



Edwards, E. M., Greenberg , L. T., Horbar, J. D., Gagliardi, L., Adams, M., Luyt, K., & et, A. (2023). Discharge Age and Weight for Very Preterm Infants in Six Countries: 2012-2020. *Neonatology*, 120(2), 208-216. <https://doi.org/10.1159/000528013>

Peer reviewed version

Link to published version (if available):  
[10.1159/000528013](https://doi.org/10.1159/000528013)

[Link to publication record in Explore Bristol Research](#)  
PDF-document

This is the accepted author manuscript (AAM). The final published version (version of record) is available online via Karger Publishers at <https://doi.org/10.1159/000528013> . Please refer to any applicable terms of use of the publisher

## University of Bristol - Explore Bristol Research

### General rights

This document is made available in accordance with publisher policies. Please cite only the published version using the reference above. Full terms of use are available:  
<http://www.bristol.ac.uk/red/research-policy/pure/user-guides/ebr-terms/>

## **Discharge Age and Weight for Very Preterm Infants in Six Countries: 2012 to 2020**

Erika M. Edwards<sup>1,2,3</sup>, Lucy T. Greenberg<sup>1,3</sup>, Jeffrey D. Horbar<sup>1,2</sup>, Luigi Gagliardi<sup>4</sup>, Mark Adams<sup>5</sup>, Angelika Berger<sup>6</sup>, Sara Leitao<sup>7</sup>, Karen Luyt<sup>8</sup>, Danielle E.Y. Ehret<sup>1,2</sup>, Jeannette A. Rogowski<sup>9</sup>

1. Vermont Oxford Network, Burlington, VT, USA
2. Department of Pediatrics, Robert Larner, MD, College of Medicine, University of Vermont, Burlington, VT, USA
3. Department of Mathematics and Statistics, College of Engineering and Mathematical Sciences, University of Vermont, Burlington, VT, USA
4. Division of Neonatology and Pediatrics, Ospedale Versilia, Viareggio, AUSL Toscana Nord Ovest, Pisa, Italy
5. Newborn Research, Department of Neonatology, University and University Hospital Zurich, Zurich, Switzerland
6. Department of Pediatrics, Division of Neonatology, Pediatric Intensive Care and Neuropediatrics, Comprehensive Center for Pediatrics, Medical University Vienna, Vienna, Austria
7. National Perinatal Epidemiology Centre, Department of Obstetrics and Gynecology, Cork University College Cork, Cork, Ireland
8. Bristol Medical School, University of Bristol, Bristol, United Kingdom
9. Department of Health Policy and Administration, The Pennsylvania State University, State College, PA, USA

Corresponding Author: Erika M. Edwards, PhD, MPH, Director of Data Science, Vermont Oxford Network, 33 Kilburn St, Burlington, VT 05401, USA, 802-865-4814 ext246, [eedwards@vtoxford.org](mailto:eedwards@vtoxford.org)

Short Title: Discharge Age and Weight in Six Countries

Tables: 3

Figures: 4

Word count: 2223

Keywords: neonatology; preterm infants; length of stay; utilization

## **Abstract**

*Background:* Postmenstrual age for surviving infants without congenital anomalies born at 24 to 29 weeks' gestational age from 2005 to 2018 in the United States increased 8 days, discharge weight increased 316 grams, and median discharge weight z-score increased 0.19 standard units. We asked whether increases were observed in other countries.

*Methods:* We evaluated postmenstrual age, weight, and weight z-score at discharge of surviving infants without congenital anomalies born at 24 to 29 weeks' gestational age admitted to Vermont Oxford Network member hospitals in Austria, Ireland, Italy, Switzerland, the United Kingdom, and the United States from 2012 to 2020.

*Results:* After adjustment, the median postmenstrual age at discharge increased significantly in Austria (3.6 days, 99% CI [1.0, 6.3]), Italy (4.0 days [2.3, 5.6]), and the United States (5.4 days [5.0, 5.8]). Median discharge weight increased significantly in Austria (181 grams, 99% CI [95, 267]), Ireland (234 [143, 325]), Italy (133 [83, 182]), and the United States (207 [194, 220]). Median discharge weight z-score increased in Ireland (0.24 standard units, 99% CI [0.12, 0.36]) and the United States (0.15 [0.13, 0.16]). Discharge on human milk increased in Italy, Switzerland, and the U.K. while going home on cardiorespiratory monitors decreased in Austria, Ireland and U.S. and going home on oxygen decreased in Ireland.

*Conclusions:* In this international cohort of neonatal intensive care units, postmenstrual discharge age and weight increased in some, but not all, countries. Processes of care at discharge did not change in conjunction with age and weight increases.

## **Introduction**

A recent study found that postmenstrual age at discharge increased 8 days, discharge weight increased 316 grams, and median discharge weight z-score increased 0.19 standard units, among surviving infants without congenital anomalies who were born at 24 to 29 weeks' gestational age from 2005 to 2018 and admitted to a Vermont Oxford Network member hospital in the United States (U.S.).[1] The authors observed increases within every week of gestational age with and without adjustment for infant characteristics. The increases in discharge age occurred despite morbidity decreases[2] and care process improvements[3] that would suggest that infants should be discharged sooner.

One hypothesis for the increase in discharge age was care process improvements such as resolving apnea of prematurity or establishing breastfeeding prior to discharge. Another hypothesis was misaligned financial incentives in the U.S. healthcare system that may encourage hospitals to keep infants hospitalized, although an accompanying commentary observed that financial incentives were stable during the study period, suggesting that probably was not the cause.[4]

This study replicates the original discharge age and weight methodology in Austria, Ireland, Italy, Switzerland, and the United Kingdom (U.K.) to ascertain if discharge age and weight increased in these countries. The idea stemmed from unpublished data in Italy where similar increases were observed. The goals of healthcare's quintuple aim are to improve population health, enhance care, reduce costs, reduce provider burnout, and advance health equity.[5]

Understanding whether postmenstrual discharge age and weight increased in countries other than the United States can help identify the role of neonatal care management and what could or should be done to help neonatology enhance care, reduce costs, and improve population health.

## Methods

Vermont Oxford Network (VON) is a voluntary worldwide community of practice with members in 38 countries dedicated to improving the quality, safety, and value of newborn care through a coordinated program of data-driven quality improvement, education, and research. The University of Vermont institutional review board determined that the use of data from the VON Research Repository for this analysis was not human subjects research.

VON member hospitals in Austria, Ireland, Italy, Switzerland, the U.K., and the U.S. contributed data on infants 401 to 1500 grams or 22 0/7 to 29 6/7 weeks' gestational age at birth who were inborn or transferred to the reporting hospital within 28 days from birth from January 1, 2012 to December 31, 2020. These countries were chosen because all or many NICUs participate in VON. The study started in 2012 due to adoption of a diagnosis-based group hospital payment system in Switzerland.[6] All data were collected by local staff using standardized definitions[7] which facilitated comparisons across countries.

All liveborn infants born from 24 0/7 to 29 6/7 weeks' gestation without congenital anomalies who survived to discharge home were included. Postmenstrual age at discharge was calculated as gestational age at birth in days plus total length of stay in days. Transferred infants' length of stay was tracked by the reporting hospitals until ultimate disposition. Discharge weight for infants was assessed for infants initially discharged home only because weight at ultimate disposition for transferred infants was not available. Z-scores for weight at birth and discharge up to 50 weeks postmenstrual age were calculated using the Fenton growth chart.[8] Z-scores for discharge after 50 weeks' postmenstrual age were calculated using the WHO Child Growth Standards with corrected age.[9] The proportions of infants who were discharged home on

oxygen, on cardiorespiratory monitors, or on any human milk were assessed to evaluate clinical factors that may influence discharge age.

The median postmenstrual age, weight, and z-score for weight at discharge were calculated using bootstrapping to estimate a 99% confidence interval for each country and year. Quantile regression adjusted for infant characteristics (gestational age in weeks, birth weight z-score, sex, multiple birth, one minute Apgar score, inborn/outborn) was used to estimate differences over time in median age, weight, and discharge weight z-score in each country. Logistic regression models with linear time trend were used to assess the significance of changes in discharges on human milk, on oxygen, and on cardiorespiratory monitors over the time period. All analyses used significance level  $\alpha=0.01$ . Sensitivity analyses were performed to assess the potential impact of the SARS-COV-2 pandemic by removing 2020.

Hospital characteristics were obtained from the VON annual member survey. Using responses to whether the hospital was required to transfer infants for assisted ventilation or whether one of eight surgeries was performed at the hospital (omphalocele repair, ventriculoperitoneal shunt, tracheoesophageal fistula and/or esophageal atresia repair, bowel resection and/or reanastomosis, meningomyelocele repair, PDA ligation, cardiac catheterization, or cardiac surgery requiring bypass), hospitals were divided into four groups: ventilation restrictions, no surgery; no ventilation restrictions, no surgery; no ventilation restrictions, surgery except cardiac requiring bypass; and no ventilation restrictions, cardiac surgery requiring bypass. Teaching hospitals included those in which pediatric residents, neonatology fellows, or other residents participated in direct patient care in the NICU.

## Results

From 2012 to 2020, 967 hospitals contributed data (Austria (n=11), Ireland (n=20), Italy (n=87), Switzerland (n=9), U.K. (n=38), U.S. (n=802)) of which 13% were hospitals with ventilation restrictions and without surgical services, 37% were without restrictions on ventilation that did not do surgery, 36% were without restrictions on ventilation that performed surgery except cardiac surgery requiring bypass, and 14% were without restrictions on ventilation that performed cardiac surgery requiring bypass. Hospital data by country are provided in Supplemental Table 1.

Overall, 232,203 infants were evaluated. From 2012 to 2020, the median postmenstrual age at discharge ranged from 37 weeks, 6 days (Ireland) to 38 weeks, 5 days (U.S.). The median discharge weight ranged from 2400g (Italy) to 2900g (Switzerland), and the median discharge weight z-score ranged from -1.5 (Italy) to -0.7 (Ireland). Observed medians over time are shown in Figure 1 and Table 2, and infant characteristics in Table 1.

After adjustment, the median postmenstrual age at discharge increased at hospitals in Austria (3.6 days, 99% CI [1.0, 6.3]), Italy (4.0 days, 99% CI [2.3, 5.6]), and the U.S. (5.4 days, 99% CI [5.0, 5.8]). Median postmenstrual age at discharge increased at hospitals in Ireland and decreased at hospitals in Switzerland and the U.K., although not significantly (Table 2 and Figure 2). Median postmenstrual age at discharge decreased with increasing gestational age at birth (Figure 3).

Median discharge weight increased at hospitals in Austria (181 grams, 99% CI [95, 267]), Ireland (234 grams, 99% CI [143, 325]), Italy (133 grams, 99% CI [83, 182]), and the U.S. (207 grams, 99% CI [194, 220]). Median discharge weight decreased at hospitals in Switzerland and

increased in the U.K., although not significantly (Table 2 and Figure 2). Median weight at discharge decreased with increasing gestational age at birth (Figure 3).

Median discharge weight z-score increased at hospitals in Ireland (0.24 standard units, 99% CI [0.12, 0.36]) and the U.S. (0.15 standard units, 99% CI [0.13, 0.16]). Median discharge weight z-score increased at hospitals in Austria, Italy, and the U.K. and decreased in Switzerland, although not significantly (Table 2 and Figure 2). Median discharge weight z-score generally increased with gestational age at birth (Figure 3).

From 2012 to 2020, the percentage of infants discharged on human milk increased in Italy (61% to 75%), Switzerland (70% to 76%), and the U.K. (43% to 62%). Hospitals in Austria (50% to 32%), Ireland (17% to 16%), and U.S. (28% to 18%) decreased the percentage of infants going home on a cardiorespiratory monitor. Hospitals in Ireland decreased (7% to 3%) rates of oxygen at discharge (Figure 4).

A sensitivity analysis excluding 2020 did not change the results (Supplemental Figure 1). The proportion of extremely preterm infants born from 24 to 26 weeks' gestational age and the proportion who survived did not change over time (Supplemental Figure 2).

## **Discussion**

In this international cohort, postmenstrual age, weight, and weight z-score at discharge increased significantly in some, but not all, countries. Median postmenstrual age at discharge increased in three of six countries (Austria, Italy, and the U.S.), median weight at discharge in four (Austria, Ireland, Italy, and the U.S.), and median discharge weight z-score in two (Ireland and the U.S.). While the difference in postmenstrual age at discharge between the six countries was only six days on average ( $37 \frac{6}{7}$  to  $38 \frac{5}{7}$ ), there was more variation in discharge weights



(2400 grams to 2900 grams on average) which likely reflects differences in feeding or nutritional practices.

We explored discharge on oxygen, cardiorespiratory monitors, and human milk to explain the increases in postmenstrual age at discharge. The proportion of infants discharged on cardiorespiratory monitors decreased in Austria and the U.S. without a decrease in oxygen at discharge. This finding suggests that use of monitors with home oxygen for bronchopulmonary dysplasia was stable while use of monitors for apnea decreased, perhaps due to more emphasis on apnea management before initial discharge or due to more strict indications for the need to discharge an infant on a monitor. However, understanding the relationship between the use of cardiorespiratory monitors and length of stay requires more detailed information than is available in the VON database. The proportion of infants discharged home on human milk increased significantly in Italy, suggesting more time or effort spent establishing breastfeeding. There is little correspondence at the country level between the increases in postmenstrual age and weight at discharge and changes in these factors. Whether these factors definitively influenced postmenstrual age at discharge is unknown. There is marked variation in clinical practices related to apnea monitoring, oxygen supplementation, postnatal steroids for chronic lung disease, and breastfeeding within and among countries, all of which may affect length of NICU stay, growth at discharge, and readmission rates. Future research should address the impact of these practices on the outcomes we have assessed. Of particular importance is the use of human milk which should be available for all preterm infants.

A previous study of length of stay among survivors born from 24 to 28 completed weeks gestational age in 2014 to 2016 across 10 countries including Switzerland and the U.K. found that median length of stay varied from 75 days in Finland to 107 days in Israel.[10] Median

length of stay was 84 days (IQR: 69, 103) in Switzerland and 82 days (IQR: 66, 103) in the U.K. A study comparing hospital length of stay for infants born 22 to 31 completed weeks gestational age in 10 European regions showed no change across regions from 2003 to 2011/2012 after adjustment, but with wide variation by country.[11] A systematic review of factors that increase length of stay in a neonatal unit found that organizational factors within a geographic region, such as level of care, may influence length of stay, but the study did not mention factors across geographic regions, such as healthcare financing systems.[12] Organizational factors such as management of neonatal intensive care units in Italy has also been found to be associated with outcomes.[13] However, in a large integrated health system in southern California, NICU patient days decreased from 2010 to 2018, although most of the change occurred among infants with higher birth weights and gestational ages.[14] The authors of that study suggest that the hospital system's financial structure, which is population-based rather than fee-for-service, had financial incentives to decrease NICU admissions and lengths of stay. The role of financial incentives in the increases observed in the current study is complex because healthcare financing mechanisms differ at the federal, state, and even local level. Still, increases in postmenstrual age at discharge were observed regardless of financing systems.

This study's limitations include lack of information on discharge policies at the unit or country level. While in Austria, Ireland, Italy, Switzerland, and the United States, all or nearly all NICUs routinely caring for the study population participate in VON, not all NICUs are VON members and the results may be different for non-members. Membership by country varies by NICU level; higher-level NICUs are more likely to be represented in VON except in the U.K., which has a highly regionalized care structure with more non-tertiary level units than tertiary units. We do not know readmission rates, and we do not have enough information to determine

causal mechanisms. There could be unmeasured differences in survivors contributing to our findings. Finally, 2020 includes part of the SARS-CoV-2 pandemic, which influenced NICU admissions and discharges[15,16]; however, a sensitivity analysis excluding 2020 did not change our results.

What do these findings mean for families? In Austria, Italy, and the U.S., age at discharge increased, meaning that infants are spending more time away from their homes today than in previous years. The balance between longer stays and readmission is the biggest unknown, although a U.S. study found that infants with shorter initial NICU lengths of stay had higher readmission rates.[17] Readmission rates may be easier to measure in countries with social insurance systems; readmission deserves further inquiry given the increases in discharge age. Infants in Austria and the U.S. are going home with less monitoring, which should benefit families. Discharge weight increased in Austria, Italy, and the U.S. too, but discharge weight z-scores increased only in the U.S., suggesting that increases in discharge weight in Austria and Italy were due to increases in discharge age and not in gains made against gestational age standards (although experts are uncertain about the usefulness of z-scores).[18] In Switzerland and the U.K., postmenstrual age at discharge did not increase significantly; however, discharge weight and discharge weight z-score also did not increase, although discharge weight and discharge weight z-score were among the highest in Switzerland during the entire period despite the highest proportion of infants small for gestational age at birth. The Irish units may have solved the value equation for families: the lowest median postmenstrual age at discharge and increases in discharge weight, discharge weight z-score, and the proportion discharged on human milk, without significant increases in discharge age.

## **Conclusions**

In this international cohort of NICUs, postmenstrual age, weight, and weight z-score at discharge age increased in some, but not all, countries. Despite the study's limitations, we contribute to the growing literature about NICU length of stay. Enhancing care, reducing costs, and advancing health equity, three parts of healthcare's quintuple aim,[5] are essential to improve the value of care for families. Apnea monitoring practices, discharge care practices, and readmission rates deserve deeper examination as the field continues to evaluate the impact of these increases.

**Acknowledgements:** We are indebted to our colleagues who submit data to Vermont Oxford Network on behalf of infants and their families. Thank you to the Neonatal Intensive Care Outcomes Research and Evaluation (NICORE) in the Republic of Ireland, the Italian Neonatal Network, and SwissNeoNet for facilitating membership and data submission on behalf of hospitals in those countries. The list of hospitals contributing data to this study are in Supplemental Table 2.

**Conflict of Interest:** Jeffrey Horbar is Chief Executive Officer, President, and Chief Scientific Officer of Vermont Oxford Network, and an unpaid member of the Vermont Oxford Network Board of Trustees. Erika Edwards receives salary support from Vermont Oxford Network. The other authors have no conflicts of interest to disclose.

**Informed Consent:** The University of Vermont institutional review board determined that the use of data from the VON Research Repository for this analysis was not human subjects research

**Ethics:** The University of Vermont institutional review board determined that the use of data from the VON Research Repository for this analysis was not human subjects research.

**Ethical Approval:** The University of Vermont institutional review board determined that the use of data from the VON Research Repository for this analysis was not human subjects research.

**Ethical Review Board:** The University of Vermont institutional review board

**Funding Sources:** None

**Contributors' Statement:** Dr. Edwards conceptualized and designed the study, drafted the initial manuscript, and reviewed and revised the manuscript. Ms. Greenberg conceptualized and designed the study, carried out the data analyses, and reviewed and revised the manuscript. Drs. Horbar, Gagliardi, Adams, Berger, Leitao, Luyt, Ehret, and Rogowski conceptualized and designed the study and reviewed and revised the manuscript.

**Data Availability:** The data that support the findings of this study are not publicly available due to data sharing agreements with member hospitals. Individuals at Vermont Oxford Network member hospitals seeking to use data can contact Erika Edwards.

## References

- 1 Edwards EM, Greenberg LT, Ehret DEY, Lorch SA, Horbar JD. Discharge age and weight for very preterm infants: 2005-2018. *Pediatrics*. 2021 Feb;147(2). DOI: 10.1542/peds.2020-016006
- 2 Horbar JD, Edwards EM, Greenberg LT, Morrow KA, Soll RF, Buus-Frank ME, et al. Variation in performance of neonatal intensive care units in the United States. *JAMA Pediatrics*. 2017;171(3):e164396.
- 3 Soll RF, Edwards EM, Badger GJ, Kenny MJ, Morrow KA, Buzas JS, et al. Obstetric and neonatal care practices for infants 501 to 1500 g from 2000 to 2009. *Pediatrics*. 2013 Aug;132(2):222–8.
- 4 Arnold C, Davis AS. Increasing length of stay in the NICU for premature newborns: Good or bad? *Pediatrics*. 2021 Feb;147(2). DOI: 10.1542/peds.2020-032748
- 5 Nundy S, Cooper LA, Mate KS. The Quintuple Aim for Health Care Improvement: A New Imperative to Advance Health Equity. *JAMA*. 2022 Jan DOI: 10.1001/jama.2021.25181
- 6 Koné I, Maria Zimmermann B, Nordström K, Simone Elger B, Wangmo T. A scoping review of empirical evidence on the impacts of the DRG introduction in Germany and Switzerland. *Int J Health Plann Mgmt*. 2019 Jan;34(1):56–70.
- 7 Vermont Oxford Network. Manual of Operations, Part 2 for Infants Born in 2020. Data Definitions and Infant Data Forms. Burlington, Vermont: Vermont Oxford Network; 2019.
- 8 Fenton TR, Kim JH. A systematic review and meta-analysis to revise the Fenton growth chart for preterm infants. *BMC Pediatr*. 2013 Apr;13:59.
- 9 WHO Multicentre Growth Reference Study Group. Length/height-for-age, weight-for-age, weight-for-length, weight-for-height, and body mass index-for-age: Methods and development. Geneva, Switzerland: World Health Organization; 2006.
- 10 Seaton SE, Draper ES, Adams M, Kusuda S, Håkansson S, Helenius K, et al. Variations in neonatal length of stay of babies born extremely preterm: An international comparison between iNeo Networks. *The Journal of Pediatrics*. 2021 Jun;233:26-32.e6.
- 11 Maier RF, Blondel B, Piedvache A, Misselwitz B, Petrou S, Van Reempts P, et al. Duration and time trends in hospital stay for very preterm infants differ across European regions. *Pediatric Critical Care Medicine*. 2018 Dec;19(12):1153–61.
- 12 Seaton SE, Barker L, Jenkins D, Draper ES, Abrams KR, Manktelow BN. What factors predict length of stay in a neonatal unit: a systematic review. *BMJ Open*. 2016 Oct;6(10). DOI: 10.1136/bmjopen-2015-010466

- 13 Fanelli S, Bellù R, Zangrandi A, Gagliardi L, Zanini R. Managerial features and outcome in neonatal intensive care units: results from a cluster analysis. *BMC Health Serv Res.* 2020 Dec;20(1):957.
- 14 Braun D, Braun E, Chiu V, Burgos AE, Gupta M, Volodarskiy M, et al. Trends in Neonatal Intensive Care Unit Utilization in a Large Integrated Health Care System. *JAMA Network Open.* 2020 Jun;3(6):e205239.
- 15 Greenbury SF, Longford N, Ougham K, Angelini ED, Battersby C, Uthaya S, et al. Changes in neonatal admissions, care processes and outcomes in England and Wales during the COVID-19 pandemic: a whole population cohort study. *BMJ Open.* 2021 Oct;11(10):e054410.
- 16 Rasmussen MI, Hansen ML, Pichler G, Dempsey E, Pellicer A, EL-Khuffash A, et al. Extremely Preterm Infant Admissions Within the SafeBoosC-III Consortium During the COVID-19 Lockdown. *Front Pediatr.* 2021 Jul;9:647880.
- 17 Bernardo J, Keiser A, Aucott S, Yanek LR, Johnson CT, Donohue P. Early Readmission following NICU Discharges among a National Sample: Associated Factors and Spending. *Am J Perinatol.* 2021 Oct;s-0041-1736286.
- 18 Fenton TR, Dai S, Lalari V, Alshaikh B. Neonatal and Preterm Infant Growth Assessment. *Clinics in Perinatology.* 2022 Jun;49(2):295–311.

## Figure Legends

Figure 1: Observed medians for postmenstrual age at discharge (red), discharge weights (green), and discharge weight z-scores (blue) with 99% confidence intervals, 2012 to 2020, by country.

Figure 2: Changes in postmenstrual age at discharge, discharge weights, and discharge weight z-scores with 99% confidence intervals, 2012 to 2020, by country, adjusted for gestational age in weeks, birth weight z-score, sex, multiple birth, one minute Apgar score, and inborn/outborn status.

Figure 3: Median postmenstrual age at discharge (red), discharge weights (green), and discharge weight z-scores (blue) with 99% confidence intervals by gestational age at birth, by country.

Figure 4: Observed rates of infants discharged on human milk (red), cardiorespiratory monitor (green), and oxygen (blue), 2012 to 2020, by country.



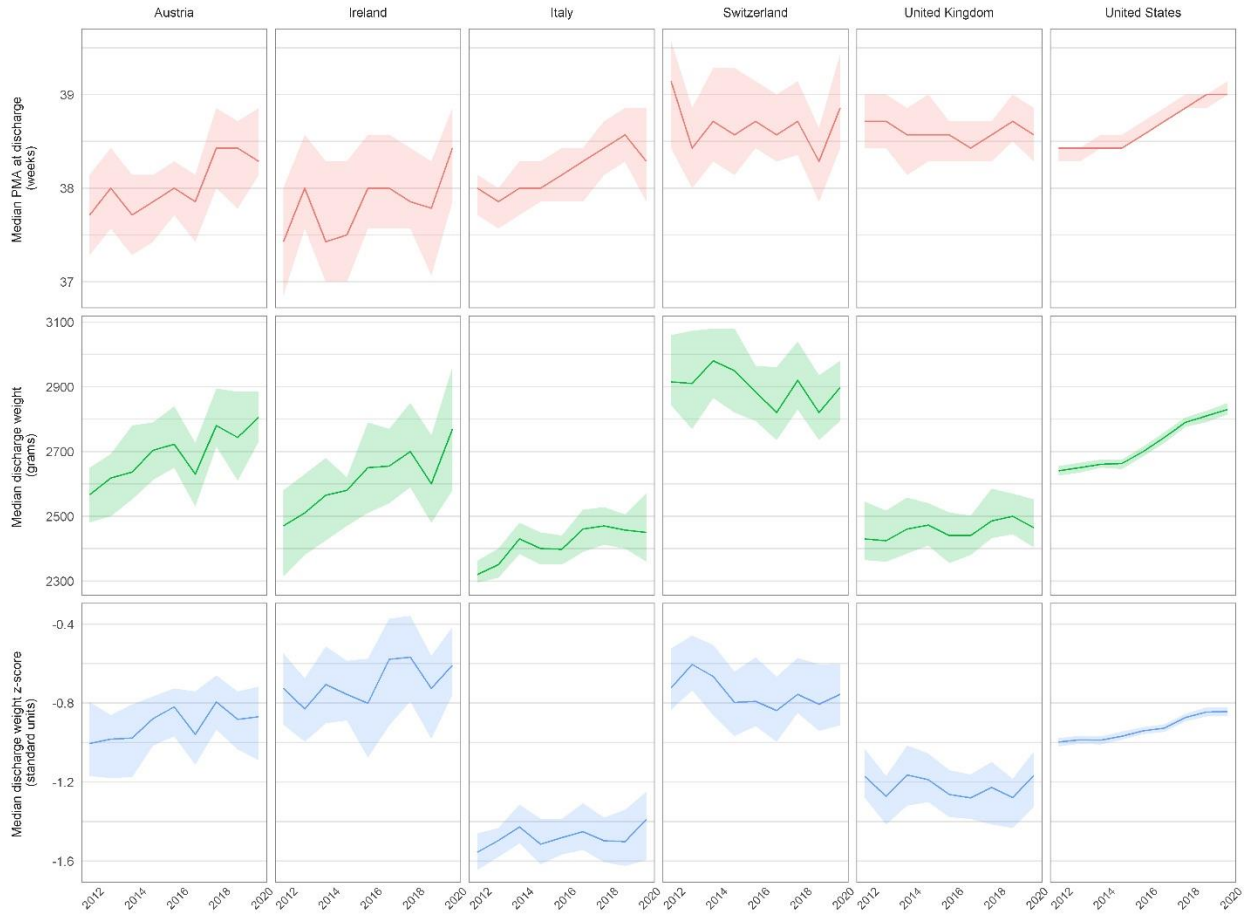


Figure 1.

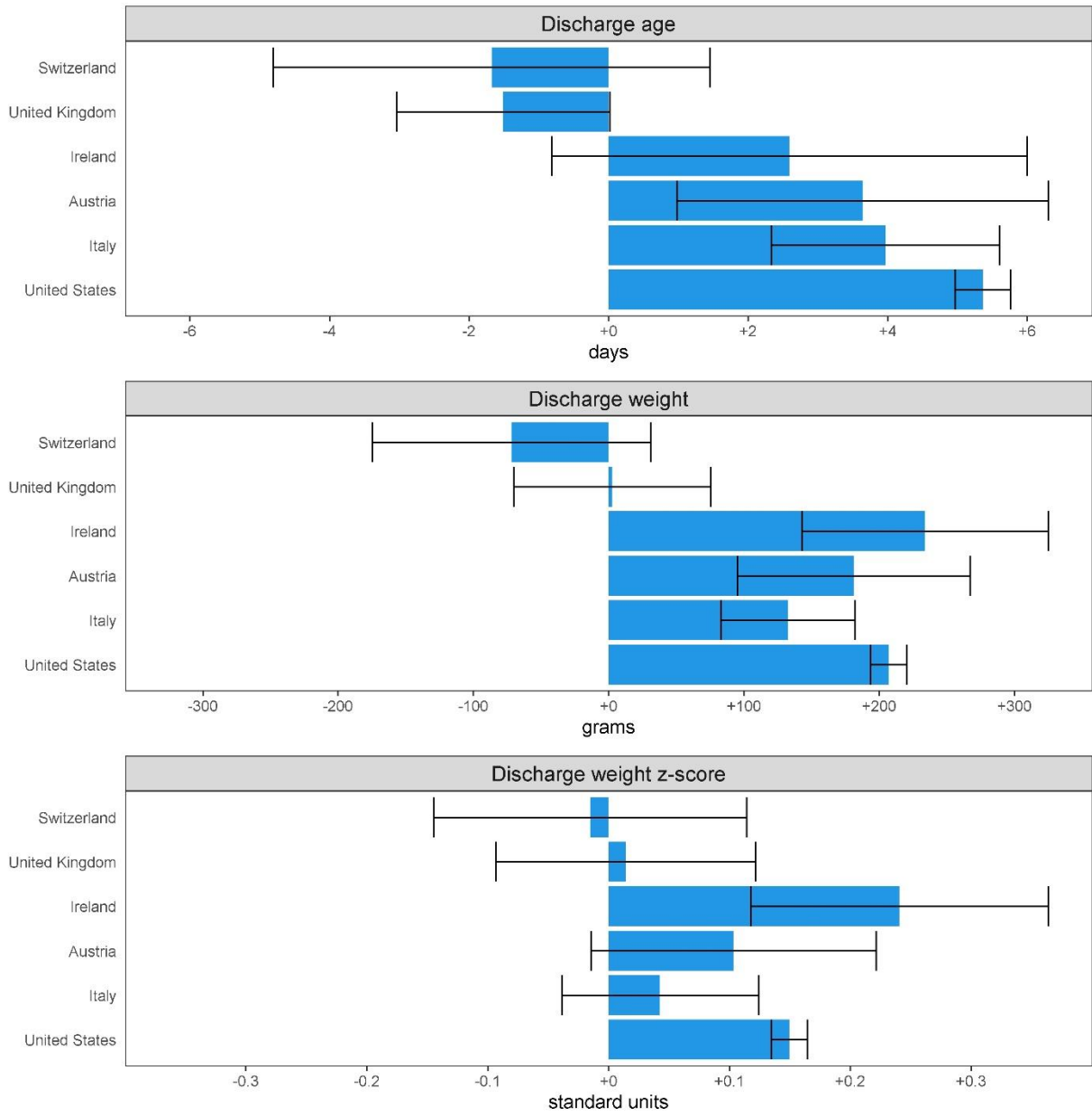


Figure 2.

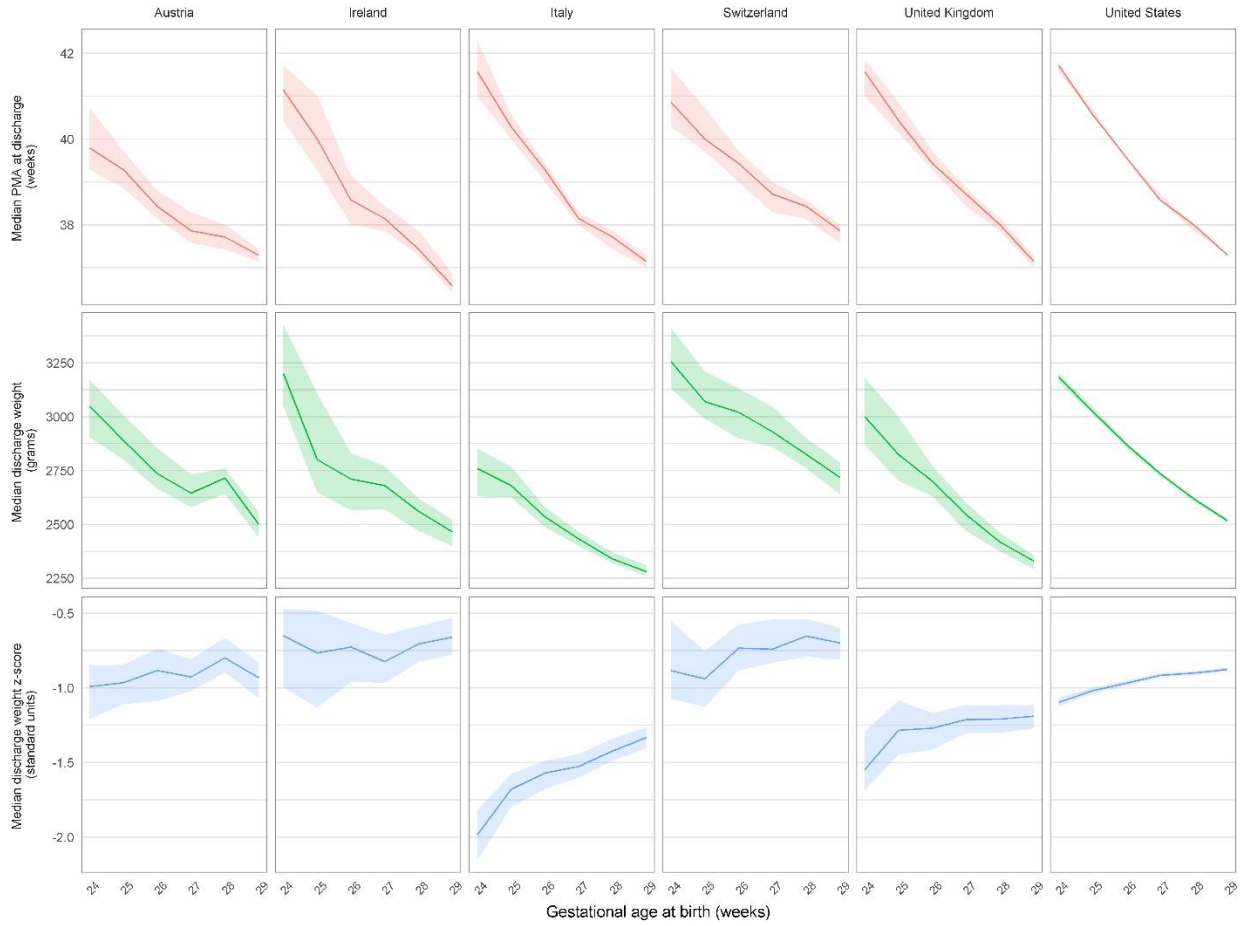


Figure 3.

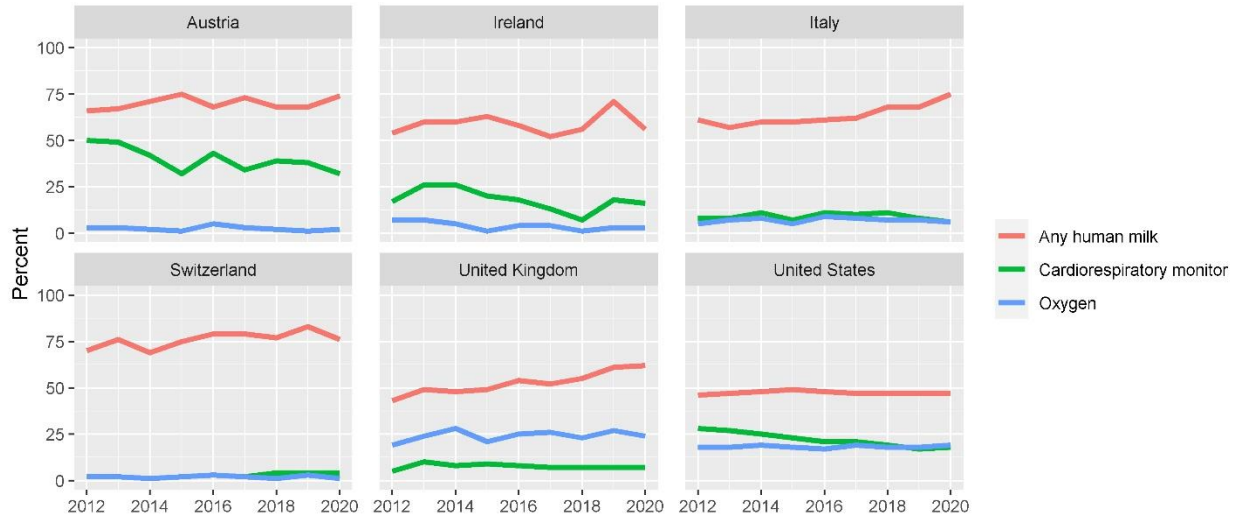


Figure 4.

Table 1. Infant Characteristics by Country

	<b>Austria</b> N=2970	<b>Ireland</b> N=2334	<b>Italy</b> N=10628	<b>Switzerland</b> N=3108	<b>United Kingdom</b> N=9835	<b>United States</b> N=203328
<b>At Birth</b>						
Gestational Age, mean $\pm$ SD*	27.1 +/- 1.6	27.2 +/- 1.6	27.3 +/- 1.5	27.2 +/- 1.6	27.1 +/- 1.6	27.1 +/- 1.6
Weight, grams, median (IQR)	990 (790,1200)	1040 (840,1240)	990 (809,1200)	980 (785,1180)	990 (804,1195)	990 (800,1200)
1-Minute Apgar, median (IQR)*	7 (6,8)	6 (5,8)	6 (4,7)	5 (3,7)	6 (4,7)	5 (3,7)
Small for Gestational Age, no. (%)*	252 (8.5%)	153 (6.6%)	1048 (9.9%)	315 (10.1%)	754 (7.7%)	15269 (7.5%)
Weight z-score, median (IQR)	0.1 (-0.5,0.5)	0.2 (-0.4,0.7)	0 (-0.6,0.5)	-0.1 (-0.7,0.4)	0.1 (-0.5,0.6)	0.1 (-0.5,0.6)
Cesarean Section, no. (%)*	2608 (87.8%)	1617 (69.3%)	7982 (75.1%)	2550 (82%)	5703 (58%)	145683 (71.6%)
Male Sex, no. (%)*	1626 (54.7%)	1253 (53.7%)	5545 (52.2%)	1613 (51.9%)	5374 (54.6%)	105963 (52.1%)
Multiple Gestation, no. (%)*	832 (28%)	737 (31.6%)	3089 (29.1%)	1002 (32.2%)	2683 (27.3%)	49371 (24.3%)
Inborn at Reporting Hospital, no. (%)*	2866 (96.5%)	2128 (91.2%)	9770 (91.9%)	2977 (95.8%)	7559 (76.9%)	174639 (85.9%)
<b>Neonatal Course</b>						
Delivery Room Intervention, no. (%)**	2565 (86.4%)	1988 (85.2%)	9176 (86.4%)	2635 (84.8%)	8964 (91.2%)	161198 (79.3%)
Ventilation after Initial Resuscitation, no. (%)*	1533 (51.7%)	1477 (63.4%)	6733 (63.4%)	2080 (66.9%)	7915 (80.5%)	143545 (70.6%)
Any Surgery, no. (%)*	513 (17.3%)	280 (12%)	1824 (17.2%)	538 (17.3%)	1476 (15%)	37864 (18.6%)

<b>Morbidities</b>						
Respiratory Distress Syndrome, no. (%)*	2077 (69.9%)	2163 (92.8%)	9551 (89.9%)	2203 (70.9%)	8390 (85.6%)	171673 (84.5%)
Early Bacterial Sepsis, no. (%)	237 (8%)	53 (2.3%)	519 (4.9%)	69 (2.2%)	212 (2.2%)	3237 (1.6%)
Any Late Infection, no. (%)	594 (20%)	376 (16.2%)	2745 (25.9%)	348 (11.2%)	2037 (20.8%)	21595 (10.6%)
Severe IVH, no. (%)	162 (5.5%)	104 (4.5%)	720 (7%)	171 (5.5%)	741 (7.6%)	13643 (6.9%)
NEC or GI Perforation, no. (%)	158 (5.3%)	144 (6.2%)	651 (6.1%)	130 (4.2%)	804 (8.2%)	12911 (6.4%)
Pneumothorax, no. (%)	116 (3.9%)	137 (5.9%)	344 (3.2%)	132 (4.2%)	388 (3.9%)	7963 (3.9%)
Chronic Lung Disease, no. (%)	451 (15.5%)	697 (31%)	2478 (23.7%)	562 (18.7%)	3313 (43.1%)	67758 (34.1%)
<b>Discharge characteristics</b>						
Post-menstrual age, weeks/days, median (IQR)	38 0/7 (36 5/7, 39 5/7)	37 6/7 (36 2/7, 40 0/7)	38 1/7 (36 4/7, 40 4/7)	38 4/7 (37 2/7, 40 4/7)	38 4/7 (36 6/7, 40 6/7)	38 5/7 (36 6/7, 41 1/7)
Weight, grams, median (IQR)	2694 (2390,3060)	2600 (2300,2980)	2400 (2120,2800)	2900 (2553,3300)	2455 (2158,2911)	2716 (2345,3225)
Weight z-score, median (IQR)	-0.9 (-1.5,-0.4)	-0.7 (-1.3,-0.2)	-1.5 (-2.3,-0.9)	-0.8 (-1.4,-0.2)	-1.2 (-1.9,-0.6)	-0.9 (-1.6,-0.4)

\* Included in risk adjustment model

\*\* Includes face mask ventilation, endotracheal tube ventilation, cardiac compression, epinephrine, or surfactant in the delivery room.

Table 2. Change in adjusted median discharge age, weight, and discharge weight z-score from 2012 to 2020.

Country	Number of infants	Change in adjusted median discharge age, days [99% CI]	Change in adjusted median discharge weight, grams [99% CI]	Change in adjusted median discharge weight z-score, standard units [99% CI]
Austria	2,970	+3.6 [+1.0, +6.3]*	+181 [+95, +267]*	+0.10 [-0.01, +0.22]
Ireland	2,334	+2.6 [-0.8, +6.0]	+234 [+143, +325]*	+0.24 [+0.12, +0.36]*
Italy	10,628	+4.0 [+2.3, +5.6]*	+133 [+83, +182]*	+0.04 [-0.04, +0.12]
Switzerland	3,108	-1.7 [-4.8, +1.5]	-72 [-175, +31]	-0.02 [-0.14, +0.11]
United Kingdom	9,835	-1.5 [-3.0, 0.0]	+3 [-70, +76]	+0.01 [-0.09, +0.12]
United States	203,328	+5.4 [+5.0, +5.8]*	+207 [+194, +220]*	+0.15 [+0.13, +0.16]*

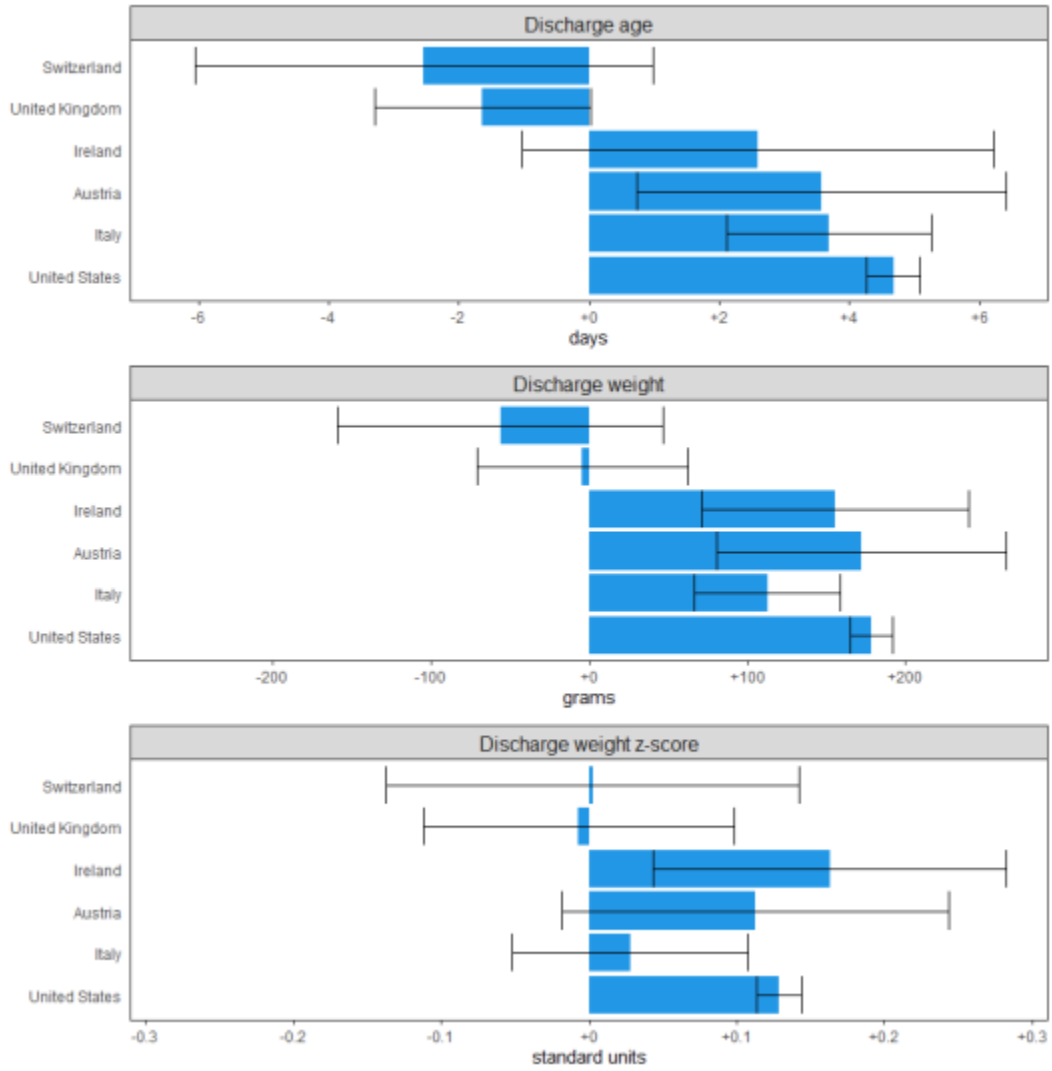
\* Change is statistically significant at  $\alpha=0.01$

Supplemental Table 1. Hospital and NICU Characteristics by Country

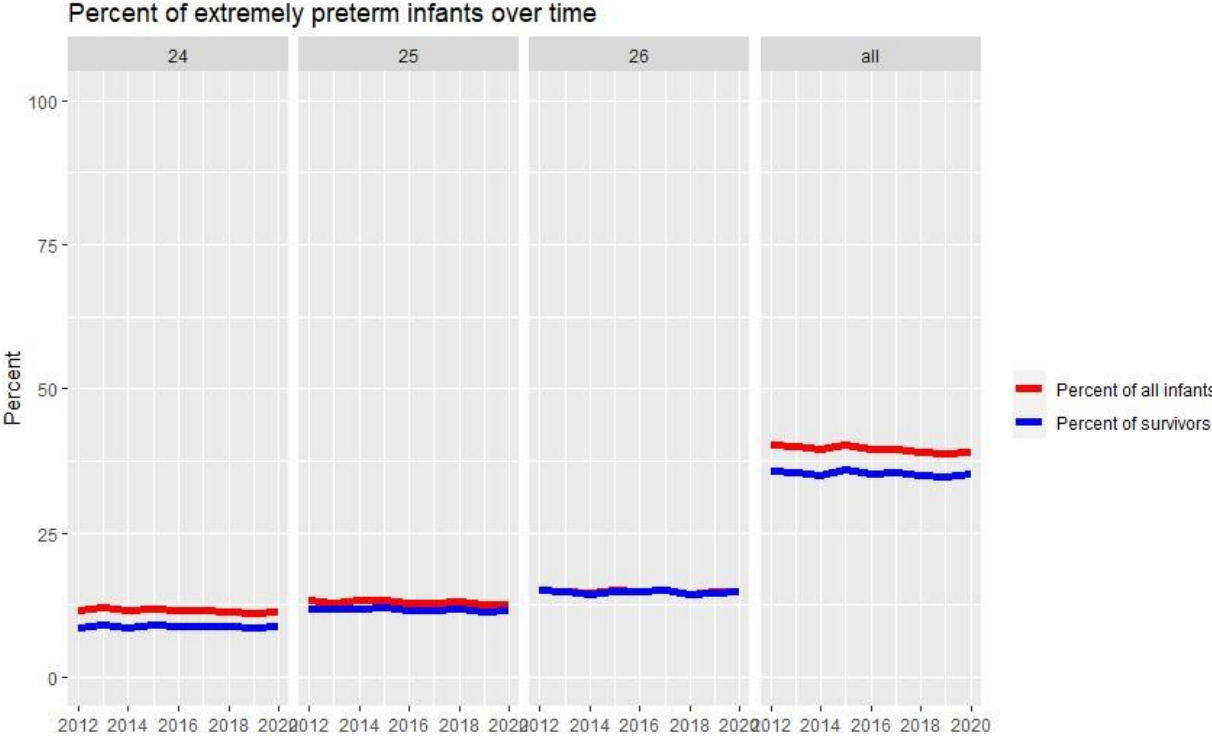
	<b>Austria (N=11)</b>	<b>Ireland (N=20)</b>	<b>Italy (N=87)</b>	<b>Switzerland (N=9)</b>	<b>U.K. (N=38)</b>	<b>U.S. (N=802)</b>
	<i>no. (%)</i>					
Capabilities						
Restrictions on ventilation	0 (0.0)	12 (60.0)	2 (2.3)	0 (0.0)	20 (52.6)	91 (11.4)
No restrictions on ventilation, no surgery	3 (27.3)	7 (35.0)	15 (17.2)	0 (0.0)	11 (29.0)	319 (39.8)
Surgery except cardiac surgery requiring bypass	5 (45.4)	1 (5.0)	56 (64.4)	5 (55.6)	4 (10.5)	281 (35.0)
Surgery including cardiac surgery requiring bypass	3 (27.3)	0 (0.0)	14 (16.1)	4 (44.4)	3 (7.9)	111 (13.8)
Teaching Hospital	11 (100.0)	16 (80.0)	69 (79.3)	9 (100.0)	35 (92.1)	396 (49.4)
	<i>Median, IQR</i>					
Total Admissions per Year	309 (258, 546)	320 (296, 1240)	345 (261, 524)	615 (523, 768)	424 (293, 578)	376 (237, 643)
NICU Beds and Stepdown Beds	16 (12, 31)	9 (7, 18)	21 (15, 26)	24 (18, 30)	14 (6, 22)	29 (18, 48)
Number of Neonatologists	9 (5, 16)	4 (0, 6)	11 (9, 14)	6 (4, 11)	8 (2, 12)	7 (4, 13)



Supplemental Figure 1. Risk-adjusted changes in postmenstrual age at discharge, discharge weights, and discharge weight z-scores with 99% confidence intervals, 2012 to 2019.



Supplemental Figure 2. Percentage of extremely preterm infants of all infants in the sample and the proportion of survivors, by year.



Supplemental Table 2. Hospitals Included in Study.

Landeskrankenhaus, Academic Teaching Hospital	Feldkirch	Austria
Univ-Klinik Fur Kinder U. Jugendheilkunde	Graz	Austria
Universitätsklinik für Pädiatrie II (Neonatologie)	Innsbruck	Austria
LKH Hochsteiermark/Leoben	Leoben	Austria
Kepler Universitätsklinikum MC IV Klinik für Neona	Linz	Austria
Universitätsklinikum Der PMU, LKH Salzburg	Salzburg	Austria
Neonatologie Landeskrankenhaus St. Poelten	St. Poelten	Austria
Danube Hospital SMZ Ost	Vienna	Austria
University Hospital Vienna AKH	Vienna	Austria
LKH Villach	Villach	Austria
Klinikum Wels Grieskirchen	Wels	Austria
Portiuncula Hospital	Ballinasloe	Ireland
Mayo University Hospital	Castlebar	Ireland
Cavan General Hospital	Cavan	Ireland
Cork University Maternity Hospital	Cork	Ireland
Our Lady of Lourdes Hospital	Drogheda	Ireland
Coombe Women's & Infants University Hospital	Dublin	Ireland
National Maternity Hospital	Dublin	Ireland
Rotunda Hospital	Dublin	Ireland
Temple Street Children's University Hospital	Dublin	Ireland
University College Hospital Galway	Galway	Ireland
St. Luke's Hospital	Kilkenny	Ireland
Letterkenny General Hospital	Letterkenny	Ireland
University Maternity Hospital Limerick	Limerick	Ireland
SCBU, Midland Regional Hospital	Mullingar	Ireland
Midland Regional Hospital Portlaoise	Portlaoise	Ireland
Sligo Regional Hospital	Sligo	Ireland
South Tipperary General Hospital	Tipperary	Ireland
Kerry General Hospital	Tralee	Ireland
University Hospital Waterford	Waterford	Ireland
Wexford General Hospital	Wexford	Ireland
NICU Ente Ecclesiastico F.Miulli	Acquaviva delle Fonti	Italy
Cesare Arrigo Children's Hospital	Alessandria	Italy
SOD Neonatologia Azienda Ospedali Riuniti Ancona	Ancona	Italy
A.O. Universitaria Policlinico Bari	Bari	Italy
Ospedale Di Venere	Bari	Italy
NICU A.O. Gaetano Rummo	Benevento	Italy
Ospedale Fatebenefratelli Benevento	Benevento	Italy
ASST Papa Giovanni XXIII Bergamo	Bergamo	Italy
Neonatologia S. Orsola	Bologna	Italy
Ospedale Maggiore, Bologna	Bologna	Italy

Ospedale di Bolzano	Bolzano	Italy
Neonatologia Spedali Civili Brescia	Brescia	Italy
Perrino Hospital, Neonatology Brindisi	Brindisi	Italy
NICU Ospedale Cardarelli	Campobasso	Italy
Camposampiero NICU	Camposampiero	Italy
Azienda Ospedaliera San Sebastiano e S. Anna	Caserta	Italy
Policlinico Vittorio Emanuele UOCUTIN	Catania	Italy
TIN Neonatologia Arnas Garibaldi	Catania	Italy
PICU NICU Ospedale M. Bufalini Cesena	Cesena	Italy
Ospedale S. Anna	Como	Italy
Ospedale Valduce	Como	Italy
NICU Ospedale Annunziata	Cosenza	Italy
NICU Istituti Ospitalieri di Cremona	Cremona	Italy
NICU Azienda Ospedaliera St. Croce e Carle	Cuneo	Italy
Unita di Terapia Intensiva Neonatale	Ferrara	Italy
Careggi University Hospital, Neonatology Unit	Florence	Italy
NICU Ospedale A. Meyer	Florence	Italy
NICU Ospedali Riuniti Foggia	Foggia	Italy
NICU Istituto G. Gaslini	Genova	Italy
Azienda Ospedaliera Cardinale Panico	Lecce	Italy
Presidio Ospedaliero Vito Fazzi	Lecce	Italy
Ospedale di Lecco	Lecco	Italy
UTIN Ospedale Versilia	Lido di Camaiore	Italy
Patologia Neonatale AO Lodi	Lodi	Italy
NICU Carlo Poma Hospital	Mantova	Italy
NICU A.O.U. G. Martino Messina	Messina	Italy
IRCCS Ospedale Maggiore di Milano	Milan	Italy
Macedonio Melloni Maternity Hospital	Milan	Italy
Ospedale Niguarda Ca Granda	Milan	Italy
Ospedale Vittore Buzzi	Milan	Italy
San Raffaele Hospital, Milan	Milan	Italy
Neonatologia A.O. Policlinico di Modena	Modena	Italy
San Gerardo Hospital	Monza	Italy
Azienda Ospedaliera A. Cardarelli	Naples	Italy
NICU Ospedale Evangelico Villa Betania	Naples	Italy
NICU Ospedale Monaldi	Naples	Italy
Ospedale Buon Consiglio Fatebenefratelli	Naples	Italy
Terapia Intensiva Neonatale AOU Federico II	Naples	Italy
Tin P.O. SS. Annunziata	Naples	Italy
TIN Osp. Umberto I	Nocera Inferiore	Italy
A.O. Maggiore Della Carita	Novara	Italy
Neonatal Intensive Care Unit, Azienda Ospedaliera	Padua	Italy
Materno Infantile Universita di Palermo	Palermo	Italy

Neonatologia e TIN AO V. Cervello	Palermo	Italy
Ospedale Buccheri La Ferla	Palermo	Italy
Neonatology and NICU University Hospital	Parma	Italy
U.O. Patologia Neonatale e TIN	Pavia	Italy
NICU Dip Interaziendale dell'eta Evolutiva	Perugia	Italy
U.O. Neonatologia AOUP	Pisa	Italy
NICU Ospedali Riuniti OORR	Reggio Calabria	Italy
NICU Azienda Ospedaliera SMN Reggio Emilia	Reggio Emilia	Italy
NICU Ospedale Di Rho	Rho	Italy
Ospedale Infermi Di Rimini U.O. TIN	Rimini	Italy
Neonatologia Policlinico Gemelli Roma	Rome	Italy
NICU Bambino Gesù Children's Hospital	Rome	Italy
Ospedale S. Giovanni Calibita Fatebenefratelli	Rome	Italy
Ospedale San Pietro F.B.F.	Rome	Italy
Policlinico Casilino	Rome	Italy
Policlinico Umberto I	Rome	Italy
IRCCS Casa Sollievo Della Sofferenza	San Giovanni R.	Italy
Ospedale di Santorso	Santorso (VI)	Italy
Ospedale Bolognini	Seriate	Italy
NICU Ospedale Le Scotte	Siena	Italy
Ospedale SS. Annunziata	Taranto	Italy
S. Maria Hospital NICU Terni	Terni	Italy
Ospedale Santa Croce	Torino	Italy
SC Neonatologia Ospedale Maria Vittoria	Torino	Italy
SCDU Neonatologia ASO OIRM S.Anna Univ.Torino	Torino	Italy
Neonatologia Trento, Ospedale S.Chiera	Trento	Italy
Patologia Neonatale Ca Foncello Hospital,Treviso	Treviso	Italy
IRCCS Burlo Garfolo	Trieste	Italy
Neonatologia Ospedaliera TINO ASO Oirm S. Anna	Turin	Italy
S.O.C. Neonatologia	Udine	Italy
NICU Azienda Ospedaliera Varese	Varese	Italy
Az.Ospedaliera Universitaria Integrata Verona-OCM	Verona	Italy
Terapia Intensiva e Patologia Neonatale	Verona	Italy
Patologia Neonatale Ospedale San Bortolo	Vicenza	Italy
Children's Hospital Aarau	Aarau	Switzerland
University Hospital Basel - UKBB	Basel	Switzerland
University Hospital Berne	Berne	Switzerland
Children's Hospital Chur	Chur	Switzerland
University Hospital Geneva - HUG	Geneva	Switzerland
University Hospital Lausanne - CHUV	Lausanne	Switzerland
Children's Hospital Lucerne	Lucerne 16	Switzerland
Cantonal Hospital St. Gallen	St. Gallen	Switzerland
University Hospital Zurich - USZ	Zurich	Switzerland

Nevill Hall Hospital	Abergavenny	United Kingdom
Antrim Area Hospital	Antrim	United Kingdom
Gwynedd Hospital	Bangor	United Kingdom
North Devon District Hospital	Barnstaple	United Kingdom
Royal United Hospital Bath NHS Trust	Bath	United Kingdom
Royal Maternity Service	Belfast	United Kingdom
Ulster Hospital	Belfast	United Kingdom
Princess of Wales Hospital	Bridgend	United Kingdom
Royal Sussex County Hospital	Brighton	United Kingdom
Southmead Hospital	Bristol	United Kingdom
St. Michael's Hospital	Bristol	United Kingdom
University Hospital of Wales	Cardiff	United Kingdom
West Wales General Hospital	Carmarthen	United Kingdom
Craigavon Area Hospital	Craigavon	United Kingdom
Grange University Hospital	Cwmbran	United Kingdom
Royal Infirmary of Edinburgh	Edinburgh	United Kingdom
Royal Devon and Exeter Hospital	Exeter	United Kingdom
Gloucestershire Royal Hospital	Gloucester	United Kingdom
Liverpool Women's Hospital	Liverpool	United Kingdom
Queen Charlotte's & Chelsea Hospital	London	United Kingdom
St. Mary's Hospital, Imperial College NHS Trust	London	United Kingdom
St. Thomas' Hospital (Evelina Neonatal Unit)	London	United Kingdom
Altnagelvin Area Hospital	Londonderry	United Kingdom
Prince Charles Hospital	Methyr Tydfil	United Kingdom
Royal Glamorgan Hospital	Mid Glamorgan	United Kingdom
John Radcliffe Hospital	Oxford	United Kingdom
Derriford Hospital	Plymouth	United Kingdom
Queen Alexandra Hospital NICU	Portsmouth	United Kingdom
Glan Clwyd Hospital	Rhyl	United Kingdom
Princess Anne University Hospital Southam	Southampton	United Kingdom
Singleton Hospital Neonatal Unit, Swansea	Swansea	United Kingdom
Great Western Hospital NHS Trust	Swindon	United Kingdom
Somerset Neonatal Intensive Care Unit	Taunton	United Kingdom
Torbay Hospital	Torquay	United Kingdom
Royal Cornwall Hospitals NHS Trust	Truro	United Kingdom
Wishaw General Hospital	Wishaw	United Kingdom
Royal Wolverhampton Hospital NHS Trust	Wolverhampton	United Kingdom
Wrexham Maelor Hospital	Wrexham	United Kingdom
Ascension St. Vincent's Birmingham	Birmingham, Alabama	United States
Brookwood Medical Center	Birmingham, Alabama	United States
University of Alabama at Birmingham	Birmingham, Alabama	United States
Huntsville Hospital	Huntsville, Alabama	United States
USA Children's and Women's Hospital	Mobile, Alabama	United States

Baptist Medical Center East	Montgomery, Alabama	United States
Baptist Medical Center South	Montgomery, Alabama	United States
Children's Hospital at Providence, Alaska, The	Anchorage, Alaska	United States
Flagstaff Medical Center	Flagstaff, Arizona	United States
Abrazo Arrowhead Campus	Glendale, Arizona	United States
Banner Children's at Thunderbird	Glendale, Arizona	United States
Banner Children's at Desert	Mesa, Arizona	United States
Banner Estrella Medical Center	Phoenix, Arizona	United States
Banner University Medical Center Phoenix	Phoenix, Arizona	United States
Phoenix Children's Hospital	Phoenix, Arizona	United States
St. Joseph's Hospital and Medical Center	Phoenix, Arizona	United States
ValleywiseHealth Medical Center	Phoenix, Arizona	United States
HonorHealth Scottsdale Shea Medical Center	Scottsdale, Arizona	United States
Banner University Medical Center - Tucson	Tucson, Arizona	United States
Washington Regional Medical Center	Fayetteville, Arkansas	United States
Mercy Hospital Fort Smith	Fort Smith, Arkansas	United States
Willow Creek Women's Hospital - NICU	Johnson, Arkansas	United States
St. Bernards Medical Center	Jonesboro, Arkansas	United States
Arkansas Children's Hospital	Little Rock, Arkansas	United States
University of Arkansas for Medical Sciences	Little Rock, Arkansas	United States
Mercy Hospital Northwest Arkansas	Rogers, Arkansas	United States
Anaheim Regional Medical Center	Anaheim, California	United States
KFH Orange County - Anaheim	Anaheim, California	United States
St. Mary Medical Center - Apple Valley	Apple Valley, California	United States
Methodist Hospital of Southern California	Arcadia, California	United States
Adventist Health Bakersfield	Bakersfield, California	United States
Bakersfield Memorial Hospital	Bakersfield, California	United States
Kern Medical Center	Bakersfield, California	United States
Mercy Southwest Hospital	Bakersfield, California	United States
KFH Baldwin Park	Baldwin Park, California	United States
Alta Bates Summit Medical Center	Berkeley, California	United States
Providence St. Joseph Medical Center	Burbank, California	United States
Mercy San Juan Medical Center	Carmichael, California	United States
Rady Children's at Scripps Mercy Chula Vista	Chula Vista, California	United States
Scripps Mercy Hospital Chula Vista	Chula Vista, California	United States
Sharp Chula Vista Medical Center	Chula Vista, California	United States
Arrowhead Regional Medical Center	Colton, California	United States
KFH Downey	Downey, California	United States
Rady Children's at Scripps Encinitas Memorial Hosp	Encinitas, California	United States
Rady Children's at Palomar Medical Center Escondido	Escondido, California	United States
Northbay Medical Center	Fairfield, California	United States
KFH Fontana	Fontana, California	United States
Fountain Valley Regional Hospital & Medical Center	Fountain Valley, California	United States

LPCH Special Care Nursery at Washington Hospital	Fremont, California	United States
Washington Hospital - Fremont	Fremont, California	United States
San Joaquin General Hospital (SJGH)	French Camp, California	United States
Community Regional Med. Center - Fresno	Fresno, California	United States
Valley Children's Hospital at St. Agnes Medical Ce	Fresno, California	United States
St. Jude Medical Center	Fullerton, California	United States
Adventist Health - Glendale	Glendale, California	United States
Glendale Memorial Hospital and Health Center	Glendale, California	United States
MarinHealth Medical Center	Greenbrae, California	United States
KFH South Bay	Harbor City, California	United States
Centinela Hospital Medical Center	Inglewood, California	United States
KFH Orange County - Irvine	Irvine, California	United States
Rady Children's at Scripps La Jolla	La Jolla, California	United States
UCSD Health La Jolla - Jacobs Medical Center	La Jolla, California	United States
Grossmont Hospital, Women's Health Center	La Mesa, California	United States
Memorialcare Saddleback Medical Center	Laguna Hills, California	United States
Antelope Valley Hospital	Lancaster, California	United States
Loma Linda University Children's Hospital	Loma Linda, California	United States
Memorialcare Miller Children's & Women's Hospital	Long Beach, California	United States
St. Mary Medical Center	Long Beach, California	United States
Adventist Health - White Memorial	Los Angeles, California	United States
California Hospital Medical Center - Los Angeles	Los Angeles, California	United States
Cedars-Sinai Medical Center (CSMC)	Los Angeles, California	United States
Children's Hospital Los Angeles (CHLA)	Los Angeles, California	United States
Hollywood Presbyterian Medical Center	Los Angeles, California	United States
KFH Los Angeles	Los Angeles, California	United States
KFH West Los Angeles	Los Angeles, California	United States
LAC/USC Medical Center	Los Angeles, California	United States
PIH Health Good Samaritan Hospital	Los Angeles, California	United States
UCLA Mattel Children's Hospital	Los Angeles, California	United States
St. Francis Medical Center	Lynwood, California	United States
Valley Children's Hospital	Madera, California	United States
Providence Holy Cross Medical Center	Mission Hills, California	United States
CHOC Children's at Mission Hospital	Mission Viejo, California	United States
Doctors Medical Center of Modesto	Modesto, California	United States
KFH Modesto	Modesto, California	United States
Memorial Medical Center - Modesto	Modesto, California	United States
Garfield Medical Center	Monterey Park, California	United States
Riverside University Health System Medical Center	Moreno Valley, California	United States
El Camino Hospital	Mountain View, California	United States
Rady Children's at Rancho Springs Medical Center	Murrieta, California	United States
Hoag Memorial Hospital, Presbyterian	Newport Beach, California	United States
Northridge Hospital Medical Center	Northridge, California	United States



KFH Oakland	Oakland, California	United States
UCSF Benioff Children's Hospital - Oakland	Oakland, California	United States
Tri-City Medical Center	Oceanside, California	United States
KFH Ontario Campus	Ontario, California	United States
CHOC Children's Hospital	Orange, California	United States
UC Irvine Medical Center	Orange, California	United States
St. John's Regional Medical Center	Oxnard, California	United States
Desert Regional Medical Center	Palm Springs, California	United States
Lucile Packard Children's Hospital Stanford	Palo Alto, California	United States
KFH Panorama City	Panorama City, California	United States
Huntington Memorial Hospital	Pasadena, California	United States
Pomona Valley Hospital Medical Center	Pomona, California	United States
Mercy Medical Center - Redding	Redding, California	United States
Redlands Community Hospital	Redlands, California	United States
LPCH Special Care Nursery at Sequoia Hospital	Redwood City, California	United States
AHMC Parkview Community Medical Center	Riverside, California	United States
KFH Riverside	Riverside, California	United States
Riverside Community Hospital	Riverside, California	United States
KFH Roseville	Roseville, California	United States
Sutter Roseville Medical Center	Roseville, California	United States
Anderson Lucchetti Women's and Children's Center	Sacramento, California	United States
Methodist Hospital of Sacramento	Sacramento, California	United States
UC Davis Medical Center	Sacramento, California	United States
Natividad Medical Center	Salinas, California	United States
Salinas Valley Memorial Hospital	Salinas, California	United States
Community Hospital of San Bernardino	San Bernardino, California	United States
St. Bernardine Medical Center	San Bernardino, California	United States
KFH San Diego	San Diego, California	United States
Rady Children's at Scripps Mercy Hospital San Diego	San Diego, California	United States
Rady Children's Hospital San Diego (RCHSD)	San Diego, California	United States
Scripps Mercy Hospital San Diego	San Diego, California	United States
Sharp Mary Birch Hospital for Women and Newborns	San Diego, California	United States
UCSD Medical Center - Hillcrest	San Diego, California	United States
California Pacific Medical Center Van Ness Campus	San Francisco, California	United States
KFH San Francisco	San Francisco, California	United States
UCSF Benioff Children's Hospital in San Francisco	San Francisco, California	United States
Zuckerberg San Francisco General Hospital	San Francisco, California	United States
San Gabriel Valley Medical Center	San Gabriel, California	United States
Good Samaritan Hospital, San Jose	San Jose, California	United States
O'Connor Hospital - San Jose	San Jose, California	United States
Santa Clara Valley Medical Center (SCVMC)	San Jose, California	United States
KFH San Leandro	San Leandro, California	United States
Sierra Vista Regional Medical Center	San Luis Obispo, California	United States

Orange County Global Medical Center	Santa Ana, California	United States
Santa Barbara Cottage Hospital	Santa Barbara, California	United States
KFH Santa Clara	Santa Clara, California	United States
Dignity Health Dominican Hospital	Santa Cruz, California	United States
Marian Regional Medical Center	Santa Maria, California	United States
Providence St. John's Health Center	Santa Monica, California	United States
Santa Monica - UCLA Medical Center	Santa Monica, California	United States
Santa Rosa Memorial Hospital	Santa Rosa, California	United States
Sutter Santa Rosa Regional Hospital	Santa Rosa, California	United States
Dameron Hospital Association	Stockton, California	United States
St. Joseph's Medical Center - Stockton	Stockton, California	United States
LAC/Olive View - UCLA Medical Center	Sylmar, California	United States
Providence Cedars-Sinai Tarzana Medical Center	Tarzana, California	United States
Los Robles Regional Hospital & Medical Center	Thousand Oaks, California	United States
LAC/HARBOR - UCLA MEDICAL CENTER	Torrance, California	United States
Providence Little Company of Mary Medical Center	Torrance, California	United States
Torrance Memorial Medical Center	Torrance, California	United States
San Antonio Regional Hospital	Upland, California	United States
Henry Mayo Newhall Memorial Hospital	Valencia, California	United States
Valley Presbyterian Hospital	Van Nuys, California	United States
Community Memorial Hospital of Ventura	Ventura, California	United States
Ventura County Medical Center (VCMC)	Ventura, California	United States
Kaweah Delta Healthcare District	Visalia, California	United States
John Muir Health, Walnut Creek Medical Center	Walnut Creek, California	United States
KFH Walnut Creek	Walnut Creek, California	United States
Watsonville Community Hospital	Watsonville, California	United States
Emanate Health - Queen of the Valley Hospital	West Covina, California	United States
Presbyterian Intercommunity Hospital (PIH Health)	Whittier, California	United States
KFH Woodland Hills	Woodland Hills, California	United States
Children's Hospital Colorado	Aurora, Colorado	United States
Medical Center of Aurora	Aurora, Colorado	United States
UCHSC	Aurora, Colorado	United States
St. Francis Medical Center	Colorado Springs, Colorado	United States
Denver Health Medical Center	Denver, Colorado	United States
Rocky Mountain Hospital for Children at P/SL	Denver, Colorado	United States
Rose Medical Center	Denver, Colorado	United States
Saint Joseph Hospital	Denver, Colorado	United States
Swedish Medical Center	Englewood, Colorado	United States
Poudre Valley Hospital	Fort Collins, Colorado	United States
St. Mary's Hospital and Medical Center	Grand Junction, Colorado	United States
Banner Health Northern Colorado Medical Center	Greeley, Colorado	United States
Good Samaritan Medical Center	Lafayette, Colorado	United States
Sky Ridge Medical Center	Lone Tree, Colorado	United States

Yale-New Haven Children's at Bridgeport Hospital	Bridgeport, Connecticut	United States
Danbury Hospital	Danbury, Connecticut	United States
Connecticut Children's NICU at UCONN Health Center	Farmington, Connecticut	United States
Greenwich Hospital	Greenwich, Connecticut	United States
Connecticut Children's Medical Center	Hartford, Connecticut	United States
St. Francis Hospital	Hartford, Connecticut	United States
Hospital of Central Connecticut, The	New Britain, Connecticut	United States
Yale-New Haven Children's Hospital	New Haven, Connecticut	United States
Norwalk Hospital	Norwalk, Connecticut	United States
Stamford Hospital	Stamford, Connecticut	United States
ChristianaCare	Newark, Delaware	United States
MedStar Georgetown University Hospital	Washington, District Of Columbia	United States
Washington Hospital Center	Washington, District Of Columbia	United States
Brandon Regional Hospital	Brandon, Florida	United States
HCA Florida University Hospital	Davie, Florida	United States
Halifax Medical Center	Daytona Beach, Florida	United States
Broward Health Medical Center/Salah Foundation Chi	Fort Lauderdale, Florida	United States
Golisano Children's Hospital of Southwest Florida	Fort Myers, Florida	United States
Lawnwood Regional Medical Center & Heart Institute	Fort Pierce, Florida	United States
North Florida Regional Medical Center, Inc.	Gainesville, Florida	United States
UF Shands Hospital Gainesville	Gainesville, Florida	United States
Joe DiMaggio Children's Hospital	Hollywood, Florida	United States
UF Health Jacksonville	Jacksonville, Florida	United States
Wolfson Children's Hospital	Jacksonville, Florida	United States
Osceola Regional Medical Center	Kissimmee, Florida	United States
Lakeland Regional Health Medical Center	Lakeland, Florida	United States
Northwest Medical Center	Margate, Florida	United States
Baptist Children's Hospital	Miami, Florida	United States
Jackson Memorial Hospital	Miami, Florida	United States
Kendall Regional Medical Center	Miami, Florida	United States
Mercy Hospital	Miami, Florida	United States
Nicklaus Children's Hospital	Miami, Florida	United States
Jackson North Medical Center	North Miami Beach, Florida	United States
Orange Park Medical Center	Orange Park, Florida	United States
AdventHealth for Children	Orlando, Florida	United States
Nemours Children's Hospital	Orlando, Florida	United States
Winnie Palmer Hospital for Women and Babies	Orlando, Florida	United States
Gulf Coast Regional Medical Center	Panama City, Florida	United States
Studer Family Children's Hospital at Ascension Sac	Pensacola, Florida	United States
Johns Hopkins All Children's Hospital	Saint Petersburg, Florida	United States
All Children's at Sarasota Memorial	Sarasota, Florida	United States
Tallahassee Memorial Hospital	Tallahassee, Florida	United States

St. Joseph's Children's Hospital	Tampa, Florida	United States
Tampa General Hospital	Tampa, Florida	United States
Women's Center - Advent Health Tampa	Tampa, Florida	United States
Wellington Regional Medical Center	Wellington, Florida	United States
St. Mary's Hospital	West Palm Beach, Florida	United States
Phoebe Putney Memorial Hospital	Albany, Georgia	United States
Piedmont Athens Regional	Athens, Georgia	United States
Emory University Hospital, Midtown	Atlanta, Georgia	United States
Grady Memorial Hospital	Atlanta, Georgia	United States
Northside Hospital	Atlanta, Georgia	United States
Piedmont Hospital	Atlanta, Georgia	United States
Augusta University Health System	Augusta, Georgia	United States
Wellstar Cobb Hospital	Austell, Georgia	United States
Northside Hospital Cherokee	Canton, Georgia	United States
Medical Center at Columbus Regional, The	Columbus, Georgia	United States
Piedmont Rockdale Hospital	Conyers, Georgia	United States
Northside Hospital Forsyth	Cumming, Georgia	United States
Hamilton Medical Center	Dalton, Georgia	United States
Piedmont Fayette Hospital	Fayetteville, Georgia	United States
Northeast Georgia Medical Center	Gainesville, Georgia	United States
Emory Johns Creek Hospital	Johns Creek, Georgia	United States
Gwinnett Hospital System	Lawrenceville, Georgia	United States
Coliseum Medical Center	Macon, Georgia	United States
Wellstar Kennestone Hospital	Marietta, Georgia	United States
Southern Regional Medical Center	Riverdale, Georgia	United States
Floyd Medical Center	Rome, Georgia	United States
Memorial Health Savannah	Savannah, Georgia	United States
St. Joseph's/Candler Health System	Savannah, Georgia	United States
Eastside Medical Center	Snellville, Georgia	United States
Piedmont Henry Hospital	Stockbridge, Georgia	United States
Kaiser Permanente Moanalua Medical Center	Honolulu, Hawaii	United States
Kapiolani Medical Center for Women & Children	Honolulu, Hawaii	United States
St. Luke's Regional Medical Center	Boise, Idaho	United States
Kootenai Health	Coeur d'Alene, Idaho	United States
Eastern Idaho Regional Medical Center (EIRMC)	Idaho Falls, Idaho	United States
St. Luke's Meridian Medical Center	Meridian, Idaho	United States
Portneuf Medical Center	Pocatello, Idaho	United States
St. Luke's Magic Valley	Twin Falls, Idaho	United States
Northwest Community Healthcare	Arlington Heights, Illinois	United States
Rush Copley Medical Center	Aurora, Illinois	United States
Memorial Hospital of Carbondale	Carbondale, Illinois	United States
Advocate Illinois Masonic Medical Center	Chicago, Illinois	United States
John H. Stroger, Jr. Hospital of Cook County	Chicago, Illinois	United States

Mercy Hospital and Medical Center	Chicago, Illinois	United States
Mt. Sinai Hospital Medical Center	Chicago, Illinois	United States
Northwestern Memorial	Chicago, Illinois	United States
Rush University Medical Center	Chicago, Illinois	United States
St. Joseph Hospital Chicago	Chicago, Illinois	United States
University of Chicago	Chicago, Illinois	United States
University of Illinois at Chicago	Chicago, Illinois	United States
Advocate Good Samaritan Hospital	Downers Grove, Illinois	United States
Elmhurst Hospital	Elmhurst, Illinois	United States
Evanston Hospital	Evanston, Illinois	United States
Adventist Hinsdale Hospital	Hinsdale, Illinois	United States
St. Alexius Medical Center	Hoffman Estates, Illinois	United States
Amita Health St. Joseph Medical Center	Joliet, Illinois	United States
RMCH at Loyola University Medical Center	Maywood, Illinois	United States
UnityPoint Trinity-Moline	Moline, Illinois	United States
Edward Hospital and Health Services	Naperville, Illinois	United States
Advocate Children's Hospital - Oak Lawn	Oak Lawn, Illinois	United States
Advocate Children's Hospital - Park Ridge	Park Ridge, Illinois	United States
CHOI at OSF St. Francis Medical Center	Peoria, Illinois	United States
Javon Bea Hospital - Riverside	Rockford, Illinois	United States
SwedishAmerican Hospital	Rockford, Illinois	United States
St. John's Hospital	Springfield, Illinois	United States
Carle Foundation Hospital	Urbana, Illinois	United States
Central DuPage Hospital	Winfield, Illinois	United States
Ascension St. Vincent Carmel	Carmel, Indiana	United States
IU Health North Hospital	Carmel, Indiana	United States
Franciscan Health Crown Point	Crown Point, Indiana	United States
Ascension St. Vincent Evansville	Evansville, Indiana	United States
Dupont Hospital	Fort Wayne, Indiana	United States
Lutheran Hospital of Indiana	Fort Wayne, Indiana	United States
Parkview Women's and Children's Hospital	Fort Wayne, Indiana	United States
St. Joseph Hospital	Fort Wayne, Indiana	United States
Methodist Hospitals Northlake Campus	Gary, Indiana	United States
Ascension St. Vincent Hospital - Women's	Indianapolis, Indiana	United States
Community Hospital North Indianapolis	Indianapolis, Indiana	United States
Franciscan St. Francis Health	Indianapolis, Indiana	United States
Methodist Hospital of Indiana	Indianapolis, Indiana	United States
Riley Hospital for Children at IU Health	Indianapolis, Indiana	United States
Wishard Memorial Hospital	Indianapolis, Indiana	United States
Franciscan Health Lafayette	Lafayette, Indiana	United States
Saint Joseph Regional Medical Center	Mishawaka, Indiana	United States
Ball Memorial Hospital	Muncie, Indiana	United States
Community Hospital	Munster, Indiana	United States

Women's Hospital	Newburgh, Indiana	United States
Memorial Hospital	South Bend, Indiana	United States
Union Hospital	Terre Haute, Indiana	United States
UnityPoint Trinity-Bettendorf NSCU	Bettendorf, Iowa	United States
St. Luke's Hospital	Cedar Rapids, Iowa	United States
Genesis Medical Center	Davenport, Iowa	United States
Blank Children's Hospital	Des Moines, Iowa	United States
Mercy Medical Center	Des Moines, Iowa	United States
University of Iowa Children's Hospital	Iowa City, Iowa	United States
St. Luke's Regional Medical Center	Sioux City, Iowa	United States
Covenant Medical Center	Waterloo, Iowa	United States
University of Kansas Hospital Authority	Kansas City, Kansas	United States
Overland Park Regional Medical Center	Overland Park, Kansas	United States
AdventHealth Shawnee Mission	Shawnee Mission, Kansas	United States
Ascension Via Christi Hospital	Wichita, Kansas	United States
Wesley Medical Center	Wichita, Kansas	United States
King's Daughters Medical Center	Ashland, Kentucky	United States
The Medical Center NICU Bowling Green	Bowling Green, Kentucky	United States
St. Elizabeth Healthcare	Edgewood, Kentucky	United States
Hardin Memorial Hospital	Elizabethtown, Kentucky	United States
Frankfort Regional Medical Center	Frankfort, Kentucky	United States
Deaconess Henderson Hospital	Henderson, Kentucky	United States
Jennie Stuart Medical Center	Hopkinsville, Kentucky	United States
Baptist Health Lexington	Lexington, Kentucky	United States
Kentucky Children's Hospital	Lexington, Kentucky	United States
Women's Hospital at St. Joseph East, The	Lexington, Kentucky	United States
Baptist Health Louisville	Louisville, Kentucky	United States
Norton Children's Hospital	Louisville, Kentucky	United States
Norton Women's and Children's Hospital	Louisville, Kentucky	United States
University of Louisville Hospital	Louisville, Kentucky	United States
Baptist Health Deaconess Madisonville	Madisonville, Kentucky	United States
Owensboro Health Regional Hospital	Owensboro, Kentucky	United States
Baptist Health Paducah	Paducah, Kentucky	United States
Christus St. Frances Cabrini Hospital	Alexandria, Louisiana	United States
Rapides Women's and Children's Hospital	Alexandria, Louisiana	United States
Baton Rouge General Medical Ctr - Bluebonnet	Baton Rouge, Louisiana	United States
Ochsner Medical Center Baton Rouge	Baton Rouge, Louisiana	United States
Woman's Hospital	Baton Rouge, Louisiana	United States
Lakeview Regional Medical Center	Covington, Louisiana	United States
St. Tammany Parish Hospital	Covington, Louisiana	United States
Ochsner Medical Center WestBank	Gretna, Louisiana	United States
North Oaks Medical Center	Hammond, Louisiana	United States
Terrebonne General Medical Center	Houma, Louisiana	United States

Lafayette General Medical Center	Lafayette, Louisiana	United States
Our Lady of Lourdes Women's & Children's Hospital	Lafayette, Louisiana	United States
Christus Lake Area Hospital	Lake Charles, Louisiana	United States
Lake Charles Memorial Hosp for Women	Lake Charles, Louisiana	United States
West Jefferson Medical Center	Marrero, Louisiana	United States
East Jefferson General Hospital	Metairie, Louisiana	United States
Tulane Lakeside Hospital	Metairie, Louisiana	United States
St. Francis Medical Center	Monroe, Louisiana	United States
Children's Hospital of New Orleans	New Orleans, Louisiana	United States
Ochsner Baptist Medical Center	New Orleans, Louisiana	United States
Ochsner Medical Center - Jefferson Hwy	New Orleans, Louisiana	United States
Touro Infirmary	New Orleans, Louisiana	United States
CHRISTUS Highland	Shreveport, Louisiana	United States
Ochsner LSU Health St. Mary Medical Center	Shreveport, Louisiana	United States
Willis Knighton South	Shreveport, Louisiana	United States
Slidell Memorial Hospital	Slidell, Louisiana	United States
Eastern Maine Medical Center	Bangor, Maine	United States
Barbara Bush Children's at Maine Medical	Portland, Maine	United States
Anne Arundel Medical Center	Annapolis, Maryland	United States
Ascension Saint Agnes Hospital	Baltimore, Maryland	United States
Franklin Square Hospital Center	Baltimore, Maryland	United States
Greater Baltimore Medical Center	Baltimore, Maryland	United States
JHBMC Hopkins Bayview Medical Ctr	Baltimore, Maryland	United States
Johns Hopkins Hospital	Baltimore, Maryland	United States
Mercy Medical Center - Baltimore	Baltimore, Maryland	United States
Sinai Hospital of Baltimore	Baltimore, Maryland	United States
Univ of Maryland Medical Center	Baltimore, Maryland	United States
Walter Reed Nat'l Mil Med Center NICU	Bethesda, Maryland	United States
University of Maryland Capital Region Medical	Cheverly, Maryland	United States
Howard County General Hospital	Columbia, Maryland	United States
Frederick Memorial Hospital	Frederick, Maryland	United States
Shady Grove Adventist Hospital	Rockville, Maryland	United States
Peninsula Regional Medical Center	Salisbury, Maryland	United States
Holy Cross Hospital	Silver Spring, Maryland	United States
Univ of Maryland St. Joseph Medical Ctr.	Towson, Maryland	United States
Beth Israel Deaconess Medical Center	Boston, Massachusetts	United States
Boston Medical Center	Boston, Massachusetts	United States
Brigham and Women's Hospital	Boston, Massachusetts	United States
Massachusetts General Hospital for Children	Boston, Massachusetts	United States
Tufts Medical Center	Boston, Massachusetts	United States
Steward St. Elizabeth's Medical Center	Brighton, Massachusetts	United States
South Shore Hospital	S. Weymouth, Massachusetts	United States
Baystate Medical Center	Springfield, Massachusetts	United States

UMass Memorial Healthcare	Worcester, Massachusetts	United States
St. Joseph Mercy Hospital	Ann Arbor, Michigan	United States
U. of MI, CS Mott Children's, Brandon NICU	Ann Arbor, Michigan	United States
Beaumont Hospital - Dearborn	Dearborn, Michigan	United States
Ascension St. John Hospital	Detroit, Michigan	United States
Children's Hospital of Michigan	Detroit, Michigan	United States
DMC Sinai-Grace Hospital	Detroit, Michigan	United States
Henry Ford Hospital	Detroit, Michigan	United States
Hutzel Women's Hospital	Detroit, Michigan	United States
Hurley Medical Center	Flint, Michigan	United States
Helen DeVos Children's Hospital	Grand Rapids, Michigan	United States
Mercy Health Saint Mary's	Grand Rapids, Michigan	United States
Henry Ford Allegiance Health	Jackson, Michigan	United States
Children's Hospital at Bronson	Kalamazoo, Michigan	United States
Sparrow Hospital	Lansing, Michigan	United States
UPHS-Marquette	Marquette, Michigan	United States
St. Joseph Mercy Oakland	Pontiac, Michigan	United States
William Beaumont Hospital	Royal Oak, Michigan	United States
Covenant Healthcare	Saginaw, Michigan	United States
Ascension Providence Hospital Southfield Campus	Southfield, Michigan	United States
Munson Medical Center	Traverse City, Michigan	United States
Essentia Health - St. Mary's Children's Hospital	Duluth, Minnesota	United States
Maple Grove Hospital	Maple Grove, Minnesota	United States
Children's Minnesota - Minneapolis	Minneapolis, Minnesota	United States
Hennepin County Medical Center	Minneapolis, Minnesota	United States
University of MN Masonic Children's Hospital	Minneapolis, Minnesota	United States
North Memorial Medical Center	Robbinsdale, Minnesota	United States
Mayo Foundation	Rochester, Minnesota	United States
St. Cloud Hospital	Saint Cloud, Minnesota	United States
Children's Minnesota-St. Paul	Saint Paul, Minnesota	United States
Merit Health River Oaks	Flowood, Mississippi	United States
Merit Health Woman's Hospital	Flowood, Mississippi	United States
Delta Regional Medical Center	Greenville, Mississippi	United States
Memorial Hospital at Gulfport	Gulfport, Mississippi	United States
Forrest General Hospital	Hattiesburg, Mississippi	United States
Merit Health Wesley	Hattiesburg, Mississippi	United States
Children's Hospital at U. of MS Health Care	Jackson, Mississippi	United States
Merit Health Central	Jackson, Mississippi	United States
Mississippi Baptist Health Systems	Jackson, Mississippi	United States
St. Dominic, Jackson Memorial Hospital	Jackson, Mississippi	United States
Anderson Regional Medical Center	Meridian, Mississippi	United States
North Mississippi Medical Center	Tupelo, Mississippi	United States
St. Francis Medical Center	Cape Girardeau, Missouri	United States



Women's & Children's Hosp, U. of MO	Columbia, Missouri	United States
Centerpoint Medical Center	Independence, Missouri	United States
Freeman Hospital and Health System	Joplin, Missouri	United States
Mercy Hospital Joplin	Joplin, Missouri	United States
Children's Mercy Kansas City	Kansas City, Missouri	United States
Research Medical Center	Kansas City, Missouri	United States
St. Luke's Hospital	Kansas City, Missouri	United States
Truman Medical Center	Kansas City, Missouri	United States
Mercy Children's Hospital , St. Louis	Saint Louis, Missouri	United States
SSM Health Cardinal Glennon Children's Hospital	Saint Louis, Missouri	United States
St. Louis Children's Hospital	Saint Louis, Missouri	United States
Cox Health - Neonatology	Springfield, Missouri	United States
Mercy Kids Springfield	Springfield, Missouri	United States
Billings Clinic	Billings, Montana	United States
St. Vincent Hospital & Health Center	Billings, Montana	United States
Benefis Healthcare	Great Falls, Montana	United States
Logan Health	Kalispell, Montana	United States
Community Medical Center	Missoula, Montana	United States
Good Samaritan Hospital Kearney	Kearney, Nebraska	United States
Bryan Medical Center	Lincoln, Nebraska	United States
CHI Health St. Elizabeth	Lincoln, Nebraska	United States
CHI Health Bergan Mercy Medical Center	Omaha, Nebraska	United States
Creighton University Medical Center	Omaha, Nebraska	United States
Methodist Women's Hospital	Omaha, Nebraska	United States
Nebraska Medical Center	Omaha, Nebraska	United States
St. Rose Dominican Hospital Siena Campus	Henderson, Nevada	United States
Children's Hospital of Nevada at UMC	Las Vegas, Nevada	United States
MountainView Hospital	Las Vegas, Nevada	United States
Sunrise Hospital and Medical Center	Las Vegas, Nevada	United States
Dartmouth Hitchcock Medical Center	Lebanon, New Hampshire	United States
Elliot Hospital	Manchester, New Hampshire	United States
Children's at Cooper University Medical Center	Camden, New Jersey	United States
Our Lady of Lourdes Medical Center	Camden, New Jersey	United States
Englewood Hospital and Medical Center	Englewood, New Jersey	United States
Hackensack University Medical Center	Hackensack, New Jersey	United States
Jersey City Medical Center	Jersey City, New Jersey	United States
Cooperman Barnabas Medical Center	Livingston, New Jersey	United States
Monmouth Medical Center	Long Branch, New Jersey	United States
Mountainside Hospital	Montclair, New Jersey	United States
Goryeb Children's Hospital	Morristown, New Jersey	United States
Jersey Shore University Medical Center	Neptune, New Jersey	United States
Robert Wood Johnson University Hospital	New Brunswick, New Jersey	United States
St. Peter's Medical Center	New Brunswick, New Jersey	United States

Children's Hospital of New Jersey at NBIMC	Newark, New Jersey	United States
University Hospital Rutgers-NJMS	Newark, New Jersey	United States
St. Joseph Hospital and Medical Center	Paterson, New Jersey	United States
Capital Health Medical Center-Hopewell	Pennington, New Jersey	United States
Penn Medicine Princeton Medical Center	Plainsboro, New Jersey	United States
Atlanticare Regional Medical Center - NICU	Pomona, New Jersey	United States
Shore Medical Center	Somers Point, New Jersey	United States
Overlook Medical Center	Summit, New Jersey	United States
Community Medical Center Toms River	Toms River, New Jersey	United States
Inspira Health Network	Vineland, New Jersey	United States
Virtua Hospital Systems	Voorhees, New Jersey	United States
Children's Medical Center at Presbyterian Hospital	Albuquerque, New Mexico	United States
Lovelace Women's Hospital	Albuquerque, New Mexico	United States
University of New Mexico Health Sciences Center	Albuquerque, New Mexico	United States
Albany Medical Center	Albany, New York	United States
St. Peter's Hospital	Albany, New York	United States
Montefiore Medical Center-Wakefield Division	Bronx, New York	United States
NYC Health + Hospitals - Jacobi Medical Center	Bronx, New York	United States
Weiler Hospital Montefiore	Bronx, New York	United States
Brookdale Hospital Medical Center	Brooklyn, New York	United States
Brooklyn Hospital Center, The	Brooklyn, New York	United States
Maimonides Medical Center	Brooklyn, New York	United States
NYC Health + Hospitals - Kings County	Brooklyn, New York	United States
NYU Lutheran Medical Center	Brooklyn, New York	United States
University Hospital of Brooklyn	Brooklyn, New York	United States
Sisters of Charity Hospital	Buffalo, New York	United States
NYC Health + Hospitals - Elmhurst	Elmhurst, New York	United States
Arnot Ogden Medical Center	Elmira, New York	United States
NYC Health + Hospitals - Queens Hospital Center	Jamaica, New York	United States
North Shore University Hospital	Manhasset, New York	United States
Orange Regional Medical Center	Middletown, New York	United States
NYU Winthrop	Mineola, New York	United States
Northern Westchester Hospital	Mount Kisco, New York	United States
Cohen Children's Medical Center of New York	New Hyde Park, New York	United States
Columbia University Medical Center	New York, New York	United States
Lenox Hill Hospital	New York, New York	United States
Mt. Sinai Kravis Children's Hospital, The	New York, New York	United States
NYC Health + Hospitals - Bellevue	New York, New York	United States
NYC Health + Hospitals - Harlem Hospital Center	New York, New York	United States
Tisch Hospital, NYU Medical Center	New York, New York	United States
Weill Cornell Medical Center	New York, New York	United States
Vassar Brothers Hospital	Poughkeepsie, New York	United States
Golisano Children's Hospital at Strong	Rochester, New York	United States

Richmond University Medical Center	Staten Island, New York	United States
Staten Island University Hospital	Staten Island, New York	United States
Stony Brook University Medical Center	Stony Brook, New York	United States
Crouse Health Baker Regional NICU	Syracuse, New York	United States
St. Joseph's Health Center	Syracuse, New York	United States
Good Samaritan Hospital Medical Center	West Islip, New York	United States
Mission Children's Hospital	Asheville, North Carolina	United States
North Carolina Children's Hospital	Chapel Hill, North Carolina	United States
Carolinas Medical Center	Charlotte, North Carolina	United States
Novant Health Presbyterian Medical Center	Charlotte, North Carolina	United States
Jeff Gordon Children's Hospital at CMC	Concord, North Carolina	United States
Duke University	Durham, North Carolina	United States
Cape Fear Valley Medical Center	Fayetteville, North Carolina	United States
CaroMont Regional Medical Center	Gastonia, North Carolina	United States
Cone Health Women & Children's Center at Moses Con	Greensboro, North Carolina	United States
Vidant Medical Center	Greenville, North Carolina	United States
Catawba Valley Medical Center	Hickory, North Carolina	United States
Onslow Memorial Hospital	Jacksonville, North Carolina	United States
FirstHealth Moore Regional Hospital	Pinehurst, North Carolina	United States
Rex Hospital	Raleigh, North Carolina	United States
WakeMedical Center	Raleigh, North Carolina	United States
Novant Health New Hanover Regional Medical Center	Wilmington, North Carolina	United States
Brenner Children's Hospital at WFUBMC	Winston-Salem, North Carolina	United States
Forsyth Memorial Hospital	Winston-Salem, North Carolina	United States
Sanford Bismarck Medical Center	Bismarck, North Dakota	United States
Essentia Health	Fargo, North Dakota	United States
Sanford Medical Center Fargo	Fargo, North Dakota	United States
Altru Health System	Grand Forks, North Dakota	United States
Trinity Hospital	Minot, North Dakota	United States
Akron Children's Hospital	Akron, Ohio	United States
Akron Children's Special Care Nursery at Summa	Akron, Ohio	United States
Akron Children's NICU at St. Elizabeth - Boardman	Boardman, Ohio	United States
Akron Children's NICU at Aultman	Canton, Ohio	United States
Children's Hospital Medical Center Cincinnati	Cincinnati, Ohio	United States
Good Samaritan Hospital	Cincinnati, Ohio	United States
University Hospital, Cincinnati	Cincinnati, Ohio	United States
Cleveland Clinic Foundation, The	Cleveland, Ohio	United States
Fairview Hospital	Cleveland, Ohio	United States
MetroHealth Medical Center	Cleveland, Ohio	United States
Rainbow Babies & Children's Hospital	Cleveland, Ohio	United States
Mount Carmel East	Columbus, Ohio	United States
NCH at Doctor's Hospital West	Columbus, Ohio	United States

NCH at Grant Medical Center	Columbus, Ohio	United States
NCH at Riverside Methodist Hospital	Columbus, Ohio	United States
NCH Main Campus	Columbus, Ohio	United States
NCH NICU @Ohio State Medical Ctr	Columbus, Ohio	United States
Dayton Children's Hospital	Dayton, Ohio	United States
Miami Valley Hospital	Dayton, Ohio	United States
Southview Medical Center	Dayton, Ohio	United States
NCH at Dublin Methodist Hospital	Dublin, Ohio	United States
Mount Carmel Grove City	Grove City, Ohio	United States
Kettering Medical Center	Kettering, Ohio	United States
CCF Children's - Hillcrest NICU	Mayfield Heights, Ohio	United States
Mercy Children's Hospital	Toledo, Ohio	United States
Russell J. Ebeid Children's Hospital	Toledo, Ohio	United States
NCH NICU at Mount Carmel St. Ann's Hospital	Westerville, Ohio	United States
Mercy Hospital Oklahoma City	Oklahoma City, Oklahoma	United States
O.U. Health Sciences Center	Oklahoma City, Oklahoma	United States
Ascension St John Medical Center	Tulsa, Oklahoma	United States
Henry Zarrow Neonatal Intensive Care Unit	Tulsa, Oklahoma	United States
OSU Medical Center	Tulsa, Oklahoma	United States
Peggy V. Helmerich Women's Center	Tulsa, Oklahoma	United States
St. Charles Health Care	Bend, Oregon	United States
Kaiser Sunnyside Medical Center	Clackamas, Oregon	United States
Rogue Regional Medical Center	Medford, Oregon	United States
Oregon Health and Science University	Portland, Oregon	United States
Providence Portland Medical Center	Portland, Oregon	United States
Providence St. Vincent Medical Center	Portland, Oregon	United States
Randall Children's Hospital at Legacy Emanuel	Portland, Oregon	United States
Salem Hospital	Salem, Oregon	United States
PeaceHealth Riverbend	Springfield, Oregon	United States
Abington Memorial Hospital	Abington, Pennsylvania	United States
Lehigh Valley Health Network	Allentown, Pennsylvania	United States
St. Luke's Allentown Campus	Allentown, Pennsylvania	United States
St. Luke's University Hospital	Bethlehem, Pennsylvania	United States
Bryn Mawr Hospital	Bryn Mawr, Pennsylvania	United States
Geisinger Medical Center	Danville, Pennsylvania	United States
Penn Highlands DuBois	DuBois, Pennsylvania	United States
Einstein Medical Center Montgomery	East Norriton, Pennsylvania	United States
St. Luke's Hospital - Anderson Campus	Easton, Pennsylvania	United States
Penn State Heath Hampden Medical Center	Enola, Pennsylvania	United States
Ephrata Community Hospital	Ephrata, Pennsylvania	United States
Hamot Medical Center	Erie, Pennsylvania	United States
St. Vincent Health Center	Erie, Pennsylvania	United States
Pinnacle Health Hospitals	Harrisburg, Pennsylvania	United States

Penn State Children's Hospital	Hershey, Pennsylvania	United States
Conemaugh Memorial Medical Center	Johnstown, Pennsylvania	United States
Lancaster General Health-Women & Babies Hospital	Lancaster, Pennsylvania	United States
St. Mary Medical Center	Langhorne, Pennsylvania	United States
Holy Redeemer Hospital and Medical Center	Meadowbrook, Pennsylvania	United States
Riddle Hospital	Media, Pennsylvania	United States
Children's Hospital of Philadelphia Newborn Center	Philadelphia, Pennsylvania	United States
Einstein Medical Center Philadelphia	Philadelphia, Pennsylvania	United States
Hahnemann University Hospital	Philadelphia, Pennsylvania	United States
Hospital of the University of Pennsylvania	Philadelphia, Pennsylvania	United States
Pennsylvania Hospital	Philadelphia, Pennsylvania	United States
Temple University Hospital	Philadelphia, Pennsylvania	United States
Thomas Jefferson University Hospital	Philadelphia, Pennsylvania	United States
Magee-Womens Hospital of UPMC	Pittsburgh, Pennsylvania	United States
Western Pennsylvania Hospital	Pittsburgh, Pennsylvania	United States
Reading Hospital-Tower Health	Reading, Pennsylvania	United States
Moses Taylor Hospital	Scranton, Pennsylvania	United States
Crozer Chester Medical Center	Upland, Pennsylvania	United States
CHOP Newborn Care at Chester County Hospital	West Chester, Pennsylvania	United States
Geisinger Wyoming Valley Medical Center	Wilkes-Barre, Pennsylvania	United States
Lankenau Medical Center	Wynnewood, Pennsylvania	United States
WellSpan York Hospital	York, Pennsylvania	United States
Women & Infants Hospital	Providence, Rhode Island	United States
Shawn Jenkins Children's Hospital	Charleston, South Carolina	United States
Trident Medical Center	Charleston, South Carolina	United States
Palmetto Health Richland	Columbia, South Carolina	United States
Prisma Health Baptist	Columbia, South Carolina	United States
McLeod Regional Medical Center	Florence, South Carolina	United States
Children's Hospital of Greenville	Greenville, South Carolina	United States
Piedmont Medical Center	Rock Hill, South Carolina	United States
Spartanburg Regional Healthcare System	Spartanburg, South Carolina	United States
Summerville Medical Center	Summerville, South Carolina	United States
Monument Health Rapid City Hospital	Rapid City, South Dakota	United States
Avera McKennan	Sioux Falls, South Dakota	United States
Boekelheide NICU at Sanford Health	Sioux Falls, South Dakota	United States
Children's Hospital at Erlanger	Chattanooga, Tennessee	United States
Parkridge East Hospital	Chattanooga, Tennessee	United States
Maury Regional Medical Center	Columbia, Tennessee	United States
TriStar Summit Medical Center	Hermitage, Tennessee	United States
Jackson Madison County General Hospital	Jackson, Tennessee	United States
Niswonger Children's Hospital	Johnson City, Tennessee	United States
East Tennessee Children's Hospital	Knoxville, Tennessee	United States
University of Tennessee Medical Center	Knoxville, Tennessee	United States

Baptist Memorial Hospital for Women	Memphis, Tennessee	United States
Regional One Health	Memphis, Tennessee	United States
Children's Hospital at TriStar Centennial, The	Nashville, Tennessee	United States
Monroe Carell Jr. Children's Hospital Vanderbilt	Nashville, Tennessee	United States
Hendrick Medical Center	Abilene, Texas	United States
Hendrick Medical Center South	Abilene, Texas	United States
Baptist St. Anthony's Health System	Amarillo, Texas	United States
Northwest Texas Healthcare System	Amarillo, Texas	United States
Medical City Arlington	Arlington, Texas	United States
Texas Health Arlington Memorial Hospital	Arlington, Texas	United States
Ascension Seton Medical Center Austin	Austin, Texas	United States
Dell Children's Medical Center of Central Texas	Austin, Texas	United States
North Austin Medical Center	Austin, Texas	United States
St. David's Medical Center	Austin, Texas	United States
St. David's South Austin Medical Center	Austin, Texas	United States
CHRISTUS Southeast Texas Hospital	Beaumont, Texas	United States
Valley Baptist Medical Center - Brownsville	Brownsville, Texas	United States
Valley Regional Medical Center TX	Brownsville, Texas	United States
HCA Houston Healthcare Conroe	Conroe, Texas	United States
Christus Spohn Hospital Corpus Christi South	Corpus Christi, Texas	United States
Corpus Christi Medical Center	Corpus Christi, Texas	United States
Driscoll Children's Hospital	Corpus Christi, Texas	United States
Baylor Healthcare System	Dallas, Texas	United States
Medical City Dallas	Dallas, Texas	United States
Methodist Dallas Medical Center	Dallas, Texas	United States
Presbyterian Hospital of Dallas	Dallas, Texas	United States
Texas Health Presbyterian Hospital Dallas	Dallas, Texas	United States
University of Texas Southwestern Med. Ctr. Dallas	Dallas, Texas	United States
William P. Clements Jr. University Hospital	Dallas, Texas	United States
Texas Health Presbyterian Hospital Denton	Denton, Texas	United States
Women's Hospital At Renaissance	Edinburg, Texas	United States
Del Sol Medical Center	El Paso, Texas	United States
El Paso Children's Hospital	El Paso, Texas	United States
Las Palmas Medical Center	El Paso, Texas	United States
Texas Health Presbyterian Hospital Flower Mound	Flower Mound, Texas	United States
Baylor All Saints Medical Center	Fort Worth, Texas	United States
Cook Children's Medical Center	Fort Worth, Texas	United States
Harris Methodist Fort Worth Hospital	Fort Worth, Texas	United States
John Peter Smith Hospital	Fort Worth, Texas	United States
Medical City Alliance	Fort Worth, Texas	United States
Medical City Frisco	Frisco, Texas	United States
University of Texas Medical Branch	Galveston, Texas	United States
Valley Baptist Medical Center - Harlingen	Harlingen, Texas	United States

Ben Taub General Hospital	Houston, Texas	United States
Children's Memorial Hermann Hospital	Houston, Texas	United States
HCA Houston Healthcare Cypress Fairbanks	Houston, Texas	United States
HCA Houston Healthcare Northwest	Houston, Texas	United States
Houston Methodist West Hospital	Houston, Texas	United States
Lyndon B. Johnson General Hospital	Houston, Texas	United States
Memorial Hermann Greater Heights Hospital	Houston, Texas	United States
Memorial Hermann Memorial City Med Ctr	Houston, Texas	United States
Memorial Hermann Southeast	Houston, Texas	United States
Memorial Hermann Southwest	Houston, Texas	United States
Methodist Willowbrook Hospital	Houston, Texas	United States
St. Joseph Hospital	Houston, Texas	United States
Texas Children's Hospital, Baylor College of Med.	Houston, Texas	United States
Woman's Hospital of Texas, The	Houston, Texas	United States
Memorial Hermann Northeast Hospital	Humble, Texas	United States
Memorial Hermann Katy Hospital	Katy, Texas	United States
HCA Houston Healthcare Kingwood	Kingwood, Texas	United States
Medical City Lewisville	Lewisville, Texas	United States
Christus Good Shepherd Medical Center	Longview, Texas	United States
Longview Regional Medical Center	Longview, Texas	United States
Covenant Children's Hospital	Lubbock, Texas	United States
University Medical Center	Lubbock, Texas	United States
Methodist Mansfield Medical Center	Mansfield, Texas	United States
Rio Grande Regional Hospital	McAllen, Texas	United States
Medical City of McKinney	McKinney, Texas	United States
HCA Houston Healthcare Southeast	Pasadena, Texas	United States
Medical City Plano	Plano, Texas	United States
Texas Health Presbyterian Hospital Plano	Plano, Texas	United States
Methodist Richardson Medical Center	Richardson, Texas	United States
Lake Pointe Medical Center	Rowlett, Texas	United States
Children's Hospital of San Antonio	San Antonio, Texas	United States
Methodist Children's Hospital	San Antonio, Texas	United States
Methodist Stone Oak Hospital (MSOH)	San Antonio, Texas	United States
Metropolitan Methodist Hospital	San Antonio, Texas	United States
North Central Baptist Hospital	San Antonio, Texas	United States
St. Luke's Baptist Hospital	San Antonio, Texas	United States
University Hospital San Antonio	San Antonio, Texas	United States
Houston Methodist Sugar Land Hospital	Sugar Land, Texas	United States
Baylor Scott & White McLane Children's Medical Cen	Temple, Texas	United States
Christus St. Michael Health System	Texarkana, Texas	United States
Houston Methodist The Woodlands Hospital	The Woodlands, Texas	United States
Memorial Hermann The Woodlands	The Woodlands, Texas	United States
St. Luke's The Woodlands Hospital	The Woodlands, Texas	United States

Texas Children's Hospital The Woodlands	The Woodlands, Texas	United States
Christus Trinity Mother Frances Health System	Tyler, Texas	United States
DeTar Hospital North	Victoria, Texas	United States
Baylor Scott & White Medical Center - Hillcrest	Waco, Texas	United States
HCA Houston Healthcare Clear Lake	Webster, Texas	United States
Intermountain Medical Center	Murray, Utah	United States
McKay Dee Hospital Center	Ogden, Utah	United States
Ogden Regional Medical Center	Ogden, Utah	United States
Timpanogos Regional Hospital	Orem, Utah	United States
Utah Valley Regional Medical Center	Provo, Utah	United States
St. George Regional Medical Center	Saint George, Utah	United States
St. Mark's Hospital	Salt Lake City, Utah	United States
University of Utah Health Sciences Center	Salt Lake City, Utah	United States
University of Vermont Children's Hospital	Burlington, Vermont	United States
Inova Alexandria Hospital (NICU)	Alexandria, Virginia	United States
Virginia Hospital Center	Arlington, Virginia	United States
University of Virginia	Charlottesville, Virginia	United States
Inova Fair Oaks Hospital	Fairfax, Virginia	United States
INOVA Children's Hospital	Falls Church, Virginia	United States
Mary Washington Hospital	Fredericksburg, Virginia	United States
Spotsylvania Regional Medical Center	Fredericksburg, Virginia	United States
Inova Loudoun Hospital	Leesburg, Virginia	United States
Centra Health, Virginia Baptist Hospital	Lynchburg, Virginia	United States
Children's Hospital of the King's Daughters	Norfolk, Virginia	United States
Reston Hospital Center	Reston, Virginia	United States
Bon Secours St. Mary's Hospital	Richmond, Virginia	United States
Children's Hosp of Richmond at VCU	Richmond, Virginia	United States
CJW Medical Center, Chippenham Campus	Richmond, Virginia	United States
Henrico Doctors' Hospital	Richmond, Virginia	United States
Johnston-Willis Hospital	Richmond, Virginia	United States
Carilion Clinic Children's Hospital	Roanoke, Virginia	United States
Winchester Medical Center	Winchester, Virginia	United States
Sentara Northern Virginia Medical Center	Woodbridge, Virginia	United States
Overlake Hospital Medical Center	Bellevue, Washington	United States
Providence Regional Medical Center Everett	Everett, Washington	United States
Evergreen Health	Kirkland, Washington	United States
UW Medicine - Valley Medical Center	Renton, Washington	United States
Kadlec Regional Medical Center	Richland, Washington	United States
Swedish Med Cen-First Hill Pavilion	Seattle, Washington	United States
University of Washington Medical Center	Seattle, Washington	United States
Deaconess Hospital	Spokane, Washington	United States
Providence Sacred Heart Medical Center & Childrens	Spokane, Washington	United States
MultiCare Health System-Tacoma General Hospital	Tacoma, Washington	United States



St. Joseph Medical Center	Tacoma, Washington	United States
Legacy Salmon Creek Hospital	Vancouver, Washington	United States
PeaceHealth Southwest Medical Center	Vancouver, Washington	United States
Yakima Valley Memorial Hospital	Yakima, Washington	United States
Charleston Area Medical Center	Charleston, West Virginia	United States
Cabell Huntington Hospital, Inc.	Huntington, West Virginia	United States
Berkeley Medical Center	Martinsburg, West Virginia	United States
West Virginia University School of Medicine	Morgantown, West Virginia	United States
Ascension NE Wisconsin - St Elizabeth Campus	Appleton, Wisconsin	United States
Aurora Baycare Medical Center	Green Bay, Wisconsin	United States
St. Vincent Hospital	Green Bay, Wisconsin	United States
Gundersen Lutheran Medical Center	La Crosse, Wisconsin	United States
American Family Children's Hospital	Madison, Wisconsin	United States
Meriter Hospital	Madison, Wisconsin	United States
SSM Health St. Mary's Hospital Madison	Madison, Wisconsin	United States
Marshfield Medical Center - Marshfield	Marshfield, Wisconsin	United States
Ascension Columbia St. Mary's Hospital Milwaukee	Milwaukee, Wisconsin	United States
Ascension SE Wisconsin Hospital - St Joseph Campus	Milwaukee, Wisconsin	United States
Aurora Sinai Medical Center	Milwaukee, Wisconsin	United States
Children's Hospital of Wisconsin, Fox Valley	Neenah, Wisconsin	United States
Ascension All Saints Hospital	Racine, Wisconsin	United States
Waukesha Memorial Hospital	Waukesha, Wisconsin	United States
Aspirus Wausau Hospital	Wausau, Wisconsin	United States
Children's Wisconsin	Wauwatosa, Wisconsin	United States
Aurora Women's Pavilion	West Allis, Wisconsin	United States