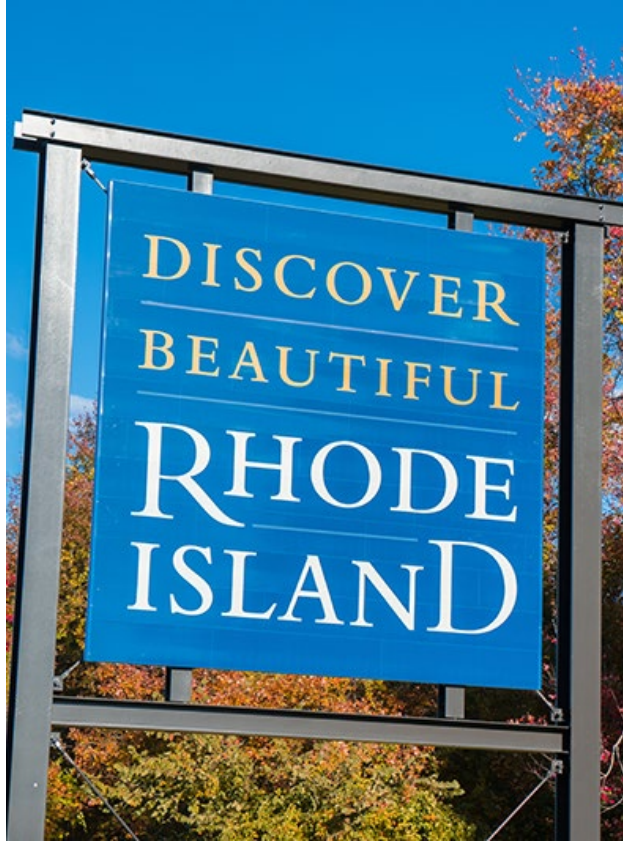
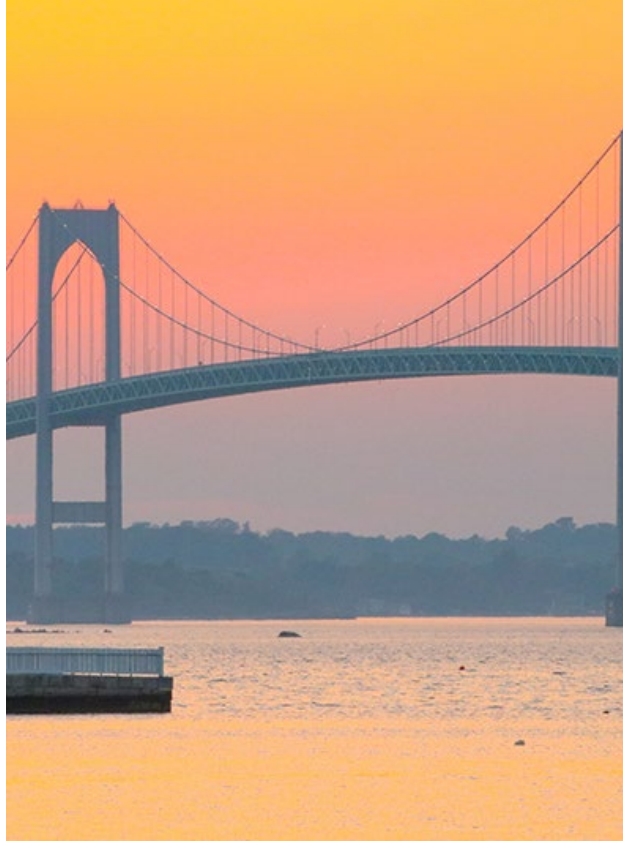
Rhode Island Department of Health

Using EHDI Data Beyond 1-3-6 to Make Informed EDHI Program Decisions





Rhode Island

- **Size:** Smallest US state by area
- **Population:** 1.09 million (#42 of 50 states)
- **Nickname:** Ocean State (40 miles of coastline)
- **State Capital:** Providence
- **39 cities and towns** | No county government

Learning Objectives

1. Identify key data points used to calculate sensitivity and specificity in newborn hearing screening programs.

2. List strategies to assess screening and audiology data sent to the EHDI program, including performance indicators.

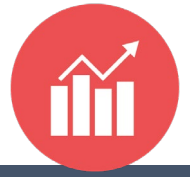
3. Identify three expanded data quality strategies that can be integrated into EHDI Programs.

How RI-EHDI Collects Screening & Diagnostic Data

RI EHDI receives hearing screening data electronically from the state's birthing hospitals and it goes directly into KIDSNET, the Rhode Island statewide data system and into RI EHDI's tracking database.

Newborn hearing screening results are uploaded from hearing screening equipment to hearing screening laptops.

The screeners transfer results from the laptops into the Rhode Island statewide data system (KIDSNET), and into RI-EHDI's tracking database.



RI-EDHI can view and track results 18-24 hours after the hearing screen.

Audiologists enter diagnostic results directly into KIDSNET.

Since 2025, RI's main birthing hospital's audiology department can enter results into the EHR and transfer results to KIDSNET via HL7 health information exchange.

Rhode Island EHDI Used Data in 2025 for Three Unique Projects

1

Determining the sensitivity of our hearing screening protocols for the purpose of monitoring the impact of protocol changes.

2

Developing competency metrics for our hospital-based newborn hearing screeners as an objective way to monitor hearing screeners' performance and competency.

3

Comparing Executive Office Of Health and Human Services Medicaid hearing diagnosis and billing codes to those reported in KIDSNET to determine if hearing healthcare providers are reporting into KIDSNET.

Project 1: Hearing Screening Protocol Sensitivity and Specificity

Sensitivity and Specificity

We asked the question: Why do we use our current protocols and what is the sensitivity and specificity of those protocols?

- Do we have the data to calculate sensitivity and specificity of our hearing screening protocols?
- Can monitoring the sensitivity and specificity be used to determine how well the RI EDHI hearing screening protocols identify hearing differences, especially mild degrees?

Calculating Sensitivity

Sensitivity: The ability of a test to correctly identify those people that DO have the condition.

Formula: True Positive (TP) / (True Positive (TP) +False Negative (FN))
True Positive (TP): **Failed** hearing screen at birth and diagnosed with **hearing difference**.
False Negative (FN): **Passed** hearing screen at birth and **later diagnosed** with **hearing difference**.

Association of Public Health Laboratories Sensitivity & Specificity ID Testing Explainer

Screening Protocol Sensitivity DOB 2015-2022

*Degree of Hearing Difference	**Failed** hearing screens at birth and **diagnosed** with **hearing difference.** (True Positive TP)	**Passed** hearing screen at birth and **later diagnosed** with **hearing difference.** (False Negative FN)	Sensitivity % $\frac{(TP)}{(TP+FN)}$
Slight (16-25 deciBel, dB)	13	15	46.4
Mild (26-40 dB)	53	27	66.3
Moderate (41-55 dB)	69	12	85.2
Moderate Severe (56-70 dB)	24	4	85.7
Severe (71-90 dB)	34	6	85.0
Profound (91+ dB)	33	1	97.1
Auditory Neuropathy Spectrum Disorder (ANSD)	17	1	94.4
Total	243	66	78.6

Example: 90% sensitivity will detect 90 out of 100 people who have a condition.

- *Degree assigned using the ear with the greatest degree of hearing loss.

Calculating Specificity

Specificity: The ability of a test to correctly identify those people that DO NOT have the condition.

*Formula: True Negative (TN) / (True Negative (TN) + False Positive (FP))
True Negative (TN):**Passed** hearing screen and were then **diagnosed** with **normal** hearing.
False Negative (FN):**Failed** hearing screens at birth and then **diagnosed** with **normal** hearing.

- *EHDI could not determine specificity because we did not have reliable data on babies who passed the newborn hearing screen and then later returned and had a normal diagnostic evaluation.

Association of Public Health Laboratories Sensitivity & Specificity ID Testing Explainer

Future Sensitivity and Specificity Uses?

Several future uses of sensitivity and specificity data have been identified

- Calculate sensitivity to include 2023 and later years for comparison and monitoring of before and after protocol changes.
- Calculate sensitivity and specificity specifically for our NICU protocols.
- Use school-based hearing screening data to determine specificity for our hearing screening protocols.
- Set sensitivity standards for our hearing screening protocols.

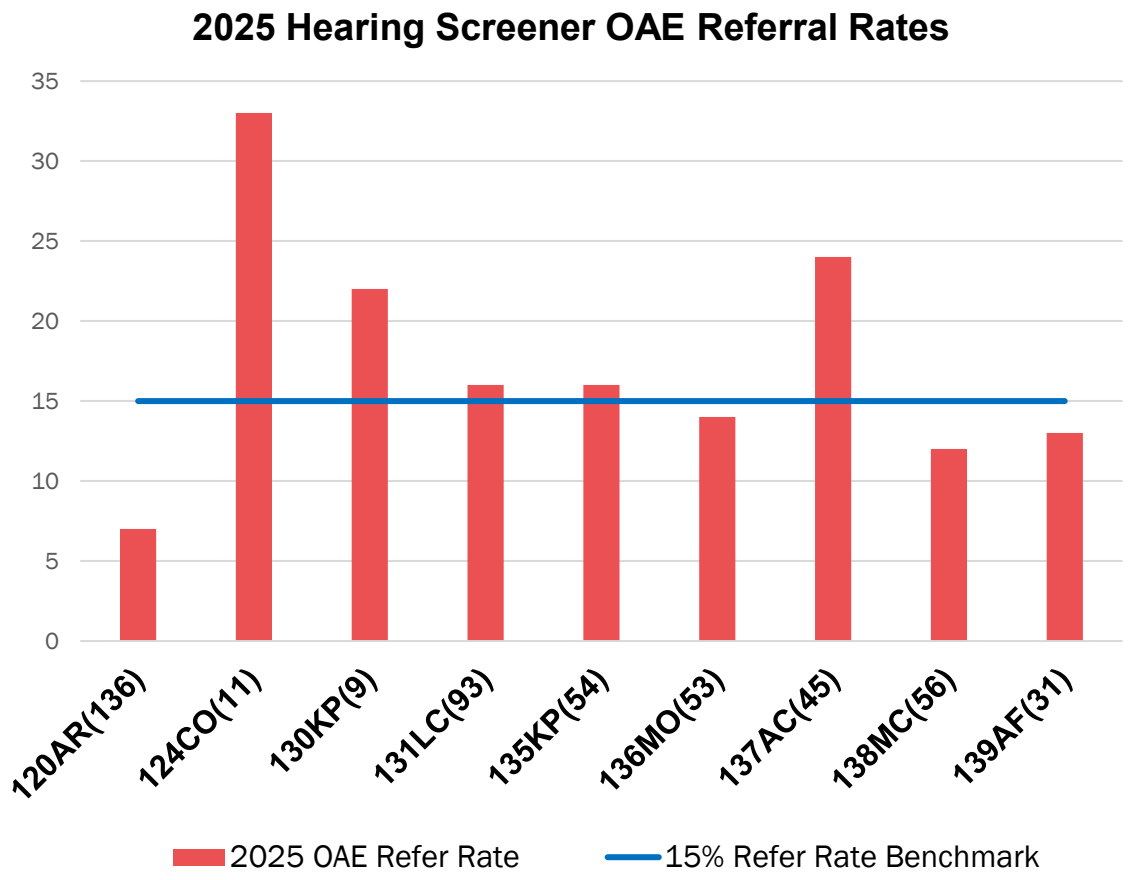
Project 2:
Hearing Screener
Competency Metrics

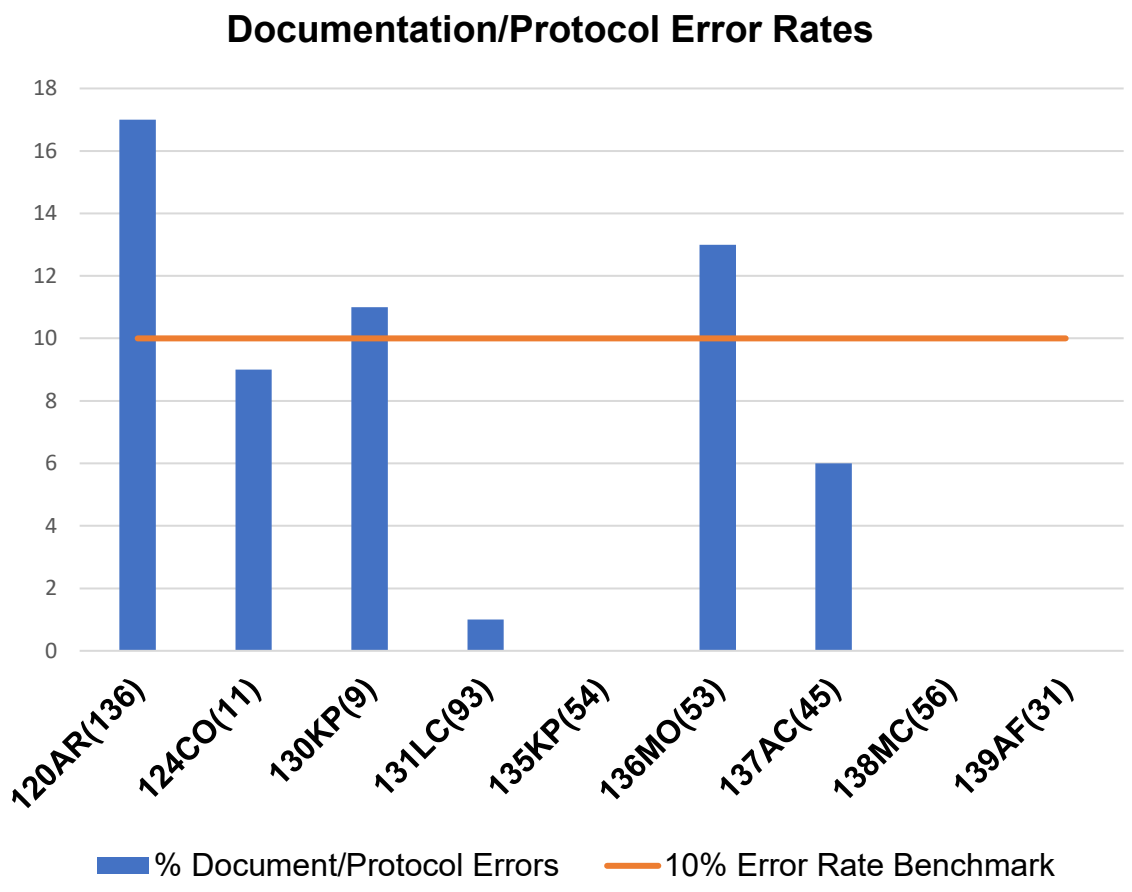
RI EHDI Developed Three Hearing Screener Competency Metrics

State regulation was passed requiring annual competency evaluations for newborn hearing screeners.

- Screening volume must be at least 24 babies per year.
- Screener inpatient otoacoustic emissions (OAE) referral rates should not exceed 15% (state average). Rate is calculated using all inpatient OAE screens the screener performed that year.
- EHDI documentation/protocol error rate should not exceed 10%.

Data reports sent to hospitals annually.





Data are reviewed quarterly by RI EHDI audiologist.

Screeners not meeting metric benchmarks receive additional training.

Project 3: Executive Office of Health and Human Services (EOHHS) Collaboration

RI-EHDI & EOHHS Medicaid Data Cross-Checking

Data reconciliation used for quality improvement

Medicaid Billing Data (EOHHS)

- Diagnostic audiology claims
- Early Interventionl service billing (when applicable)
- Enrollment & service dates

RI-EHDI Surveillance System

- Newborn hearing screening results
- Diagnostic confirmation
- EI referral & enrollment status

Secure Cross-Checking & Validation

- Confirms service utilization
- Identifies loss to follow-up
- Flags data discrepancies
- Supports 1-3-6 benchmark tracking

All data-sharing activities comply with HIPAA and FERPA requirements. Personally identifiable information is shared only as permitted by law and, where required, with documented parental consent. Data are used solely for public health surveillance, care coordination, and continuous quality improvement.

Executive Office Health and Human Service Data Ecosystem

Rhode Island Data Ecosystem Request Process

1. Rhode Island Office of Data, Analytics, and Evaluation (ODAE)
2. Data Ecosystem Data License Request
    - Data Request Form (DRF)
    - Approved or Rejected
3. Data Use License (DUL)

RI-EHDI & EOHHS Medicaid Data Cross-Checking

Proposed Questions Raised by Advisory Committee

1. Among Medicaid insured, how many have a **diagnosis code of hearing loss**?
2. Among Medicaid insured children with a screening audiology follow-up recommendation of **"ABR" or "VRA medical monitor,"** how many in each group have any audiology billing (regardless of diagnosis) indicating they have seen an audiologist?
3. How many and which audiologists and/or audiology facilities have billed Medicaid for children born between **1/1/2018 to 6/30/2021 during 2020 and 2021?**
4. Among Medicaid insured, how many children have billed Medicaid for an **amplification device?**
5. Among children born with a hearing loss diagnosis in Rhode Island, how many are enrolled in EI, how many were **enrolled by six months** of age, and which **hearing loss specialty services** were received in EI and/or were billed to Medicaid?
4. Among Medicaid insured, how many children born are **enrolled in EI** and have a hearing loss diagnosis?

Medicaid Billing & Diagnostic Coding Analysis

Medicaid Billing & Diagnostic Coding Analysis

- Process to use data from the “All Payor Claims Database”
- Cross-referenced Medicaid billing data with KIDSNET record
- Compared ICD-10 hearing loss diagnosis codes to statewide reporting
- Amplification device codes

V5060	**Hearing aid, monaural, behind the ear**
V5253	**Hearing aid, digitally programmable, binaural, BTE**
L8690	**Auditory Osseo integrated device, includes all internal and external components**
L8614	**Cochlear device, includes all internal and external components**

Conclusion

1. EHDI programs can determine sensitivity of their protocols by looking at two key screening and diagnostic data points:
    - Babies that failed and were diagnosed with hearing differences.
    - Babies that passed and were later diagnosed with hearing differences.

2. Performance indicators like referral rates and documentation errors can be used as quality measures for individual screeners or hospital screening programs. Also, billing codes can be used to assess audiology reporting.

Conclusion

3. Three expanded data quality strategies that can be integrated into EHDI programs include:
   - Use EHDI data to monitor and make decisions about the ongoing effectiveness of hearing screening protocols.
   - Use EHDI data to monitor screening quality at the screener level and hospital program level.
   - Coordinate with other agencies that have similar data to validate EHDI program data.

Questions

Thank you!

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