Health Impact Review of HB 2410
Requiring coverage for hearing instruments for children and adolescents
(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-2020-04-HB2410.pdf

Acknowledgements

We would like to thank the key informants who provided consultation and technical support during this Health Impact Review.

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(2020 Legislative Session)

Evidence indicates that HB 2410 would likely result in fully-funded health plans including coverage for hearing instruments and associated care for individuals 18 years of age or younger, which could increase the affordability of hearing instruments, increase the number of youth accessing hearing instruments and technology, improve health outcomes, and reduce health inequities for youth who are deaf or hard of hearing.

BILL INFORMATION

Sponsors: Kilduff, Harris, Orwall, Frame, Kloba, Leavitt, Gregerson, Valdez, Stonier, Pollet, Goodman, Wylie, Doglio, Morgan

Summary of Bill:

- Requires a health carrier offering a health plan issued or renewed on or after January 1, 2021 to include coverage for hearing instruments, including bone conduction hearing devices, for individuals 18 years of age or younger.
- Specifies that coverage must include the hearing instrument, initial assessment, fitting, adjustment, auditory training, and ear molds as necessary to maintain optimal fit.
- Sets a maximum benefit amount (not subject to deductible) of $2,500.00 per hearing impaired ear* every 36 months.
- Exempts the hearing aid mandate from the health insurance anti-discrimination clause found in RCW 48.43.

HEALTH IMPACT REVIEW

Summary of Findings:

This Health Impact Review found the following evidence for provisions in HB 2410:

- **Informed assumption** that requiring health carriers to include coverage for hearing instruments and associated care for individuals 18 years of age or younger would result in fully-funded health plans including this coverage. This is based on information from Washington State Office of the Insurance Commissioner (OIC), Health Benefit Exchange (HBE), and health carriers in Washington State.
- **Informed assumption** that fully-funded health plans including coverage for hearing instruments and associated care for individuals 18 years of age or younger would increase the affordability of hearing instruments and associated care for families. This is based on information from key informant interviews.

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* This analysis recognizes that "hearing impaired" is not preferred language of the community. However, since HB 2410 uses the phrase "hearing impaired ear" in bill provisions, this language is preserved here for accuracy.

- **Informed assumption** that increasing the affordability of hearing instruments and associated care would increase the number of youth who are deaf or hard of hearing accessing hearing instruments and technology. This is based on information from key informant interviews.
- **Strong** evidence that increasing the number of youth who are deaf or hard of hearing accessing hearing instruments and technology will improve health outcomes for these individuals.
- **Strong** evidence that improving health outcomes for youth who are deaf or hard of hearing would decrease health inequities for these individuals. It is unclear how HB 2410 would impact inequities by insurance status and geography.

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 2410 (HB 2410).

Staff analyzed the content of HB 2410 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.

Staff also completed key informant interviews to gather additional supporting evidence. In total, we spoke with 17 key informant interviewees, including: 7 informants representing six Washington State agencies; 3 informants representing health care providers or agencies; 3 informants representing health carriers; 2 parents of youth who are deaf or hard of hearing; and 2 informants representing community organizations. More information about key informants and detailed methods are available upon request.

Interviews were conducted within time and process constraints. The primary intent of key informant interviews was to gather supporting evidence to understand different viewpoints, challenges, and benefits to the bill; however, we did not intend to gather all potential viewpoints. Interviewees were selected purposively, with emphasis on informants that could help elucidate bill provisions or the potential impact of the bill on families in Washington State. We identified further key informants using snowball methodology. While we followed-up with many of these recommendations, we were not able to connect with all individuals within time limitations.

Interview questions focused on current health plan coverage and potential impacts of requiring coverage. Questions also explored the potential impact of bill provisions on affordability, access, and health equity. We took detailed notes during the conversations and analyzed these notes to identify themes. We then summarized these themes and incorporated salient results into the HIR document, as applicable. All results from key informant interviews are presented in summary by theme, and are not attributed to individual interviewees (unless otherwise noted).

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 2410 and the Scientific Evidence

Summary of relevant background information

- Under Medicaid, states are required to provide coverage for hearing instruments for children and adolescents under 21 years of age. Washington State Apple Health provides coverage for "new, nonrefurbished, monaural or binaural hearing aids, which includes the ear mold and batteries, for eligible clients age 20 and younger."[1] Under certain circumstances, coverage also includes hearing aid replacements, repairs, and rentals.[1] Apple Health also provides coverage for Cochlear implant external speech processors and Bone Anchored Hearing Aids (Baha) speech processors, including maintenance, repair, and batteries.[1]
- The Patient Protection and Affordable Care Act (ACA) details ten essential health benefits that must be included in every individual and small employer health plan.[2,3] For children, hearing screening and Cochlear implants are considered essential health benefits under rehabilitative and habilitative services and devices (personal communication, Health Benefit Exchange (HBE), December 2019). However, the ACA does not include hearing aids as an essential health benefit, and individual health plans on the private health market are not required to provide coverage for hearing aids for youth (personal communication, HBE, December 2019).
- As of 2017, 24 states have mandated that private health plans provide coverage for hearing instruments for youth.[4]
- While some health plans in Washington State include coverage for hearing instruments, individual and small employer health plans offered on the Exchange generally do not provide a hearing aid benefit for youth (personal communication, December 2019).
- The Affordable Care Act is currently being challenged in the U.S. Court System. On January 3, 2020 Washington State Attorney General Bob Ferguson stated that Washington, as part of a 20 state coalition, is "seeking review of a decision in the U.S. Court of Appeals for the Fifth Circuit, which held that the individual mandate is unconstitutional, but declined to further rule on the validity of the ACA's remaining provisions."[5] The court's ruling on the ACA would impact health care coverage and affordability in Washington State.[5]

Summary of HB 2410

- Requires a health carrier offering a health plan issued or renewed on or after January 1, 2021 to include coverage for hearing instruments, including bone conduction hearing devices, for individuals 18 years of age or younger.
  - RCW 48.43 impacts all fully-insured health plans in Washington State, including individual and small group/small employer plans offered on the Exchange and Public Employees Benefits Board (PEBB) and School Employees Benefits Board (SEBB) government-sponsored plans (personal communication, January 2020). These fully-insured plans must comply with state mandates. The provisions in the bill would not apply to self-insured plans (large employer plans), which must

    comply with federal laws and are not subject to state laws (personal communication, January 2020).
    - Hearing instruments, as defined in RCW 18.35.010 include "any wearable, prosthetic instrument or device designed for or represented as aiding, improving, compensating for, or correcting defective human hearing and any parts, attachments, or accessories of such an instrument or device, excluding batteries and cords, ear molds, and assistive listening devices."[6]
- Specifies that coverage must include the hearing instrument, initial assessment, fitting, adjustment, auditory training, and ear molds as necessary to maintain optimal fit.
- Sets a maximum benefit amount (not subject to deductible) of $2,500.00 per hearing impaired ear[2] every 36 months.
- Exempts the hearing aid mandate from the health insurance anti-discrimination clause found in RCW 48.43.

Health impact of HB 2410

Evidence indicates that HB 2410 would likely result in fully-funded health plans including coverage for hearing instruments and associated care for individuals 18 years of age or younger, which could increase the affordability of hearing instruments, increase the number of youth accessing hearing instruments and technology, improve health outcomes, and reduce health inequities for youth who are deaf or hard of hearing.

Pathway to health impacts

The potential pathway leading from the provisions of HB 2410 to decreased health inequities are depicted in Figure 1. We have made informed assumptions that requiring health carriers to include coverage for hearing instruments and associated care for individuals 18 years of age or younger would result in fully-funded health plans including this coverage; that fully-funded health plans including coverage for hearing instruments and associated care for individuals 18 years of age or younger would increase the affordability of hearing instruments and associated care for families; and that increasing the affordability of hearing instruments and associated care would increase the number of youth who are deaf or hard of hearing accessing hearing instruments and technology. These informed assumptions are based on information from key informant interviews. There is strong evidence that increasing the number of youth who are deaf or hard of hearing accessing hearing instruments and technology will improve health outcomes for these individuals.[7-11] There is also strong evidence that improving health outcomes for youth who are deaf or hard of hearing would decrease health inequities for these individuals.[9-11] The impact of HB 2410 on inequities by insurance status and geography is unclear.

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[2] This analysis recognizes that "hearing impaired" is not preferred language of the community. However, since HB 2410 uses the phrase "hearing impaired ear" in bill provisions, this language is preserved here for accuracy. Overall, key informants preferred changing the bill language from "per hearing impaired ear" to "per ear." This preferred language is not interchangeable with provision language as most youth who are deaf or hard of hearing would require two hearing aids, even if they experienced unilateral hearing thresholds that were in the mild to severe range (personal communication, December 2019).

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:

- Potential cost-savings for families as a result of increased hearing instrument affordability. For example, one key informant talked about the need to balance their family's budget and compare costs between hearing aids and other expenditures (e.g. family vacations).
- Potential impact on family situation and income. For example, one key informant shared that they chose not to work so that their family continued to qualify for Medicaid coverage and ensured access to hearing technology.

Magnitude of impact

There is limited data on the number of youth who are deaf or hard of hearing nationally and in Washington State. Typically, data sources rely on information from newborn hearing screening programs or about youth enrolled in public schools (personal communication, December 2019). However, national estimates suggest that 2 to 3 out of every 1,000 children are born deaf or hard of hearing and that more children develop hearing problems after birth.[12] Washington State Department of Health (DOH) newborn hearing screening data indicate that 1 to 3 out of 1,000 infants are born deaf or hard of hearing in the state.[13] Based on data from DOH's Early Hearing-loss Detection, Diagnosis and Intervention program, in 2017, a total of 157 infants out of 86,070 births (2 out of 1,000 infants) were identified through newborn hearing screening as having hearing thresholds in the mild to profound range.[13]

In 2006, the National Institute on Deafness and other Communication Disorders (NIDCD) (part of the National Institutes of Health), analyzed National Health and Nutrition Examination Survey (NHANES) data from 1976 to 1994 to estimate the prevalence of hearing thresholds among U.S. children aged 6 to 19.[14] They estimated that 1.57% to 1.66% of U.S. children aged 6 to 19 experience bilateral hearing thresholds in the mild, moderate, or severe range and 4.9% to 5.7% experience unilateral hearing thresholds in these ranges.[14] NHANES estimates represent the best national estimates for school-aged youth who are deaf or hard of hearing, and only the 1976-1980 and 1988-1994 NHANES samples included audiometric data for 6 to 19 year olds.[8] More recent NHANES datasets (including the 1994-2010 datasets) only include audiometric data for 12 to 19 year olds.[8] These data suggest that the prevalence of youth who are deaf or hard of hearing has not increased significantly over time.[8] NHANES stopped collecting audiometric data in 2010,[8] and so, while older, these data are the best national data available. The Washington State Center for Deaf and Hard of Hearing Youth conducts an annual survey of public school districts in Washington State. In 2018, 198 out of 296 school districts (67%) reported that 4,423 children 3 to 21 years of age were deaf or hard of hearing (personal communication, Center for Deaf or Hard of Hearing Youth, January 2020).

In Washington State, 15,723 individuals 0 to 17 years of age were covered by a qualified health plan through Health Benefit Exchange (HBE) in 2019 (personal communication, HBE, December 2019). There were also approximately 65,000 individuals 0 to 18 years of age enrolled in a health plan through PEBB and 67,000 individuals 0 to 18 years of age enrolled in a health plan through the SEBB (personal communication, Health Care Authority (HCA), January 2020).

Based on insurance enrollment data and national prevalence estimates, HBE estimated that the changes proposed in HB 2410 would impact 24 to 65 youth enrolled in a plan through the Exchange (personal communication, HBE, December 2019). Using DOH’s 2017 newborn hearing screening data, an estimated 31 individuals aged 0 to 17 enrolled in a plan through the Exchange and 264 individuals aged 0 to 18 enrolled in a health plan through PEBB/SEBB may be diagnosed at birth as deaf or hard of hearing and may be impacted by this bill. Based on national estimates for school aged children, approximately 247 to 896 school aged children enrolled in a plan on the Exchange and 2,072 to 7,524 individuals enrolled through PEBB/SEBB may be impacted by this bill.

Therefore, based on these estimates, we anticipate approximately 295 to 8,400 youth aged 0 to 18 enrolled in a plan through the Exchange or PEBB/SEBB may be impacted by HB 2410. It is important to note that not all youth who are deaf or hard of hearing would require or choose to use hearing instruments covered by this bill (e.g. hearing aids, Baha, etc.) and that care should be tailored to each child. Therefore, we expect that only a certain percentage of these individuals would use health insurance coverage for hearing instruments provided by HB 2410.

Logic Model

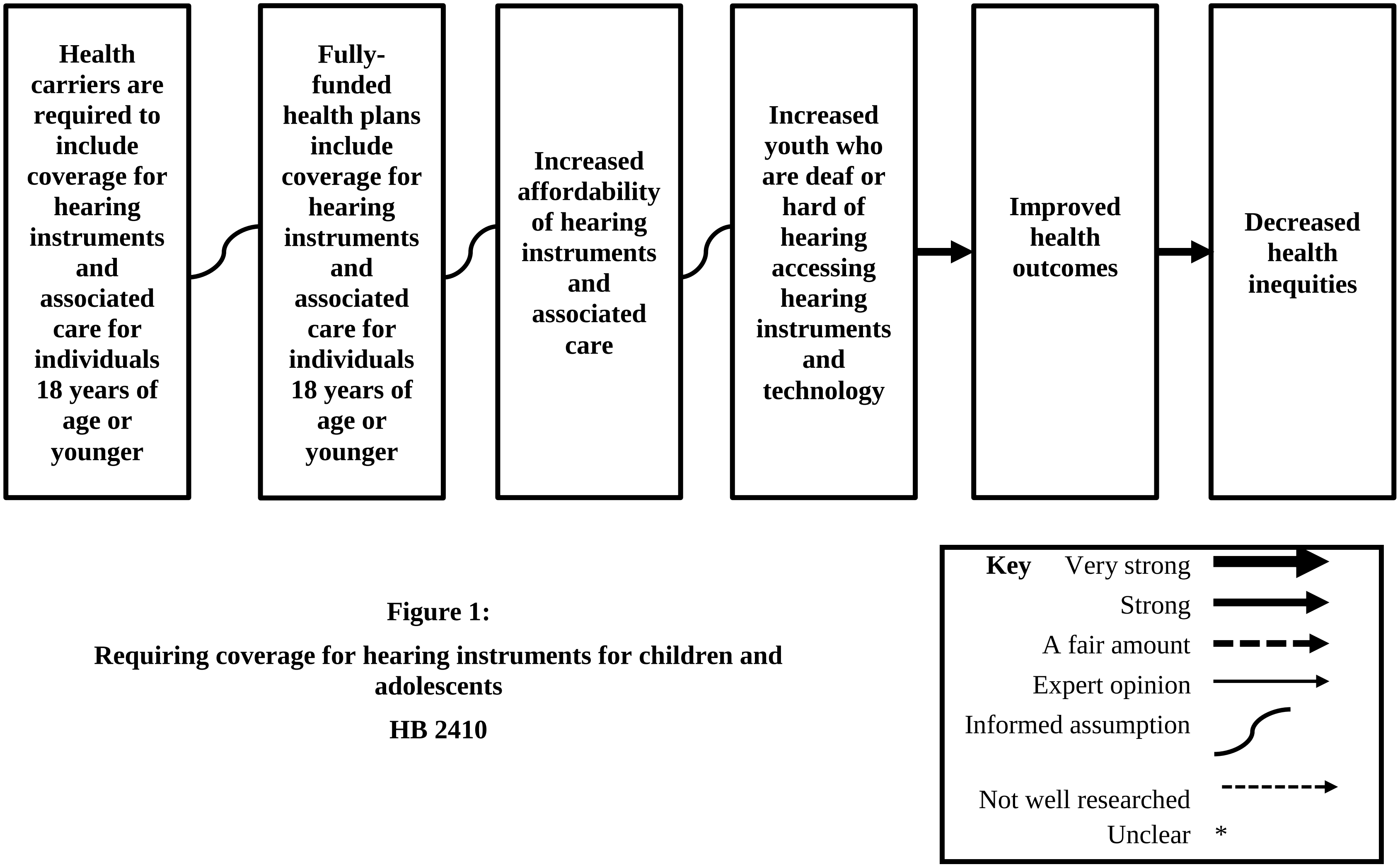

Figure 1:

Requiring coverage for hearing instruments for children and adolescents

HB 2410

Summaries of Findings

Will requiring health carriers to include coverage for hearing instruments and associated care for individuals 18 years of age or younger result in fully-funded health plans including this coverage?

We have made the informed assumption that requiring health carriers to include coverage for hearing instruments and associated care for individuals 18 years of age or younger would result in fully-funded health plans including this coverage. This informed assumption is based on information from the Washington State Office of the Insurance Commissioner (OIC), Health Benefit Exchange (HBE), and health carriers in Washington State.

Since the passage of the ACA and subsequent adoption of Washington State's essential health benefits, the legislature has not passed a bill requiring a new mandated benefit in addition to the federally-required essential health benefits (personal communication, OIC, December 2019). If the legislature required health carriers to provide a new health benefit, OIC would list coverage of hearing instruments as a required state benefit (personal communication, OIC, December 2019). In turn, fully-funded health plans offered in Washington State would be required to meet this new mandate in order to sell plans in the state, including individual and small group/small employer plans offered on the Exchange and PEBB/SEBB government-sponsored plans (personal communication, January 2020).

This new requirement would likely necessitate the state legislature to cover or defray the cost of the benefit for all qualified enrollees (personal communication, OIC, December 2019). The ACA stipulates that states may require additional benefits, but must assume the cost.[15] Therefore, this bill could trigger the federal requirement that the state pay for any premium increase due to this new mandated benefit as well as subsidize any cost-sharing reduction payments necessary (personal communication, HBE, December 2019). Benefits provided by a health plan in addition to the federally-defined essential health benefits are not eligible for premium tax credit subsides and states must "defray the cost to the individual of any additional benefits."[15] There is the potential that the additional requirement may increase plan rates or premiums (personal communication, HBE, December 2019). Key informants representing health carriers in Washington State stated that premiums would likely increase, even if the state had to cover costs, due to the provision of new services (personal communication, January 2020).

Fiscal analyses from other states that have proposed or passed similar legislation suggest that the amount of rate or premium increase would likely be small. For example, Georgia proposed a bill that would require coverage for one hearing aid per ear and associated care every 36 months at a minimum benefit level of $2,500 and a maximum benefit level of $3,000 (personal communication, December 2019). A fiscal analysis (that did not include an actuarial analysis) found that plan premiums would increase by $0.11 to $1.20 per member per month and cost the state $831,600 to $9,072,000 (unpublished data, personal communication, December 2019). An analysis of a similar bill in North Carolina estimated that premiums would increase by $0.39 per member per year and cost the state $1,984,000 annually.[16] A national analysis by the 2006 Children's Audiology Financing Workgroup concluded that state mandates would likely increase premiums by less than 1%.[9]

Overall, if the legislature required health carriers to include coverage for hearing instruments and associated care, we have made the assumption that fully-funded health plans would include this required coverage in order to meet state law.

If fully-funded health plans include coverage for hearing instruments and associated care for individuals 18 years of age or younger, will hearing instruments and associated care for families be more affordable?

We have made the informed assumption that fully-funded health plans including coverage for hearing instruments and associated care for individuals 18 years of age or younger would increase the affordability of hearing instruments and associated care for families. This informed assumption is based on information from key informant interviews.

A 2003 survey of all state Early Hearing Detection and Intervention programs found that 88% of programs cited financing problems as a significant barrier for youth who are deaf or hard of hearing to access hearing instruments.[9] Key informants unanimously stated that affordability is a barrier to accessing hearing aids for youth. They shared that a diagnosis of deaf or hard of hearing is always an unexpected diagnosis and that the cost of first-time and replacement hearing aids is always an unexpected cost (personal communication, December 2019). In addition, key informants stated that the cost of associated care was also a barrier and not often covered by insurance (e.g. adjustments, ear molds). One key informant stated that travelling to Seattle or to the nearest pediatric audiologist could also be cost prohibitive for families (personal communication, December 2019).

In Washington State, families may access hearing aids through Medicaid, Seattle Children's Hospital (which will provide care regardless of insurance status), private insurance, or out-of-pocket expenses (personal communication, December 2019). While some health plans offered on the Exchange or as part of PEBB/SEBB medical coverage include some coverage for hearing instruments, others do not provide any coverage, requiring families to pay for the cost out-of-pocket (personal communication, December 2019). Key informants shared that their health plans provided coverage ranging from $600 per hearing aid every 36 months to $2,000 for both ears (personal communication, December 2019). One health carrier stated that their plans currently provide $1,000 every 3 years for hearing instruments (personal communication, January 2020). However, other plans specifically exclude hearing aids, offer inconsistent coverage among plans, and/or do not provide coverage for associated care (e.g. adjustments, ear molds, wires, batteries) (personal communication, December 2019). One key informant shared that their average out-of-pocket expense for hearing aids was approximately $8,000 per year after insurance (personal communication, December 2019). Another key informant shared that their family's out of pocket expense for first-time hearing aids and associated care was $10,000 (personal communication, December 2019). Lastly, key informants were concerned that bill language specifying coverage "per hearing impaired ear" would limit the ability to get hearing instruments required for youth, since youth typically require two hearing aids, even if they experience unilateral hearing thresholds in the mild to severe range (personal communication, December 2019). If coverage is only provided "per hearing impaired ear," key informants were concerned that this would further add to out-of-pocket expenses for families (personal communication, December 2019).

The average cost of one hearing aid is $2,363 (personal communication, HBE, December 2019). However, basic models may not provide adequate levels of technology for children and higher technology models may cost up to $4,000 per hearing aid (personal communication, December 2019). Two key informants were concerned that setting a maximum benefit amount at $2,500 per ear every 36 months could result in families not getting the best technology or best fit for their child (personal communication, December 2019). One key informant was concerned that lower technology levels may not be compatible with assistive listening devices used in school settings (personal communication, December 2019). In addition, ear molds cost an average of $100 to $250 per set and need to be replaced 1 to 3 times per year depending on the age of the child (personal communication, December 2019). The cost of other hearing instruments (e.g. Bahas) may also be cost prohibitive, and families may have limited options to access hearing technology for youth (personal communication, December 2019).

The 2006 Children's Audiology Financing Workgroup (workgroup) concluded that approximately $3,000 per hearing aid (in 2010 dollars) would be required to provide the hearing aid, accessories, and related professional services to children 0 to 3 years of age,[9] suggesting that a maximum benefit amount of $2,500 may not be sufficient to fully cover costs. The workgroup concluded that one barrier to state mandated coverage is that families will likely still be responsible for some level of cost-sharing or out-of-pocket expenses.[9] However, the workgroup also stated that, "the lifetime economic cost of permanent hearing loss in children in terms of special education expenditures, direct medical costs, and lost productivity is estimated to be more than $400,000 per child."[9]

Generally, key informants felt that any level of hearing aid was better than going without any technology, and that HB 2410 would help make hearing aids more affordable for families. Since HB 2410 would provide a maximum benefit amount of $2,500 per ear every 36 months, which would provide coverage for the average cost of one hearing aid and associated care, HB 2410 would likely provide a richer benefit than is available through plans currently. Since many plans do not currently offer any hearing aid benefit, we have made the informed assumption that HB 2410 would offset some of the costs of hearing instruments and therefore increase affordability for families.

Will increasing the affordability of hearing instruments and associated care increase the number of youth who are deaf or hard of hearing accessing hearing instruments and technology?

We have made the informed assumption that increasing the affordability of hearing instruments and associated care would increase the number of youth who are deaf or hard of hearing accessing hearing instruments and technology. This informed assumption is based on information from key informant interviews.

Overall, affordability is a barrier to accessing hearing instruments and associated care for families (personal communication, December 2019). Families often have to pay for hearing instruments out-of-pocket, resulting in families delaying care or extending the life of a hearing aid (personal communication, December 2019). Key informants also shared that there is a gap in coverage for hearing instruments. Families that do not meet income-eligibility for Medicaid, and do not have fiscal resources to pay for hearing instruments out-of-pocket are more likely to delay care (personal communication, December 2019). In addition, while Seattle Children's Hospital will provide care regardless of insurance status, many families experience barriers to accessing Seattle Children's Hospital, including travel time or cost (personal communication, December 2019). Key informants also shared personal financial impacts to ensuring youth have access to hearing technology.

In addition, key informants shared that hearing aid technology is constantly changing. Affordability may cause families to choose more basic technology models or choose not to upgrade to newer technology when it becomes available (personal communication, December 2019). Typically, the most appropriate hearing aids for children are digital hearing aids with specific features, including automatic feedback cancellation, low-level noise reduction, multiple channels, compatibility with remote-microphone (FM) technology, tamper-proof battery doors, wide dynamic range compression, and flexible gain and output characteristics that can be modified as hearing changes.[9,10] These models may be more expensive than basic models (personal communication, December 2019). Allowing coverage every 36 months will ensure that children have access to the best available technology at consistent intervals (personal communication, December 2019). While key informants felt that youth, especially younger children, may still need to have their hearing aids replaced more frequently than every 3 years (e.g. due to wear and tear, accidental loss or damage), all key informants felt that being able to access new technology every 3 years was a reasonable timeframe and improvement.

Overall, providing coverage at $2,500 per ear every 36 months for hearing instruments will likely increase the number of youth who are deaf or hard of hearing accessing hearing instruments and up-to-date technology.

If more youth who are deaf or hard of hearing have access to hearing instruments and technology, will health outcomes improve for these individuals?

There is strong evidence that increasing the number of youth who are deaf or hard of hearing accessing hearing instruments and technology will improve health outcomes for these individuals.

Negative outcomes have been shown for youth with any degree of hearing outside the typical range.[11] Early access to hearing habilitative services is crucial for development (personal communication, December 2019). Generally, "without appropriate access to language, hearing technology, and early intervention, children [who are deaf or hard of hearing] almost always fall behind their peers in language, cognition, and social-emotional development."[9] Infants that do not receive appropriate early intervention services often exhibit at least one developmental delay.[9] Hearing thresholds in the mild, moderate, or severe range have been associated with physical, cognitive, behavioral, and social impacts, including reduced quality of life, isolation or exclusion, and increased symptoms of depression.[7] Youth who are deaf or hard of hearing may experience poor psychosocial health, school performance, academic achievement, social engagement, speech and language development, self-esteem, and social and emotional outcomes.[8,10]

Access to hearing instruments can improve social and emotional outcomes, mental health outcomes, and educational outcomes for youth.[9-11] In 2019, the Joint Committee on Infant

Hearing (JCIH) reaffirmed the importance of fitting hearing aids using evidence-based protocols to ensure maximum audibility as soon as possible after diagnosis, ideally no later than four months of age, for families that have chosen development of listening and spoken language as a goal.[10] They stated that, "without appropriate language exposure and access, [children who are deaf or hard of hearing] will fall behind their hearing peers in communication, language, speech, cognition, reading, and social-emotional development, and delays may continue to affect the child's life into adulthood."[10] The Outcomes of Children with Hearing Loss project examining long-term outcomes for children who use hearing aids also hypothesized that, "provision of well-fit [hearing aids], higher levels of audibility, and consistent [hearing aid] use will lead to better access to linguistic input and higher levels of cumulative linguistic experience."[11]

Previous research has also shown that social engagement and interaction with caregivers and peers play an important role in language development, and youth who have hearing thresholds in the mild, moderate, or severe range may miss out on some of these “incidental” learning opportunities without access to hearing technology.[11] Hearing aids can provide access to friends, family, and relationships (personal communication, December 2019). The Outcomes of Children with Hearing Loss project asserted that removing some of these barriers through appropriate hearing amplification interventions may provide children who are deaf or hard of hearing with resilience in language development.[11] They concluded that there are three main factors that influence access to linguistic input for children who are deaf or hard of hearing, including 1) aided audibility; 2) hearing aid use, including age at fitting, duration, and consistency of use; and 3) quantity and quality of linguistic input from caregivers.[11]

Lastly, level of hearing aid technology is important to expose youth to the greatest range of sound necessary for development (personal communication, January 2020). For example, “limited bandwidth provided by amplification can render final -s nearly inaudible" and, over time, this can reduce the child's "cumulative linguistic experience, which places the child at risk for reductions in language learning efficiency and for language delays."[11] Previous research has shown that higher levels of aided audibility (for example, due to better technology) resulted in better speech production and language skills in preschoolers, and better language outcomes in school-aged children who are hard of hearing.[11]

Overall, there is strong evidence that improving access to hearing instruments and technology will improve outcomes for youth who are deaf or hard of hearing.

Will improving health outcomes for youth that are deaf or hard or hearing decrease health inequities for these individuals?

There is strong evidence that improving health outcomes for youth who are deaf or hard of hearing would decrease health inequities for these individuals. Youth who are deaf or hard of hearing already experience inequities,[7-11] and there is evidence that access to hearing instruments and technology has the ability to reduce or eliminate negative outcomes.[9-11] The JCIH stated that, “with early detection and appropriate, targeted intervention, developmental milestones for an infant who is deaf or hard of hearing can be expected to be achieved, more accurately reflecting the child’s true potential.”[10] Therefore, since HB 2410 has the potential to improve access to hearing instruments and technology, this bill is likely to reduce inequities experienced by youth who are deaf or hard of hearing. The impact of HB 2410 on inequities by insurance status or geography is unclear.

Inequities by insurance status

Key informants shared that there is a gap in health insurance coverage for hearing instruments. Families that do not meet income-eligibility for Medicaid, and do not have fiscal resources to pay for hearing instruments out-of-pocket are more likely to delay care (personal communication, December 2019). Key informants also mentioned that individuals that are recent immigrants or refugees may have limited access to initial hearing screening tests and limited access to health insurance. However, youth aged 0 to 19 who are income-eligible may qualify for Apple Health regardless of citizenship status.[17] In addition, while HB 2410 applies to individual and small group/small employer plans offered on the Exchange and PEBB/SEBB government-sponsored plans, the provisions in the bill would not apply to self-insured plans (large employer plans) (personal communication, January 2020). National studies have estimated that state mandates for hearing instruments would only extend coverage to approximately 20% of youth who are deaf and hard of hearing.[9] Therefore, the impact of HB 2410 on current inequities by insurance status are unclear.

Inequities by geography

Shortages of audiologists with pediatric training have been identified as a barrier to youth accessing and receiving necessary services and technology across the U.S.[9,10] Access to hearing screening services and pediatric audiology is disproportionately spread across Washington State, with the majority of services located in urban areas (personal communication, December 2019). While many communities have access to an audiologist, most hearing clinics will not provide care for children as pediatric audiology is highly specialized to fit the needs of children and their families (personal communication, December 2019). The JCIH recommends that children who are deaf or hard of hearing be fitted for hearing aids by an audiologist with expertise, skills, and knowledge in pediatric audiology.[10] Youth typically “require more frequent professional services than adults because of the complexity and variation in their hearing loss.”[9] For example, pediatric audiologists provide monitoring for fit and access to technology, ongoing counseling for the child, and services for other members of the family (personal communication, December 2019). Pediatric audiologists often work with a child’s school system to ensure they are getting the services they need (personal communication, December 2019). One key informant from Whatcom County shared that their family had to transfer all of their care to Seattle Children’s Hospital in order to access a pediatric audiologist and hearing aids, requiring changes in providers and long travel times.

In addition, “most parents are unfamiliar with hearing loss and hearing aids when they begin the intervention process, making it difficult for them to recognize when they are missing critical information related to their child's care and intervention"[18] and emphasizing the important role audiologists play in care. In a survey of 27 families with toddlers with binaural hearing aids, the majority reported that their primarily source of information and skills was the audiologist, with other health care providers teaching hearing aid management skills infrequently.[18] The study noted that, "supporting parents in how they manage their child's hearing aid use not only includes addressing technical aspects of hearing testing and hearing aid function but also addressing parent thoughts, feelings, and emotions. Counseling and emotional support is part of an audiologist's scope of practice and is a critical component of routine audiological care. Supporting parental well-being and adjustment to their child's hearing loss and ongoing hearing needs can influence daily management, positively affecting child development outcomes."[18] While HB 2410 may improve access to and make hearing instruments and technology more affordable, it is unlikely to impact access to care or pediatric audiology services in Washington State. Therefore, the impact of the bill by geography is unclear.

Overall, HB 2410 has the potential to reduce inequities for youth who are deaf or hard of hearing, and the impacts on inequities by insurance status and geography are unclear.

Annotated References

1. **Authority Washington State Health Care. Washington Apple Health Hearing Hardware Billing Guide: Washington Apple Health Clients Age 20 and Younger; DDA Clients Age 21 and Older. 2016.**
In this guide, Washington State Health Care Authority summaries coverage requirements for hearing hardware under Washington Apple Health programs, including Medicaid, the children's health insurance program (CHIP), and state-only funded health care programs. Medicaid and the Developmental Disabilities Administration programs provide coverage for "new, nonrefurbished, monoaural or binaural hearing aids, which includes the ear mold and batteries, for eligible clients age 20 and younger." The programs also cover replacement hearing aids after warranty if the aids are lost, beyond repair, or not sufficient for the client's hearing loss as well as ear molds when the mold is damaged or no longer fits, batteries, repairs, and rentals. Coverage also includes a prefitting evaluation, ear mold, and minimum of three post-fitting consultations. Both programs also provides coverage for Cochlear implant external speech processors and Baha speech processors, including maintenance, repair, and batteries.

2. **What health insurance plans must cover. 2019; Available at: https://www.insurance.wa.gov/what-health-insurance-plans-must-cover. Accessed 12/30/2019, 2019.**
The Office of the Insurance Commissioner provides information about what health plans in Washington State must cover based on the Affordable Care Act and state requirements.

3. **What Marketplace health insurance plans cover: 10 essential health benefits. 2019; Available at: https://www.healthcare.gov/coverage/what-marketplace-plans-cover/. Accessed 12/30/2019, 2019.**
The U.S. Centers for Medicare & Medicaid Services outlines the 10 essential health benefits required by the Affordable Care Act.

4. **Utah State University. Hearing Aid Legislation. 2017; Available at: http://infanthearing.org/legislation/hearingaid.html. Accessed 12/30/2019, 2019.**
The National Center for Hearing Assessment and Management at Utah State University compiled a summary of enacted hearing aid legislation. As of 2017, 24 states required health insurance plans to cover hearing aids for youth. This website provides a summary of each state's legislation.

5. **AG Ferguson Statement on Seeking Supreme Court Review of ACA [press release]. January 3, 2020 2020.**
In this press release, the Washington State Office of the Attorney General provided comment on the current status of the Affordable Care Act (ACA) in the U.S. Court System. Attorney General Bob Ferguson asked the U.S. Supreme Court to review the lower court's decision in a challenge to the Affordable Care Act. Washington State, as part of a 20 state coalition is, "seeking review of a decision in the U.S. Court of Appeals for the Fifth Circuit, which held that the individual mandate is unconstitutional, but declined to further rule on the validity of the ACA's remaining provisions." The court's ruling on the ACA would impact health care coverage and affordability in Washington State.

6. **Legislature Washington State. Definitions. *RCW 18.35.010*2014.**
RCW 18.35.010 provides definitions for "hearing instrument" and "hearing aid specialist," among other terms.

7. **Arlinger Stig. Negative consequences of uncorrected hearing loss—a review. *International Journal of Audiology.* 2003;42(2):S17-S20.**
Arlinger provides a review and commentary on the impacts of reduced hearing thresholds. While the review primarily focuses on literature related to older adults, Arlinger provides general information that reduced hearing thresholds have been associated with physical, cognitive, behavioral, and social impacts. It has also been associated with poorer quality of life, isolation, reduced social activity, feelings of exclusion, and increased prevalence in symptoms of depression. Arlinger notes that, "these findings indicate the importance of early identification of hearing loss and offers of rehabilitative support, where fitting of hearing aids is usually an important component."

8. **Barrett T.S., White K.R. Trends in Hearing Loss Among Adolescents. *Pediatrics.* 2017;140(6).**
Barrett and White updated previous estimates of the prevalence of adolescents aged 12 to 19 that are deaf or hard of hearing in the U.S. They analyzed National Health and Nutrition Examination Survey (NHANES) data from 1994 to 2010, which included information for 6,891 adolescents, to determine prevalence at low and high hearing thresholds. NHANES is the only national dataset with audiometry examination measures. Overall, they found a decrease in prevalence for mild hearing thresholds and similar prevalence for severe hearing thresholds. They also found that unilateral hearing impacts were more prevalent than bilateral hearing impacts. From 1994 to 2010, Barrett and White concluded that 7.01 to 8.56 out of 1000 adolescents ages 12 to 19 experience bilateral hearing thresholds greater than or equal to 25 decibels and 26.8 to 46.8 out of 1000 experience unilateral hearing thresholds greater than or equal to 25 decibels. The concluded that, "hearing loss [greater than or equal to] 15 dB affects 3% to 5% of adolescents and hearing loss >15 dB affects 15% to 20% of adolescents." The authors concluded that prevalence did not increase between 1994 and 2010. The authors state that youth that are deaf or hard of hearing may experience poor psychosocial health, school performance, social engagement, language development, and self-esteem. These impacts affect all youth that are deaf or hard of hearing, including youth with mild hearing thresholds and unilateral or bilateral impacts. NHANES has not collected audiometric data since 2010, and data collected in 2006, 2008, and 2010 were only available for children aged 12 to 19 years. The only NHANES data available for children aged 6 to 19 were data collected in 1988 and 1994. The authors recommend that NHANES resume collecting audiometric data for children ages 6 to 19 to provide up-to-date prevalence data for youth that are deaf or hard of hearing in the U.S.

9. **Limb S. J., McManus M. A., Fox H. B., et al. Ensuring financial access to hearing aids for infants and young children. *Pediatrics.* 2010;126 (Supplement 1):S43-S51.**
In 2006, the National Center for Hearing Assessment and Management convened a Children's Audiology Financing Workgroup to make recommendations about funding for hearing aids and associated care for children aged 0-3 years of age. The workgroup recognized that, "many children with permanent hearing loss do not receive hearing aids and related professional

services, in part because of public and private financing limitations." They cite a 2003 survey with all Early Hearing Detection and Intervention programs, in which 88% of programs stated that financing problems for hearing aids was a significant barrier for youth that are deaf or hard of hearing. The authors write that, "without appropriate access to language, hearing technology, and early intervention, children with hearing loss almost always fall behind their peers in language, cognition, and social-emotional development." Infants that do not receive appropriate early-intervention services often exhibit at least one developmental delay. Hearing technology has the ability to reduce or eliminate negative outcomes. The workgroup made four recommendations: 1. Expand the definition of hearing assistive technology provided in the Individuals With Disabilities Education Act that hearing aids includes both analog and digital devices to ensure devices with adequate technology for children are included. Typically, the most appropriate hearing aids for children are digital hearing aids with specific features, including automatic feedback cancellation, low-level noise reduction, multiple channels, and wide dynamic range compression. 2. Ensure that digital hearing aids, which are the medically necessary type of hearing aid for infants and children are covered by Medicaid and the Children's Health Insurance Program. 3) Encourage state legislative mandates that private health insurance must cover digital hearing aids and related professional services for infants and children. The workgroup estimated that this option would provide coverage for approximately 20% of infants and children that are deaf or hard of hearing, with an increase in premiums of less than 1%. This option would not provide coverage for all youth that are deaf or hard of hearing since self-insured plans are excluded from state mandates. In addition, these mandates are unlikely to fully cover the cost of hearing aids, accessories, and professional services, requiring some level of cost-sharing or out-of-pocket expenses from families. 4) Establish loaner program for hearing aids in every state. The workgroup estimated that approximately $3,000 per hearing aid (in 2010 dollars) would be required to provide the hearing aid, accessories and related professional services to children 0 to 3 years of age.

10. **Hearing The Joint Commitee on Infant. Year 2019 Position Statement: Principles and Guidelines for Early Hearing Detection and Intervention Programs. *The Journal of Early Hearing Detection and Intervention.* 2019;4(2):1-44.**
In 2019, the Joint Committee on Infant Hearing issued an updated position statement. The report clarified preferred language. The committee recommend using person-first language phrases like "infants or children who are deaf or hard of hearing" to be inclusive of all children with varied hearing levels. They also recommended replacing "hearing loss" with "hearing thresholds in the mild, moderate, severe, or profound range" to acknowledge that infants and children with hearing outside the typical range have not experienced a loss. Lastly, "the JCIH recognizes that terms like hearing loss, hearing impairment, and hearing levels have different values or interpretations assigned to them depending on one's cultural perspective." The committee affirmed the importance of fitting hearing aids using evidence-based protocols to ensure maximum audibility as soon as possible after diagnosis, ideally no later than four months of age, for families that have chosen development of listening and spoken language as a goal. A child who is deaf or hard of hearing may experience delays in speech and language development, academic achievement, and social and emotional outcomes. They stated, "the goals of early hearing detection and intervention (EHDI) are to maximize language and communication competence, literacy development, and psychosocial well-being for children who are deaf or hard of hearing. Without appropriate language exposure and access, these children will fall

behind their hearing peers in communication, language, speech, cognition, reading, and social-emotional development, and delays may continue to affect the child's life into adulthood. With early detection and appropriate, targeted intervention, developmental milestones for an infant who is deaf or hard of hearing can be expected to be achieved." The committee also states that, "consistent with pediatric diagnostic evaluations, the fitting of pediatric amplification should be provided by an audiologist with expertise, skills, and knowledge in pediatric audiology." The committee recognizes the national shortage of pediatric audiologists and recommends continued efforts to increase the number of audiologists with pediatric knowledge and skills. Hearing aids for children should include technology features such as pediatric-sized earhooks, tamper-proof battery doors, compatibility with remote-microphone (FM) technology, and flexible gain and output characteristics that can be modified as an infant's hearing changes.

11. **Moeller M. P., Tomblin J. B. An Introduction to the Outcomes of Children with Hearing Loss Study. *Ear and Hearing.* 2015;36 Suppl 1:4S-13S.**
The Outcomes of Children with Hearing Loss project resulted after a National Institute on Deafness and other Communication Disorders (NIDCD) work group identified a lack of research on the outcomes of children who use hearing aids. The project gathered evidence about the benefits of early access to hearing amplification technology and identified factors that contribute to the risk and protection of children who use hearing aids. The authors cite past research on language development showing that, "access to the acoustic-phonetic properties in the input is essential for spoken language learning and a hearing loss could result in reduced learning both with respect to what is learned and how rapidly it is learned." They also point out that the "most potent input for language learning will occur in the context of social engagement and interaction with caregivers and playmates," and that children who have hearing thresholds in the mild, moderate, or severe ranges could miss out on some of these learning opportunities. The authors asserted that removing some of these barriers through appropriate interventions may provide children who are deaf or hard of hearing with resilience in language development. Hearing aids can help to amplify sound and, for children, the technology of the aids makes a large difference. For example, the authors state "limited bandwidth provided by amplification can render final -s nearly inaudible" and, over time, this can reduce the child's "cumulative linguistic experience, which places the child at risk for reductions in language learning efficiency and for language delays." Any degree of hearing outside the typical range could place a child at risk for negative outcomes. The authors concluded that there are three main factors that influence access to linguistic input for children who are deaf or hard of hearing, including 1) aided audibility; 2) hearing aid use, including age at fitting, duration, and consistency of use; and 3) quantity and quality of linguistic input from caregivers. They also cite previous research showing that higher levels of aided audibility resulted in better speech production and language skills in preschoolers, and better language outcomes in school-aged children who are hard of hearing. For the Outcomes of Children with Hearing Loss project, the authors hypothesized that, "provision of well-fit [hearing aids], higher levels of audibility, and consistent [hearing aid] use will lead to better access to linguistic input and higher levels of cumulative linguistic experience."

12. **Vision and Hearing Screening Services for Children and Adolescents. 2019; Available at: https://www.medicaid.gov/medicaid/benefits/early-and-periodic-screening-diagnostic-and-treatment/vision-and-hearing-screening-services-children-and-adolescents/index.html. Accessed 12/30/2019, 2019.**

The U.S. Centers for Medicare and Medicaid Services (CMS) summarizes vision and hearing screening services for children and adolescents. CMS reports that two to three out of every 1,000 children are born deaf or hard of hearing, with many more children developing hearing problems after birth. While 95% of all newborns receive hearing screening, many children do not receive early diagnosis and treatment for hearing conditions. They state that, hearing conditions "can have negative impacts on language and speech development, academic performance, and overall well-being. Research shows that identifying and treating hearing impairments early- before 6 months of age- can help prevent these outcomes." CMS Early and Periodic Screening, Diagnostic and Treatment guidelines requires that Medicaid cover hearing aids, replacement batteries, and Cochlear implants.

13. **Health Washington State Department of. Early Hearing-loss Detection, Diagnosis and Intervention: Diagnostic and Early Intervention Statistics 2018. 2019.**
In 2017, there were 86,070 infants born in Washington State. Approximately 97% received a newborn hearing screening test before 1 month of age. DOH notes that many infants born outside of hospitals do not receive newborn hearing screening. Of infants screened, 93% (70,758 infants) passed the initial newborn hearing screening test and 5% (3,982 infants) did not pass. Of infants that did not pass the initial screen, 80% (3,189 infants) passed the follow-up screen and 14% (552 infants) were referred. Another 6% were lost to follow-up (202 infants) or other reasons (39 infants). Overall, in 2017, 687 infants were referred for audiological evaluation and approximately 2 out of 1,000 infants were identified with hearing loss (total of 157 infants). Infants with hearing problems are diagnosed with a slight, mild, moderate, severe, or profound degree of hearing loss. DOH reports that 1-3 out of 1,000 infants are born deaf or hard of hearing.

14. **(NIDCD) National Institute on Deafness and Other Communication Disorders. NIDCD Statistical Report: Prevalence of Hearing Loss in U.S. Children, 2005. National Institutes of Health, U.S. Department of Health and Human Services; 2006.**
The National Institute on Deafness and other Communication Disorders (NIDCD) of the National Institutes of Health (NIH), published a statistical report in 2006 using data from the National Health and Nutrition Examination Surveys (NHANES) from 1976 to 1994 to estimate the prevalence of youth that are deaf or hard of hearing in the U.S. The NIDCD classifies hearing thresholds as normal, mild, moderate, severe, and profound, with normal hearing levels less than or equal to 15 decibels and profound hearing levels more than 75 decibels. Audiometry in children 6 t o19 years of age was measured in 7,119 children in 1976-1980 and 6,166 children in 1988-1994 NHANES. Based on survey data, and adjusted for the 2005 U.S. population, NIDCD found that 903,000 (1.57%) to 957,000 (1.66%) U.S. children 6 to 19 years of age experience bilateral mild, moderate, or severe hearing levels. They estimate that 4.9% to 5.7% of children 6 to 19 years of age experience unilateral mild, moderate, or severe hearing levels. For the 2005 population, these percentages represent 2.6 to 2.8 million U.S. children with unilateral mild to severe hearing levels.

15. **Congress 111th. The Patient Protection and Affordable Care Act. *Public Law 111-148*2010.**
Section 1311(d)(3) of the Patient Protection and Affordable Care Act outlines requirements related to states requiring additional benefits in addition to the federally-defined essential health

benefits. Subsection (3)(B)(ii) outlines ways that the state must assume the cost of additional benefits.

16. **Alberg J. Insurance Coverage for Children's Hearing Aids: Making it a reality. BEGINNINGS for Parents of Children Who Are Deaf or Hard of Hearing, Inc.**
This PowerPoint presentation summarizes work by the North Carolina chapter of the Hearing Loss Association of America to pass hearing aid legislation in North Carolina. The bill would have required health insurance providers to cover the cost of hearing aids for children at $2,000 per ear every 36 months. As part of their efforts, the authors estimated the cost of the benefit per year at $1,984,000 and the estimated increase in insurance premiums at $0.39 per member per year.

17. **Authority Washington State Health Care. Citizenship and Immigration Status Guide. 2019.**
The Washington State Health Care Authority provides an overview of potential program eligibility based on citizenship and immigration status.

18. **Munoz K., Olson W.A., Twohig M.P., et al. Pediatric hearing aid use: Parent-Reported Challenges. *Ear and Hearing.* 2015;36(2):279-287.**
The authors conducted the Parent Hearing Aid Management Inventory study to identify parent-reported challenges to hearing aid management for children ages 0 to 3 years old and family demographics. Thirty-seven families completed surveys through Early Intervention programs in Utah and Indiana. Questions explored access to information, parent confidence, expectations, communication with the audiologist, and challenges with using hearing aids. Survey questions also asked about symptoms of depression, psychological flexibility, experiential avoidance, and internal thought processes. The majority of parents responding to the survey had children that were 22 months old and had been wearing binaural hearing aids for about 15 months. Recommendations state that infants receive hearing intervention services before 6 months of age to optimize spoken language development as "children with hearing loss, regardless of the degree, are at risk for developmental consequences as a result of their hearing loss." Many families report challenges accessing services. In this survey, parents reported that their primary source of information and skills was the audiologist, and studies have shown the importance of hearing professionals in providing support to parents. The authors stated that, "supporting parents in how they manage their child's hearing aid use not only includes addressing technical aspects of hearing testing and hearing aid function but also addressing parent thoughts, feelings, and emotions. Counseling and emotional support is part of an audiologist's scope of practice and is a critical component of routine audiological care. Supporting parental well-being and adjustment to their child's hearing loss and ongoing hearing needs can influence daily management, positively affecting child development outcomes." Half of parents (43%) reported not receiving any information about hearing instruments other than hearing aids (e.g. FM systems, cochlear devices). Parents also reported that other providers (not audiologists) taught hearing aid management skills infrequently. More than 50% of parents reported two main challenges to managing hearing aid use: 1) child's behavior and activities (e.g. playing outside); and 2) alternate care settings. There was a statistically significant relationship between hours of hearing aid use and parental challenges (e.g. frustration) (p= 0.001), perception of hearing aid benefits (p= 0.001), and extent of challenges reported (e.g. playing outside) (p= 0.02). The

authors stated that, "most parents are unfamiliar with hearing loss and hearing aids when they begin the intervention process, making it difficult for them to recognize when they are missing critical information related to their child's care and intervention."