**SUPPLEMENTARY ONLINE FILES**

**Supplementary Table S1: Characteristics of children in the dataset by ethnic group (n=5350)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Ethnic Group** | **White** | **British Asian** | **Black British** | **All Other** | **Ethnicity not stated** |
|  | **N=3968** | **N=604** | **N=240** | **N=320** | **N=218** |
|  | **N;** % (95% CI) | **N;** % (95% CI) | **N;** % (95% CI) | **N;** % (95% CI) | **N;** % (95% CI) |
| **INDIVIDUAL CHARACTERISTICS** |  |
| Male (n=2940)\* | **2207;** 55.6 (54.0, 57.1) | **332;** 55.0 (50.9,59.0) | **113;** 47.1 (40.9,53.4) | **166;** 51.9 (46.4,57.3) | **122;** 56.0 (49.3,62.4) |
| Preterm (n=534)\* | **391;** 9.9(9.0, 10.8) | **64;** 10.6 (8.4,13.3) | **25;** 10.4(7.2,14.9) | **35;** 10.9(8.0,14.8) | **19;** 8.7 (5.7,13.2) |
| **NON-CARDIAC CLINICAL DIAGNOSES** |  |
| Non-cardiac congenital anomalies (n=1125) | **823;** 20.7 (19.5, 22.0) | **132;** 21.9 (18.7, 25.3) | **60;** 25.0 (19.9, 30.8) | **83;** 25.9 (21.4, 31.0) | **27**§**;** 12.4 (8.7, 17.4) |
| Preoperative acquired comorbidities (n=354) | **253;** 6.4 (5.7, 7.2) | **45;** 7.5 (5.6, 9.8) | **23;** 9.6 (6.5, 14.0) | **24;** 7.5 (5.1, 10.9) | **9**§**;** 4.1 (2.2, 7.7) |
| Neuro-developmental problems (n=212) | **135;** 3.4 (2.9, 4.0) | **43;** 7.1 (5.3, 9.5) | **14;** 5.8 (3.5, 9.6) | **15;** 4.7 (2.9, 7.6) | **5**§**;** 2.3 (1.0, 5.3) |
| **CARE-RELATED FACTORS** |  |
| Antenatally diagnosed (n=1549)\* | **1113;** 28.0 (26.7, 29.5) | **178;** 29.5 (26.0, 33.2) | **85;** 35.4 (29.6, 41.7) | **89;** 27.8 (23.2, 33.0) | **84**§**;** 38.5 (32.3, 45.1) |
| Preoperative clinical deterioration (n=1014) | **732;** 18.4 (17.3, 19.7) | **118;** 19.5 (16.6, 22.9) | **51;** 21.3 (16.5, 26.9) | **72;** 22.5 (18.3, 27.4) | **41**§**;** 18.8 (14.2, 24.5) |

**Supplementary Table S1 (continued): Characteristics of children in the dataset by ethnic group (n=5350)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Ethnic Group** | **White** | **British Asian** | **Black British** | **All Other** | **Ethnicity not stated** |
|  | **N=3968** | **N=604** | **N=240** | **N=320** | **N=218** |
|  | **N;** % (95% CI) | **N;** % (95% CI) | **N;** % (95% CI) | **N;** % (95% CI) | **N;** % (95% CI) |
| **PRIMARY CARDIAC DIAGNOSIS** |  |
| HLH  | **231;** 5.8 (*5.1,**6.6)* | **30;** 5.0 (3.4, 7.0) | **22;** 9.2 **(**5.8,13.5) | **17;** 5.3 (3.1, 8.4) | **16;** 7.3 (4.3, 11.6) |
| UVH  | **193;** 4.9 **(***4.2,**5.6)* | **41;** 6.8 (4.9, 9.1) | **16;** 6.7 (3.9, 10.6) | **11;** 3.4 (1.7, 6.1) | **11;** 5.0 (2.5, 8.8) |
| CAT  | **72;** 1.8 (1.4, 2.3) | **8;** 1.3 (0.6, 2.6) | **<5** | **9;** 2.8 (1.3, 5.3) | **<5** |
| TGA with VSD  | **354;** 8.9 (8.0, 9.9) | **44;** 7.3 (5.3, 9.7) | **11;** 4.6 (2.3, 8.1) | **30;** 9.4 (6.4, 13.1) | **16;** 7.3 (4.3, 11.6) |
| IAA  | **51;** 1.3 (1.0, 1.7) | **5;** 0.8 (0.3, 1.9) | **<5** | **<5** | **<5** |
| TGA + IVS | **128;** 3.2 (2.7, 3.8) | **27;** 0.4 (3.0, 6.4) | **<5** | **13;** 4.1 (2.2, 6.8) | **8;** 3.7 (1.6, 7.1) |
| PA + IVS  | **104;** 2.6 (2.1, 3.2) | **22;** 3.6 (2.3, 5.5) | **<5** | **6;** 1.9 (0.7, 4.0) | **<5** |
| PA + VSD  | **129;** 3.3 (2.7, 3.9) | **23;** 3.8 (2.4, 5.6) | **9;** 3.7 (1.7, 7.0) | **17;** 5.3 (3.1, 8.4) | **<5** |
| Misc. primary cardiac diagnoses | **222;** 5.6 (4.9, 6.4) | **33;** 5.5 (3.8, 7.6) | **11;** 4.6 (2.3, 8.1) | **13;** 4.1 (2.2, 6.8) | **8;** 3.7 (1.6, 7.1) |
| Complete AVSD  | **360;** 9.1 (8.2, 10.0) | **36;** 6.0 (4.2, 8.2) | **37;** 15.4 (11.1, 20.6) | **26;** 8.1 (5.4, 11.7) | **20;** 9.2 (5.7, 13.8) |
| Fallot’s tetralogy  | **416;** 10.5 (9.5, 11.5) | **80;** 13.2 (10.6, 16.2) | **16;** 6.7 (3.9, 10.6) | **29;** 9.1 (6.2, 12.8) | **20;** 9.2 (5.7, 13.8) |
| Aortic stenosis  | **106;** 2.7 (2.2, 3.2) | **8;** 1.3 (0.6, 2.6) | **<5** | **<5** | **<5** |
| Abnormal tricuspid valve | **35;** 0.9 (0.7, 1.3) | **5;** 0.8 (0.3, 1.9) | **<5** | **<5** | **<5** |
| Abnormal mitral valve  | **38;** 1.0 (0.7, 1.3) | **7;** 1.2 (0.5, 2.4) | **<5** | **7;** 2.2 (0.9, 4.5) | **<5** |
| TAPVC  | **90;** 2.3 (1.8, 2.8) | **20;** 3.3 (2.0, 5.1) | **5;** 2.1 (0.7, 4.8) | **7;** 2.2 (0.9, 4.5) | **<5** |
| Aortic arch obstruction  | **467;** 11.7 (10.7, 12.8) | **54;** 8.9 (6.8, 11.5) | **19;** 7.9 (4.8, 12.1) | **23;** 7.2 (4.6, 10.6) | **31;** 14.2 (9.9, 19.6) |
| PS  | **143;** 3.6 (3.0, 4.2) | **12;** 2.0 (1.0, 3.4) | **7;** 2.9 (1.2 5.9) | **10;** 3.1 (1.5, 5.7) | **5;** 2.3 (0.7, 5.3) |
| VSD  | **661;** 16.7 (15.5, 17.9) | **111;** 18.4 (15.4, 21.7) | **55;** 22.9 (17.8, 28.7) | **66;** 20.6 (16.3, 25.5) | **40;** 18.3 (13.4, 24.1) |
| ASD  | **40;** 1.0 (0.7, 1.4) | **12;** 2.0 (1.0, 3.4) | **<5** | **12;** 3.7 (2.0, 6.5) | **6;** 2.8 (1.0, 5.9) |
| PDA | **74;** 1.9 (1.5, 2.3) | **19;** 3.1 (1.9, 4.9) | **6;** 0.2 (0.9, 5.4) | **7;** 2.2 (0.9, 4.5) | **7;** 3.2 (1.3, 6.5) |
| Misc. congenital terms | **41;** 1.0 (0.7, 1.4) | **<5** | **<5** | **<5** | **6;** 2.8 (1.0, 5.9) |

**Supplementary Table S1 (continued): Characteristics of children in the dataset by ethnic group (n=5350)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Ethnic Group** | **White** | **British Asian** | **Black British** | **All Other** | **Ethnicity not stated** |
|  | **N;** % (95% CI) | **N;** % (95% CI) | **N;** % (95% CI) | **N;** % (95% CI) | **N;** % (95% CI) |
| **SOCIOECONOMIC DEPRIVATION (Index of Multiple Deprivation) QUINTILE** †  |  |
| **N** | **N=3718** | **N=592** | **N=238** | **N=312** | **N=202** |
| 1: most deprived | **919;** 24.7 (23.4, 26.1) | **304;** 51.4 (47.3, 55.4) | **127;** 53.4 (47.0, 59.6) | **138;** 44.2 (38.8, 49.8) | **52;** 25.7 (20.2, 32.2) |
| 2 | **788;** 21.2 (19.9, 22.5) | **141;** 23.8 (20.6, 27.4) | **68;** 28.6 (23.2, 34.6) | **54;** 17.3 (13.5, 21.9) | **46;** 22.8 (17.5, 29.0) |
| 3 | **694;** 8.7 (17.4, 20.0) | **73;** 12.3 (9.9, 15.2) | **26;** 10.9 (7.6, 15.5) | **53;** 17.0 (13.2, 21.5) | **37;** 18.3 (13.6, 24.2) |
| 4 | **641;** 17.2 (16.1, 18.5) | **49;** 8.3 (6.3, 10.8) | **10;** 4.2 (2.3, 7.6) | **39;** 12.5 (9.3, 16.6) | **30;** 14.9 (10.6, 20.4) |
| 5: least deprived  | **676;** 18.2 (17.0, 19.5) | **25;** 4.2 (2.9, 6.2) | **7;** 2.9 (1.4, 5.9) | **28;** 9.0 (6.3, 12.7) | **37;** 18.3 (13.6, 24.2) |
| **WEIGHT Z-SCORE AT INDEX PROCEDURE**‡ |  |
| **N** | **N=3592** | **N=512** | **N=214** | **N=281** | **N=192** |
| > -2SD  | **2088;** 58.1 (56.5, 59.7) | **275;** 53.7 (49.4, 58.0) | **106;** 49.5 (42.9, 56.2) | **150;** 53.4 (47.5, 59.1) | **115;** 59.9 (52.8, 66.6) |
| -2 to -4SD | **1198;** 33.4 (31.8, 34.9) | **192;** 37.5 (33.4, 41.8) | **88;** 41.1 (34.7, 47.8) | **103;** 36.7 (31.2, 42.4) | **60;** 31.3 (25.1, 38.1) |
| < -4SD | **306;** 8.5 (7.6, 9.5) | **45;** 8.8 (6.6, 11.6) | **20;** 9.3 (6.1, 14.0) | **28;** 10.0 (7.0, 14.0) | **17;** 8.9 (5.6, 13.7) |
| **AGE CATEGORIES AT INDEX PROCEDURE** |  |
| **N** | **N=3968** | **N=604** | **N=240** | **N=320** | **N=218** |
| > 3 months | **1632;** 41.1 (39.6, 42.7) | **248;** 41.1 (37.2, 45.0) | **121;** 50.4 (44.1, 56.7) | **131;** 40.9 (35.7, 46.4) | **77;** 35.3 (29.3, 41.9) |
| 1-2 months | **717;** 18.1 (16.9, 19.3) | **100;** 16.6 (13.8, 19.7) | **39;** 16.2 (12.1, 21.4) | **75;** 23.4 (19.1, 28.4) | **39;** 17.9 (13.4, 23.5) |
| 10-30 days | **582;** 14.7 (13.6, 15.8) | **108;** 17.9 (15.0, 21.1) | **25;** 10.4 (7.2, 14.9) | **38;** 11.9 (8.8, 15.9) | **36;** 16.5 (12.2, 22.0) |
| <10 days | **1037;** 26.1 (24.8, 27.5) | **148;** 24.5 **(**21.2,28.1) | **55;** 22.9 (18.1, 28.6) | **76;** 23.8 (19.4, 28.7) | **66;** 30.3 (24.6, 36.7) |

**Notes:** 95%CI=95% confidence intervals using binomial exact method;

\*missing data: sex (n=2), gestation (n= 1681), antenatal diagnosis (n=278);

† excludes 288 children with no IMD data (250 White, 22 Asian/Black/Other, 16 no stated ethnicity);

‡ excludes 559 children without weight z-score (376 White, 92 British Asian, 26 Black British, 39 Other, 26 no recorded ethnicity);

**Misc. (miscellaneous)** **primary cardiac diagnoses** are a group of very rare but severe primary diagnoses; **Misc. (miscellaneous) congenital terms** comprise structural cardiac defects of varying severity, that are not recognized as distinct primary diagnoses. **Isolated subaortic stenosis** and **aortic regurgitation** are not shown as there were ≤10 children per subgroup.

**Abbreviations: HLH**=hypoplastic left heart; **UVH**=functionally univentricular heart; **CAT**=common arterial trunk; **TGA**=transposition of the great arteries; **IVS** intact ventricular septum; **DORV**=double outlet right ventricle; **PA**=pulmonary atresia; **AVSD**=atrioventricular septal defect; **TAPVC**= totally anomalous pulmonary venous connection; **PS**=pulmonary stenosis; **VSD**=ventricular septal defect; **ASD**=atrial septal defect; **PDA**=persistent ductus arteriosus;

**Supplementary Table S2. Mortality risk during the first year of life (univariable)**

|  |  |  |
| --- | --- | --- |
|  | ***Primary outcome*** | ***Secondary outcomes: mortality during/after index hospital admission*** |
| *Died within 1 year of birth* | *Died in-hospital (index admission)* | *Died (unexpected death)* | *Died (during planned hospital readmission)* |
| **RR** | *95%CI* | **RR** | *95%CI* | **RR** | *95%CI* | **RR** | *95%CI* |
| **Ethnic** group (ref: White; missing n=218) |
| British Asian | **1.65** | ***(1.29,*** | ***2.10)*** | **1.60** | ***(1.11,*** | ***2.29)*** | 1.54 | *(0.97,* | *2.43)* | **2.01** | ***(1.14,*** | ***3.56)*** |
| Black British | 1.44 | *(0.98,* | *2.12)* | 1.61 | *(0.94,* | *2.74)* | 1.23 | *(0.58,* | *2.62)* | 1.35 | *(0.49,* | *3.71)* |
| All Other (Chinese, Mixed, Other) | **1.73** | ***(1.27,*** | ***2.36)*** | **1.72** | ***(1.09,*** | ***2.71)*** | **1.85** | ***(1.07,*** | ***3.20)*** | 1.52 | *(0.66,* | *3.52)* |
| **Sex** (ref: boys; missing n=2) |
| Girls | 1.01 | *(0.84,* | *1.20)* | 1.07 | *(0.83,* | *1.38)* | 0.95 | *(0.69,* | *1.31)* | 0.94 | *(0.60,* | *1.47)* |
| **Deprivation** (ref: quintile 5 = least deprived; missing n=288) |
| Quintile 4 | 1.21 | *(0.86,* | *1.72)* | 1.01 | *(0.61,* | *1.67)* | 1.41 | *(0.73,* | *2.71)* | 1.56 | *(0.68,* | *3.59)* |
| Quintile 3 | 0.99 | *(0.69,* | *1.42)* | 0.88 | *(0.53,* | *1.45)* | 1.40 | *(0.74,* | *2.65)* | 0.68 | *(0.25,* | *1.82)* |
| Quintile 2 | **1.54** | ***(1.13,*** | ***2.11)*** | **1.58** | ***(1.03,*** | ***2.42)*** | 1.50 | *(0.82,* | *2.76)* | 1.49 | *(0.68,* | *3.27)* |
| Quintile 1 | 1.30 | *(0.96,* | *1.76)* | 1.18 | *(0.77,* | *1.80)* | 1.51 | *(0.84,* | *2.68)* | 1.34 | *(0.63,* | *2.87)* |
| **Birth gestation** (ref:term birth ≥37 completed weeks gestation; missing n=1681) |
| Preterm (< 37 weeks) | 1.33 | *(0.94,* | *1.90)* | *Too few events* | **1.51** | ***(0.98,*** | ***2.33)*** | 1.02 | *(0.53,* | *2.00)* |
| **Prenatal diagnosis** (ref: not prenatally diagnosed; missing n=278) |
| Prenatal diagnosis | **2.85** | ***(2.37,*** | ***3.42)*** | **3.27** | ***(2.50,*** | ***4.27)*** | **1.91** | ***(1.37,*** | ***2.66)*** | **4.11** | ***(2.56,*** | ***6.61)*** |
| **Non-cardiac comorbidities and procedure-related clinical status** (ref: no comorbidities; nil missing) |
| Congenital anomalies | **1.56** | ***(1.29,*** | ***1.90)*** | 1.23 | *(0.92,* | *1.65)* | **1.96** | ***(1.40,*** | ***2.74)*** | **1.95** | ***(1.22,*** | ***3.12)*** |
| Acquired comorbidities | **1.65** | ***(1.24,*** | ***2.19)*** | **1.59** | ***(1.05,*** | ***2.42)*** | **1.98** | ***(1.23,*** | ***3.21)*** | 1.21 | *(0.53,* | *2.77)* |
| Neurodevelopment problem | **1.55** | ***(1.08,*** | ***2.23)*** | 0.66 | *(0.30,* | *1.46)* | **1.97** | ***(1.08,*** | ***3.59)*** | **3.67** | ***(1.92,*** | ***7.04)*** |
| Pre-procedure deterioration | **1.78** | ***(1.47,*** | ***2.16)*** | **1.64** | ***(1.24,*** | ***2.18)*** | **2.09** | ***(1.49,*** | ***2.94)*** | 1.63 | *(0.99,* | *2.69)* |
| **Admission for first intervention** (per 1 unit increase; weight z-score missing n=559) |
| Age (per week) | **0.94** | ***(0.93,*** | ***0.95)*** | **0.95** | ***(0.94,*** | ***0.97)*** | **0.93** | ***(0.91,*** | ***0.95)*** | **0.91** | ***(0.89,*** | ***0.94)*** |
| Weight z-score | 1.07 | *(0.99,* | *1.16)* | *Too few events* | 1.04 | *(0.94,* | *1.15)* | 1.13 | *(0.98,* | *1.30)* |

|  |
| --- |
| **Primary cardiac diagnosis** (ref: VSD = ventricular septal defect; nil missing) |
| Hypoplastic left heart  | **10.49** | ***(7.09,*** | ***15.51)*** | **14.76** | ***(7.58,*** | ***28.76)*** | **6.33** | ***(3.40,*** | ***11.78)*** | **13.58** | ***(5.21,*** | ***35.42)*** |
| Functionally univentricular heart  | **7.45** | ***(4.90,*** | ***11.32)*** | **10.29** | ***(5.10,*** | ***22.78)*** | **4.16** | ***(2.08,*** | ***8.34)*** | **10.98** | ***(4.06,*** | ***29.69)*** |
| Common arterial trunk  | **4.74** | ***(2.60,*** | ***8.66)*** | **9.82** | ***(4.19,*** | ***22.99)*** | 1.40 | *(0.32,* | *6.08)* | 3.93 | *(0.77,* | *19.98)* |
| TGA with VSD/DORV  | 1.41 | *(0.81,* | *2.47)* | **2.46** | ***(1.07,*** | ***5.65)*** | 0.73 | *(0.27,* | *2.02)* | 1.23 | *(0.30,* | *5.13)* |
| Interrupted aortic arch  | **4.45** | ***(2.20,*** | ***9.01)*** | **10.05** | ***(3.95,*** | ***25.53)*** | 2.05 | *(0.48,* | *8.83)* | *Too few events* |
| TGA with intact ventricular septum  | 1.25 | *(0.56,* | *2.81)* | 1.04 | *(0.23,* | *4.69)* | 1.85 | *(0.68,* | *5.08)* | *Too few events* |
| Pulmonary atresia + IVS | **5.55** | ***(3.33,*** | ***9.26)*** | **1.07** | ***(4.61,*** | ***21.96)*** | **3.84** | ***(1.64,*** | ***8.97)*** | 1.34 | *(0.16,* | *11.41)* |
| Pulmonary atresia + VSD  | **4.07** | ***(2.41,*** | ***6.86)*** | **8.20** | ***(3.78,*** | ***17.78)*** | **2.56** | ***(1.05,*** | ***6.26)*** | *Too few events* |
| Miscellaneous primary cardiac diagnoses | **2.58** | ***(1.52,*** | ***4.38)*** | **3.25** | ***(1.37,*** | ***7.73)*** | 1.63 | *(0.66,* | *3.99)* | **3.90** | ***(1.20,*** | ***12.69)*** |
| Complete AVSD  | **2.22** | ***(1.36,*** | ***3.61)*** | **2.53** | ***(1.12,*** | ***5.73)*** | **2.09** | ***(1.02,*** | ***4.29)*** | 1.95 | *(0.57,* | *6.70)* |
| Fallot’s tetralogy/ DORV  | 1.09 | *(0.62,* | *1.92)* | 2.16 | *(0.95,* | *4.90)* | 0.48 | *(0.16,* | *1.44)* | 0.66 | *(0.13,* | *3.42)* |
| Aortic valve stenosis  | **5.01** | ***(2.90,*** | ***8.66)*** | **8.41** | ***(3.65,*** | ***19.39)*** | 2.18 | *(0.73,* | *6.53)* | **6.12** | ***(1.67,*** | ***22.48)*** |
| Tricuspid valve abnormality  | **4.11** | ***(1.79,*** | ***9.41)*** | **7.94** | ***(2.59,*** | ***24.38)*** | 2.84 | *(0.66,* | *12.12)* | *Too few events* |
| Mitral valve abnormality | **4.91** | ***(2.44,*** | ***9.88)*** | **7.91** | ***(2.79,*** | ***22.39)*** | **3.39** | ***(1.00,*** | ***11.46)*** | 3.16 | *(0.38,* | *26.64)* |
| Totally Anomalous Pulmonary Venous Connection  | 1.29 | *(0.51,* | *3.26)* | 0.75 | *(0.10,* | *5.78)* | 1.07 | *(0.25,* | *4.64)* | 2.99 | *(0.59,* | *15.23)* |
| Aortic arch obstruction  | 1.30 | *(0.76,* | *2.21)* | 1.41 | *(0.58,* | *3.46)* | 1.35 | *(0.63,* | *2.89)* | 0.94 | *(0.23,* | *3.93)* |
| Pulmonary stenosis  | 0.55 | *(0.17,* | *1.77)* | 1.05 | *(0.23,* | *4.77)* | *Too few events* | 1.05 | *(0.12,* | *8.97)* |
| Subaortic stenosis | *Too few events* | *Too few events* | *Too few events* | *Too few events* |
| Aortic regurgitation | *Too few events* | *Too few events* | *Too few events* | *Too few events* |
| ASD  | **3.04** | ***(1.38,*** | ***6.71)*** | **6.30** | ***(2.21,*** | ***17.96)*** | 1.80 | *(0.42,* | *7.78)* | *Too few events* |
| PDA  | 1.71 | *(0.72,* | *4.03)* | 1.65 | *(0.37,* | *7.44)* | 1.77 | *(0.52,* | *6.06)* | 1.65 | *(0.19,* | *14.01)* |
| Miscellaneous congenital terms | 1.69 | *(0.53,* | *5.39)* | *Too few events* | 2.34 | *(0.54,* | *10.04)* | 3.27 | *(0.39,* | *27.56)* |

**Key:** Results from univariable complete-case models. Bold text indicates 95% confidence intervals do not include 1; rates for subaortic stenosis and aortic regurgitation not shown as sample size <10 children; **Abbreviations:** HLH hypoplastic left heart; UVH functionally univentricular heart; PA pulmonary atresia; IVS intact ventricular septum; DORV double outlet right ventricle; VSD ventricular septal defect

**Supplementary Table S3. Death during planned readmission (multivariable analysis)**

|  |
| --- |
| **OUTCOME: Unexpected death in the community or after urgent readmission** |
|  | Relative Risk (RR) | 95%CI | p-value |
| **Ethnicity** (ref: White) |
| **British Asian** | **1.86** | **(1.02,** | **3.39)** | **0.043** |
| Black British | 1.11 | (0.41, | 3.03) | 0.833 |
| All Other | 1.58 | (0.68, | 3.63) | 0.285 |
| **Sex** (ref: boys) |
| Girls | 1.03 | (0.65, | 1.64) | 0.890 |
| **Area deprivation (IMD) quintile** (ref: Quintile 5 = least deprived) |
| Quintile 4 | 1.81 | (0.75, | 4.36) | 0.184 |
| Quintile 3 | 0.85 | (0.31, | 2.34) | 0.752 |
| Quintile 2 | 1.37 | (0.58, | 3.23) | 0.471 |
| Quintile 1: most deprived | 1.02 | (0.45, | 2.35) | 0.954 |
| **Birth gestation** (ref: term birth ≥37 weeks gestation) |
| Preterm (<37 weeks) | 1.04 | (0.51, | 2.11) | 0.917 |
| **Prenatal diagnosis** (ref: not prenatally diagnosed) |
| **Prenatal diagnosis** | **1.84** | **(1.05,** | **3.25)** | **0.034** |
| **Non-cardiac comorbidities & procedure-related clinical status** (ref: no comorbidities) |
| **Congenital anomalies** | **2.68** | **(1.60,** | **4.49)** | **<0.001** |
| Acquired comorbidities | 1.04 | (0.44, | 2.48) | 0.924 |
| Neurodevelopmental problems | 1.75 | (0.90, | 3.43) | 0.101 |
| Pre-procedure deterioration | 1.21 | (0.68, | 2.18) | 0.518 |
| **Index admission**  |
| **Age** (per week increase) | **0.93** | **(0.89,** | **0.97)** | **<0.001** |
| **Weight z-score** | 0.92 | (0.74, | 1.13) | 0.405 |
| **Primary cardiac diagnoses** (ref: VSD) |
| **Hypoplastic left heart syndrome**  | **4.61** | **(1.47,** | **14.51)** | **0.009** |
| **Functionally univentricular heart**  | **4.41** | **(1.35,** | **14.45)** | **0.014** |
| Common arterial trunk  | 1.51 | (0.27, | 8.43) | 0.642 |
| TGA with VSD/DORV-TGA type  | 0.66 | (0.14, | 3.15) | 0.606 |
| Interrupted aortic arch  | *Too few events* |
| TGA + IVS  | *Too few events* |
| Pulmonary atresia + IVS | 0.51 | (0.06, | 4.45) | 0.539 |
| Pulmonary atresia + VSD  | *Too few events* |
| Miscellaneous primary cardiac diagnoses | 2.44 | (0.75, | 7.91) | 0.138 |
| Complete AVSD  | 1.23 | (0.37, | 4.16) | 0.736 |
| Fallot’s tetralogy/ DORV-Fallot type  | 0.72 | (0.15, | 3.48) | 0.681 |
| Aortic valve stenosis (isolated)  | 3.89 | (0.91, | 16.63) | 0.067 |
| Tricuspid valve abnormality  | *Too few events* |
| Mitral valve abnormality | 3.32 | (0.40, | 27.73) | 0.268 |
| TAPVC  | 1.99 | (0.38, | 10.49) | 0.417 |
| Aortic arch obstruction  | 0.51 | (0.12, | 2.26) | 0.377 |
| Pulmonary stenosis | 0.99 | (0.12, | 8.33) | 0.992 |
| ASD | *Too few events* |
| PDA | 1.43 | (0.17, | 12.15) | 0.745 |
| Miscellaneous congenital terms | *Too few events* |

**Key:** Results obtained from multivariable Poisson model including 5132 infants and using 20 imputed datasets. TAPVC Totally Anomalous Pulmonary Venous Connection; IVS intact ventricular septum; TGA transposition of the great arteries; DORV double outlet right ventricle; ASD/VSD atrial/ventricular septal defect; AVSD atrioventricular septal defect; PDA persistent ductus arteriosus. Bold text indicates significant result at p<0.05.

**Supplementary Table S4. Unexpected death following discharge (multivariable analysis)**

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| --- |
| **OUTCOME: Unexpected death in the community or after urgent readmission** |
|  | Relative Risk (RR) | 95%CI | p-value |
| **Ethnicity** (ref: White) |
| British Asian | 1.29 | (0.80, | 2.10) | 0.296 |
| Black British | 1.03 | (0.49, | 2.16) | 0.939 |
| All Other | 1.63 | (0.93, | 2.85) | 0.086 |
| **Sex** (ref: boys) |
| Girls | 0.99 | (0.71, | 1.38) | 0.956 |
| **Area deprivation (IMD) quintile** (ref: Quintile 5 = least deprived) |
| Quintile 4 | 1.44 | (0.73, | 2.84) | 0.296 |
| Quintile 3 | 1.60 | (0.81, | 3.15) | 0.173 |
| Quintile 2 | 1.32 | (0.69, | 2.53) | 0.395 |
| Quintile 1: most deprived | 1.37 | (0.72, | 2.60) | 0.335 |
| **Birth gestation** (ref: term birth ≥37 weeks gestation) |
| Preterm (<37 weeks) | 1.49 | (0.95, | 2.32) | 0.080 |
| **Prenatal diagnosis** (ref: not prenatally diagnosed) |
| Prenatal diagnosis | 1.07 | (0.72, | 1.59) | 0.733 |
| **Non-cardiac comorbidities & procedure-related clinical status** (ref: no comorbidities) |
| **Congenital anomalies** | **2.00** | **(1.35,** | **2.98)** | **0.001** |
| **Acquired comorbidities** | **1.92** | **(1.16,** | **3.17)** | **0.011** |
| Neurodevelopmental problems | 1.07 | (0.59, | 2.00) | 0.844 |
| **Pre-procedure deterioration** | **1.68** | **(1.17,** | **2.41)** | **0.005** |
| **Index admission**  |
| **Age** (per week increase) | **0.91** | **(0.88,** | **0.95)** | **0.001** |
| **Weight z-score** | **0.86** | **(0.74,** | **0.97)** | **0.020** |
| **Primary cardiac diagnoses** (ref: VSD) |
| **Hypoplastic left heart syndrome**  | **2.57** | **(1.19,** | **5.57)** | **0.016** |
| Functionally univentricular heart  | 1.93 | (0.86, | 4.33) | 0.112 |
| Common arterial trunk  | 0.61 | (0.13, | 2.78) | 0.525 |
| TGA with VSD/DORV-TGA type  | 0.39 | (0.13, | 1.19) | 0.098 |
| Interrupted aortic arch  | 0.71 | (0.15, | 3.28) | 0.657 |
| TGA + IVS  | 0.91 | (0.31, | 2.73) | 0.870 |
| Pulmonary atresia + IVS | 1.74 | (0.70, | 4.33) | 0.232 |
| Pulmonary atresia + VSD  | 1.34 | (0.52, | 3.49) | 0.543 |
| Miscellaneous primary cardiac diagnoses | 0.98 | (0.38, | 2.48) | 0.958 |
| Complete AVSD  | 1.44 | (0.69, | 3.06) | 0.330 |
| Fallot’s tetralogy/ DORV-Fallot type  | 0.63 | (0.21, | 1.85) | 0.398 |
| Aortic valve stenosis (isolated)  | 1.28 | (0.41, | 3.96) | 0.670 |
| Tricuspid valve abnormality  | 1.84 | (0.41, | 8.20) | 0.426 |
| Mitral valve abnormality | 2.94 | (0.91, | 9.53) | 0.073 |
| TAPVC  | 0.49 | (0.11, | 2.15) | 0.345 |
| Aortic arch obstruction  | 0.69 | (0.30, | 1.62) | 0.397 |
| Pulmonary stenosis  | *Too few events* |
| ASD | 1.89 | (0.46, | 7.70) | 0.375 |
| PDA | 1.47 | (0.44, | 4.93) | 0.534 |
| Miscellaneous congenital terms | 1.60 | (0.37, | 6.86) | 0.528 |

**Key:** Results obtained from multivariable Poisson model including 5132 infants and using 20 imputed datasets. TAPVC Totally Anomalous Pulmonary Venous Connection; IVS intact ventricular septum; TGA transposition of the great arteries; DORV double outlet right ventricle; ASD/VSD atrial/ventricular septal defect; AVSD atrioventricular septal defect; PDA persistent ductus arteriosus. Bold text indicates significant result at p<0.05.