**Supplementary Table 1. Number of cases with esophageal atresia, 1980-2015, and prevalence by participating program, International Clearinghouse for Birth Defects Surveillance and Research**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Program** | **Birth cohort** | N cases | Prevalence per 10,000 births | 95% CI |
| **Europe** |  |  |  |  |
| Czech Republic | 1994-2014 | 479 | 2.2 | 2.0-2.4 |
| France, Paris | 1981-2014 | 280 | 3.2 | 2.8-3.6 |
| Germany, Saxony‐Anhalt | 1980-2014 | 121 | 2.3 | 1.9-2.7 |
| Italy, Lombardy | 2003-2012 | 49 | 3.7 | 2.7-4.9 |
| Italy, Tuscany | 1992-2014 | 130 | 2.0 | 1.7-2.4 |
| Malta | 1995-2013 | 16 | 2.0 | 1.1-3.2 |
| Northern Netherlands | 1981-2014 | 145 | 2.6 | 2.2-3.0 |
| Slovak Republic | 2001-2014 | 136 | 1.7 | 1.5-2.1 |
| Spain, ECEMC | 1980-2013 | 527 | 1.8 | 1.7-2.0 |
| Sweden | 1980-2014 | 965 | 2.7 | 2.5-2.9 |
| Ukraine, OMNI-Net | 2000-2013 | 97 | 2.4 | 1.9-2.9 |
| Wales. CARIS | 1998-2014 | 154 | 2.7 | 2.3-3.2 |
| **Asia** |  |  |  |  |
| Iran, TRoCA | 2005-2012 | 163 | 11.5 | 9.8-13.4 |
| Israel | 2000-2014 | 52 | 2.6 | 1.9-3.4 |
| **North America** |  |  |  |  |
| Mexico, Nuevo Leon | 2011-2015 | 27 | 0.6 | 0.4-0.9 |
| Mexico, RYVEMCE | 1980-2013 | 235 | 2.0 | 1.8-2.3 |
| USA, Arkansas | 1993-2012 | 157 | 2.0 | 1.8-2.4 |
| USA, Atlanta MACDP | 1980-2007 | 219 | 1.9 | 1.7-2.2 |
| USA, Texas BDES | 1996-2012 | 1092 | 1.8 | 1.7-1.9 |
| USA, Utah BDN | 1994-2012 | 182 | 2.5 | 2.2-2.9 |
| **South America** † |  |  |  |  |
| Argentina, RENAC  | 2009-2014 | 342 | 3.3 | 3.0-3.7 |
| Colombia, Bogotá  | 2001-2014 | 126 | 3.1 | 2.6-3.7 |
| Colombia, Cali  | 2011-2014 | 8 | 2.9 | 1.3-5.8 |
| South America, ECLAMC  | 1995-2014 | 1099 | 3.8 | 3.5-4.0 |
| **ALL** |  | **6801** | **2.4** | **2.4-2.5** |

† Some data overlap between Argentina, RENAC; Colombia, Bogotá and Cali, with South America, ECLAMC. Colombia, Bogotá: 2001-2010, all data included in South America ECLAMC, 2011-2014 data from only 1 hospital included in South America ECLAMC. Colombia, Cali: 2011-2014 only data from 1 hospital included in South America ECLAMC. Some data from Argentina RENAC for 2009-2014 may overlap with South America, ECLAMC data.

CI=Confidence Interval, BDES= Birth Defects Epidemiology and Surveillance Branch, BDN= Birth Defect Network, CARIS= Congenital Anomaly Register & Information Services, ECEMC= Spanish Collaborative Study of Congenital Malformations, ECLAMC= South America Latin American Collaborative Study of Congenital Malformations, MACDP= Metropolitan Atlanta Congenital Defects Program, OMNI-Net= Ukraine Birth Defects Program, RENAC= National Network of Congenital Anomalies of Argentina, RYVEMCE=Mexican Registry and Epidemiological Surveillance of External Congenital Malformations, TRoCA= Tabriz Registry of Congenital Anomalies.

**Supplementary Table 2. Survival for liveborn infants with isolated esophageal atresia, born 1980-2015, International Clearinghouse for Birth Defects Surveillance and Research**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Survival to 1 month** |  |  | **Survival to 1 year** |  |  | **Survival to 5 years** |  |  |
| Program | Cohort | N infants | % Survival | 95% CI | Cohort | N infants | % Survival | 95% CI | Cohort | N infants | % Survival | 95% CI |
| **Europe** |  |  |  |  |  |  |  |  |  |  |  |  |
| France, Paris † | 1981-2014 | 140 | 98.6 | 94.9-99.8 |  |  |  |  |  |  |  |  |
| Germany, Saxony‐Anhalt | 1980-2014 | 46 | 93.5 | 82.1-98.6 | 1980-2014 | 46 | 91.3 | 79.2-97.6 |  |  |  |  |
| Italy, Lombardy | 2003-2012 | 21 | 95.2 | 76.2-99.9 | 2003-2012 | 21 | 95.2 | 76.2-99.9 | 2003-2010 | 20 | 100.0 | 83.2-100.0 |
| Malta | 1995-2013 | 6 | 100.0 | 54.1-100.0 | 1995-2013 | 6 | 100 | 54.1-100.0 |  |  |  |  |
| Northern Netherlands | 1981-2014 | 56 | 96.4 | 87.7-99.6 | 1981-2014 | 56 | 94.6 | 85.1-98.9 |  |  |  |  |
| Slovak Republic † | 2001-2014 | 66 | 98.5 | 91.8-100.0 |  |  |  |  |  |  |  |  |
| Spain, ECEMC † | 1980-2013 | 275 | 97.8 | 95.3-99.2 |  |  |  |  |  |  |  |  |
| Sweden | 1980-2014 | 495 | 98.4 | 96.8-99.3 | 1980-2014 | 495 | 96.2 | 94.1-97.7 | 1980-2010 | 433 | 94.9 | 92.4-96.8 |
| Ukraine, OMNI-Net | 2000-2013 | 38 | 84.2 | 68.7-94.0 | 2000-2013 | 38 | 73.7 | 56.9-86.6 |  |  |  |  |
| Wales, CARIS | 1998-2014 | 46 | 97.8 | 88.5-99.9 | 1998-2014 | 46 | 97.8 | 88.5-99.9 | 1998-2009 | 28 | 96.4 | 81.7-99.9 |
| **Asia** |  |  |  |  |  |  |  |  |  |  |  |  |
| Israel  | 2000-2014 | 45 | 97.8 | 88.2-99.9 | 2000-2013 | 43 | 97.7 | 87.7-99.9 | 2000-2009 | 34 | 94.1 | 80.3-99.3 |
| **North America** |  |  |  |  |  |  |  |  |  |  |  |  |
| Mexico, RYVEMCE † | 1980-2013 | 100 | 82.0 | 73.1-89.0 |  |  |  |  |  |  |  |  |
| USA, Utah BDN | 1999-2012 | 38 | 97.4 | 86.2-99.9 | 1999-2012 | 38 | 97.4 | 86.2-99.9 | 1999-2010 | 34 | 97.1 | 84.7-99.9 |
| **South America** ‡ |  |  |  |  |  |  |  |  |  |  |  |  |
| Argentina, RENAC † | 2009-2014 | 144 | 86.1 | 79.4-91.3 |  |  |  |  |  |  |  |  |
| Colombia, Bogotá † | 2001-2014 | 85 | 97.6 | 91.8-99.7 | 2001-2013 | 80 | 98.8 | 93.2-100.0 |  |  |  |  |
| Colombia, Cali † | 2011-2014 | 8 | 100.0 | 63.1-100.0 | 2011-2013 | 5 | 100.0 | 47.8-100.0 |  |  |  |  |
| South America, ECLAMC †  | 1995-2014 | 454 | 85.0 | 81.4-88.2 |  |  |  |  |  |  |  |  |
| **All** |  | **2063** | **93.3** | **92.1-94.4** |  | **874** | **95.3** | **93.7-96.6** |  | **549** | **95.3** | **93.1--96.9** |
| **Programs with survival data to 1 year (n=11)** |  | **884 §** | **96.0** | **94.5-97.2** |  | **874 §** | **95.3** | **93.7-96.6** |  | **¶** |  |  |
| **Programs and cohorts with survival data to 5 years (n=4)** |  | **549** | **97.1** | **95.3-98.3** |  | **549** | **96.2** | **94.0-97.5** |  | **549** | **95.3** | **93.1--96.9** |

† Survival to hospital discharge

‡ Some data overlap between Argentina, RENAC; Colombia, Bogotá and Cali, with South America, ECLAMC. Colombia, Bogotá: 2001-2010, all data included in South America ECLAMC, 2011-2014 data from only 1 hospital included in South America ECLAMC. Colombia, Cali: 2011-2014 only data from 1 hospital included in South America ECLAMC. Some data from Argentina RENAC for 2009-2014 may overlap with South America, ECLAMC data.

§ slight difference in total case numbers due to cohort restriction for follow-up duration in 3 programs

¶ analysis not possible

CI=Confidence Interval, BDES= Birth Defects Epidemiology and Surveillance Branch, BDN= Birth Defect Network, CARIS= Congenital Anomaly Register & Information Services, ECEMC= Spanish Collaborative Study of Congenital Malformations, ECLAMC= South America Latin American Collaborative Study of Congenital Malformations, MACDP= Metropolitan Atlanta Congenital Defects Program, OMNI-Net= Ukraine Birth Defects Program, RENAC= National Network of Congenital Anomalies of Argentina, RYVEMCE=Mexican Registry and Epidemiological Surveillance of External Congenital Malformations, TRoCA= Tabriz Registry of Congenital Anomalies.

**Supplementary Table 3. Survival for liveborn infants with esophageal atresia and an additional major anomaly, born 1980-2015, International Clearinghouse for Birth Defects Surveillance and Research**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Survival to 1 month** |  |  | **Survival to 1 year** |  |  | **Survival to 5 years** |  |  |
| Program | Cohort | N infants | % Survival | 95% CI | Cohort | N infants | % Survival | 95% CI | Cohort | N infants | % Survival | 95% CI |
| **Europe** |  |  |  |  |  |  |  |  |  |  |  |  |
| France, Paris† | 1981-2014 | 59 | 83.1 | 71.0-91.6 |  |  |  |  |  |  |  |  |
| Germany, Saxony‐Anhalt | 1980-2014 | 46 | 93.5 | 82.1-98.6 | 1980-2014 | 46 | 91.3 | 79.2-97.6 |  |  |  |  |
| Italy, Lombardy | 2003-2012 | 27 | 92.6 | 75.7-99.1 | 2003-2012 | 27 | 88.9 | 70.8-97.6 | 2003-2010 | 22 | 90.9 | 70.8-98.9 |
| Malta | 1995-2013 | 7 | 100.0 | 59.0-100.0 | 1995-2013 | 7 | 85.7 | 42.1-99.6 |  |  |  |  |
| Northern Netherlands | 1981-2014 | 29 | 62.1 | 42.3-79.3 | 1981-2014 | 29 | 62.1 | 42.3-79.3 |  |  |  |  |
| Slovak Republic † | 2001-2014 | 58 | 75.9 | 62.8-86.1 |  |  |  |  |  |  |  |  |
| Spain, ECEMC † | 1980-2013 | 193 | 83.4 | 77.4-88.4 |  |  |  |  |  |  |  |  |
| Sweden | 1980-2014 | 340 | 88.8 | 85.0-92.0 | 1980-2014 | 340 | 85.3 | 81.1-88.9 | 1980-2010 | 282 | 79.4 | 74.2-84.0 |
| Ukraine, OMNI-Net | 2000-2013 | 35 | 57.1 | 39.4-73.7 | 2000-2013 | 35 | 40.0 | 23.9-57.9 |  |  |  |  |
| Wales, CARIS | 1998-2014 | 63 | 92.1 | 82.4-97.4 | 1998-2014 | 63 | 85.7 | 74.6-93.3 | 1998-2009 | 48 | 79.2 | 65.0-89.5 |
| **Asia** |  |  |  |  |  |  |  |  |  |  |  |  |
| Israel † | 2000-2014 | 7 | 85.7 | 42.1-99.6 | 2000-2013 | 7 | 71.4 | 29.0-96.3 | 2000-2009 | 3 | 66.7 | 9.4-99.2 |
| **North America** |  |  |  |  |  |  |  |  |  |  |  |  |
| Mexico, RYVEMCE † | 1980-2013 | 101 | 82.2 | 73.3-89.1 |  |  |  |  |  |  |  |  |
| USA, Utah BDN | 1999-2012 | 110 | 91.8 | 85.0-96.2 | 1999-2012 | 110 | 84.5 | 76.4-90.7 | 1999-2010 | 101 | 83.2 | 74.4-89.9 |
| **South America** |  |  |  |  |  |  |  |  |  |  |  |  |
| Argentina, RENAC † ‡ | 2009-2014 | 167 | 56.3 | 48.4-63.9 |  |  |  |  |  |  |  |  |
| Colombia, Bogotá † ‡ | 2001-2014 | 22 | 95.5 | 77.2-99.9 | 2001-2014 | 22 | 95.5 | 77.2-99.9 |  |  |  |  |
| South America, ECLAMC † ‡ | 1995-2014 | 592 | 52.9 | 48.8-57.0 |  |  |  |  |  |  |  |  |
| **All** |  | **1856** | **72.5** | **70.4-74.5** |  | **686** | **82.7** | **79.6-85.4** |  | **456** | **80.7** | **76.8-84.2** |
| **Programs with survival data to 1 year (n=10)** |  | **686** | **87.6** | **84.9-90.0** |  | **686** | **82.7** | **79.6-85.4** |  | **§** |  |  |
| **Programs and cohorts with survival data to 5 years (n=3)** |  | **456** | **89.7** | **86.5-92.3** |  | **456** | **83.3** | **79.6-86.6** |  | **456** | **80.7** | **76.8-84.2** |

† Survival to hospital discharge

‡ Some data overlap between Argentina, RENAC; Colombia, Bogotá and Cali, with South America, ECLAMC. Colombia, Bogotá: 2001-2010, all data included in South America ECLAMC, 2011-2014 data from only 1 hospital included in South America ECLAMC. Colombia, Cali: 2011-2014 only data from 1 hospital included in South America ECLAMC. Some data from Argentina RENAC for 2009-2014 may overlap with South America, ECLAMC data.

§ Analysis not possible

CI=Confidence Interval, BDES= Birth Defects Epidemiology and Surveillance Branch, BDN= Birth Defect Network, CARIS= Congenital Anomaly Register & Information Services, ECEMC= Spanish Collaborative Study of Congenital Malformations, ECLAMC= South America Latin American Collaborative Study of Congenital Malformations, MACDP= Metropolitan Atlanta Congenital Defects Program, OMNI-Net= Ukraine Birth Defects Program, RENAC= National Network of Congenital Anomalies of Argentina, RYVEMCE=Mexican Registry and Epidemiological Surveillance of External Congenital Malformations, TRoCA= Tabriz Registry of Congenital Anomalies.

**Supplementary Table 4. Trends in survival to one month and one year, for liveborn infants with esophageal atresia, by type of EA and decade of birth, 1980s to 2010s, International Clearinghouse for Birth Defects Surveillance and Research †**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Survival to one month** **(n=6 programs)** |  |  | **Survival to one year** **(n= 3 programs)** |
| **Decade of birth** | N infants | % Survival | 95% CI |  |  | N infants | % Survival | 95% CI |
| **Isolated EA** |  |  |  |  |  |
| 1980s ‡ | 249 | 92.8 | 88.8-95.7 ¶ †† |  |  | 130 | 91.5 | 85.4-95.7 ¶ |
| 1990s ‡ | 384 | 96.4 | 94.0-98.0 †† |  |  | 207 | 95.2 | 91.3-97.7 |
| 2000s ‡ | 332 | 97.6 | 95.3-99.0 |  |  | 168 | 97.6 | 94.0-99.3 |
| 2010s § | 147 | 99.3 | 96.3-100.0 ¶  |  |  | 92 | 98.9 | 94.1-100.0 ¶ |
| **EA and additional major anomaly** |  |  |  |  |  |
| 1980s ‡ | 123 | 70.7 | 61.9-78.6 ¶ , †† |  |  | 58 | 70.7 | 57.3-81.9 ¶ |
| 1990s ‡ | 257 | 83.3 | 78.1-87.6 †† , ‡‡ |  |  | 128 | 78.9 | 70.8-85.6 |
| 2000s ‡ | 272 | 91.9 | 88.0-94.9 ‡‡ |  |  | 145 | 86.9 | 80.3-91.9 |
| 2010s § | 116 | 92.2 | 85.8-96.4 ¶ |  |  | 84 | 85.7 | 76.4-92.4 ¶ |
| **EA and a chromosomal or genetic syndrome diagnosis** |  |  |  |  |  |
| 1980s ‡ | 53 | 49.1 | 35.1-63.2 |  |  | 30 | 36.7 | 19.9-56.1 |
| 1990s ‡ | 69 | 65.2 | 52.8-76.3 |  |  | 38 | 52.6 | 35.8-69.0 |
| 2000s ‡ | 72 | 58.3 | 46.1-69.8 |  |  | 47 | 46.8 | 32.1-61.9 |
| 2010s § | 36 | 69.4 | 51.9-83.7 |  |  | 23 | 60.9 | 38.5-80.3 |

EA = esophageal atresia; CI=confidence interval

† Programs with data spanning 1980s-2010s. Only one program reported survival to 5 years for infants by type of EA from 1980s to 2010s. Programs with one-month survival: France, Paris; Germany Saxony-Anhalt, Mexico, RYMEMCE; Northern Netherlands; Spain; Sweden Programs with one-year survival: Germany Saxony-Anhalt; Northern Netherlands; Sweden.

‡ at least 5 years of data for each decade

§ data to 2013 (4 years data) or 2014

¶, ††, ‡‡ difference in survival between these decades (p<0.05)

**Supplementary Table 5. Proportion of cases reported from ETOPFA and stillbirths by decade, 1980s to 2010s, International Clearinghouse for Birth Defects Surveillance and Research†**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Decade of birth** | **N programs** | **N cases** | **% ETOPFA** | **% stillborn** | **% live born** |
| 1980s | 4 | 169 | 6.5 | 11.2 | 82.2 |
| 1990s | 12 | 685 | 4.4 | 3.1 | 92.6 |
| 2000s | 16 | 2153 | 3.5 | 1.2 | 95.3 |
| 2010s | 16 | 995 | 2.7 | 2.0 | 95.3 |

ETOPFA = elective termination of pregnancy for fetal anomaly

† Data reported from programs recording ETOPFA and stillbirths in that decade