


SNP 2024 State of the
Science Symposium
Make Every Day Count



September 26, 2024

Health Economic Impact of Reducing the Incidence of Preterm & Early Preterm Birth in the U.S. with Supplemental Algal DHA

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The U.S. preterm birth rate has increased over the last 10 years

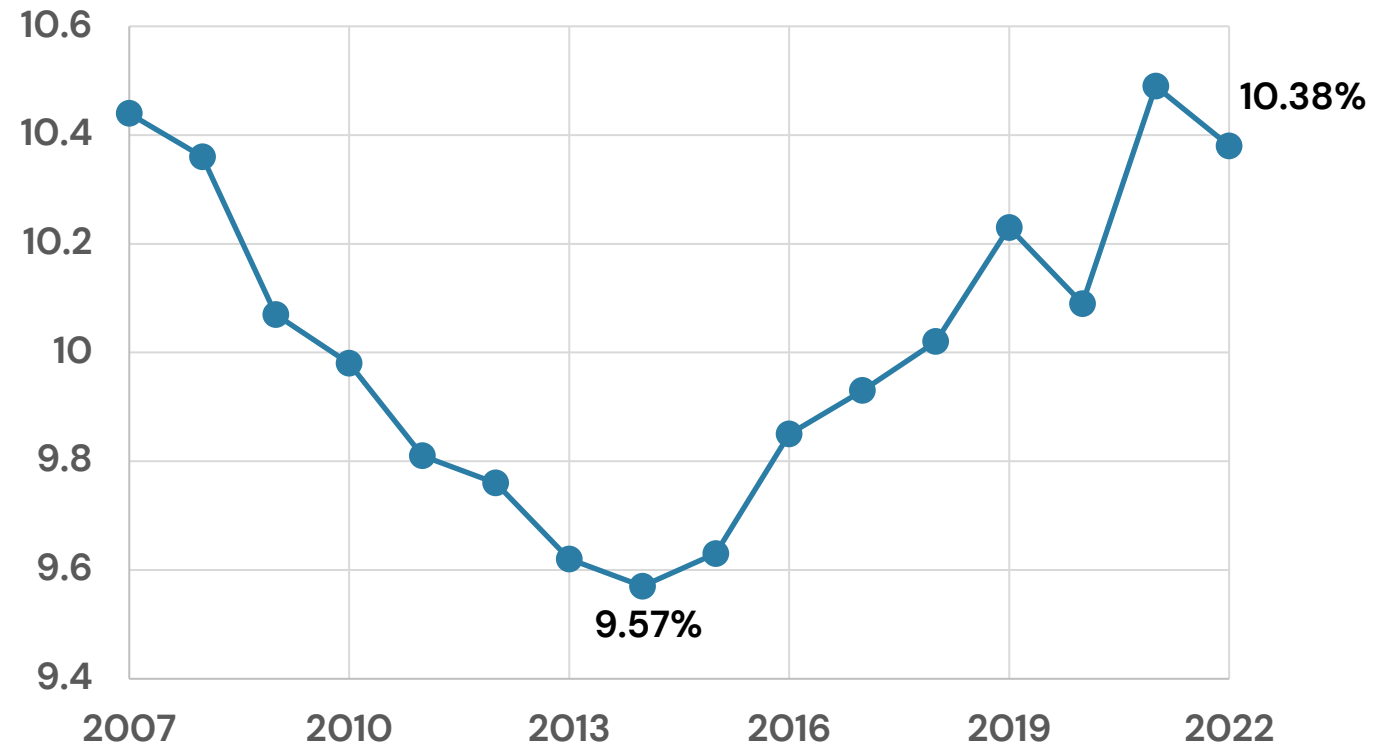
The preterm birth rate (<37 weeks gestation) has **increased substantially** since 2014.

More than **380,000 infants** were born preterm in 2022.

The early preterm birth rate (<34 weeks gestation) has held relatively constant at around 2.8% since 2010.

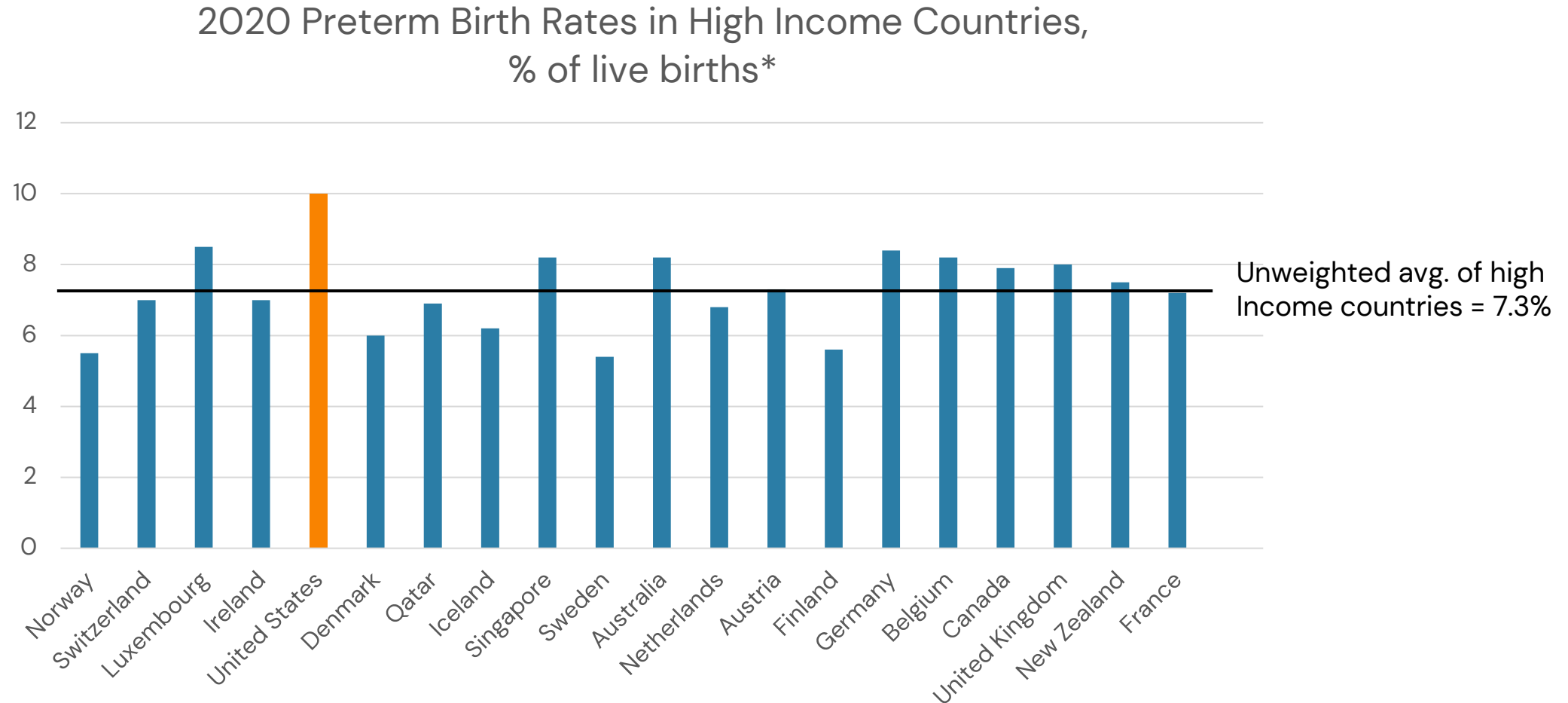
Approximately **101,000 infants** were born early preterm in 2022.

U.S. Preterm birth rate (%), 2007 – 2022



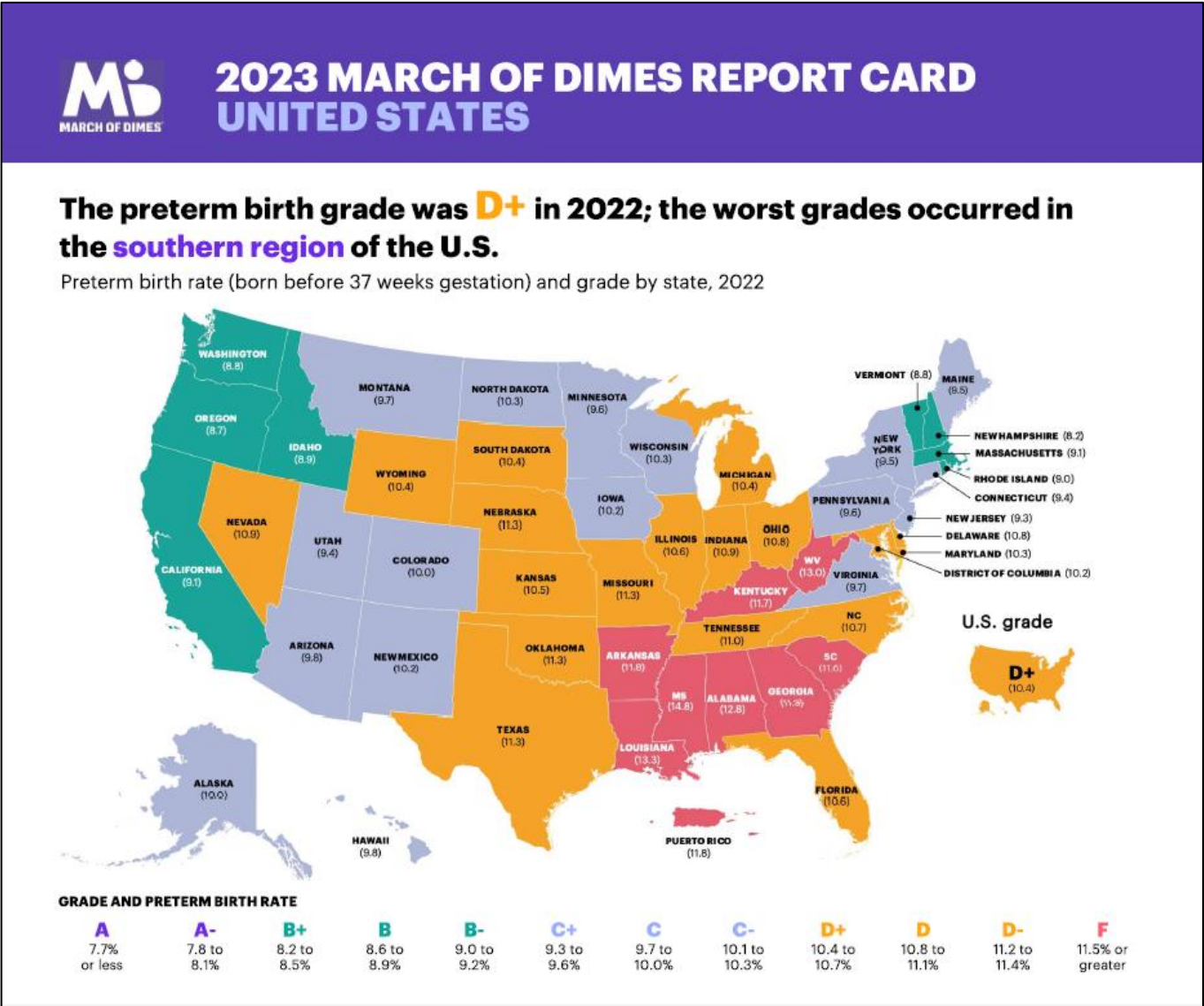
Sources: Osterman et al. (2022) National Vital Statistics Reports vol 72 no 1, CDC National Center for Health Statistics;
Hamilton et al. (2023) Vital Statistics Rapid Release no 28, CDC National Center for Health Statistics;
Martin et al. (2023) NCHS Data Brief no 477, CDC National Center for Health Statistics.

The United States preterm birth rate exceeds that of other high-income countries*



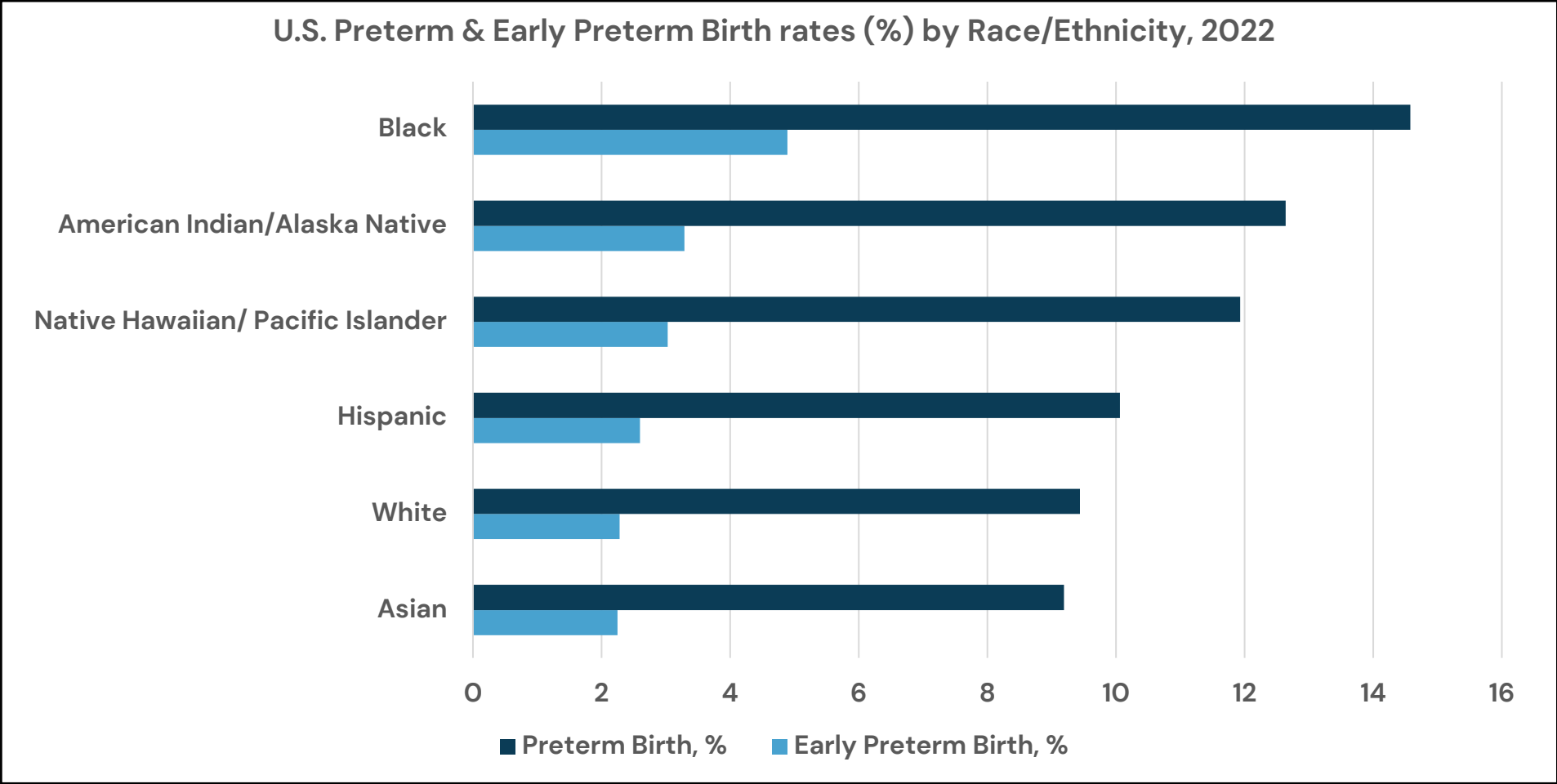
- *Top 20 High Income Countries with available PTB rates according to <https://worldpopulationreview.com/country-rankings/high-income-countries>
- PTB rates from: Ohuma EO, et al. National, regional, and global estimates of preterm birth in 2020, with trends from 2010: a systematic analysis. Lancet 2023; 402: 1261-1271. [Corrected appendix appears in Lancet. 2024 Feb 17;403(10427):618. doi: 10.1016/S0140-6736(24)00267-8.]

The March of Dimes rates the U.S. a D+ for preterm birth



Source: <https://www.marchofdimes.org/report-card>; Used with permission

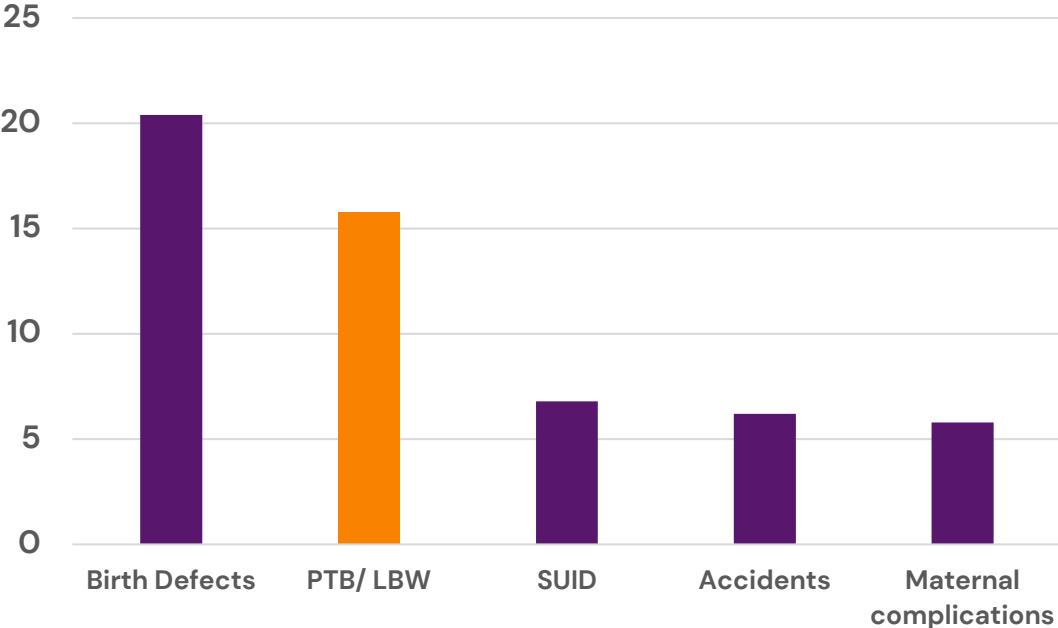
There are stark racial & ethnic disparities in PTB and early PTB rates in the U.S.



The preterm birth rate among babies born to Black birthing people is **54% higher** than the rate in white people. The early preterm birth rate is **more than double**.

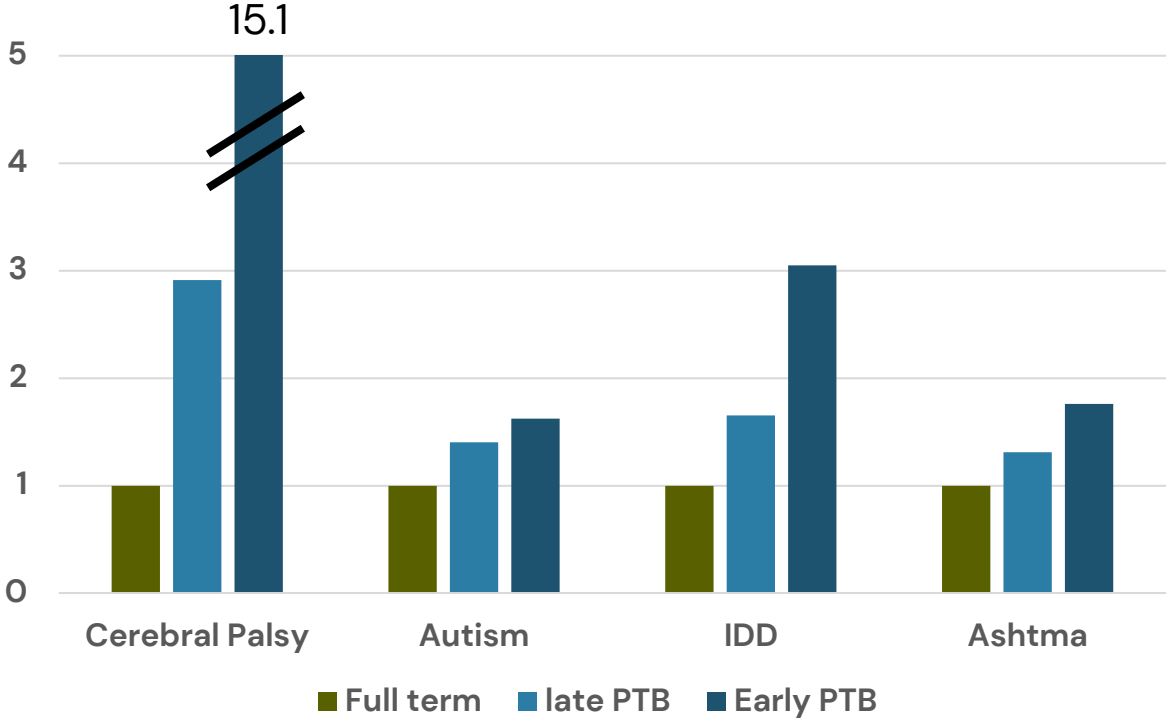
Preterm birth is a leading cause of infant mortality, and increases the risk of certain long-term disabilities

Percent of total deaths by primary cause, 2019–2021



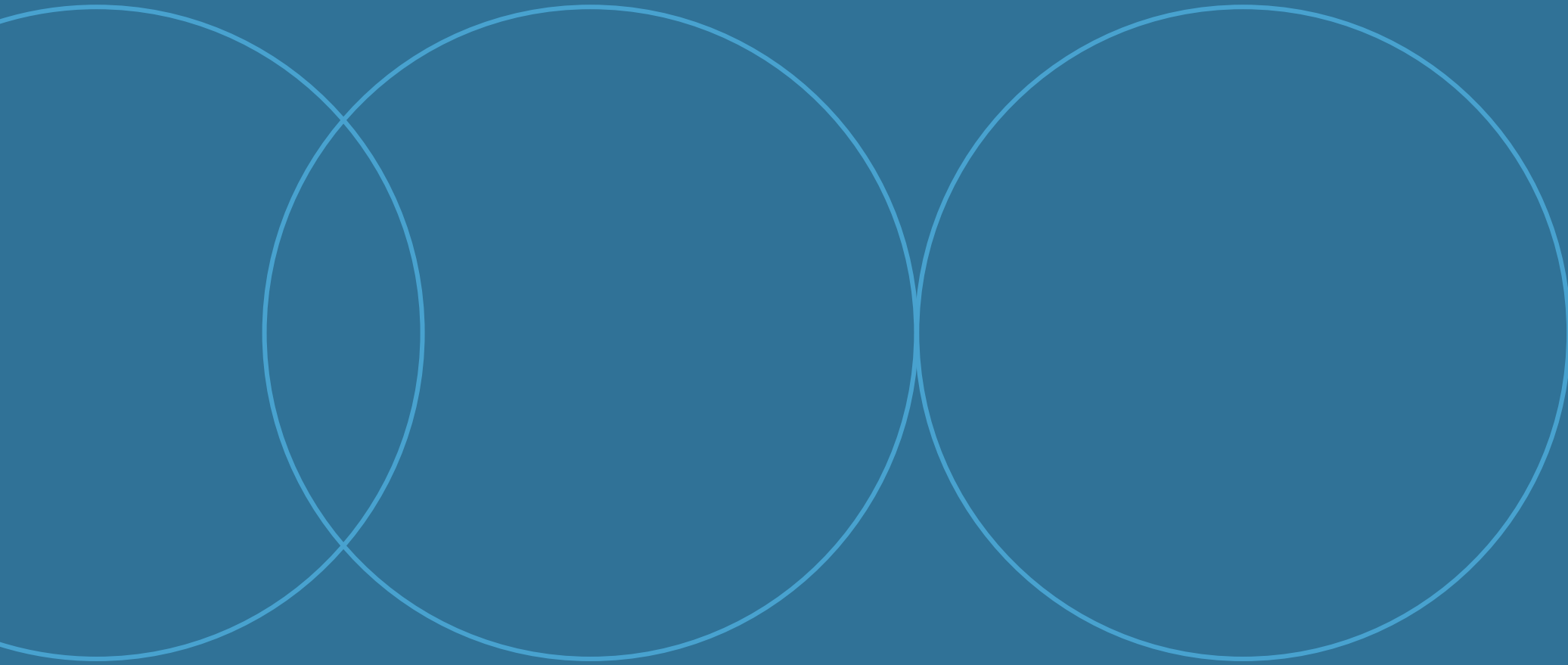
LBW = low birth weight
 SUID = sudden unexpected infant death

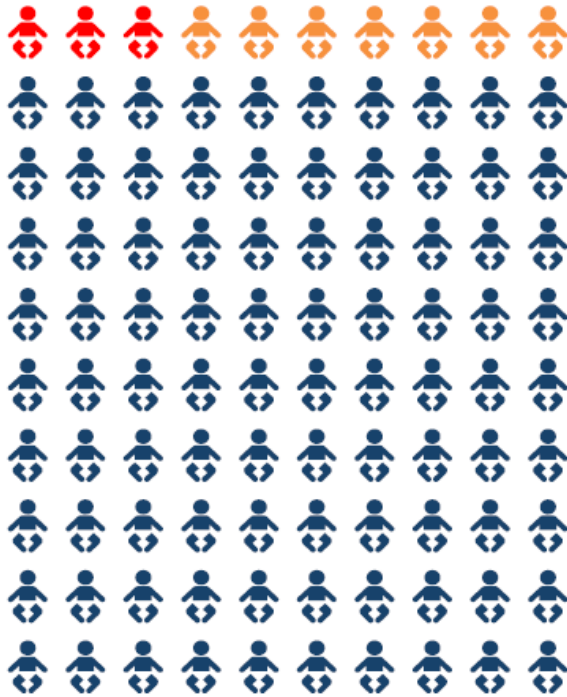
Fold increase in relative risk of negative health outcomes by gestation length



IDD = intellectual or developmental disabilities
 Late PTB = 34 – 36 weeks gestation

Health economic assessment: Assumptions & Findings





IN THE UNITED STATES:

10 OUT OF **100**
BABIES ARE BORN
PRETERM

3 OUT OF **100**
BABIES ARE BORN
EARLY PRETERM

Reducing the economic impact of preterm and early preterm birth in the United States by providing supplemental algal DHA to expectant mothers

FROST & SULLIVAN

Christopher Shanahan M.S.

April 2023

www.frost.com

Report by Frost & Sullivan, April 2023

Available for download at:

https://www.everydaycounts.com/en_us/health-economics.html

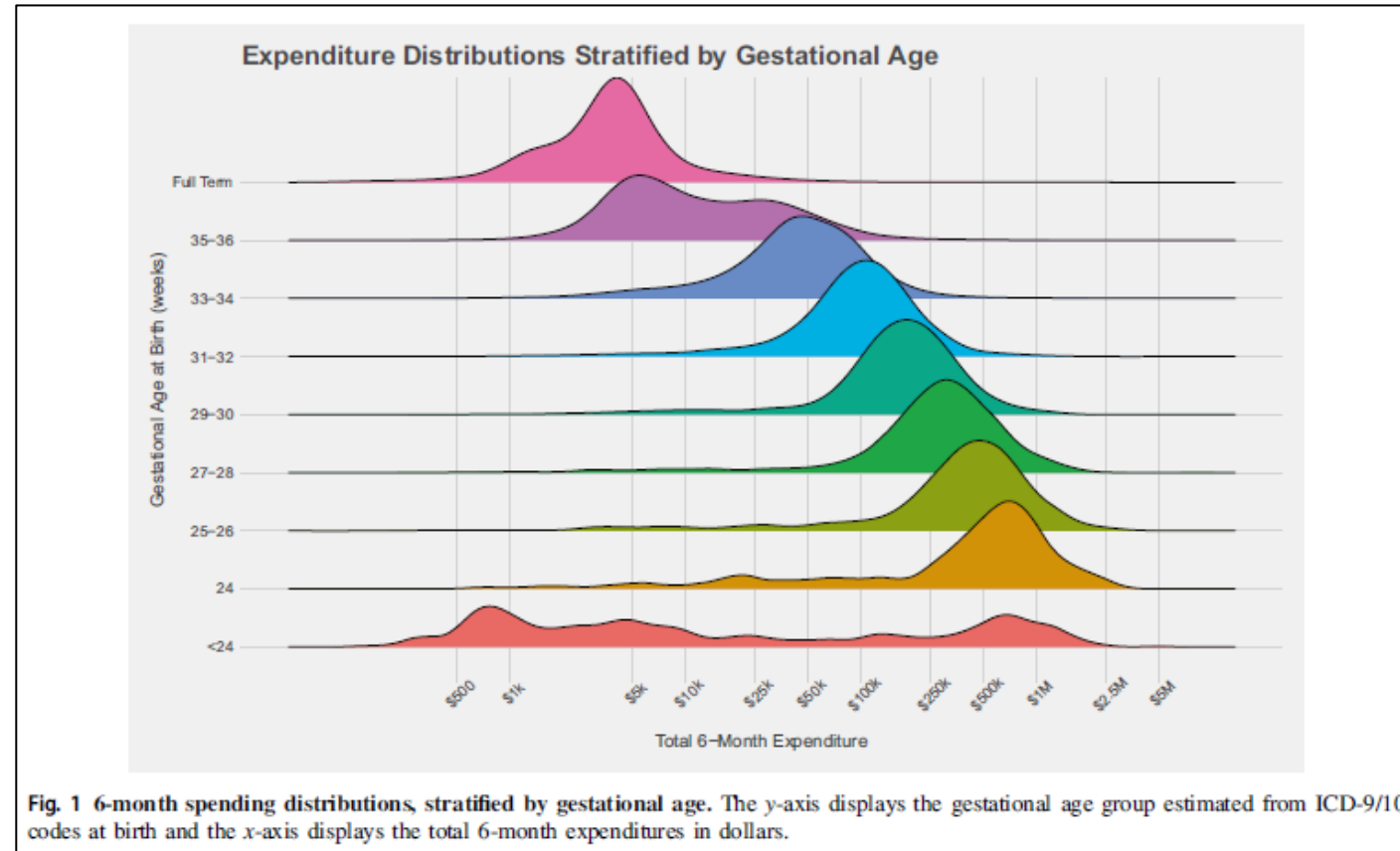


Frost & Sullivan made the following conservative assumptions

- **Birth rates:**
 - Complete dataset of births, preterm births, and early preterm births was available through 2021.
 - **To be conservative, a PTB rate of 10.1% was used as baseline when forecasting** PTB rates from 2022 – 2030. (10.1% is the average between 2016 – 2021).
 - A baseline **early PTB rate of 2.76%** was used.
 - U.S. **overall birth rates were assumed to continue to decline** at similar rates as in the previous decade.
- **Efficacy of DHA supplementation:**
 - Estimate of **12% reduction in PTB, 35% reduction in Early PTB** (Best et al., 2022).
 - This estimate is more conservative than the Cochrane Review (11% and 42%, respectively).
- **Dose and Source:**
 - Assumed all who are pregnant are provided **1,000mg/d of algal DHA for the final 24 weeks of pregnancy.**
 - The ADORE trial utilized 1,000mg/d of algal DHA
 - The Frost & Sullivan report was conducted prior to publication of the new Clinical Practice Guidelines (Cetin et al., 2024). Assuming the same efficacy of supplementation at these (overall) lower doses, the health cost savings and ROI would be greater.
 - Algal DHA oils are a sustainable alternative to fish oil with no impact on the marine ecosystem. Historically, algal sources have been more expensive than fish oils, but recently the dynamics have changed considerably so that algal sources are more accessible and scalable.

“Direct costs”: First 6 months of medical care

- Frost & Sullivan calculated the **excess neonatal medical/hospitalization care costs for the first 6 months of life**:
 - Consulted recent **health economic literature** for costs associated with:
 - Hospitalization/NICU costs by gestational age (e.g., gestation <37 weeks vs. <34 weeks)
 - Private insurance vs. Medicaid
 - Costs were over and above costs for term infants, and adjusted for inflation
 - In 2021, the estimated excess direct cost for a **late preterm infant** was about **\$20,000**
 - The estimated excess direct cost for an **early preterm infant** was about **\$149,000**



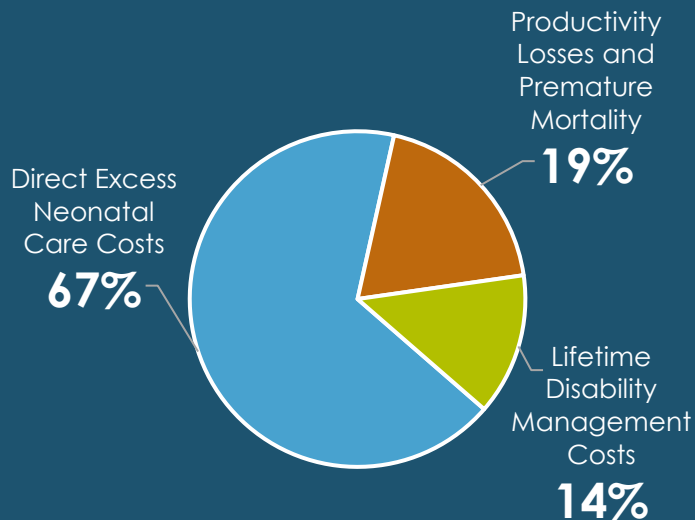
“Indirect costs”: lifetime costs of preterm birth-related disabilities

- Frost & Sullivan calculated the **longer term & lifetime costs (“Indirect costs”)**:
 - Reviewed the scientific literature and the CDC National Health Survey, and consulted with medical experts to estimate **the *increased* incidence of four long-term negative health outcomes** associated with preterm birth (the incidence above that found with full term births):
 - Cerebral Palsy
 - Autism
 - Intellectual and developmental disabilities
 - Asthma
 - (These estimates were shown in a previous slide)
 - Reviewed the health economic literature for **costs associated with these comorbidities**, and adjusted these for inflation:
 - Medical costs: physician visits, medications, hospital stays, therapy/rehab, long-term care
 - Non-medical costs: special education, home modifications and transport
 - Productivity losses due to disability: the individual, and parent caregiver

Preterm birth cost \$34.5 Billion in 2021, with most of the cost from early preterm births

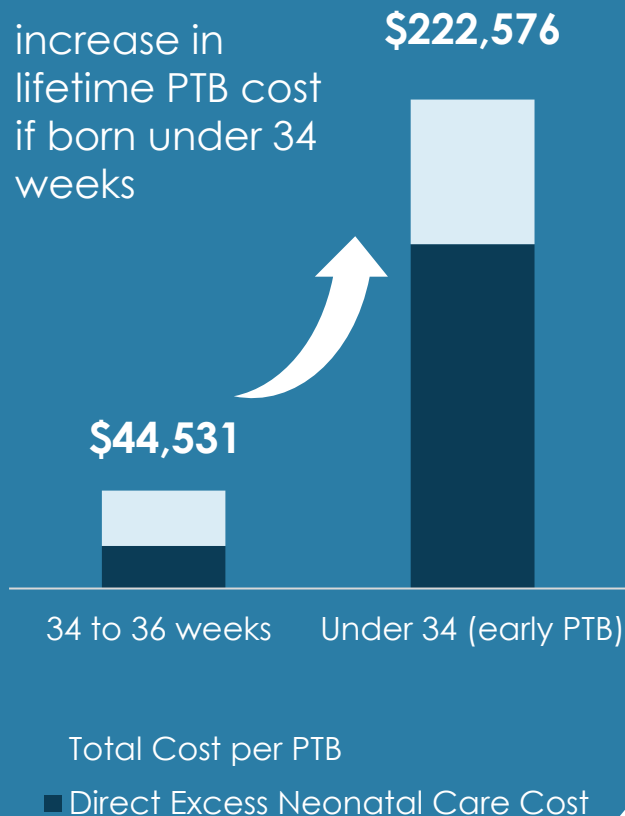
2/3

of the cost of a PTB attributed to excess neonatal care cost



5x

increase in lifetime PTB cost if born under 34 weeks



Total Population Cost of All PTB

\$34.5 BILLION

Total Population Cost of all preterm births in the United States in 2021

Total Population Cost of ePTB

\$22.9 BILLION

Total Population Cost of early preterm births in the United States in 2021

DHA supplementation could prevent 40,000 preterm births per year

Literature Review

Two recent Meta-analyses show with high certainty evidence that risk of PTB is reduced by Omega-3 intake during pregnancy

- Best et al. 2022
 - 23,726 study participants across 36 qualified studies

Benefits of Omega-3 DHA

12%

relative risk reduction of any type of PTB

35%

relative risk reduction of an early PTB

Avoidable Preterm Births Per Year

40,568

Average number of Avoidable Preterm Births (<37 weeks) per year from 2023 to 2030 if all expectant mothers take Omega-3 DHA at preventive intake levels



Avoidable Early Preterm Births Per Year

32,240

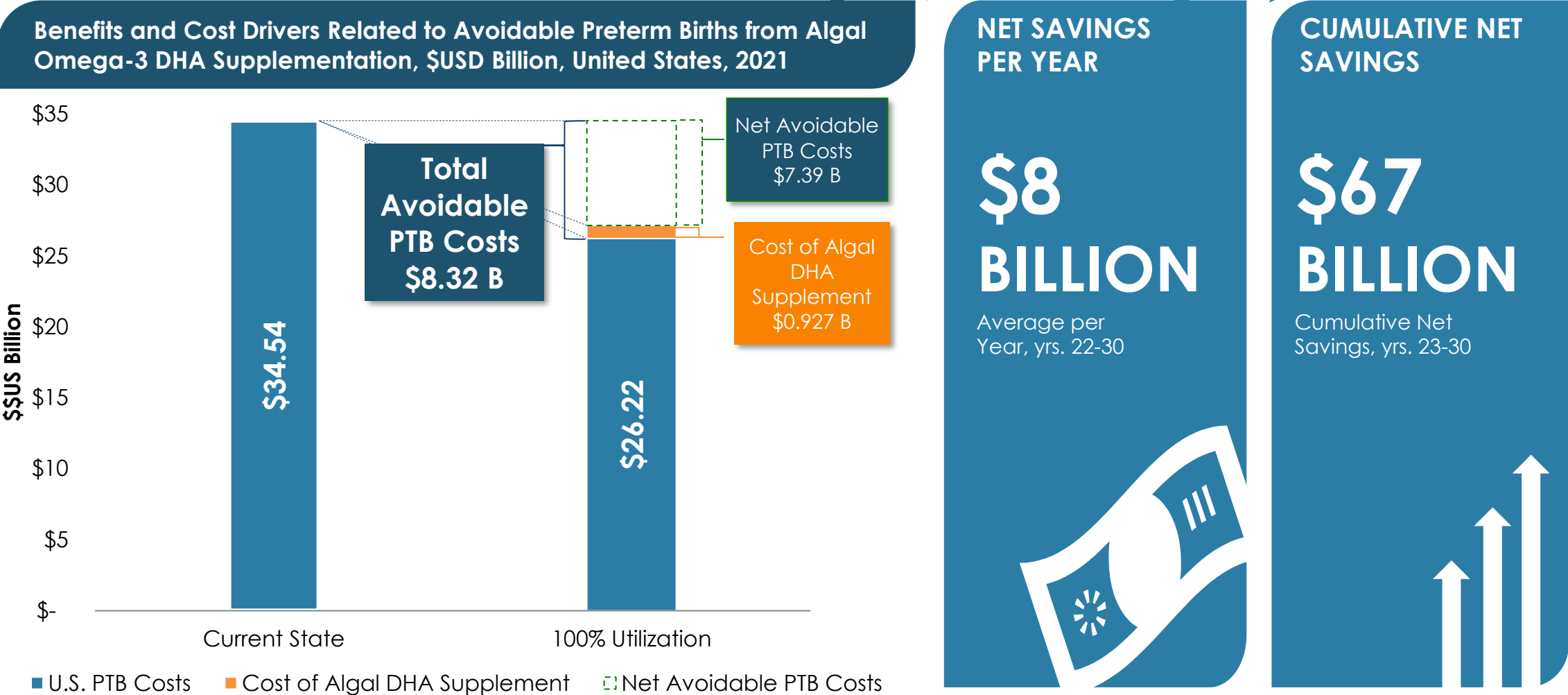
Average number of Avoidable Early Preterm Births (<34 weeks) per year from 2023 to 2030 if all expectant mothers take Omega-3 DHA at preventive intake levels



dsm-firmenich 

Sources: Best 2022 and Frost & Sullivan 2023

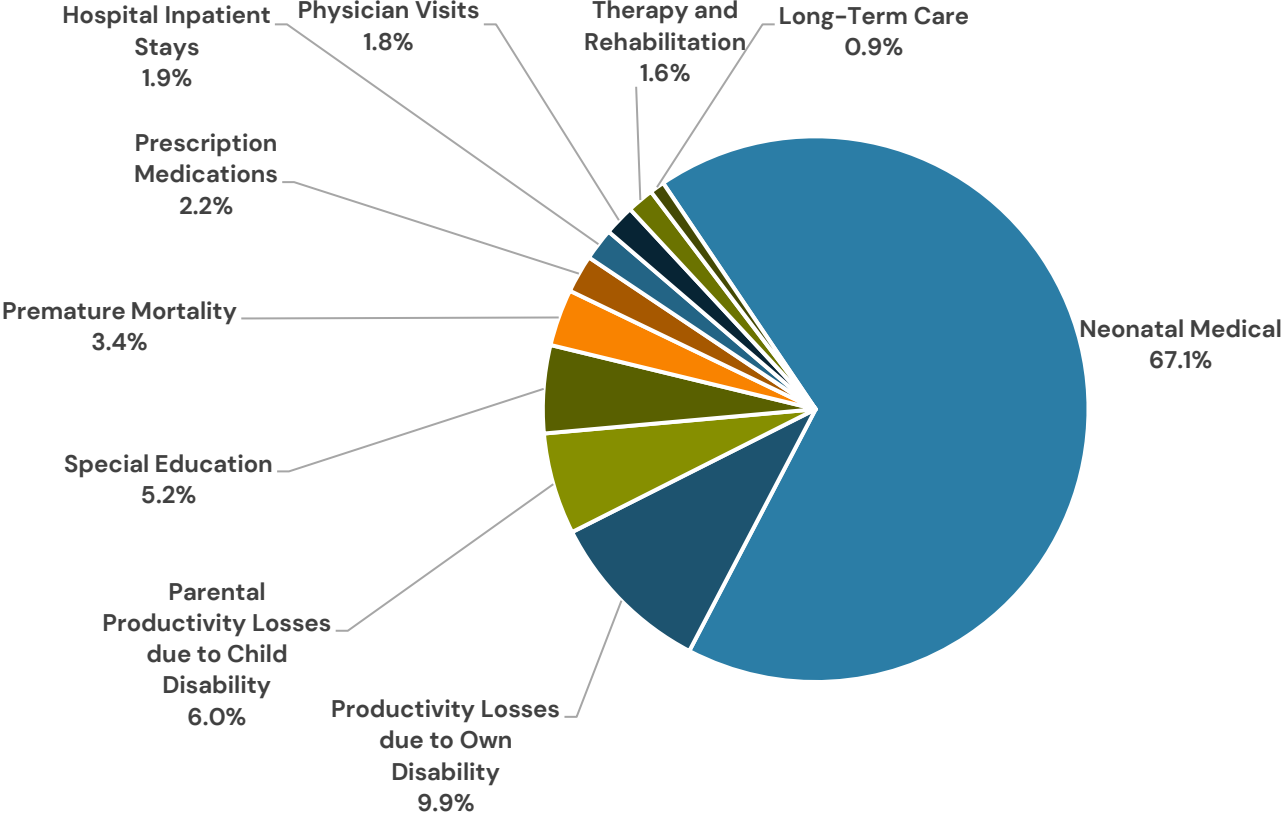
Supplementation with 1,000 mg/d of algal DHA could reduce costs associated with PTB by \$8 billion/year



Source: Frost & Sullivan 2023

Net Health Care Cost Savings from Avoidable PTBs by Cost Component

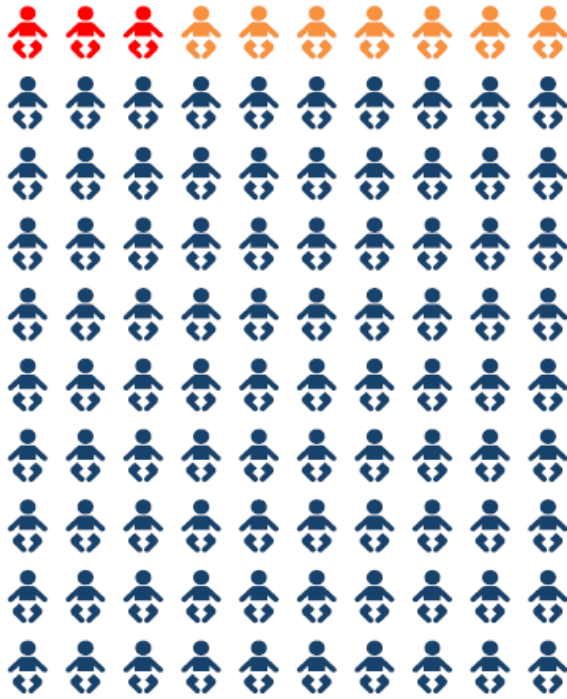
Share of Total Potential Health Direct and Indirect Care Cost Savings from Avoidable PTBs had Mother Utilized Omega-3 DHA Supplements (1,000 mg) by Cost Type, %, United States, 2021



- Sixty-seven percent (67%) of potential healthcare cost savings will be from avoided neonatal healthcare costs that occur during the first 6 months.
- Lifetime productivity losses related to possible preterm birth-related disabilities, both the losses of the sufferer and the caregiving parent, are the next largest cost components (16%) that could be avoided.
- The remainder of the potential savings would be associated with medical costs associated with these disabilities.

Conclusions

- Preterm and especially early preterm birth are **leading causes of infant mortality and increase the risk of disabilities** such as cerebral palsy, intellectual and developmental disabilities, autism, and asthma.
- The U.S. preterm birth rate has increased substantially since 2014. Currently, **more than one in ten infants is born preterm. Of these, about one in four is born early preterm.**
- There is a **pronounced racial and ethnic disparity in rates of PTB and early PTB**, with increased rates in several groups (Black, American Indian & Alaska Native, Native Hawaiian & Pacific Islander, Hispanic) compared to non-Hispanic White and Asian populations.
- Preterm birth is **estimated to have cost the U.S. over \$34 billion in 2021**. Almost \$23 billion was associated with early preterm births.
- Supplementation of all those who are pregnant with effective levels of DHA is **predicted to reduce the number of preterm births by over 40,000 per year, including a reduction of over 32,000 early preterm births per year.**
- This would translate to a **net savings per year of \$8 billion per year**, about 2/3 of which would be realized in reduced hospital/NICU costs over the first 6 months after birth.



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