

# Stanford

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## Suzan L Carmichael, PhD, MS

Professor (Research) of Pediatrics (Neonatology), of Obstetrics & Gynecology (Maternal Fetal Medicine) and, by courtesy, of Epidemiology and Population Health  
Pediatrics - Neonatal and Developmental Medicine

### Bio

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#### BIO

Dr. Carmichael is a perinatal and nutritional epidemiologist and Professor of Pediatrics and Obstetrics and Gynecology at the Stanford University School of Medicine. Her research focuses on finding ways to improve maternal and infant health. Exposure themes include nutrition, social context, care, environmental contaminants and genetics. Outcomes include severe maternal morbidity, stillbirth, birth defects, and preterm delivery. She is particularly interested in understanding the intersection of these varied types of exposures and outcomes and how they interact to impact health and health disparities, for the mother-baby dyad, in domestic as well as global health settings.

#### ACADEMIC APPOINTMENTS

- Professor (Research), Pediatrics - Neonatal and Developmental Medicine
- Professor (Research), Obstetrics & Gynecology - Maternal Fetal Medicine
- Professor (Research) (By courtesy), Epidemiology and Population Health
- Member, Bio-X
- Member, Maternal & Child Health Research Institute (MCHRI)

#### ADMINISTRATIVE APPOINTMENTS

- Co-Director, Perinatal Epidemiology & Population Health, Dunlevie Maternal Fetal Medicine Center, Stanford, (2022- present)
- Adjunct Professor, Dept. of Epidemiology, Tulane Univ. School of Public Health & Tropical Medicine, (2022- present)
- Fellow, Center for Emerging Reproductive & Perinatal Epidemiology (CERPE), Tulane Univ. School of Public Health & Tropical Medicine, (2022- present)
- Faculty Senator, Stanford University, (2020-2022)
- Head, Department of Pediatrics Research and Statistical Unit, (2012-2018)
- Epidemic Intelligence Service Officer, CDC, (1996-1998)

#### HONORS AND AWARDS

- Fulbright Scholar Award, University of Bergen (2023)
- Scholars in Service Award, Stanford Impact Labs and Haas Center for Public Service (2022-2023)
- Post-Doc Mentor Award, Dept. of Pediatrics, Stanford Univ. School of Medicine (2020)
- F. Clarke Fraser New Investigator Award, Teratology Society (2005)
- Public Health Citation, Public Health Service, DHHS (1997)
- Warren Winkelstein Epidemiology Award, U.C., Berkeley (1996)
- Regents Fellowship and Kaiser Fellowship, U.C., Berkeley (1994-95)

- A.J. Bryan Scholarship, Kaiser Fellowship, U.C., Berkeley (1993-94)
- Lechner Fellowship, Texas A&M University (1984-88)

## **BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS**

- President-Elect, President, Past President, Society for Pediatric and Perinatal Epidemiologic Research (2014 - 2017)
- Associate Editor, Annals of Epidemiology (2009 - 2022)
- Faculty Fellow, Stanford Center for Population Health Sciences (2017 - present)
- Member, Science Advisory Board, Developmental and Reproductive Toxicant Identification Committee, OEHHA, State of California (2015 - present)
- Epidemiology Section Editor, Cleft Palate-Craniofacial Journal (2014 - 2017)
- Member at Large, Society for Pediatric and Perinatal Epidemiologic Research (2007 - 2011)
- Secretary, Society for Pediatric and Perinatal Epidemiologic Research (1998 - 2002)

## **PROFESSIONAL EDUCATION**

- PhD, U.C., Berkeley , Epidemiology (1996)
- M.S., U.C., Davis , International Agricultural Development (1992)
- B.S., Texas A&M University , Scientific Nutrition (1988)

## **COMMUNITY AND INTERNATIONAL WORK**

- Peace Corps Volunteer, Honduras, 1992

## **LINKS**

- Carmichael Lab web-site: <https://med.stanford.edu/carmichaellab.html>

## **Research & Scholarship**

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### **CURRENT RESEARCH AND SCHOLARLY INTERESTS**

Dr. Carmichael is a perinatal and nutritional epidemiologist and Professor of Pediatrics and Obstetrics and Gynecology at the Stanford University School of Medicine.

Her team is committed to finding ways to improve maternal and infant health outcomes and equity by leading research that identifies effective leverage points for change, from upstream 'macro' social and structural factors, to downstream clinical factors (eg, related to care and morbidities) through a collaborative research approach that integrates epidemiologic approaches with community engagement and systems thinking.

Exposure themes include social context, nutrition, care, environmental contaminants and genetics. Outcome themes include severe maternal morbidity, stillbirth, birth defects, and preterm delivery. She is particularly interested in understanding the intersectionality of these varied types of exposures and outcomes and how they interact to impact health and health disparities, for the mother-baby dyad.

Please see the team web-site for further information!

<https://med.stanford.edu/carmichaellab.html>

## **Teaching**

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### **STANFORD ADVISEES**

#### **Postdoctoral Faculty Sponsor**

Marina Magalhães

**Doctoral Dissertation Advisor (AC)**

Shalmali Bane

**Master's Program Advisor**

Irogue Igbinosa, Sofia Pesantez

## **Publications**

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### **PUBLICATIONS**

- **Racial and Ethnic Disparities in Anemia and Severe Maternal Morbidity.** *Obstetrics and gynecology*  
Igbinosa, I. I., Leonard, S. A., Noelette, F., Davies-Balch, S., Carmichael, S. L., Main, E., Lyell, D. J.  
2023
- **Periconceptional intakes of methyl donors and other micronutrients involved in one-carbon metabolism may further reduce the risk of neural tube defects in offspring: a United States population-based case-control study of women meeting the folic acid recommendations.** *The American journal of clinical nutrition*  
Petersen, J. M., Smith-Webb, R. S., Shaw, G. M., Carmichael, S. L., Desrosiers, T. A., Nestoridi, E., Darling, A. M., Parker, S. E., Politis, M. D., Yazdy, M. M., Werler, M. M.  
2023; 118 (3): 720-728
- **Neighborhood gentrification, displacement, and severe maternal morbidity in California.** *Social science & medicine (1982)*  
Gao, X., Thomas, T. A., Morello-Frosch, R., Allen, A. M., Snowden, J. M., Carmichael, S. L., Mujahid, M. S.  
2023; 334: 116196
- **Are individual-level risk factors for gastroschisis modified by neighborhood-level socioeconomic factors?** *Birth defects research*  
Neo, D. T., Martin, C. L., Carmichael, S. L., Gucsavas-Calikoglu, M., Conway, K. M., Evans, S. P., Feldkamp, M. L., Gilboa, S. M., Insaf, T. Z., Musfee, F. I., Shaw, G. M., Shumate, C., Werler, et al  
2023
- **Oxidative balance scores and neural crest cell-related congenital anomalies.** *Birth defects research*  
Carmichael, S. L., Yang, W., Ma, C., Desrosiers, T. A., Weber, K., Collins, R. T., Nestoridi, E., Shaw, G. M.  
2023
- **Early postpartum hospital encounters among patients with genitourinary and wound infections during hospitalization for birth.** *American journal of perinatology*  
Leonard, S. A., Girsen, A., Trepman, P., Carmichael, S. L., Darmawan, K., Butwick, A., Gibbs, R.  
2023
- **Racial and Ethnic Disparities in Primary Cesarean Birth and Adverse Outcomes Among Low-Risk Nulliparous People.** *Obstetrics and gynecology*  
Carmichael, S. L., Snowden, J.  
2023; 141 (5): 1024
- **Neighborhood-level socioeconomic position during early pregnancy and risk of gastroschisis.** *Epidemiology (Cambridge, Mass.)*  
Neo, D. T., Desrosiers, T. A., Martin, C. L., Carmichael, S. L., Gucsavas-Calikoglu, M., Conway, K. M., Evans, S. P., Feldkamp, M. L., Gilboa, S. M., Insaf, T. Z., Musfee, F. I., Shaw, G. M., Shumate, et al  
2023
- **Exome-wide assessment of isolated biliary atresia: A report from the National Birth Defects Prevention Study using child-parent trios and a case-control design to identify novel rare variants.** *American journal of medical genetics. Part A*  
Sok, P., Sabo, A., Almli, L. M., Jenkins, M. M., Nembhard, W. N., Agopian, A. J., Bamshad, M. J., Blue, E. E., Brody, L. C., Brown, A. L., Browne, M. L., Canfield, M. A., Carmichael, et al  
2023
- **Neighborhood Deprivation and Severe Maternal Morbidity in the State of California: An Examination of Effect Modification by Race/Ethnicity.** *American journal of obstetrics & gynecology MFM*  
Mujahid, M. S., Wall-Wieler, E., Hailu, M. E., Berkowitz, R. L., Gao, M. X., Morris, M. C., Abrams, B., Lyndon, A., Carmichael, S. L.  
2023: 100916

- **Prepregnancy body mass index and gestational diabetes mellitus across Asian and Pacific Islander subgroups in California.** *AJOG global reports*  
Sperling, M. M., Leonard, S. A., Blumenfeld, Y. J., Carmichael, S. L., Chueh, J.  
2023; 3 (1): 100148
- **Factors Associated with Transfer Distance from Birth Hospital to Repair Hospital for First Surgical Repair among Infants with Myelomeningocele in California.** *American journal of perinatology*  
Kancherla, V., Ma, C., Purkey, N. J., Hintz, S. R., Lee, H. C., Grant, G., Carmichael, S. L.  
2023
- **Linked Birth Cohort Files for Perinatal Health Research: California as a Model for Methodology and Implementation.** *Annals of epidemiology*  
Danielsen, B. H., Carmichael, S. L., Jb, G., Hc, L.  
2023
- **Increased rates of postpartum emergency department visits and inpatient readmissions in people with epilepsy**  
Darmawan, K. F., Leonard, S. A., Meador, K., McElrath, T. F., Carmichael, S. L., Lyell, D. J., El-Sayed, Y. Y., Herrero, T., Druzin, M. L., Panelli, D. M.  
MOSBY-ELSEVIER.2023: S163
- **Severe maternal morbidity among people with cardiac disease: getting to the heart of the problem**  
Darmawan, K. F., Panelli, D. M., Mayo, J. A., Leonard, S. A., Girsen, A., Carmichael, S. L., Bianco, K.  
MOSBY-ELSEVIER.2023: S163-S164
- **Increased primary cesarean delivery rate among people with epilepsy: Risks, drivers and future directions**  
Darmawan, K. F., Leonard, S. A., Meador, K., McElrath, T. F., Carmichael, S. L., Lyell, D. J., El-Sayed, Y. Y., Herrero, T., Druzin, M. L., Panelli, D. M.  
MOSBY-ELSEVIER.2023: S162-S163
- **Adverse Pregnancy Outcomes Among Asian Subgroups - Does Gestational Diabetes Mellitus Increase the Risk?**  
Perlman, N. C., Sperling, M. M., Mayo, J., Leonard, S. A., Blumenfeld, Y. J., Carmichael, S. L., Maine, E., Chueh, J., Bianco, K.  
SPRINGER HEIDELBERG.2023: 131A-132A
- **Remapping racial and ethnic inequities in severe maternal morbidity: The legacy of redlining in California.** *Paediatric and perinatal epidemiology*  
Gao, X., Snowden, J. M., Tucker, C. M., Allen, A., Morello-Frosch, R., Abrams, B., Carmichael, S. L., Mujahid, M. S.  
2022
- **Structural racism and adverse maternal health outcomes: A systematic review.** *Health & place*  
Hailu, E. M., Maddali, S. R., Snowden, J. M., Carmichael, S. L., Mujahid, M. S.  
2022; 78: 102923
- **Assessing associations between residential proximity to greenspace and birth defects in the National Birth Defects Prevention Study.** *Environmental research*  
Weber, K. A., Yang, W., Carmichael, S. L., Collins, R. T., Luben, T. J., Desrosiers, T. A., Insaf, T. Z., Le, M. T., Evans, S. P., Romitti, P. A., Yazdy, M. M., Nemphard, W. N., Shaw, et al  
2022: 114760
- **ASSOCIATION BETWEEN INFERTILITY SUBTYPES AND ATHEROSCLEROTIC CARDIOVASCULAR DISEASE AMONG POSTMENOPAUSAL PARTICIPANTS FROM THE WOMEN'S HEALTH INITIATIVE.**  
Murugappan, G., Leonard, S., Lathi, R. B., Farland, L. V., Carmichael, S. L., Parikh, N. J., Stefanick, M. L.  
ELSEVIER SCIENCE INC.2022: E4-E5
- **Early postpartum readmissions: identifying risk factors at birth hospitalization.** *AJOG global reports*  
Girsen, A. I., Leonard, S. A., Butwick, A. J., Joudi, N., Carmichael, S. L., Gibbs, R. S.  
2022; 2 (4): 100094
- **Postpartum Readmissions With and Without Severe Maternal Morbidity Within 1 Year of Birth, Oregon, 2012-2017.** *American journal of epidemiology*  
Kaufman, M., McConnell, K. J., Carmichael, S. L., Rodriguez, M. I., Richardson, D., Snowden, J. M.  
2022
- **Antihypertensive Medication Use before and during Pregnancy and the Risk of Severe Maternal Morbidity in Individuals with Prepregnancy Hypertension.** *American journal of perinatology*  
Bane, S., Wall-Wieler, E., Druzin, M. L., Carmichael, S. L.  
2022

- **Differential newborn DNA methylation among individuals with complex congenital heart defects and childhood lymphoma.** *Birth defects research*  
Richard, M. A., Yang, W., Sok, P., Li, M., Carmichael, S. L., von Behren, J., Reynolds, P., Fisher, P. G., Collins, R. T., Hobbs, C. A., Luke, B., Shaw, G. M., Lupo, et al  
2022
- **Early pregnancy vitamin D status and risk of select congenital anomalies in the National Birth Defects Prevention Study.** *Birth defects research*  
Adrien, N., Orta, O. R., Nestoridi, E., Carmichael, S. L., Yazdy, M. M., For The National Birth Defects Prevention Study  
2022
- **Racial/ethnic disparities in severe maternal morbidity: An intersectional lifecourse approach.** *Annals of the New York Academy of Sciences*  
Hailu, E. M., Carmichael, S. L., Berkowitz, R. L., Snowden, J. M., Lyndon, A., Main, E., Mujahid, M. S.  
2022
- **Risk factors and pregnancy outcomes vary among Asian American, Native Hawaiian, and Pacific Islander individuals giving birth in California.** *Annals of epidemiology*  
Bane, S., Abrams, B., Mujahid, M., Ma, C., Shariff-Marco, S., Main, E., Profit, J., Xue, A., Palaniappan, L., Carmichael, S. L.  
2022
- **Using Longitudinally Linked Data to Measure Severe Maternal Morbidity Beyond the Birth Hospitalization in California.** *Obstetrics and gynecology*  
Carmichael, S. L., Girsen, A. I., Ma, C., Main, E. K., Gibbs, R. S.  
2022
- **Distance from home to birth hospital, transfer, and mortality in neonates with hypoplastic left heart syndrome in California.** *Birth defects research*  
Purkey, N. J., Ma, C., Lee, H. C., Hintz, S. R., Shaw, G. M., McElhinney, D. B., Carmichael, S. L.  
2022
- **Subsequent risk of stillbirth, preterm birth, and small for gestational age: A cross-outcome analysis of adverse birth outcomes.** *Paediatric and perinatal epidemiology*  
Bane, S., Simard, J. F., Wall-Wieler, E., Butwick, A. J., Carmichael, S. L.  
2022
- **Does active treatment in infants born at 22-23 weeks correlate with outcomes of more mature infants at the same hospital? An analysis of California NICU data, 2015-2019.** *Journal of perinatology : official journal of the California Perinatal Association*  
Bane, S., Rysavy, M. A., Carmichael, S. L., Lu, T., Bennett, M., Lee, H. C.  
2022
- **Association of infertility with atherosclerotic cardiovascular disease among postmenopausal participants in the Women's Health Initiative.** *Fertility and sterility*  
Murugappan, G., Leonard, S. A., Farland, L. V., Lau, E. S., Shadyab, A. H., Wild, R. A., Schnatz, P., Carmichael, S. L., Stefanick, M. L., Parikh, N. I.  
2022
- **Clinical and Hospital Factors Associated with Increased Cesarean Birth Rate Among People with Epilepsy**  
Darmawan, K., Cruz, G., Leonard, S., Meador, K., McElrath, T., Carmichael, S., Lyell, D., El Sayed, Y., Herrero, T., Druzin, M., Panelli, D.  
SPRINGER HEIDELBERG.2022: 216
- **Interpregnancy Weight Change: Associations with Severe Maternal Morbidity and Neonatal Outcomes.** *American journal of obstetrics & gynecology MFM*  
Abrams, B. F., Leonard, S. A., Kan, P., Lyell, D. J., Carmichael, S. L.  
2022: 100596
- **Impact of Medicaid Expansion on Interpregnancy Interval.** *Women's health issues : official publication of the Jacobs Institute of Women's Health*  
Liu, C., Snowden, J. M., Rossin-Slater, M., Torche, F., DiTosto, J. D., Carmichael, S. L.  
1800
- **Hospital Readmissions after Postpartum Emergency Department Visit**  
Girsen, A., Leonard, S. A., Carmichael, S. L., Gibbs, R. S., Butwick, A.  
MOSBY-ELSEVIER.2022: S517-S518
- **Ways Forward in Preventing Severe Maternal Morbidity and Maternal Health Inequities: Conceptual Frameworks, Definitions, and Data, from a Population Health Perspective.** *Women's health issues : official publication of the Jacobs Institute of Women's Health*  
Carmichael, S. L., Abrams, B., El Ayadi, A., Lee, H. C., Liu, C., Lyell, D. J., Lyndon, A., Main, E. K., Mujahid, M., Tian, L., Snowden, J. M.

1800

● **Association of Epilepsy and Severe Maternal Morbidity.** *Obstetrics and gynecology*

Panelli, D. M., Leonard, S. A., Kan, P., Meador, K. J., McElrath, T. F., Darmawan, K. F., Carmichael, S. L., Lyell, D. J., El-Sayed, Y. Y., Druzin, M. L., Herrero, T. C.  
2021

● **INFERTILITY AND RISK OF CARDIOVASCULAR DISEASE AMONG POSTMENOPAUSAL PARTICIPANTS IN THE WOMEN'S HEALTH INITIATIVE.**

Murugappan, G., Leonard, S. A., Carmichael, S. L., Stefanick, M. L., Parikh, N. I.  
ELSEVIER SCIENCE INC.2021: E15

● **Does Severe Maternal Morbidity impact the probability of subsequent birth? A population-based study of women in California from 1997-2012.** *Annals of epidemiology*

Bane, S., Carmichael, S. L., Snowden, J. M., Liu, C., Lyndon, A., Wall-Wieler, E.  
2021

● **Maternal exposure to hydroxychloroquine and birth defects.** *Birth defects research*

Howley, M. M., Werler, M. M., Fisher, S. C., Van Zutphen, A. R., Carmichael, S. L., Broussard, C. S., Heinke, D., Ailes, E. C., Pruitt, S. M., Reefhuis, J., Mitchell, A. A., Browne, M. L., National Birth Defects Prevention Study  
2021

● **Implementing health communication tools at scale: mobile audio messaging and paper-based job aids for front-line workers providing community health education to mothers in Bihar, India.** *BMJ global health*

Ward, V., Abdalla, S., Raheel, H., Weng, Y., Godfrey, A., Dutt, P., Mitra, R., Sastry, P., Chamberlain, S., Shannon, M., Mehta, K., Bentley, J., Darmstadt Md, et al  
2021; 6 (Suppl 5)

● **Drinking water contaminants in California and hypertensive disorders in pregnancy.** *Environmental epidemiology (Philadelphia, Pa.)*

Padula, A. M., Ma, C., Huang, H., Morello-Frosch, R., Woodruff, T. J., Carmichael, S. L.  
2021; 5 (2): e149

● **Severe Maternal Morbidity: A Comparison of Definitions and Data Sources.** *American journal of epidemiology*

Snowden, J. M., Lyndon, A., Kan, P., El Ayadi, A., Main, E., Carmichael, S. L.  
2021

● **Risk Factors for Postpartum Readmission Among Women After Having a Stillbirth.** *American journal of obstetrics & gynecology MFM*

DiTosto, J. D., Liu, C., Wall-Wieler, E., Gibbs, R. S., Girsen, A. I., El-Sayed, Y. Y., Butwick, A. J., Carmichael, S. L.  
2021: 100345

● **Interpregnancy Interval and Subsequent Severe Maternal Morbidity: A Population-based Study from California over 16 years.** *American journal of epidemiology*

Liu, C., Snowden, J. M., Lyell, D. J., Wall-Wieler, E., Abrams, B., Kan, P., Stephansson, O., Lyndon, A., Carmichael, S. L.  
2021

● **Timing of Transfer and Mortality in Neonates with Hypoplastic Left Heart Syndrome in California.** *Pediatric cardiology*

Purkey, N. J., Ma, C., Lee, H. C., Hintz, S. R., Shaw, G. M., McElhinney, D. B., Carmichael, S. L.  
2021

● **Prepregnancy body mass index and gestational diabetes mellitus across asian subpopulations**

Sperling, M., Leonard, S. A., Waldrop, A. R., Miller, S., Blumenfeld, Y. J., Carmichael, S., Chueh, J.  
MOSBY-ELSEVIER.2021: S118–S119

● **Obstetric comorbidity scores and disparities in severe maternal morbidity across marginalized groups.** *American journal of obstetrics & gynecology MFM*

Leonard, S. A., Main, E. K., Lyell, D. J., Carmichael, S. L., Kennedy, C. J., Johnson, C., Mujahid, M. S.  
2021: 100530

● **Maternal Exposure to Disinfection By-Products and Risk of Hypospadias in the National Birth Defects Prevention Study (2000-2005).** *International journal of environmental research and public health*

Zaganjor, I., Luben, T. J., Desrosiers, T. A., Keil, A. P., Engel, L. S., Michalski, A. M., Carmichael, S. L., Nemphard, W. N., Shaw, G. M., Reefhuis, J., Yazdy, M. M., Langlois, P. H., Feldkamp, et al  
2020; 17 (24)

- **Factors associated with follow-up of infants with hypoxic-ischemic encephalopathy in a high-risk infant clinic in California.** *Journal of perinatology : official journal of the California Perinatal Association*  
Pai, V. V., Kan, P., Lu, T., Gray, E. E., Bennett, M., Jocson, M. A., Lee, H. C., Carmichael, S. L., Hintz, S. R.  
2020
- **Trends in reproductive, maternal, newborn and child health and nutrition indicators during five years of piloting and scaling-up of Ananya interventions in Bihar, India.** *Journal of global health*  
Abdalla, S., Weng, Y., Mehta, K. M., Mahapatra, T., Srikanthiah, S., Shah, H., Ward, V. C., Pepper, K. T., Bentley, J., Carmichael, S. L., Creanga, A., Wilhelm, J., Tarigopula, et al  
2020; 10 (2): 021003
- **Health layering of self-help groups: impacts on reproductive, maternal, newborn and child health and nutrition in Bihar, India.** *Journal of global health*  
Mehta, K. M., Irani, L., Chaudhuri, I., Mahapatra, T., Schooley, J., Srikanthiah, S., Abdalla, S., Ward, V., Carmichael, S. L., Bentley, J., Creanga, A., Wilhelm, J., Tarigopula, et al  
2020; 10 (2): 021007
- **Health impact of self-help groups scaled-up statewide in Bihar, India.** *Journal of global health*  
Mehta, K. M., Irani, L., Chaudhuri, I., Mahapatra, T., Schooley, J., Srikanthiah, S., Abdalla, S., Ward, V. C., Carmichael, S. L., Bentley, J., Creanga, A., Wilhelm, J., Tarigopula, et al  
2020; 10 (2): 021006
- **Impact of mHealth interventions for reproductive, maternal, newborn and child health and nutrition at scale: BBC Media Action and the Ananya program in Bihar, India.** *Journal of global health*  
Ward, V. C., Raheel, H., Weng, Y., Mehta, K. M., Dutt, P., Mitra, R., Sastry, P., Godfrey, A., Shannon, M., Chamberlain, S., Kaimal, R., Carmichael, S. L., Bentley, et al  
2020; 10 (2): 021005
- **Evaluation of a large-scale reproductive, maternal, newborn and child health and nutrition program in Bihar, India, through an equity lens.** *Journal of global health*  
Ward, V. C., Weng, Y., Bentley, J., Carmichael, S. L., Mehta, K. M., Mahmood, W., Pepper, K. T., Abdalla, S., Atmavilas, Y., Mahapatra, T., Srikanthiah, S., Borkum, E., Rangarajan, et al  
2020; 10 (2): 021011
- **Impact of the Ananya program on reproductive, maternal, newborn and child health and nutrition in Bihar, India: early results from a quasi-experimental study.** *Journal of global health*  
Darmstadt, G. L., Weng, Y., Pepper, K. T., Ward, V. C., Mehta, K. M., Borkum, E., Bentley, J., Raheel, H., Rangarajan, A., Bhattacharya, D., Tarigopula, U. K., Nanda, P., Sridharan, et al  
2020; 10 (2): 021002
- **Postpartum health risks among women with hypertensive disorders of pregnancy, California 2008-2012.** *Journal of hypertension*  
Murray Horwitz, M. E., Rodriguez, M. I., Dissanayake, M., Carmichael, S. L., Snowden, J. M.  
2020
- **Recurrence of severe maternal morbidity: A population-based cohort analysis of California women.** *Paediatric and perinatal epidemiology*  
Bane, S., Wall-Wieler, E., Lyndon, A., Carmichael, S. L.  
2020
- **Birth Hospital and Racial/Ethnic Differences in Severe Maternal Morbidity in the State of California.** *American journal of obstetrics and gynecology*  
Mujahid, M. S., Kan, P., Leonard, S. A., Hailu, E. M., Wall-Wieler, E., Abrams, B., Main, E., Profit, J., Carmichael, S. L.  
2020
- **Opioid Prescription and Persistent Opioid Use After Ectopic Pregnancy.** *Obstetrics and gynecology*  
Wall-Wieler, E., Shover, C. L., Hah, J. M., Carmichael, S. L., Butwick, A. J.  
2020
- **An Expanded Obstetric Comorbidity Scoring System for Predicting Severe Maternal Morbidity.** *Obstetrics and gynecology*  
Leonard, S. A., Kennedy, C. J., Carmichael, S. L., Lyell, D. J., Main, E. K.  
2020
- **Congenital diaphragmatic hernia and maternal dietary nutrient pathways and diet quality.** *Birth defects research*

Carmichael, S. L., Ma, C., Witte, J. S., Yang, W., Rasmussen, S. A., Brunelli, L., Nestoridi, E., Shaw, G. M., Feldkamp, M. L., National Birth Defects Prevention Study  
2020

- **Asthma Medication Use and Risk of Birth Defects: National Birth Defects Prevention Study, 1997-2011.** *The journal of allergy and clinical immunology. In practice*

Howley, M. M., Papadopoulos, E. A., Van Bennekom, C. M., Van Zutphen, A. R., Carmichael, S. L., Munsie, J. W., Herdt, M. L., Browne, M. L., National Birth Defects Prevention Study  
2020

- **Benzodiazepine use before conception and risk of ectopic pregnancy.** *Human reproduction (Oxford, England)*

Wall-Wieler, E., Robakis, T. K., Lyell, D. J., Masarwa, R., Platt, R. W., Carmichael, S. L.  
2020

- **Antidepressant Use around Conception, Prepregnancy Depression, and Risk of Ectopic Pregnancy.** *Canadian journal of psychiatry. Revue canadienne de psychiatrie*

Wall-Wieler, E., Robakis, T. K., Cesta, C. E., Masarwa, R., Lyell, D. J., Liu, C., Platt, R. W., Carmichael, S. L.  
2020: 706743720927829

- **Treating Center Volume and Congenital Diaphragmatic Hernia Outcomes in California.** *The Journal of pediatrics*

Apfeld, J. C., Kastenberg, Z. J., Gibbons, A. T., Carmichael, S. L., Lee, H. C., Sylvester, K. G.  
2020

- **Defining maternal obesity in studies of birth outcomes: Comparing ICD-9 codes at delivery and measures on the birth certificate.** *Paediatric and perinatal epidemiology*

Wall-Wieler, E., Abrams, B., Snowden, J. M., Carmichael, S. L.  
2020

- **Multilevel social factors and NICU quality of care in California.** *Journal of perinatology : official journal of the California Perinatal Association*

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