

Health Impact Review of HB 2480
Providing a sales and use tax exemption for diapers and diaper services
(2020 Legislative Session)

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Full review

The full Health Impact Review report is available at:

<https://sboh.wa.gov/Portals/7/Doc/HealthImpactReviews/HIR-2020-09-HB2480.pdf>

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Executive Summary
HB 2480, Providing a sales and use tax exemption for diapers and diaper services
(2020 Legislative Session)

Evidence indicates that HB 2480 would likely increase affordability of, access to, and use of diapers, which would likely improve health outcomes and decrease health inequities by socioeconomic status for infants, children, and parents and caregivers.

BILL INFORMATION

Sponsors: Robinson, Rude, Leavitt, Valdez, Doglio, Pollet, Cody, Riccelli

Summary of Bill:

- Establishes that the retail sales tax ([RCW 82.08.020](#)) does not apply to the sales of diapers or diaper services.
- Establishes that provisions of Washington’s use tax ([Chapter 82.12 RCW](#)) do not apply to diapers or diaper services.
- Exempts this act from the provisions of RCWs [82.32.805](#) (Tax preferences—Expiration dates) and [82.32.808](#) (Tax preferences—Performance statement requirement).

HEALTH IMPACT REVIEW

Summary of Findings:

This Health Impact Review found the following evidence for relevant provisions in HB 2480:

- **Informed assumption** that exempting diapers and diaper services from Washington’s sales and use taxes would increase affordability of diapers and diaper services. This assumption is based on information from California, the Washington State sales and use tax rates, and national cost savings estimates.
- **Informed assumption** that increasing affordability of diapers and diaper services would result in increased access to and use of diapers for infants and children, particularly among families with low-incomes. This assumption is based on cost savings and evidence from a study of families receiving assistance from a community-based diaper bank.
- **Strong evidence** that increasing access to and use of diapers for infants and children would result in improved health outcomes for infants, children, and parents and caregivers.
- **Strong evidence** improving health outcomes for infants, children, and parents and caregivers would likely decrease health inequities by socioeconomic status.

Introduction and Methods

A Health Impact Review is an analysis of how a proposed legislative or budgetary change will likely impact health and health disparities in Washington State ([RCW 43.20.285](#)). For the purpose of this review ‘health disparities’ have been defined as the differences in disease, death, and other adverse health conditions that exist between populations ([RCW 43.20.270](#)). This document provides summaries of the evidence analyzed by State Board of Health staff during the Health Impact Review of House Bill 2480 ([HB 2480](#)).

Staff analyzed the content of HB 2480 and created a logic model depicting possible pathways leading from the provisions of the bill to health outcomes. We consulted with experts and contacted key informants about the provisions and potential impacts of the bill. We conducted an objective review of published literature for each pathway using databases including PubMed, Google Scholar, and University of Washington Libraries. More information about key informants and detailed methods are available upon request.

The following pages provide a detailed analysis of the bill including the logic model, summaries of evidence, and annotated references. The logic model is presented both in text and through a flowchart (Figure 1). The logic model includes information on the strength-of-evidence for each relationship. The strength-of-evidence has been defined using the following criteria:

- **Very strong evidence:** the review of literature yielded a very large body of robust evidence supporting the association with few if any contradictory findings. The evidence indicates that the scientific community largely accepts the existence of the association.
- **Strong evidence:** the review of literature yielded a large body of evidence on the relationship (a vast majority of which supported the association) but the body of evidence did contain some contradictory findings or studies that did not incorporate the most robust study designs or execution or had a higher than average risk of bias; or there were too few studies to reach the rigor of “very strong evidence;” or some combination of these.
- **A fair amount of evidence:** the review of literature yielded several studies supporting the association, but a large body of evidence was not established; or the review yielded a large body of evidence but findings were inconsistent with only a slightly larger percentage of the studies supporting the association; or the research did not incorporate the most robust study designs or execution or had a higher than average risk of bias.
- **Not well researched:** the review of literature yielded few if any studies or only yielded studies that were poorly designed or executed or had high risk of bias.

This review was subject to time constraints, which influenced the scope of work for this review. The annotated references are only a representation of the evidence and provide examples of current research. In some cases only a few review articles or meta-analyses are referenced. One article may cite or provide analysis of dozens of other articles. Therefore the number of references included in the bibliography does not necessarily reflect the strength-of-evidence. In addition, some articles provide evidence for more than one research question, so are referenced multiple times.

Analysis of HB 2480 and the Scientific Evidence

Summary of relevant background information

- States commonly impose a personal income tax, corporate income tax, sales tax, and real property tax to raise revenue to finance public services.¹
- Washington State does not have a personal or corporate income tax.²
- According to the U.S. Department of Treasury, state sales taxes impact individuals differently depending on their income “because the people with smaller incomes pay a larger percentage of their money into the sales tax system than people with higher incomes.”¹ For example, a 2018 report from the Institute of Taxation and Economic Policy found that Washingtonians with incomes in the lowest 20% (less than \$24,000 annually) pay 13.3% of their family income in sales and excise taxes compared to those with incomes in the top 20% (more than \$116,300 annually) that pay less than 4.7% of their family income.³ The Institute also calculates a Tax Inequality Index “which measures the impact of each state’s tax system on income inequality.”³ According to their measures, “Washington has the most unfair state and local tax system in the country. Incomes are more unequal in Washington after state and local taxes are collected than before.”³ One reason for this inequity is due to Washington’s comparatively high combined state and local sales tax rate.³
- Washington State sales taxes are imposed on retail sales of most articles of tangible personal property, including diapers.⁴ A retail sale is a sale to the final consumer or end user of the property.² Washington State’s sales and use tax rate is 6.5%.⁴ Most cities and all counties in Washington State also levy a sales and use tax, and rates vary from 0.5% to 3.9%.⁴ Therefore, individuals may pay between 7% and 10.4% in sales and use taxes on diapers and diaper services.
- State retail tax exemptions are often made for food, clothing, medicine, newspaper, and utilities.¹ Washington State currently has retail sales and use tax exemptions ([RCW 82.08](#)) for a number of products, including some farm products, producer goods, interstate sales, public activities, food and food ingredients, health-related purchases, and deferrals and credits.² Examples of health-related purchase exemptions include prescription drugs ([RCW 82.08.0281](#)) and certain medical items ([RCW 82.08.0283](#)), including prosthetic devices and oxygen.
- According to Washington State health insurance regulations, the term “medically necessary” means a “requested service which is reasonably calculated to prevent, diagnose, correct, cure, alleviate or prevent worsening of conditions in the client that endanger life, or cause suffering or pain, or result in an illness or infirmity, or threaten to cause or aggravate a handicap, or cause physical deformity or malfunction. There is no other equally effective, more conservation or substantially less costly course of treatment available or suitable for the client requesting the service” ([WAC 182-500-0070](#)).
- Benefits from federal assistance programs (e.g. Special Supplemental Nutrition Program for Women, Infants, and Children [WIC]; Supplemental Nutrition Assistance Program [SNAP]) exist to provide a safety net for families experiencing food insecurity.⁵ These benefits cannot be applied to nonfood essentials such as diapers.⁵

- A Flexible Spending Arrangement, commonly referred to as a Flexible Spending Account (FSA), allows employees to be reimbursed for medical expenses.⁶ FSAs are usually funded through voluntary salary reduction agreements with an individual's employer.⁶ Employee contributions to an FSA are exempt from employment and federal income taxes.⁶ Diapers and diaper service expenses are generally ineligible unless they are used to alleviate the effects of a particular disease or medical condition, in which a Letter of Medical Necessity from a doctor must be submitted to the FSA administrator for reimbursement.⁷
- Diaper need is defined as an inadequate supply of diapers to change a child as often as needed⁸ to keep children clean, dry, and healthy.⁵ Diaper need is considered a form of maternal (i.e., parental and caregiver) hardship.⁸
- As of January 1, 2020, 36 states charged sales tax on diapers. Nine states exempt diapers from taxation and five states do not have a sales tax.⁹ Fifteen states have sales tax holiday(s) when diapers are exempt.⁹

Summary of HB 2480

- Establishes that the retail sales tax ([RCW 82.08.020](#)) does not apply to the sales of diapers or diaper services.
 - Defines “diaper” to mean “an absorbent garment that is washable or disposable and is designed, manufactured, processed, fabricated, or packaged for use by infants, toddlers, or children who are incapable of or have difficulty controlling their bladder or bowel movements.
 - Defines “diaper service” to mean “a business that supplies and launders diapers.”
- Establishes that provisions of Washington's use tax ([Chapter 82.12 RCW](#)) do not apply to diapers or diaper services (as defined in the act).
- Exempts this act from the provisions of RCWs [82.32.805](#) (Tax preferences—Expiration dates) and [82.32.808](#) (Tax preferences—Performance statement requirement).

Health impact of HB 2480

Evidence indicates that HB 2480 would likely increase affordability of, access to, and use of diapers, which would likely improve health outcomes and decrease health inequities by socioeconomic status for infants, children, and parents and caregivers.

Pathway to health impacts

The potential pathway leading from the provisions of HB 2480 to decreased health inequities are depicted in Figure 1. This HIR makes the informed assumption that exempting diapers and diaper services from Washington's sales and use taxes would increase affordability of diapers and diaper services. This assumption is based on information from California, the Washington State sales and use tax rates, and national cost savings estimates. This HIR makes the informed assumption that increasing affordability of diapers and diaper services would result in increased access to and use of diapers for infants and children, particularly among families with low-incomes. This assumption is based on cost savings and evidence from a study of families receiving assistance from a community-based diaper bank. There is strong evidence that increasing access to and use of diapers for infants and children would result in improved health outcomes for infants and children¹⁰⁻¹³ and parents and caregivers.^{8,14-16} There is strong evidence

that improving health outcomes for infants, children, and parents and caregivers would likely decrease health inequities by socioeconomic status.^{12,13,16-22}

Scope

Due to time limitations, we only researched the most direct connections between the provisions of the bill and decreased health inequities and did not explore the evidence for all possible pathways. For example, we did not evaluate potential impacts related to:

- Increasing sales and use tax rates as a result of an additional tax exemption. For example, recent research has found that for each additional sales tax exemption, the rate of sales taxes typically increase by 0.10 to 0.25 percentage points.²³
- Cost-savings from the tax exemption and potential impact of additional expendable income for other expenses. Though cost savings as a result of this tax exemption may be relatively small, savings may help with the cost of other necessities. One WIC Coordinator in Washington noted, “Diapers are a huge cost for families with limited resources and is especially burdensome on families with several small children, who may be paying hundreds of dollars a month just to meet the most basic need of sanitation. [...] Any bit of relief from this could be welcome from families and allow them to utilize their resources more efficiently” (Washington State Department of Health, personal communication, February 2020).

Magnitude of impact

As of November 2018, Washington was home to an estimated 274,550 children younger than 3 years of age.²⁴ In 2018, approximately 16% lived in families earning less than 100% of the Federal Poverty Level (FPL)^{A,25} and 15% lived in families earning 100% to 200% of the FPL.²⁴

A study examining diaper need among low-income U.S. children in 2016 found that 131,783 children in Washington were younger than 4 years of age and living at or below 200% of the federal poverty level (FPL).⁵ Of those, 6,924 children were served monthly by the National Diaper Bank Network (NDBN), a network of diaper banks in the U.S. that provide a supplemental supply of diapers to families.⁵ Data indicate the NDBN met 5% of the diaper need in Washington State in 2016.⁵ There are currently seven diaper banks operating in Washington (WestSide Baby, public testimony, House Finance Committee hearing on HB 2480, January 30, 2020).

A 2017 survey of King County families with children aged 6 months through 5th grade examined whether or not families have struggled to afford basic needs since the child was born. The study found that “23% of King County children [ages 0-5 years] lived in families that had found it difficult to afford diapers or formula as least some of the time since the child was born.”²² Similar data were not available for other regions in the state.

^A Federal poverty level (FPL) is a measure of income issued every year by the U.S. Department of Health and Human Services (HHS). FPL incomes are based on family size. In 2019 FPL incomes were: \$12,490 for individuals; \$16,910 for a family of 2; \$21,330 for a family of 3; \$25,750 for a family of 4; and \$4,420 per each additional family member. FPL incomes were slightly lower for 2018.

Logic Model

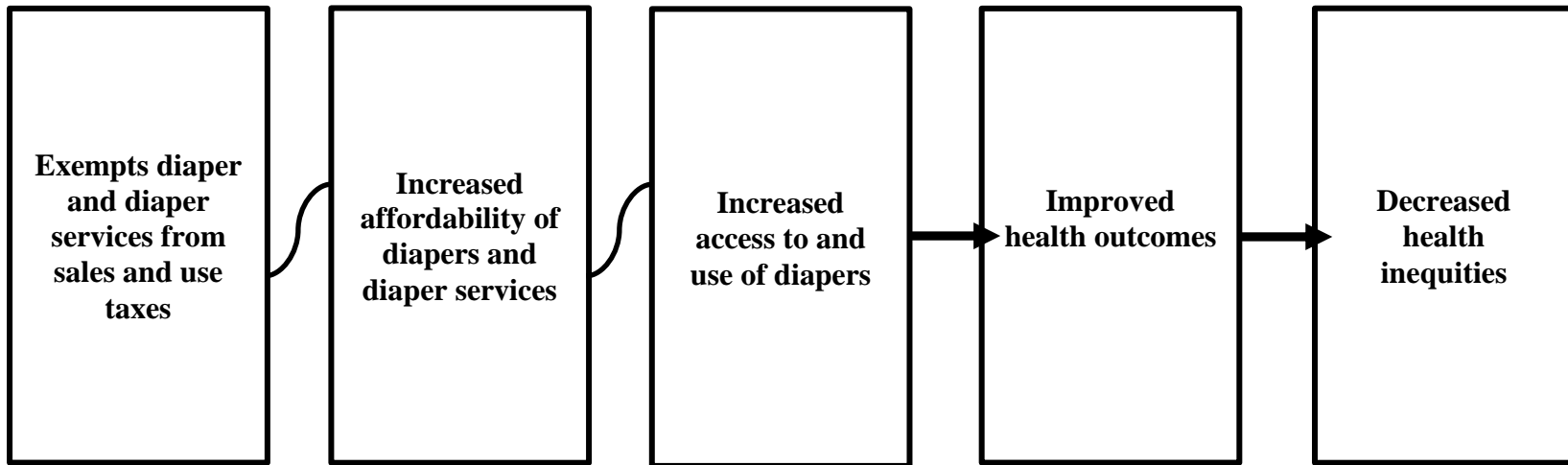
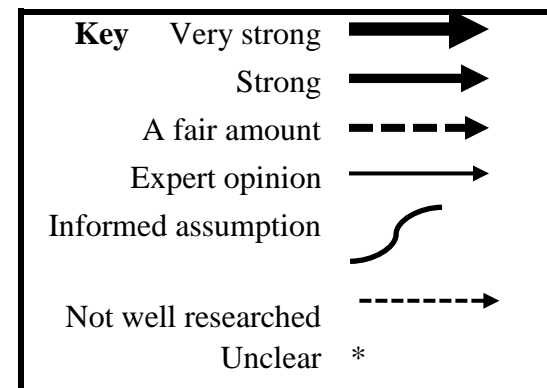


Figure 1:
Providing a sales and use tax exemption for diapers and diaper services
HB 2480



Summaries of Findings

Will exempting diapers and diaper services from Washington’s sales and use taxes increase the affordability of diapers and diaper services?

We have made the informed assumption that exempting diapers and diaper services from Washington’s sales and use taxes would increase affordability of diapers and diaper services. This assumption is based on a California analysis on similar legislation, Washington’s sales and use tax rates, the Fiscal Note for HB 2480, and cost savings estimates from the National Diaper Bank Network (NDBN).

Effective January 1, 2020, California implemented a new law ([Senate Bill 92](#)) to exempt diapers for infants, toddlers, and children from the state’s sales and use taxes.²⁶ The California Legislature’s Legislative Analyst’s Office (LAO) conducted an analysis of the proposal in 2019 and found that “parents throughout the income distribution would save some money while their children are very young.”²⁷

In Washington, those purchasing diapers would save between 7% and 10.4%, depending on their local jurisdictions’ sales and use taxes, when purchasing diapers. The Washington State Department of Revenue (DOR) estimates that HB 2480 would decrease state revenue from sales and use tax by approximately \$15 million during Fiscal Year (FY) 2021 (11 months of impacted collections), \$16 million during FY 2022, and \$17 million for each fiscal year through 2025.²⁸ Additionally, the proposal would decrease sales and use tax revenues collected by local governments (cities and counties) by an estimated \$7 million per FY.²⁸

Children wearing diapers require an average 6-12 daily,^{13,14} and the majority of infants and children use disposable diapers (estimated 95%).²⁸ Estimates for monthly disposable diaper costs per child range from \$46 to \$125 per month.^{13,14,16,18,29} If purchased in smaller packages, diapers can cost substantially more than average.¹⁶ Based on a diaper expense of \$936 per year (per child), the NDBN estimates eliminating a 7% or 11% tax rate would save a family \$66 or \$103 per year, respectively.⁹ The average cost of a cloth diaper service is about \$70 per month (\$840 annually per child).²⁸ Therefore, based on average diaper service expense, families would save approximately \$59 or \$92 per year by eliminating sales and use tax (7% or 11%).

HB 2480 eliminates sales and use taxes on diapers and diaper services which would affect families across the income distribution who have very young children in Washington. Therefore, we have made the informed assumption that exempting diapers and diaper services from Washington’s sales and use taxes would increase the affordability of diapers and diaper services.

Will increasing affordability of diapers and diaper services result in increased access to and use of diapers for infants and children?

We have made the informed assumption that increasing affordability for diapers and diaper services would result in increased access to and use of diapers for infants and children, particularly among families with low-incomes. This assumption is based on demand for diapers, estimates of additional diapers that could be purchased with cost savings from a sales and use tax exemption, and a study of families receiving assistance from a community-based diaper bank.

Because diapers are essential to care for infants and children who are not toilet trained, consumer demand for these products is highly inelastic (i.e., the quantity purchased is insensitive to a change in price). In other words, if diaper prices decrease the quantity of diapers parents and caregivers demand may increase only slightly (conversely, if prices increase demand may decrease only slightly). Generally, parents and caregivers will continue to buy the number of diapers necessary, as resources allow, to keep a child dry, healthy, and comfortable. However, for families with limited resources who experience diaper need (i.e., inadequate supply of diapers), eliminating sales and use taxes on these purchases would increase access to diapers by enabling them to purchase additional diapers for the same amount they already spend each month.

The NDBN estimates that, “by reducing the sales tax, families can buy 2 additional diapers for every percentage point reduction in the sales tax for the same money they would have used to buy 200 diapers [estimated average monthly supply] with tax.”⁹ Using this estimate, Washington families would be able to buy between 14-20 additional diapers per month. Based on the average 6-12 diapers per day, this would provide between a 1 to 3 days’ supply of diapers.

A Seattle-based diaper bank estimates that if diapers were exempt from sales tax in Washington, families would be able to purchase 36 additional diapers per month.¹⁸ Based on average diaper use, this would amount to a 3 to 6 day supply. Additionally, a survey of families (N=150) receiving assistance from a community diaper bank in the southeastern U.S., found that more than 68% of participating families described the effect of a supplemental supply of diapers (an average of two to three days’ supply) as helping “*a lot*”.¹² Thirty percent of families indicated the supplemental diaper supply helped “*a little*”.¹²

Therefore, because estimated cost savings could provide additional diapers (1 to 6 day supply), and families experiencing diaper need report that a supplemental supply of diapers is beneficial (and cannot be met through other federal and state assistance programs), this HIR makes the informed assumption that increasing affordability for diapers and diaper services would increase access to and use of diapers for infants and children, particularly among families with low-incomes.

Will increasing access to and use of diapers for infants and children result in improved health outcomes for infants, children, and parents and caregivers?

There is strong evidence that increasing access to and use of diapers for infants and children would result in improved health outcomes for infants, children, and parents and caregivers. Specifically, evidence indicates diaper need affects children’s physical and socioemotional development, household finances, and parents’ and caregivers’ mental health.^{5,13}

Infants and children

Diaper need “puts children at risk for experiencing the pain and discomfort that comes from wearing diapers longer than recommended, disposable diapers previously worn, diapers too small or large, or cloths or plastic bags in the absence of diapers.”^{5,12} Evidence indicates that wearing disposable diapers for extended periods between changes puts infants and children at increased risk of urinary tract infections¹⁰ and dermatological problems (e.g., diaper dermatitis, commonly known as diaper rash).¹¹ For example, a study in England found a significant

association between reduced diaper changes and both current and recurrent episodes of diaper dermatitis.¹¹ Authors noted, “Although diaper dermatitis rarely causes persisting problems, it can cause significant discomfort to infants and considerable parental anxiety.” Meanwhile evidence indicates that maternal stress and depression are significant contributors to child development.¹⁴

Parents and caregivers

A growing body of evidence suggests that material hardship, including lack of basic needs like diapers, influences parental stress and mental health concerns.^{8,16} Evidence indicates stress associated with diaper rash and the experience of diaper need are associated with parental anxiety and elevated levels of maternal depressive symptoms.⁵ For example, a cross-sectional study examining the association between diaper need and food insufficiency and maternal depressive symptoms found that “women who reported diaper need had a significantly higher [depression] score than women who did not report diaper need.”⁸ Evidence indicates the severity and persistence of depressive symptoms are both moderating factors that can affect the association between maternal depression, maternal behavior, and child outcomes.¹⁵ A systematic review identified 4 studies that demonstrated a significantly negative effect of maternal postpartum depression on infant-mother bonding and 11 studies that demonstrated a negative effect of maternal depression on mother-to-infant bonding.³⁰ For example, “women with depressive symptoms showed less closeness, warmth, and sensitivity and a significantly lower level of mutual attunement (with regard to emotional availability) and experienced more difficulties in their relationships with their child during the first year than women without depressive symptoms.”³⁰

Therefore, since lower frequency of diaper changes is associated with worse infant and child health outcomes and diaper need is associated with greater stress, anxiety, and depressive symptoms among parents and caregivers, there is strong evidence that HB 2480 will likely improve health outcomes for infants, children, and parents and caregivers.

Will improving health outcomes for infants, children, and parents and caregivers decrease health inequities?

There is strong evidence that improving health outcomes for infants, children, and parents and caregivers would likely decrease health inequities by socioeconomic status.

It is well-documented that individuals with low socioeconomic status experience worse health outcomes. Significant correlations exist between lower income and a number of health indicators, including mental health outcomes.¹⁷ Furthermore, household income was the strongest predictor of self-reported health status in Washington in 2016, even after accounting for age, education, and race/ethnicity.¹⁹ Overall, there is strong consensus in the scientific literature that improving health outcomes for low-income populations would help decrease health disparities by income.

Individuals with low socioeconomic status are also at greater risk of diaper need.^{12,21,22} In Washington, WIC Program staff report, “Diapers are often the first topic our low income families want to discuss when they come into the WIC Program for services” (Washington State Department of Health [DOH], personal communication, February 2020). For example, one WIC client shared, “Paying for diapers for my infant and toddler has been really hard, especially since

my husband got laid off [...] At times I have had to buy less food for my husband and me in order to make sure I have enough money to buy diapers for our kids” (DOH, personal communication, February 2020). Another parent explained, “Diapers are really expensive. If you buy the cheapest ones they don’t work very well, and then you have to deal with a mess. The name brand ones work great, but cost a lot. It makes it tempting to not change the baby until the diaper is super full, but that can be a problem too. It would be good if they cost less, because they are so necessary” (DOH, personal communication, February 2020).

Individuals with low socioeconomic status would also benefit disproportionately by the tax exemption on diapers and diaper services. Consumer expenditure data from the U.S. Bureau of Labor Statistics show the lowest earning quintile (i.e., the bottom 20% of consumers by income, with an average after-tax income of \$11,253) spent 13.9% of their income on diapers in 2014.²⁰ Moreover, “for the years 2004 to 2014, this quintile spent a far larger share of their income on diapers than any of the other quintiles, roughly 2 to 2.75 times greater than the next lowest earning quintile.”²⁰ The second lowest earning quintile (i.e., average after-tax income of \$29,012) spent 5.0% of their income on diapers—almost double the share of the next highest quintile.²⁰ Meanwhile, those with an average income of \$166,061 in 2014 (i.e., the highest earning quintile) spent just 1.0% of their income on diapers.²⁰ Furthermore, researchers and organizations serving families with diaper need state that families with low-incomes face economic constraints and barriers that result in higher costs for diapers¹³ (e.g., lack transportation to discount stores, limited or no Internet access for online purchasing, costly membership fees).¹⁸ Finally, because sales tax is based on a set percentage of retail cost, all consumers, regardless of their income level, pay the same dollar amount. Therefore, people with lower incomes pay a larger share of their income in sales tax than do people with higher incomes and/or wealth.¹⁶

Researchers and key informants noted that females, single-parent households, individuals with mental health conditions, people of color, immigrants and refugees, and individuals with other marginalized identities may also disproportionately have low socioeconomic status⁸ and diaper need in Washington State. Therefore, associated health outcomes may be exacerbated by intersectional marginalized identities. For example, researchers note that U.S. females have higher lifetime risk of anxiety and depressive disorders (1.7 to 2.0 times) than U.S. males, and this risk is further compounded for women of color with low-incomes who are “less likely to obtain mental health care [...] and are less likely to receive appropriate care when they do seek it.”¹⁶

Therefore, since individuals with low-incomes experience worse health outcomes, are less likely to have access to diapers, and are more likely to benefit from a tax exemption on diapers and diaper services, there is strong evidence that HB 2480 will likely decrease health inequities by socioeconomic status for infants, children, and parents and caregivers.

Other considerations

This Health Impact Review focused on the most direct pathway between provisions in the bill and health outcomes and health equity. Evidence for other potential pathways are discussed below.

Absenteeism related to diaper need

Researchers have noted that an adequate supply of diapers is essential for working parents and caregivers of young infants who use childcare services.^{14,16,31} Most childcare centers and in-home daycares require families to provide diapers (1-2 week supply) as a condition for care.^{14,16} While a few surveys have indicated that some parents and caregivers have had to miss work or school as a result of diaper need,^{12,21,24} there is not enough available evidence to include this pathway in the logic model.

Annotated References

1. **State and Local Taxes. 2020; Available at: <https://www.treasury.gov/resource-center/faqs/Taxes/Pages/state-local.aspx>. Accessed February 2020.**

The U.S. Department of Treasury outlines and defines state and local taxes.

2. **Find taxes and rates. 2020; Available at: <https://dor.wa.gov/find-taxes-rates>. Accessed February 2020.**

The Washington State Department of Revenue provides information about taxes and rates for sales and use tax rates. They also provide details about retail sales tax, use tax, and income tax in the state.

3. **Policy Institute of Taxation and Economic. Who Pays? A distributional analysis of the tax systems in all 50 states.2018.**

This 2018 report from the Institute of Taxation and Economic Policy analyzes each states tax system and its impact on equity. They found that Washingtonians with incomes in the lowest 20% (less than \$24,000 annually) pay 13.3% of their family income in sales and excise taxes compared to those with incomes in the top 20% (more than \$116,300 annually) that pay less than 4.7% of their family income. The Institute also calculates a Tax Inequality Index “which measures the impact of each state’s tax system on income inequality.” According to their measures, “Washington has the most unfair state and local tax system in the country. Incomes are more unequal in Washington after state and local taxes are collected than before.” One reason for this inequity is due to Washington’s comparatively high combined state and local sales tax rate.

4. **Tucker Nick. Bill Analysis HB 2480. In: Committee HF, ed. Olympia, Washington: Washington State House of Representatives Office of Program Research; 2020.**

This House Finance Committee Bill Analysis summarizes the provisions of HB 2480 and provides an overview of retail sales and use taxes and tax preferences in Washington State.

5. **Massengale K. E. C., Comer L. H., Austin A. E., et al. Diaper Need Met Among Low-Income US Children Younger Than 4 Years in 2016. *Am J Public Health*. 2020;110(1):106-108.**

Massengale et al. document the collective effort of diaper banks in the US and estimate the percentage of low-income children whose diaper need is met through these efforts. For each state, authors "compared the number of children younger than 4 years in families living at or below 200% of the federal poverty level with the number of children served by diaper banks in each state." From January to March 2017, authors conducted a survey of diaper banks (n=262) to collect data on all 2016 activities. Authors estimated "the number of families susceptible to diaper need by using population-level data about the number of children living in poverty, assuming that many families with young children living in poverty may benefit from diaper bank assistance." Authors used "income level as a proxy for families who may benefit from diaper bank assistance as 77% of NDBN member diaper banks indicate that their clientele have incomes at or less than 200% of the [Federal Poverty Level] FPL." Additionally, "on average children complete daytime toilet training between the ages of 22 months and 4.5 years and complete nighttime toilet training from ages 3.5 to 5 years." Results show, "in each state, the percentage of

children experiencing diaper need that received assistance from a diaper bank ranged from 0% to 16% per month." In 2016, 131,783 children in Washington were younger than 4 years of age and living at or below 200% of the FPL. Of those, 6,924 children were served monthly by the National Diaper Bank Network (NDBN). Therefore, the NDBN met 5% of the diaper need in Washington State in 2016. Authors conclude, study findings "highlight that a small proportion of low-income families accessed diapers through the existing community-based safety net provided by a national network of nonprofit diaper banks. Policies at the federal, state, and municipal level are needed to alleviate this consequence of poverty for children and their families."

6. Publication 969 (2018), Health Savings Accounts and Other Tax-Favored Health Plans. 2019; Available at:

https://www.irs.gov/publications/p969#en_US_2015_publink1000204174. Accessed. This U.S. Internal Revenue Service webpage includes a discussion of Flexible Savings Agreements (FSAs).

7. Are diapers FSA eligible? Available at: https://fsastore.com/FSA-Eligibility-List.aspx?utm_source=FSAblog&utm_campaign=FSael_102816&utm_medium=blogpost. Accessed February 2020, 2020.

FSastore.com is the largest online marketplace for guaranteed FSA-eligible products and educational resources for flexible spending accounts. This page explains that diapers and diaper services are usually not eligible as purchases with FSAs, unless they are necessary to treat a disease or medical condition.

8. Austin A. E., Smith M. V. Examining Material Hardship in Mothers: Associations of Diaper Need and Food Insufficiency with Maternal Depressive Symptoms. *Health Equity*. 2017;1(1):127-133.

Austin and Smith explore material hardship, including lack of basic needs, as a potential mechanism by which poverty influences the mental health of mothers. They examined the association between diaper need and food insufficiency (two forms of material hardship) and maternal depressive symptoms. They analyzed data from a cross-sectional study (New Haven Mental Health Outreach for Mothers [MOMS] Partnership) of 296 urban, pregnant or parenting, women with low-incomes. The average interview lasted 35 minutes and participants received compensation in the form of a \$10 gift card. The majority of needs assessments were completed as self-report (70%); however, questionnaires were read to women who either requested it or demonstrated difficulty reading or interpreting the questions. Using a linear regression model authors examined "the association of maternal depressive symptoms, measured by the Center for Epidemiologic Studies Depression (CES-D) score, with diaper need and food insufficiency, after adjustment for demographic factors." The CES-D score is based on 20 questions regarding depressive symptoms (rated from 0 to 3 or from rarely to most/all of the time, respectively) and has been shown to be a reliable and valid measure in community samples. Overall, more than half of women surveyed reported diaper need (50.3%) and food insufficiency (54.7%), and nearly one-third of women who reported diaper need did not report food insufficiency (32.2%). Findings of bivariate analyses show "diaper need and food insufficiency were associated with maternal CES-D score." Meanwhile, multivariate analyses found "women who reported diaper need had a significantly higher CES-D score than women who did not report diaper need (beta=3.5, p=0.03)." Women who reported food insufficiency did not have a significantly higher

CES-D score than women who did not report food insufficiency (beta=2.4, p=0.15). Authors conclude that diaper need is a form of material hardship, which, unlike food, is not a currently allowable expense in U.S. antipoverty programs. Findings suggest, "Diaper need may contribute to maternal depressive symptoms, beyond the contribution of other forms of material hardship, because there are no supports in place to provide assistance meeting this basic need." Study limitations include: 1) cross-sectional study design cannot be used to determine a causal relationship; 2) the diaper need measure used had not been validated, but was developed with expert input and pilot tests (n=46); 3) some potential confounders were not included (e.g., maternal postpartum depression, child age).

9. National Diaper Bank Network. State Issues. 2018; Available at:

<https://nationaldiaperbanknetwork.org/state-issues/>. Accessed January 2020, 2020.

The National Diaper Bank Network (NDBN) is a 501(c)(3) nonprofit organization that partners with diaper banks, allied programs, donors, sponsors, and elected officials to end diaper need and period poverty in the U.S. Its mission is to: 1) Raise awareness of diaper need and its pervasiveness in America; 2) Support the development and expansion of community-based diaper banks throughout the country, so each can better meet the basic needs of babies and families; and 3) Distribute diapers and funding to our national network of community partners/community-based diaper banks. This page provides an overview state level issues. Data provided are current as of July 1, 2018. States that exempt diapers from taxation include: Connecticut, Massachusetts, Minnesota, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and (as of January 1, 2020) California. States that do not have a sales tax include: Alaska, Delaware, Montana, New Hampshire, and Oregon.

10. Sugimura Tetsu , Tananari Yoshifumi , Ozaki Yukiko , et al. Association Between the Frequency of Disposable Diaper Changing and Urinary Tract Infection in Infants. *Clinical Pediatrics*. 2009;48(1):18-20.

Sugimura et al. examined the association between the frequency of changing disposable diapers and urinary tract infections (UTI) in infants. UTI is the most common serious bacterial infection in infants and children. Participating infants (n=131) were outpatients in of Sugimura Children's Clinic, wore disposable diapers, were between the ages of 2 months to 2.5 years of age, and presented with a temperature equal to or greater than 38 degrees Celsius with no symptoms of upper respiratory tract infection. Three infants were excluded. A total of 128 infants were divided into 2 groups: group A, without UTI (n=96, aged 1.1+/- 0.6 years); group B, with UTI (n=32, aged 1.2 +/- 0.6 years). The number of daily diaper changes was compared between the groups. "In group A (52 boys and 44 girls), the daily number of bowel movements and the number of diaper changes was 0.5 to 5.0 (1.6 ± 1.1) and 5.0 to 11.0 (7.5 ± 1.4), respectively." While, "In group B (14 boys and 18 girls), the daily number of bowel movements and the number of diaper changes was 0.5 to 5.0 (1.4 ± 1.0) and 3.0 to 8.0 (4.7 ± 1.4), respectively." Statistical analysis found, "the number of diaper changes was significantly lower ($P < .0001$) in group B (infants with UTI) than in group A (infants without UTI)." Authors concluded, "findings suggest that among infants wearing disposable diapers, there is increased risk of UTI as the frequency of changing diapers decreases."

11. **Adalat Shazia, Wall David, Goodyear Helen. Diaper Dermatitis-Frequency and Contributory Factors in Hospital Attending Children. *Pediatric Dermatology*. 2007;24(5):483-488.**

Adalat et al. conducted a survey of parents who had children wearing diapers (N=532) to better understand the frequency of diaper dermatitis, treatment practices, and the current importance of previously identified etiological factors. Authors describe the mechanism that predispose infants' skin to irritants and "opportunistic infection by fecal microbes such as *Candida albicans*, leading to a more severe and chronic diaper dermatitis." Researchers sent a 28-item (majority check-box response) questionnaire to parents of children wearing diapers who attended the pediatric wards, outpatient clinics, or neonatal unit of the Birmingham Heartlands and Solihull NHS Trust in England. The questionnaire defined diaper dermatitis as "a rash in the diaper region thought to be caused by the infant wearing a diaper." Questions ascertained demographic data, feeding and diaper changing practices, previous episodes of diaper dermatitis, family history of dermatologic conditions, and all children had a full general examination and any characteristics of diaper dermatitis present were noted. Overall, 64% of surveys were completed on the pediatric wards, 19% in the neonatal unit, and 17% in outpatient clinics. Ages of children ranged from preterm infants (24 weeks gestation onwards) to children older than 24 months of age. Overall, 48% of the study population had never had an episode of diaper dermatitis; however, this varied by age (e.g., neonates: 71% never had diaper dermatitis). Of those 12-24 months of age, 45% of children had experienced 3 or more episodes of diaper dermatitis. Among those 6-12 months, 23% had experienced 3 or more episodes. Fifteen percent of children had experienced 3 or more discrete episodes of diaper dermatitis. Results show, "children with previous episodes of diaper dermatitis were more likely to have diaper dermatitis at the time of the study ($p < 0.001$)." At the time of survey, 16% of the study population had diaper dermatitis. "Of the neonatal population with diaper rash, 84% had neonatal abstinence syndrome, as a result of having substance abusing mothers." Specific to diaper usage, 99% of participating children wore disposable diapers. "Diaper changes were on a three-to-four hourly basis, with 20% of parents changing their child's diaper less regularly. A significant association between reduced frequency of diaper changes and both current ($p = 0.002$) and recurrent ($p = 0.04$) episodes of diaper dermatitis was found." Findings indicate that "barrier cream use and frequency of diaper changes are the only factors independently associated, with the pathogenesis of a diaper dermatitis that can be manipulated to ensure that such rashes are less likely to occur."

12. **Massengale K. E. C., Erausquin J. T., Old M. Health, Social, and Economic Outcomes Experienced by Families as a Result of Receiving Assistance from a Community-Based Diaper Bank. *Matern Child Health J*. 2017;21(10):1985-1994.**

Massengale et al. describe low-income recipients of a community-based diaper bank in the southeastern U.S. and the multiple daily challenges they face. Additionally, authors documented the health, social, and financial outcomes recipients experienced after receiving assistance. Authors surveyed families ($n = 150$) in English and Spanish ($n=55$) about their experiences receiving diapers from a diaper bank and conducted short, focused interviews with families ($n = 15$) about outcomes after receiving diapers. Overall, families regularly experienced a range of challenges meeting basic needs, including high unmet needs for transportation, food, and nonfood essentials such as personal hygiene items. Results showed "families experiencing the greatest difficulty in paying utility or medical bills were significantly more likely to have a high level of diaper need compared to families facing these challenges less often (AORs ranging from

3.40 to 9.39)." Consequences experienced and strategies employed by families (N=136) as a result of diaper need included: asked for money/diapers of a family member (45%), friend (43%), or neighbor (20%); child wore a diaper longer than usual (28%); used a cloth or towel instead of a diaper (24%); used a diaper that was too big (21%) or too small (21%); child got a rash (15%); child was unhappy (15%); child did not wear a diaper (12%); child could not go to childcare (8%); adult had to miss work or school (7%); cleaned and reused a soiled diaper (3%); and used a plastic bag instead of a diaper (2%). On average the supplemental supply of diapers provided by diaper banks, once a month or less often, was enough to last 2 or 3 days. More than two-thirds of families described the effect as helping "a lot." Families reported positive health, social, and economic outcomes as a result of receiving diapers. Specifically, families reported positive changes in parental mood (62%); improved child health (28%) and happiness (43%); increased opportunities for childcare (18%) and work and school attendance (15%); and the ability to divert household finances toward other basic needs, including utilities (27%) and medical care (5%). Authors recommended expanding federal, state, and local safety net programs to help low-income families secure a steady supply of diapers.

13. Porter Sallie, Lorraine Steefel. Diaper Need: A Change for Better Health. *Pediatric Nursing*. 2015;41(3):141-144.

Diaper dermatitis is the most common skin disorder diagnosed during infancy and necessitates quick treatment because it can prompt skin breakdown with secondary infections and may require hospitalizations. Frequent diaper change is a primary prevention and treatment strategy for diaper dermatitis. Newborns require frequent diaper changes, as often as every hour; and older infants should be changed every 3 to 4 hours. "Pediatric nurses advise parents to look for six-to-eight wet diapers per day to determine that their infant is sufficiently hydrated and taking in adequate volumes of breast milk and/or formula." Based on an average 7 diapers per day (2,555 diapers/year), authors estimated the annual cost for disposable diapers to be about \$945.00 (in 2015). Authors note the cost of diapers may be higher for families with low incomes. "Because of economic constraints, [families with low-incomes] often cannot buy in bulk, lack transportation to supermarkets, discount stores, and warehouses with the lowest diaper prices; have limited or no Internet access for purchasing; and must rely on local convenience stores to purchase diapers." Additionally, reusable cloth diapers require purchasing sufficient amounts and facilities for daily laundering. Moreover, many child care centers require infants to wear disposable diapers. Potential consequences of diaper need include physical factors (e.g., discomfort or pain, urinary tract infection, communicable disease, oral-fecal contamination); behavioral/developmental factors (e.g., irritability, children kept home from child care and early childhood development programs, negative impact on peer relationships during toddler years, parental attempts at developmentally inappropriate toilet training); economic factors (e.g., purchasing less clothing, food, or other necessities or baby care items; utility bills or rent not paid; prescriptions not filled; parents miss work or school to tend to ill child); and social/emotional factors (e.g., maternal guilt, maternal frustration, negative impact on feelings of parenting, negative impact on parent-infant interactions) (see full list in article). Authors note that pediatric nurses should "consider diaper need as a contributing factor or underlying cause of diaper dermatitis and include ways to ease the factors causing diaper need as part of the management plan." This requires consideration of family economic circumstances as well as those who may be at special risk for diaper need (e.g., parents with more than one child in diapers, mothers with mental health concerns, infants with conditions that increase stooling).

14. **Smith M. V., Kruse A., Weir A., et al. Diaper need and its impact on child health. *Pediatrics*. 2013;132(2):253-259.**

Smith et al. conducted the first study to quantify diaper need and the psychosocial stressors and needs low-income urban families experience. Authors derived data from a cross-sectional study of pregnant and parenting women (N=877), in which mothers completed structured surveys on topics related to mental health, basic needs, and health care use. Surveys were administered in an urban, northeast city between November 2010 and September 2012. Women were recruited through direct, in-person outreach by bilingual (Spanish-English) trained research assistants and were interviewed in-person at a single time point. The majority of respondents were African American (56.4%) or Hispanic (29.4%), and 14.7% (n = 129) of women spoke Spanish as their primary language. The mean age of participants was 36.2 years (SD = 11.0). “The majority of women had 2 to 3 children under the age of 18 years living with them (45.6%), with a mean of 2.1 children (SD = 1.2).” Respondents were asked questions about their mental health; substance use; trauma histories; basic needs such as food, housing, and diapers; health care and social service use; and basic demographics. “Diaper need was assessed with the question, ‘If you have children in diapers, do you ever feel that you do not have enough diapers to change them as often as you would like?’” Those who responded “yes” were asked what they do when they do not have enough diapers. Authors assessed mental health need using a composite of three separate items from the survey (i.e., “I have the skills to manage/control my stress,” “Managing my sadness or depression is...,” and “Coping with the traumatic things that have happened to me is...”) each measured on a scale from 1 to 10. Overall, 31.7% of women (n = 278) reported mental health need; of those, only 10% (n = 28) were engaged in mental health treatment. Meanwhile, 27.5% (n = 241) of women reported diaper need. Of those who reported lacking an adequate supply of diapers, “10% (n = 88) reported that they received additional diapers from an agency, 10% (n = 86) reported that they borrow diapers or money from family or friends, and 3% (n = 29) reported using some other method to obtain enough diapers such as seeking the assistance of a church.” Nearly 8% of respondents (n = 64) reported that they stretch the diapers they have when their supply is running short. This practice is associated with UTIs and diaper dermatitis, which are responsible for numerous pediatric office and emergency department visits per year. Results showed diaper need was associated with: being Hispanic (P=.02); speaking Spanish as primary language (P=.02); being 45 years of age or older, a proxy for grandparents raising grandchildren (P=.02); reporting mental health need (P=.01); and having received treatment of a mental illness (P=.002). Results from the multivariable logistic regression model showed, “Hispanic women were significantly more likely to report diaper need than African American women (OR: 1.96; 95% CI: 1.51–3.33), and women 45 years of age and older were significantly more likely than [those] ages [20-44] years to report diaper need (OR: 2.53; 95% CI: 1.21–5.28).” Additionally, “women who reported mental health need were significantly more likely than women who did not report mental health need to also report diaper need (OR: 1.89; 95% CI: 1.16–3.09).” Authors note, “maternal stress and depression are significant contributors to child development and mediate the relationship between poverty and child outcomes.” Findings suggest that an adequate supply of diapers may be one strategy to reduce parenting stress and increase parents’ sense of competency, “enabling parents to be more sensitive with their children, and thereby improving parenting quality and overall child outcomes.” Study limitations include an inability to assess diaper need among teen parents (a population likely to be at significant risk); cross-sectional design cannot prove causality; mental health status was not

assessed with a diagnostic instrument; potential underestimate of association between diaper need and maternal mental health status; and measure for diaper need has not been validated, although developed with expert input and several pilot tests (n=46).

15. Goodman Janice H. . Perinatal depression and infant mental health. *Archives of Psychiatric Nursing*. 2019;33(2019):217-224.

In this paper, Goodman provides an overview of maternal perinatal depression, the risk it poses to infant/early-childhood mental health, and strategies for intervention. Perinatal depression (i.e., maternal major and minor depression during pregnancy and/or during the first year postpartum) "affects up to 20% of perinatal women in the general U.S. population, with higher rates for women with history of major depression, and for low socioeconomic status and/or immigrant women." Specifically, "major features of perinatal depression include depressed mood, anxiety, compulsive thoughts, loss of control, feelings of inadequacy, inability to cope, irrational fears, fatigue, and despair" and in some cases "suicidal and/or infanticidal thoughts." Evidence shows that in the postpartum period, depression affects a mother's practical caregiving practices (e.g., less likely to breastfeed; less likely to follow infant safety recommendations; take their child to fewer well-child healthcare visits; read and sing to their infants less; and use less healthy sleep practices with their infant). The author cites a large body of research "demonstrating that maternal prenatal and postpartum depression are associated with increased risk for wide-ranging adverse child development effects that can affect mental health." For example, "perinatal depression has been associated with an increased risk for emotional problems, including depression and anxiety, starting in early childhood and persisting into young adulthood." Furthermore, negative effects are seen among children with clinically depressed mothers and children of mothers who have subclinical levels of depressive symptoms. The author cites evidence that compromised parenting is considered "the most critically important mechanism during the postpartum period by which maternal depression affects child mental health outcomes." Specifically, maternal sensitive responses to an infant's signals and communications is "one of the most crucial dimensions of mother-infant interaction and is known to predict positive outcomes in children, including attachment security." Maternal depression, especially if chronic, can disrupt appropriate maternal responses to an infant's cues, babbles, and behavior, interactions that are essential to healthy development. Evidence from a 2000 meta-analysis of studies found depressed mothers of infants were more irritable and hostile, more disengaged from their child, and had lower rates of play and other positive social interactions with their child. "In response, infants may alter their interactive behavior with a depressed mother, leading to broad range of infant deficits including poor emotional behavioral state regulation, fewer positive and more negative facial expressions, avoidance, and greater fussiness." This can lead to a negative pattern of mother-infant interaction. Evidence indicates that "hostile parenting behavior increases risk of child externalizing problems." The severity and persistence of depressive symptoms are both moderating factors that can affect the association between maternal depression, maternal behavior, and child outcomes. For example, "findings from a large observational study (Netsi et al., 2018) indicated an increased risk for adverse behavioral, cognitive, and emotional outcomes among children of women who had persistent PPD (define as depressed at both 2 and 8 months postpartum) compared with women whose PPD did not persist." Most perinatal depression treatment studies have focused exclusively on maternal depression outcomes and do not consider outcomes related to mother-infant relationship or child outcomes. However, "interventions aimed at improving the mother-infant relationship and

interaction have shown promise or effectiveness in lessening the negative consequences of maternal depression on the developing child."

16. Wallace L. R., Weir A. M., Smith M. V. Policy Impact of Research Findings on the Association of Diaper Need and Mental Health. *Women's Health Issues*. 2017;27 Suppl 1:S14-S21.

Wallace et al. describe the research findings on diaper need reported by the New Haven Mental Health Outreach for Mothers Partnership and the process of translating these findings into broader policy and advocacy efforts. Authors note, "maternal mental illness constitutes one of most significant public health problems facing women of reproductive age and their children," and "women who mother in poverty experience additional stressors, pointing to the need for innovative public health promotion efforts to reduce mental illness." Authors discuss the scope of the issue citing multiple studies that address gender disparities in risk and treatment of anxiety and depressive disorders in the U.S. as well as research that addresses how poverty affects risks and how race/ethnicity affects access to and use of appropriate mental health care. Authors examined national-, state-, and local-level diaper policy activities that occurred from 2013 to 2016 following the publication of an article on diaper need. The analysis identified several diaper-related policy activities: 1 at the city level, 11 at the state level, and 2 at the federal level. Authors state, "five of the identified activities represented policy changes that were enacted or implemented." Authors conclude, "community coalitions can effect gender-responsive policy change by conducting and disseminating research, engaging stakeholders, and mobilizing and leveraging their networks."

17. Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System Prevalence And Trends Data: Washington-2014. 2014; Available at: <http://apps.nccd.cdc.gov/brfss/page.asp?cat=XX&yr=2014&state=WA#XX>. Accessed August 16, 2016.

Behavioral Risk Factor Surveillance System (BRFSS) 2014 data from Washington State show significant correlations between lower income and a number of health indicators including: worse overall self-reported health, depression, asthma, arthritis, stroke, oral health, tobacco use, women's health indicators, health screening rates, physical activity, and diabetes.

18. WestSide Baby. Diaper Need. 2020; Available at: <https://westsidebaby.org/about-us/diaper-need/>. Accessed January 2020, 2020.

WestSide Baby was founded in 2001 in Seattle, Washington and is a member of the National Diaper Bank Network. In partnership with community, WestSide Baby provides essential items to local children in need by collecting and distributing diapers, clothing, and equipment. This page provides an overview of diaper need in Seattle, King County, and nationally and discusses sales taxes on diapers. WestSide Baby estimates a healthy supply of diapers for a newborn costs approximately \$75-\$100 per month. Authors note, "the privilege of buying cheaper diapers in bulk, at a big box store or online is not available to all families when costly memberships or public transportation are a barrier. Families living in poverty may pay double what higher-income families pay because of this diaper price disparity." Newborn assumptions: use an average 10-14 diapers/day; newborn diapers range in price from \$0.20/diaper (cheaper) to \$0.30/diaper (more expensive). Size 5 assumptions: use an average of 7-10 diapers/day; Size 5 diapers range in price from \$0.36 (cheaper) to \$0.68 (more expensive).

19. Serafin M. Health of Washington State Report: Self-reported Health Status. Data Update 2016. Washington State Department of Health;2016.

Serafin presents data from Washington state on self-reported health status. The data show that after accounting for age, education, race and ethnicity, household income was a strong predictor of self-reported health status.

20. Center for Economic and Policy Research. Policies Like the Hygiene Assistance for Families of Infants and Toddlers Act Will Help the Poor Pay for Diapers. Center for Economic and Policy Research Blog [Blog post]. 2015; 23 November 2015:Available at: <http://cepr.net/blogs/cepr-blog/the-hygiene-assistance-for-families-of-infants-and-toddlers-act-will-help-the-poor-pay-for-diapers>. Accessed January 2020, 2020.

This policy blog post from the Center for Economic and Policy Research (CERP) discusses proposed federal legislation (H.R. 4055, the Hygiene Assistance for Families of Infants and Toddlers Act of 2015, which would allow states to create pilot projects that provide diapers or subsidies for diapers to families with low-incomes. It notes that those who are unable to afford an adequate supply of diapers may wash and reuse soiled diapers. Inappropriate reuse of diapers and an inadequate supply in general can lead to health problems for children (e.g., urinary tract infections) and caregivers (e.g., mental health concerns). The analysis includes data from the Bureau of Labor Statistics' Consumer Expenditure Diary Survey, which tracks household ("consumer unit") expenditures on a weekly basis by various demographic characteristics. Referenced data show average expenditures on diapers ("infant underwear") by income quintile from 2004-2014, as a percentage of average after-tax income." Results show, the lowest earning quintile "(the bottom 20[%] of consumer units by income, with an average after-tax income of \$11,253) spent 13.9[%] of their income on diapers in 2014." Moreover, "for the years 2004 to 2014, this quintile spent a far larger share of their income on diapers than any of the other quintiles, roughly 2 to 2.75 times greater than the next lowest earning quintile." Similarly, the second lowest earning quintile "(average after-tax income of \$29,012) spent 5.0[%] of their income on diapers [...] almost double the share of the next highest quintile." Meanwhile, those with an average income of \$166,061 in 2014, the highest earning quintile spent just 1.0% of their income on diapers. Evidence shows that the cost of diapers disproportionately burdens those with the lowest incomes. Cashman concludes, "the necessity of diapers, the frequency of their use, and their high costs, add up to a significant burden for these households."

21. Raver Cybele , Letourneau Nicole , Scott Jennifer , et al. Huggies® Every Little Bottom Study Diaper need in the U.S. and Canada. June 2010 2010.

This study conducted by Raver et al. was commissioned by Huggies®. The study was conducted to better understand the issue of diaper need in the U.S. and Canada and to provide insights into its scope and scale. The study was fielded by Abt SRBI, a full-service global strategy and research organization specializing in public policy and opinion surveys in the corporate, government and research institute sectors. Researchers conducted a quantitative telephone survey among a nationally representative sample of mothers with at least one child aged birth through 4 years currently in diapers in the U.S. and Canada. The U.S. survey was conducted in both English and Spanish and averaged 20 minutes in duration. The U.S. sample included 1,513 mothers and includes a representative sample of mothers living below the Federal Poverty Level (26%). Additionally, the study identified mothers living in financial hardship (32%) --income

greater than the FPL but had difficulty in the past 12 months to meet essential expenses (i.e., food, housing, utilities, childcare, etc.). The remaining 42% of respondents were identified as non-hardship-- having not experienced financial hardship in the past year. Results indicate that mothers who struggle with diaper need are more likely to have incomes at or below the FPL or to experience financial hardship and are less likely to be married. U.S. mothers with diaper need are less likely to be employed or to have attained higher education. Hispanic mothers are statistically significantly more likely to experience with diaper need than white mothers (Hispanic 41%, African American 36%, White 31%). Results also indicate that 15% of U.S. mothers have limited their activities because they did not have enough diapers for their child. Specifically, mothers report having to stay home when they need to go out (10%), miss work or school (2%), or keep their child out of daycare because they did not have enough diapers (2%). "In the U.S., African-American and Hispanic mothers are also more likely than [white] mothers to report that they have had to limit their activities because they did not have enough diapers for their child (U.S. 21%, 22% vs. 11%)." Mothers who struggle with diaper need are more likely than their counterparts to have had to limit their activities because they did not have enough diapers for their child (U.S. 33%): 22% stayed at home when they needed to go out; 6% cancelled doctor's or other appointments; 5% missed work or school; and 4% kept their child out of daycare.

22. Best Starts for Kids Health Survey Data. In: County PH-SK, ed. County PH-SK, trans. Seattle, Washington: Public Health - Seattle & King County

Conducted by Public Health - Seattle & King County, Best Starts for Kids Health Survey (BSKHS) is a survey about the health and well-being of King County children 5th grade and younger. Data available as of February 3, 2020, were collected in late 2016 and early 2017. Respondents were asked, "Since this child was born, how often has it been very hard to get by on your family's income-hard to cover basics like diapers or formula?" Available answer choices were "All of the time", "Most of the time", or "Some of the time." In 2017, 23% of King County children lived in families that found it difficult to afford diapers or formula at least some of the time since the child was born. In 2017, families who identified as Native Hawaiian/Pacific Islander (61%) and Latino (37%) disproportionately experienced difficulty affording diapers or formula. Families with lower annual incomes also disproportionately experienced difficulty affording these necessities (i.e., 53% of families with an annual income < \$15,000; 45% of families earning \$15,000-\$24,999; and 46% of families earning \$35,000-\$49,999). Respondents without a college degree (i.e., less than high school; high school graduate/GED; some college, no degree) were significantly more likely than average to report difficulty affording basics, as were families living in South King County (36%). Lesbian, gay, and bisexual respondents were more likely (45%) to experience difficulty affording diapers and formula. Male respondents were less likely (13%) than average to have difficulty affording these basics.

23. Cotropia C.A., Rozema K. Who Benefits from Repealing Tampon Taxes? Empirical Evidence from New Jersey. *Journal of Empirical Legal Studies*. 2018;15(3):620-647.

Cotropia and Rozema examined the impact of New Jersey's 2005 sales tax exemption for menstrual hygiene products. This article outlines their methodology and various economic analyses. It also discusses the impact of sales and tax use exemptions more broadly.

24. Network National Diaper Bank. Washington Diaper Facts. New Haven, Connecticut: National Diaper Bank Network; 2018.

This report compiled by the National Diaper Bank Network estimates diaper need in Washington State. It estimates the total population under age 3 years was 274,550. In Washington, 17% of children under 18 are infants or toddlers; 16% of children live in families earning less than 100% of the Federal Poverty Level (FPL) and 15% live in families earning 100% to 200% of FPL. Fifty-eight percent of Washington Mothers with infants are in the workforce. "Nationally, 57% of parents experiencing diaper need who rely on child care said they missed an average of 4 days of school or work in the past month because they didn't have diapers."

25. **HealthCare.gov. Federal Poverty Level (FPL). 2019; Available at: <https://www.healthcare.gov/glossary/federal-poverty-level-fpl/>. Accessed February 2020, 2020.**

26. **Senate Bill 92, Taxation, Section 6363.9 Revenue and Taxation Code(2019).** This California law adds Section 6363.9 to the state's Revenue and Tax Code. Effective January 1, 2020, "there are exempted from the taxes imposed by this part the gross receipts from the sale in this state of, and the storage, use, or other consumption in this state of, diapers designed, manufactured, processed, fabricated, or packaged for use by infants, toddlers, and children." This section shall become inoperative on January 1, 2022.

27. **The California Legislature's Nonpartisan Fiscal and Policy Advisor. The 2019-20 May Revision | Sales Tax Exemptions for Diapers and Menstrual Products. Budget and Policy Post 2019; Available at: <https://lao.ca.gov/Publications/Report/4040>. Accessed January 2020, 2020.**

This analysis from the California Legislative Analyst's Office, the California Legislature's Nonpartisan Fiscal and Policy Advisor, addresses the Governor's proposal for two new sales tax exemptions: 1) an exemption for children's diapers and 2) an exemption for menstrual products. The analysis provides background on California's sales tax, the Governor's proposal, sales taxation of necessities, and discussion of equity considerations for each proposed exemption.

28. **Nabors Ramona Multiple Agency Fiscal Note Summary. Olympia, Washington: Washington State Office of Financial Management; 2020.**

This Multiple Agency Fiscal Note estimates decreases in state revenues as a result of HB 2480. The Department of Revenue's fiscal note states, "This bill decreases state revenues by an estimated \$15,024,000 in the 11 months of impacted collections in Fiscal Year 2021, and by \$16,026,000 in Fiscal Year 2022, the first full year of impacted collections. This bill also decreases local revenues by an estimated \$7,000,000 in Fiscal Year 2021, and by \$7,000,000 in Fiscal Year 2022, the first full year of impacted collections." An estimated 10,000 taxpayers would be affected by this change. These estimates are based on the following assumptions: this proposal is implemented effective July 1, 2020, impacting 11 months of collections in Fiscal Year 2021; most children will no longer require diapers after 4 years of age; average disposable diaper cost is \$0.20 and the average child will require 2,700 diapers per year; approximately 95% of babies use disposable diapers; and the average cost of cloth diaper service is \$70 per month. Disposable diaper costs and the average number of diapers worn per year assumptions are based on information from a January 2020 Investopedia post. The original article does not include data sources for the provided estimates.

29. **Investopedia. Budgeting for a New Baby. Personal Finance | Budgeting & Savings 2020; Available at: <https://www.investopedia.com/articles/pf/08/budgeting-for-baby.asp>. Accessed January 2020, 2020.**

This Investopedia article provides information about personal finances (e.g., one-time expenses and ongoing expense) related to infants. The author notes that diapers vary in price (average price of \$0.20 per disposable diaper). The average child uses more than 2,700 in the first year of life, which can add up to more than \$550 in diaper costs. The author notes that disposable diapers can be purchased with coupons for as low as \$0.15 per diaper while imported diapers can cost \$1.40 per diaper. The author estimates that a cloth diaper service costs around \$70 per month. Materials to make cloth diapers at home can cost \$250 or more upfront. The author does not provide any citations for these estimates.

30. **Slomian Justine , Honvo Germain , Emons Patrick , et al. Consequences of maternal postpartum depression: A systematic review of maternal and infant outcomes. *Women's Health*. 2019;15(2019):1-55.**

Slomian et al. conducted a systematic review (January 1, 2005 through August 17, 2016) to evaluate both the infant and maternal consequences of untreated maternal postpartum depression. The analysis included 122 studies that met criteria; 61 (46 cohort studies and 21 cross sectional studies) records were included for review of maternal consequences of postpartum depression; and 67 (61 cohort studies and 12 cross-sectional studies) records were included for review of infantile consequences of postpartum depression. Nineteen studies examined both infant and maternal consequences of postpartum depression. Of the maternal focused studies, 28 of 68 were conducted in the U.S. and 22 were conducted in Europe. Of the infant focused studies 27 of 73 were performed in the U.S. and 20 were performed in Europe. Results were synthesized into three categories: (a) the maternal consequences of postpartum depression, including physical health (3 studies), psychological health (6 studies), quality of life (8 studies), relationships (7 studies), and risky behaviors (i.e., addictive behavior (4 studies) and suicidal ideation (7 studies); (b) the infant consequences of postpartum depression, including anthropometry (13 studies), physical health (10 studies), sleep (3 studies), and motor development (7 studies), cognitive development (11 studies), language development (13 studies), emotional development (5 studies), social development (4 studies), and behavioral development (12 studies); and (c) mother-child interactions, including bonding (15 studies), breastfeeding (22 studies), and the maternal role (i.e., maternal behaviors (9 studies), maternal competence (2 studies), infant health care practices or utilization measures (8 studies), maternal perception of the infant's patterns (5 studies), and the risk of maltreatment (2 studies)). Of the studies focused on maternal health, "five studies showed that higher levels of depressive symptoms were associated with an increased prevalence of suicidal ideation." Specific to infant health consequences, "of the 10 cohort studies, 9 indicated a significant association between maternal PPD and health concerns in infants." For example, "maternal depressive symptoms at 5 months seemed to predict more overall physical health concerns for infants at 9 months and a greater proportion of childhood illnesses." Additionally, results from 7 of the 11 studies indicate a significant and negative association between maternal postpartum depressive symptoms and cognitive development in children. Specific to mother-child interactions, "a total of 11 studies demonstrated a negative effect of maternal depression on mother-to-infant bonding." Additionally, "women with depressive symptoms showed less closeness, warmth, and sensitivity and a significantly lower level of mutual attunement (with regard to emotional availability) and experienced more

difficulties in their relationships with their child during the first year than women without depressive symptoms." Overall, authors conclude that "maternal [postpartum depression] seems to have many negative effects on both child (up to 3 years of age) and maternal health." Specifically, postpartum depression impacts mothers' "psychological health, quality of life, and interactions with their infant, partner, and relatives." Results also show that "the health of infants and children is intimately associated with the health of their mothers." Finally, risks are greater for children in low-income populations.

31. **Randles Jennifer. The Diaper Dilemma. *Contexts*. 2017;16(4):66-68.**

This article by Jennifer Randles of California State University-Fresno's sociology department appeared in *Contexts*, a quarterly publication from the American Sociological Association that aims to make social research accessible to general readers. Randles states, "the average cost of disposable diapers is \$18 a week or \$936 annually per child," which amounts to more than 6% of a year-round full-time federal minimum wage salary (\$15,080). The author notes, "cloth diapers are not a viable alternative for most low-income families because they cannot afford in-home washers and dryers (assuming they have homes), it is illegal to wash reusable diapers in most public laundry facilities, and [most] daycare centers require disposable diapers." Families experiencing diaper need may resort to diaper stretching strategies (washing, drying, and reusing disposable diapers) or toilet training children earlier than developmentally appropriate. In 2017, California passed AB480: Diaper Assistance for CalWORKS Families, and as of April 2018 welfare-to-work program participants receive a \$30 monthly diaper voucher.