

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