

**Social and structural determinants of preterm birth disparities: A systematic review and a framework for variable elicitation**

**Authors:** Ruby Barnard-Mayers,<sup>1</sup> Ashley Scott,<sup>1</sup> Meadow Hall,<sup>2</sup> Aline Mweze,<sup>3</sup> Mohammad Jalali,<sup>4</sup> Lorraine Lacroix-Williamson<sup>3</sup> Collette N. Ncube<sup>1</sup>

**Authors' affiliations:**

<sup>1</sup> Department of Epidemiology, Boston University School of Public Health, Boston, MA, 02118

<sup>2</sup> Department of Organismic and Evolutionary Biology Harvard University, Cambridge, MA 02138

<sup>3</sup> Department of Health Sciences, Bouvé College of Health Sciences, Northeastern University, Boston, MA 02115

<sup>4</sup> Massachusetts General Hospital, Harvard Medical School, Boston, MA 02114

**Corresponding Author**

Collette N. Ncube  
ncube@bu.edu

Commented [SA1]: @Barnard-Mayers, Ruby I updated numbers throughout and will proof read after 6:30pm likely but don't wait on me if you feel good about it! Still not sure about title change

Commented [BR2R1]: Sounds good @Scott, Ashley ! Let me know when you've had a chance to proof read. I've added the citations and I think I we are almost good to go except the results of the CLD and a few remaining comments

## **ABSTRACT**

**Background:** More than a third of infant deaths are due to causes related to preterm birth (PTB). Racial disparities in PTB persist and contribute to infant and adult health disparities. Identifying all the factors that contribute to PTB racial disparities is a complex task; one that calls for system dynamics modeling.

**Methods:** We conducted a systematic literature review of studies on preterm birth and documented the results of the studies included in our review. We used the results to build a preliminary causal loop diagram (CLD).

**Results:** Most of the articles included in the review examined biological or psychosocial determinants of preterm birth. A feedback loop between stress and preterm birth emerged from our preliminary CLD.

**Conclusion:** Preterm birth disparities are a complex and interwoven problem that requires systems thinking.

## INTRODUCTION

In the United States, 105 out of every 1,000 infants is born preterm, or before 37 completed weeks gestation<sup>1</sup>. Infants born preterm have a higher risk of death in the first year of life compared to term infants, and those that survive have a higher risk of neonatal morbidities, like neurological conditions, as well as chronic diseases that persist into adulthood, including hypertension and diabetes, compared to infants born at term<sup>2-4</sup>(Karvonen, 2021; Ananth, 2005; Crump 2020). Racial and ethnic disparities in preterm births (PTB) persist across the country and contribute to the widening gaps in perinatal outcomes and health across the life course<sup>3,5-7</sup>. It is well documented that non-Hispanic Black and Hispanic individuals are at higher risk of having a preterm delivery compared to their non-Hispanic White counterparts<sup>7,8</sup>. Understanding contributors to racial and ethnic disparities in preterm birth is critical to improving perinatal, as well as adult, health outcomes.

Social determinants of health are factors that impact health that are not medical in nature. The World Health Organization created 16 different domains to group these determinants into<sup>9</sup>. These domains include health system, social class, material circumstances, and macroeconomic policies. Numerous determinants have been linked to preterm birth risk, such as race/ethnicity, socioeconomic status, neighborhood conditions, and stress<sup>10-12</sup>. One benefit that these health domains bring to research is the ability to represent and study the effect of feedback/interactions between these domains. Most studies on the social determinants of preterm birth examine factors that are primarily biological and psychosocial. There is a dearth of evidence on how the different domains impact preterm birth disparities and how the various domains may interact with each other. Understanding how the social determinants interact and feedback to each other is critical for unraveling the mystery of preterm birth disparities.

Identifying key contributors to preterm births is an immense task that can be made simpler using causal loop diagrams [CLDs], a type of system dynamics (SD) model. Briefly, SD modeling is a type of systems science that is used to understand and model dynamic systems by modeling loops of dynamic events and variable states (normally called stock and flow diagrams)<sup>13</sup>. CLDs are a graphical tool that map relationships between variables. These relationships can be positive or negative in value and can feed back upon themselves. These diagrams are a useful tool not only for synthesizing existing literature but also for representing otherwise unobserved interactions and feedback loops.

In order to build a model to tackle complex and dynamic problems (like preterm birth disparities), it is essential to understand what is known in the field and how different factors feed into others. This generally requires a systematic literature review and subsequent variable extraction. As this research team embarked on the journey of building an SD model, we discovered a lack of literature outlining best practices for completing a literature review meant for an SD model. Thus, the objective of this paper is to provide an example of how this may be done using racial disparities in preterm birth as a case study.

## METHODS

Commented [NN3]: @Barnard-Mayers, Ruby Do we have all these citations or are these notes to remind us to find them

Commented [BR4R3]: We have these citations just a reminder for me to put them in in mendeley!

Commented [NN5R3]: I would suggest adding a comment with the article DOI because as the write up becomes more extensive we're less likely to remember which paper was supposed to be cited where. Alternatively, since you are the only one touching the citations/references feel free to work on that now using Mendeley Cite in Word.

Commented [NN6]: We can consider adding the life course health implications "and among the increasing number that survive they are at risk for ..."

Commented [NN7]: We can consider extrapolating this to adult health as well.

Commented [NN8]: We can revisit this since the health care sector is one of the domains identified in the SDoH framework

Commented [SA9]: [A conceptual framework for action on the social determinants of health \(who.int\)](#)

Commented [BR10]: Things to add:  
- Research on Domains of SDoH for PTB <- i can't find much on this  
- Other work interrogated interaction/feedback between domains

Commented [BR11R10]: Highlight the dearth of evidence

Commented [NCN12]: Hi team @Barnard-Mayers, Ruby and @Scott, Ashlie you can feel free to start adding text here in the Methods section.

Commented [NN13]: @Barnard-Mayers, Ruby I would suggest using the PRISMA explanation and elaboration article to write up the Methods, but also any other relevant sections that are specific to the systematic literature review. It includes examples of how to write up the methods <https://doi.org/10.1136/bmj.n160>

Commented [BR14R13]: Can do! I think I'm getting a little confused as to whether to approach this as a systematic review paper or a more classic paper since we are now incorporating the CLD component as well.

Commented [NN15R13]: Thanks! The paper has elements of a systematic literature review and elements of the system dynamics variable elicitation process. I think we should write the respective sections consistent with any guidelines available for each methodology.

Commented [BR16]: @Scott, Ashlie Can you add in details for some of this when you get a chance? I'm looking through the folders but not all the information is there

Commented [SA17R16]: Yes I will work on this tomorrow

To outline the above goals, research methods included (1) a systematic literature review to identify relevant studies, (2) variable elicitation to extract relevant information for the creation of causal loop diagrams, and (3) development of an initial causal loop diagram. These steps are explained below. |

### Search strategy

We systematically searched for peer-reviewed articles related to social and structural determinants of health and preterm birth by race and ethnicity. Information sources for our search included PubMed, EMBASE, and the Web of Science. The search terms can be found in the appendix. We identified 3,862 articles initially from all three sources combined and removed 710 duplicates for a total of 3,152 articles. Three reviewers, a mix of graduate and undergraduate students with public health knowledge, completed the abstract review. For the initial review, we completed five pilot rounds on 702 articles with the three reviewers using Abtrackr. Abtrackr is a machine learning tool to improve efficiency in the abstract review process with a low risk of missing relevant articles, particularly for two or more reviewers<sup>14</sup>. This team then reviewed each title and abstract for relevancy using specific inclusion and exclusion criteria. Once reviewers became familiar with the process, we shifted to at least two reviewers per abstract. Conflicts were resolved by consensus among all three reviewers. The resulting sample from abstract review included 265 articles for an assessment of study quality.

### Eligibility Criteria

We narrowed down studies based on the following inclusion criteria:

1. Preterm birth is studied.
2. The study reports results separately for each racial/ethnic group or reports results to explain the disparity between racial/ethnic groups
3. The study examines a relationship between preterm birth and one or more social or structural determinants of health based on the WHO framework for SDoH<sup>15</sup>.
4. It is a study of a U.S. population.
5. The study was published in English between 1950 and 2021.
6. The study design is a case-control, cohort, randomized control trial, cross-sectional, or qualitative study and is not a correction or erratum. |

We excluded articles that were systematic reviews, meta-analyses, letters, editorials, commentaries, conceptual papers, case reports, or conference papers.

### Data collection process

Each article that passed abstract and risk of bias review was eligible for variable elicitation, a data extraction process to identify variables related to preterm birth. Four reviewers completed the variable elicitation phase including two pilot phases of 10 articles each. Two reviewers were assigned to each article to extract exposure, outcome, effect measure, intermediary pathways, confidence interval, author, and study population. Our literature search initially yielded 178 studies initially. During the elicitation phase, we again screened the articles for accessibility, eligibility, duplicates, and poor quality removing an additional 63 articles. After extraction, two research assistants used the WHO structural and social determinants of health framework to classify each output-exposure relationship as one or more of the following: political, macroeconomics, social policies, public policy, cultural & societal values, socioeconomic

Commented [BR18]: Our outline

Article search  
Abtrackr - Meadow has access and can write abstract review process  
Study quality/bias assessment step on is Aline  
PRISMA guidelines (added a document in this folder with the Prisma Checklist and another with the Prisma flow chart)  
Variable elicitation spreadsheet creation and fill-in process  
63 excluded during variable elicitation

Commented [SA19]: where did we find this number?

Commented [SA20]: <https://bmcmcdresmethodol.biomedcentral.com/articles/10.1186/s12874-020-01031-w>

Commented [SA21]: Abtrackr Citation Review Results.xlsx - 3,152 articles in this list but I can't tell if they were the included ones or if this was the list from the final search (and the number 43,582 is wrong -- it seems that is a lot to do abstract review on... and ROB on over 3,000 article also doesn't sound right

Commented [SA22R21]: @Ncube, Collette - do you have access to this google for for full text review? it seems there may a tally  
[https://bushare.sharepoint.com/w/r/sites/GRP-Ncube-Lab-Structural/\\_layouts/15/Doc.aspx?sourcedoc=%7BC2709B97-EB76-43C4-A94B-137C72BCA4CA%7D&file=Full%20text%20Review%20Google%20Form%20Info.docx&action=default&mobileredirect=true](https://bushare.sharepoint.com/w/r/sites/GRP-Ncube-Lab-Structural/_layouts/15/Doc.aspx?sourcedoc=%7BC2709B97-EB76-43C4-A94B-137C72BCA4CA%7D&file=Full%20text%20Review%20Google%20Form%20Info.docx&action=default&mobileredirect=true)

Commented [NN23R21]: I do have access to that Google form. However, Meadow already used the information... [1]

Commented [SA24R21]: Ok I will try to find that

Commented [NN25R21]: I think we may need to get a hold of Meadow to make sense of this within the next day.

Commented [SA26R21]: I sent Meadow an email on Friday (marked !) but I know she was in Central America for... [2]

Commented [SA27R21]: Meadow's response - "702 articles were reviewed in the pilot, and 2,108 were... [3]

Commented [NN28R21]: Based upon her response, n=2,810 for title and abstract review. The subset of 70... [4]

Commented [SA29]: citation: Solar O, Irwin A. A conceptual framework for action on the social determi... [5]

Commented [SA30R29]: ... [6]

Commented [NN31R29]: The entire research strategy per electronic database searched can be provided in the... [7]

Commented [SA32]: exclusion if: systematic review, meta-analysis, letter, editorial, commentary, conceptual pa... [8]

Commented [SA33]: I'm not sure if we are saying reviewers or research assistants

Commented [BR34R33]: let's go with reviewers

position, social cohesion & social capital, material circumstance, behaviors, biological factors, psychosocial factors, and health system.

### Data items

We sought measures of effect (like odds ratios, risk ratios, and rate ratios) from studies making comparisons across racial groups, reporting race-stratified results, or examining one racial group. When raw rates or raw numbers were the only statistics reported, we reported these values and calculated raw rates if only raw numbers were reported. We only extracted measurements reported for major U.S. ethnic groups and did not include 'other' or 'mixed race'. We also extracted confidence intervals, or standard errors, when possible.

If a study reported the outcome as continuous, we used positive, negative, or null polarity. We calculated the point estimate from studies that reported continuous outcomes with confidence intervals and calculated the mean difference from reported means. To calculate the point estimate from a confidence interval, we calculated the center of the confidence interval (the difference between the upper limit and lower limit divided by 2). The calculation for the mean difference was just the crude difference between the reported means. Polarity was not included in articles that only presented raw numbers, percentages, or rates with no comparison group.

### Study Risk of Bias assessment

Using NIH-NHLBI study quality tools by study design, we created a google form to facilitate a risk of bias assessment by study type. All studies were reviewed by at least two research assistants for inclusion criteria while only case-control, cohort, and randomized control trial studies were reviewed using available study specific quality assessment tools. Cross-sectional and qualitative studies were assessed during the full-text review for variable. Research assistants discussed and resolved discrepancies with a third reviewer as needed. We narrowed the article list to 178 articles for variable elicitation.

### Spreadsheet Development

As the literature search was in progress, we developed an excel spreadsheet to collect and organize the information from the selected articles. Initially, we anticipated organizing the articles by exposure. However, after testing the spreadsheet on ten articles, we discovered that our initial design was not efficient nor practical for our extraction process. Over the course of the redesign, we also discovered that extracting the measure of effect, rather than groupings of polarity, and it was also important to collect information on precision (measured by confidence intervals) as well as any intermediary steps looked at in the papers as well.

Four reviewers completed the variable elicitation phase with at least two reviewers for each article to ensure accuracy. Reviewers completed two pilot rounds each. Discrepancies were discussed as a team with all reviewers and the study PI. A total of 63 articles were excluded during extraction mainly due to not reporting stratified results. All qualitative studies were also excluded.

### Model Development

We used Stella Architect by isee systems<sup>16</sup> to create a causal loop diagram using the information from the variable elicitation process. We supplemented the nodes in the diagram with information from an article by Braveman and colleagues<sup>8</sup>. In that paper, researchers and

Commented [SA35]: not sure where to organize this

Commented [SA36R35]: do we include the polarity range here?

Commented [NN37R35]: I would suggest adding this immediately following the sentence the states we extracted odds ratios, relative risks etc. Ruby can you add some specificity to description of these calculations.

Commented [NCN38]: Let's write this out in the title

Commented [SA39]: Are we doing this section in order? Should this go above data collection process?

Commented [BR40R39]: @Scott, Ashlie this is the order that PRSIMA had but I feel ok about moving it

Commented [SA41]: <https://www.nhlbi.nih.gov/health-topics/study-quality-assessment-tools>

Commented [NCN42]: Double-check

Commented [SA43]: Do we want to include this in data collection above?

Commented [SA44]: K01 Grant • Braveman Extraction / By Type • Kumu

stakeholders came together to review knowledge about PTB disparities between Black and White women. This convention resulted in a list of upstream, downstream, and midstream factors that plausibly contribute to PTB disparities, along with weight of the evidence. We incorporated this information into our CLD development.

## **RESULTS**

Our literature review process resulted in a total of 116 articles, with a grand total of 2,249 measurements for 86 different exposures. These exposures ranged from individual level characteristics, like age, physical activity, and substance use, to system level variables like Medicaid expansion, election results, and drinking age restrictions (Table 1). Almost all of the measurements indicated heterogeneity in preterm birth outcomes across race/ethnicity groups (See appendix for full variable elicitation spreadsheet).

About two-thirds of the articles hypothesized intermediary steps between the exposure and outcome. These intermediary steps included stress, socioeconomic status, violent crime exposure, education, and access to care. However, of these, only half of them actually explored these intermediary steps in their data analysis (Data not shown). Based on the World Health Organization social determinants of health domains (SDoH), the majority of exposures were intermediary determinants; mostly for behaviors & biological factors or psychosocial factors (Table 2). Twenty-two articles were categorized under multiple SDoH categories (Table 3).

The most common exposure variable was maternal age. Of the articles that looked at the effect of age on preterm birth, there was a very slight overall positive effect of age on preterm birth. Another common exposure was racial discrimination and stress. Overall, these articles also found a positive effect on preterm birth, with the impact appearing strongest for Non-Hispanic Black individuals. Prenatal care was positive as well, with the apparent strongest association for Hispanic women.

Figure 2 below represents our preliminary causal loop diagram. In the diagram, the dotted lines represent hypothesized relationships based upon our variable elicitation as source documents. Some of the connections are established from the articles but the pathway is theoretical. The solid lines are connections documented in the articles. While most of the relationships in this preliminary diagram are acyclic, one prominent reinforcing feedback loop emerged between stress and preterm delivery.

## **DISCUSSION**

Overall, we found that most articles studying preterm birth (as an outcome) focused on individual characteristics and risk factors, like age and stress, that fall under the umbrellas of psychosocial, behavioral, and biological social determinants of health domains. Very few articles explored societal cultural practices and the role of health policies in preterm birth rates and racial disparities.

This process highlighted several key points for researchers interested in conducting this type of review. Firstly, make sure that the articles included in the literature review contain the information you require for the CLD. Second, it is important to identify the key information points

necessary for building a CLD. This likely consists of study population, exposure, outcome, intermediary steps, polarity, and reference groups. Third, test run the spreadsheet layout with a few papers to make sure that the layout makes sense, and that the information is being collected in an efficient way. Once the spreadsheet layout and the list of included articles are finalized, assign at least two reviews to each article and proceed with the (tedious) process of extracting the information for the spreadsheet.

After conducting this literature review, our next step is to develop a quantitative model. To do this, we need to work to reduce the number of exposures from the 86 we have in our final spreadsheet to a reasonable number for a causal loop diagram. Our exposures were based on each article and not a set drop down, so many identical exposures from the articles appear unique, which requires more time to create a comprehensive yet minimal list of exposures.

Our literature review process had a few limitations. One potential limitation is that we did not engage content experts or stakeholders in our CLD building process. However, given that this has already been done<sup>9</sup> and we incorporated the information elicited from this paper, our CLD is likely comprehensive. Second, due to the lack of available resources to guide the spreadsheet building, our review was not efficient and required a few rebuilds. We hope that our experience can serve as a resource for future researchers embarking on creating a CLD.

#### **Acknowledgment**

The authors would like to thank Craig McFarland for his contributions to this study.

## REFERENCES

1. Centers for Disease Control and Prevention. Preterm Birth . Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion. Published 2022. Accessed March 19, 2023. <https://www.cdc.gov/reproductivehealth/maternalinfanthealth/pretermbirth.htm>
2. Karvonen Kayla L., Baer Rebecca J., Rogers Elizabeth E., et al. Racial and ethnic disparities in outcomes through 1 year of life in infants born prematurely: a population based study in California. *Journal of Perinatology*. 2021;41:220-231.
3. Ananth C V., Joseph KS, Oyelese Y, Vintzileos AM. Trends in preterm birth and perinatal mortality among singletons: united states, 1989 through 2000. *Obstetrics and Gynecology*. 2005;105(5):1084-1091. doi:10.1097/01.AOG.0000158124.96300.c7
4. Crump C. An overview of adult health outcomes after preterm birth. *Early Hum Dev*. 2020;150:105187. doi:10.1016/J.EARLHUMDEV.2020.105187
5. Grobman WA, Parker CB, Willinger M, et al. Racial Disparities in Adverse Pregnancy Outcomes and Psychosocial Stress. *Obstetrics & Gynecology*. 2018;131(2):328-335. doi:10.1097/AOG.0000000000002441.Racial
6. Pearl M, Ahern J, Hubbard A, et al. Life-course neighbourhood opportunity and racial-ethnic disparities in risk of preterm birth. *Paediatr Perinat Epidemiol*. 2018;32(5):412-419. doi:10.1111/ppe.12482
7. Engelhardt KA, Hisle-Gorman E, Gorman GH, Dobson NR. Lower Preterm Birth Rates but Persistent Racial Disparities in an Open-Access Health Care System. *Mil Med*. 2018;183(9-10):e570-e575. doi:10.1093/milmed/usy012
8. Braveman P, Dominguez TP, Burke W, et al. Explaining the Black-White Disparity in Preterm Birth: A Consensus Statement From a Multi-Disciplinary Scientific Work Group Convened by the March of Dimes. *Frontiers in Reproductive Health*. 2021;0:49. doi:10.3389/FRPH.2021.684207
9. World Health Organization. A conceptual framework for action on the social determinants of health. Published online 2010. <https://apps.who.int/iris/handle/10665/44489>
10. Korinek K, Ahmmad Z. The Racial Configuration of Parent Couples and Premature Birth: an Analysis of the Utah Population Database. *J Racial Ethn Health Disparities*. Published online 2021. doi:10.1007/s40615-021-00997-7
11. Foster HW, Wu L, Bracken MB, Semanya K, Thomas J, Thomas J. Intergenerational effects of high socioeconomic status on low birthweight and preterm birth in African Americans. *J Natl Med Assoc*. 2000;92(5):213-221.
12. Mendez DD, Hogan VK, Culhane JF. Institutional racism, neighborhood factors, stress, and preterm birth. *Ethn Health*. 2014;19(5):479-499. doi:10.1080/13557858.2013.846300
13. Hovmand PS. *Community Based System Dynamics*. Springer; 2014.
14. Gates A, Gates M, Sebastianski M, Guitard S, Elliott SA, Hartling L. The semi-automation of title and abstract screening: A retrospective exploration of ways to leverage Abstrackr's relevance predictions in systematic and rapid reviews. *BMC Med Res Methodol*. 2020;20(1). doi:10.1186/s12874-020-01031-w
15. Solar O, Irwin AA. *A Conceptual Framework for Action on the Social Determinants of Health : Debates, Policy & Practice, Case Studies.*; 2010.
16. isee systems. Stella Architect.



**Table 1: List of exposures from included articles and their frequencies**

<b>Exposure</b>	<b>Count</b>	<b>Percent</b>
Race	64	11.96%
Age	62	11.59%
Stress	38	7.10%
Gestational Age	30	5.61%
Prenatal Care	27	5.05%
IPI	22	4.11%
Physical Activity	19	3.55%
Neighborhood SES	15	2.80%
Education	14	2.62%
Marital Status	14	2.62%
Smoking	13	2.43%
Income	11	2.06%
Pregnancy History	11	2.06%
ART	10	1.87%
Neighborhood Crime	8	1.50%
Ancestry	7	1.31%
Environmental Exposures	7	1.31%
Coping Style	6	1.12%
Health Insurance	6	1.12%
Health Status	6	1.12%
Racial Discrimination	6	1.12%
Violence	6	1.12%
Weight	6	1.12%
Weight Gain	6	1.12%
Desegregation	5	0.93%
Census Tract	4	0.75%
Experience of Racism	4	0.75%
Neighborhood Opportunity	4	0.75%
Race and Age	4	0.75%
Acculturation	3	0.56%
Age, Education, Weight Gain	3	0.56%
Depression	3	0.56%
Drinking Age	3	0.56%
Employment	3	0.56%
Enlistment	3	0.56%
House Value	3	0.56%

Parity	3	0.56%
Poverty Level	3	0.56%
Race and Work	3	0.56%
Segregation	3	0.56%
Sex	3	0.56%
Single Mom	3	0.56%
WIC	3	0.56%
PTB	3	0.56%
Cortisol	2	0.37%
Diabetes	2	0.37%
Experience of Racism, Stress, Depression	2	0.37%
Medicaid Expansion	2	0.37%
Mobility	2	0.37%
Neighborhood Quality	2	0.37%
Place of Birth	2	0.37%
Politics	2	0.37%
Poverty and Education	2	0.37%
Psychobehavioral factors	2	0.37%
SLE	2	0.37%
Stress and Microbiota	2	0.37%
Work	2	0.37%
Year	2	0.37%
Cannabis	1	0.19%
Depression and Race	1	0.19%
Disability	1	0.19%
Ethnicity	1	0.19%
Exercise	1	0.19%
Farmwork	1	0.19%
Healthy Start	1	0.19%
HIV	1	0.19%
Home Visits	1	0.19%
Incarceration	1	0.19%
Insurance	1	0.19%
Intendedness of pregnancy	1	0.19%
Major Discrimination	1	0.19%
Microbiota	1	0.19%
Neighborhood Perceptions	1	0.19%
Neighborhood Race	1	0.19%

<b>Nurse Intervention</b>	<b>1</b>	<b>0.19%</b>
<b>Plurality</b>	<b>1</b>	<b>0.19%</b>
<b>Poverty</b>	<b>1</b>	<b>0.19%</b>
<b>Redlining</b>	<b>1</b>	<b>0.19%</b>
<b>Relationship Type</b>	<b>1</b>	<b>0.19%</b>
<b>Sexual Identity</b>	<b>1</b>	<b>0.19%</b>
<b>Skin Color</b>	<b>1</b>	<b>0.19%</b>
<b>Social Mobility</b>	<b>1</b>	<b>0.19%</b>
<b>Social Support</b>	<b>1</b>	<b>0.19%</b>
<b>Substance Use</b>	<b>1</b>	<b>0.19%</b>
<b>Vaginal Douching</b>	<b>1</b>	<b>0.19%</b>
<b>Vitamins</b>	<b>1</b>	<b>0.19%</b>

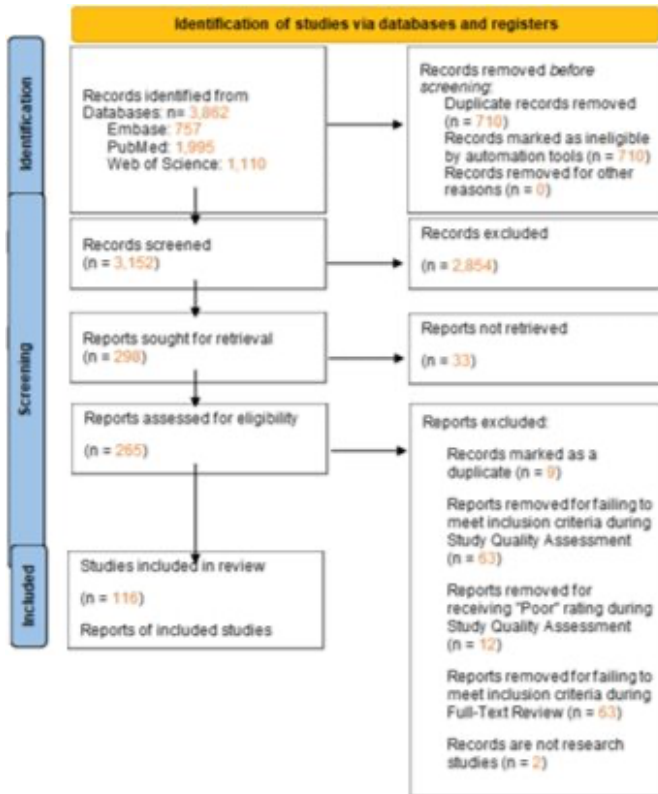
**Table 2: Social Determinants of Health Domains in included articles and their frequencies**

<b>Category</b>	<b>Count</b>	<b>Percent</b>	<b>Cumulative %</b>
<b>ID behavioral + biological</b>	199	37.20%	37.20%
<b>ID psychosocial</b>	83	15.51%	52.71%
<b>SEP ethnicity</b>	71	13.27%	65.98%
<b>ID Health system</b>	57	10.65%	76.64%
<b>ID material circumstances</b>	39	7.29%	83.93%
<b>SPC public policy</b>	18	3.36%	87.29%
<b>SEP education</b>	14	2.62%	89.91%
<b>SEP income</b>	12	2.24%	92.15%
<b>SEP occupation</b>	12	2.24%	94.39%
<b>SPC social policies</b>	10	1.87%	96.26%
<b>SEP social class</b>	7	1.31%	97.57%
<b>SPC governance</b>	5	0.93%	98.50%
<b>SPC cultural and societal values</b>	4	0.75%	99.25%
<b>SEP gender</b>	3	0.56%	99.81%
<b>SES ethnicity</b>	1	0.19%	100.00%

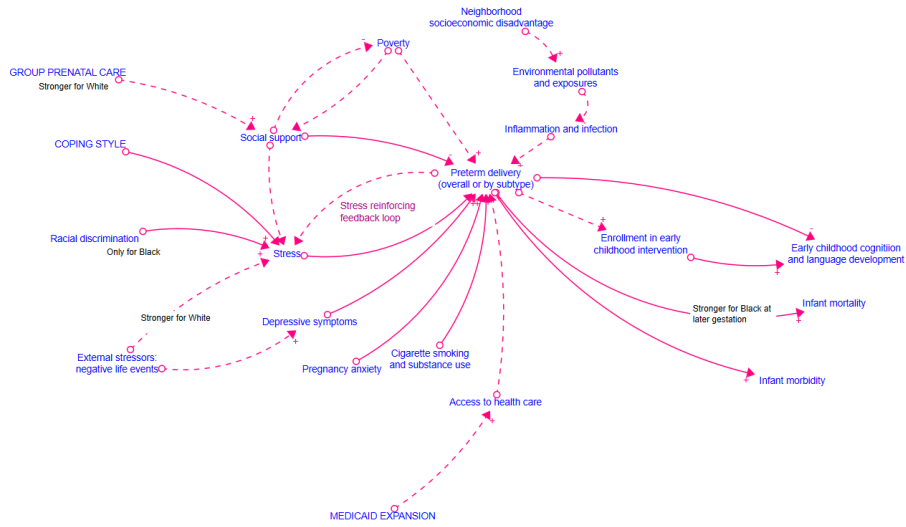
**Table 3: Crossover Domains in included articles**

<b>Category</b>	<b>Count</b>
<b>ID behav + bio &amp;</b>	
ID psychosoc	2
SEP Education	3
SEP Ethnicity	1
<b>ID Health Sys &amp;</b>	
ID Behav + Bio	1
<b>ID material circ &amp;</b>	
ID psychosoc	1
<b>ID psychosoc &amp;</b>	
ID material circumstances	8
<b>SPC cult and societal values &amp;</b>	
ID psychosoc	3
<b>SPC public pol &amp;</b>	
ID Behav + Bio	2
<b>SPC soc pol &amp;</b>	
ID material circumstances	1
<b>Total</b>	<b>22</b>

Figure 1. PRISMA Flow Sheet



**Figure 2. Preliminary Causal Loop Diagram**



**Page 4: [1] Commented [NN23R21] Ncube, Collette N 3/20/23 10:08:00 AM**

I do have access to that Google form. However, Meadow already used the information in the form and consolidated it in another spreadsheet which should be in the project folder.

**Page 4: [2] Commented [SA26R21] Scott, Ashley 3/20/23 10:53:00 AM**

I sent Meadow an email on Friday (marked !) but I know she was in Central America for a spring break project. I'll try again to bring it to the top of her inbox today

**Page 4: [3] Commented [SA27R21] Scott, Ashley 3/20/23 9:45:00 PM**

Meadow's response - "702 articles were reviewed in the pilot, and 2,108 were reviewed in total.

Lorraine, Craig, and I were the ones conducting the review on Abstrackr. "

**Page 4: [4] Commented [NN28R21] Ncube, Collette N 3/21/23 12:50:00 PM**

Based upon her response, n=2,810 for title and abstract review. The subset of 702 can be mentioned in the description of the pilot process.

**Page 4: [5] Commented [SA29] Scott, Ashley 3/18/23 1:09:00 PM**

citation: Solar O, Irwin A. A conceptual framework for action on the social determinants of health. Social Determinants of Health Discussion

Paper 2 (Policy and Practice).

**Page 4: [6] Commented [SA30R29] Scott, Ashley 3/18/23 1:27:00 PM**

Search terms (WHO frameworks for SDoH, race/racial disparities, and PTB)

SDoH including politics, macroeconomics, social policies, public policy, cultural & societal values, socioeconomic position, social cohesion & social capital, material circumstance, behaviors, biological factors, psychosocial factors, health system – from the WHO Commission on the SDoH report

**Page 4: [7] Commented [NN31R29] Ncube, Collette N 3/21/23 12:51:00 PM**

The entire research strategy per electronic database searched can be provided in the Appendix

**Page 4: [8] Commented [SA32] Scott, Ashley 3/18/23 1:02:00 PM**

exclusion if: systematic review, meta-analysis, letter, editorial, commentary, conceptual paper, case report, or a conference paper