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# Exploring EHDI Data

Unveiling Novel Parameters for State-to-State Comparison

Keshav Kumar, Marie Richter, Veronica Chaitan | March 17, 2024

# Welcome



# Tell us about yourselves

- What is your name?
- What is your profession/title?
- Where do you work?
- Why did you sign up for this session?



# Learning objectives

1. Participants will be able to figure out the national and state trends of more than 25 parameters to assess the EHDI program.
2. Participants will be able to analyze the prevalence of hearing loss across the states and years.
3. Participants will be able to share data from the website: print/download visualizations and data.

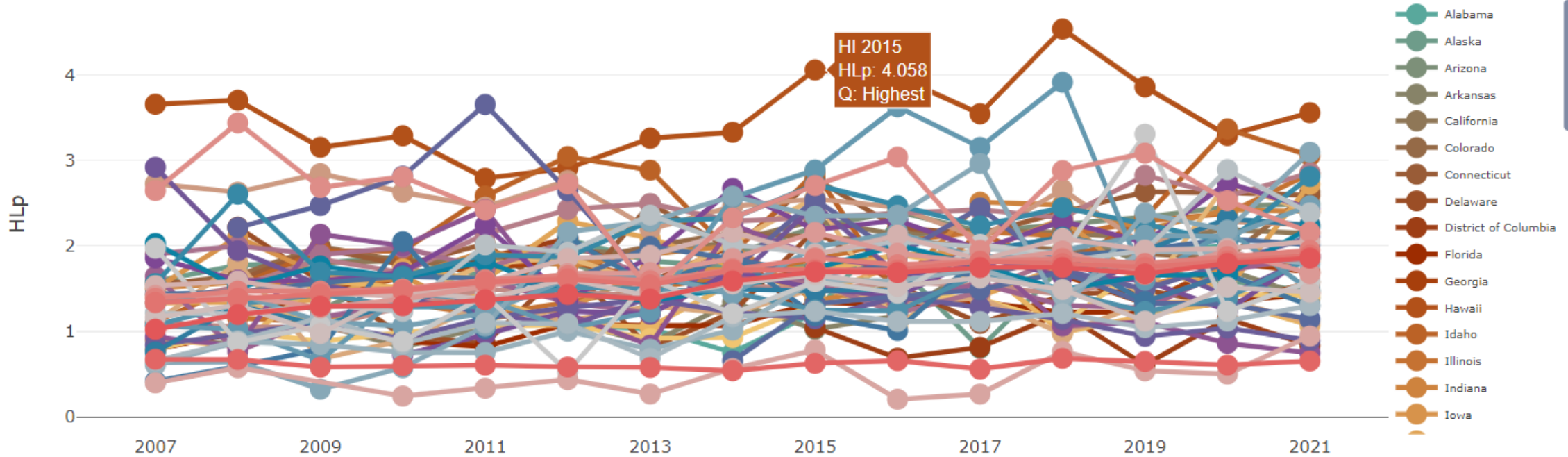


# Teaser: Interactive plot on new website

Choose state(s) to explore

Alabama, Alaska, Arizona, Arkansas, Calif

Comparison lines of Hearing Loss Prevalence by state and in the aggregate, 2007-2021



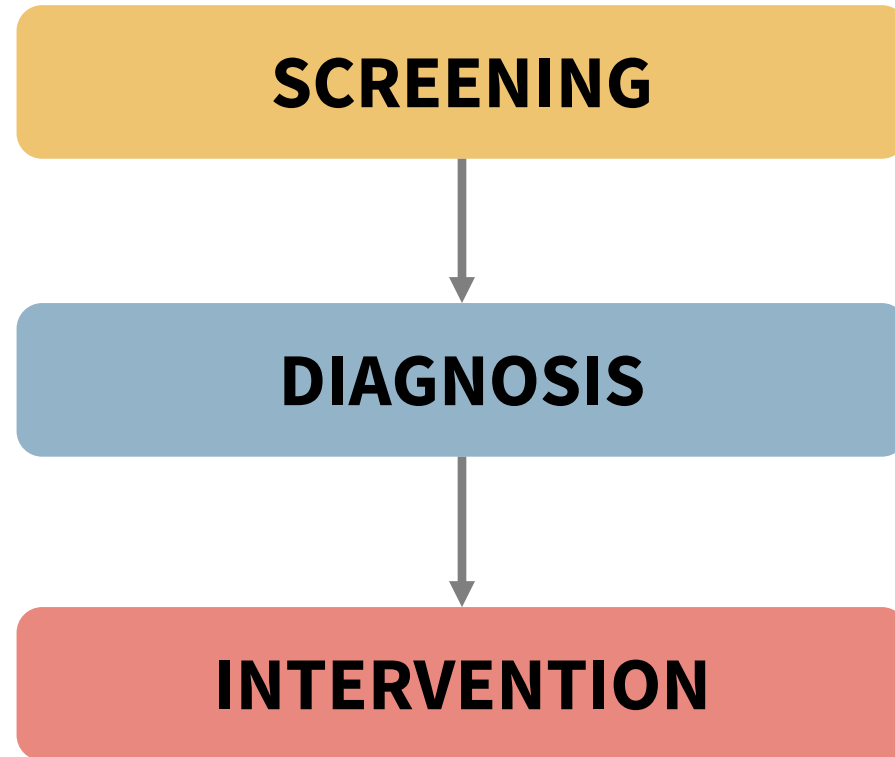
Source: Center for Public Health Systems Science. (January 31, 2024). Early Hearing Detection and Intervention Data. <https://EHDIdata.wustl.edu>



# Introduction



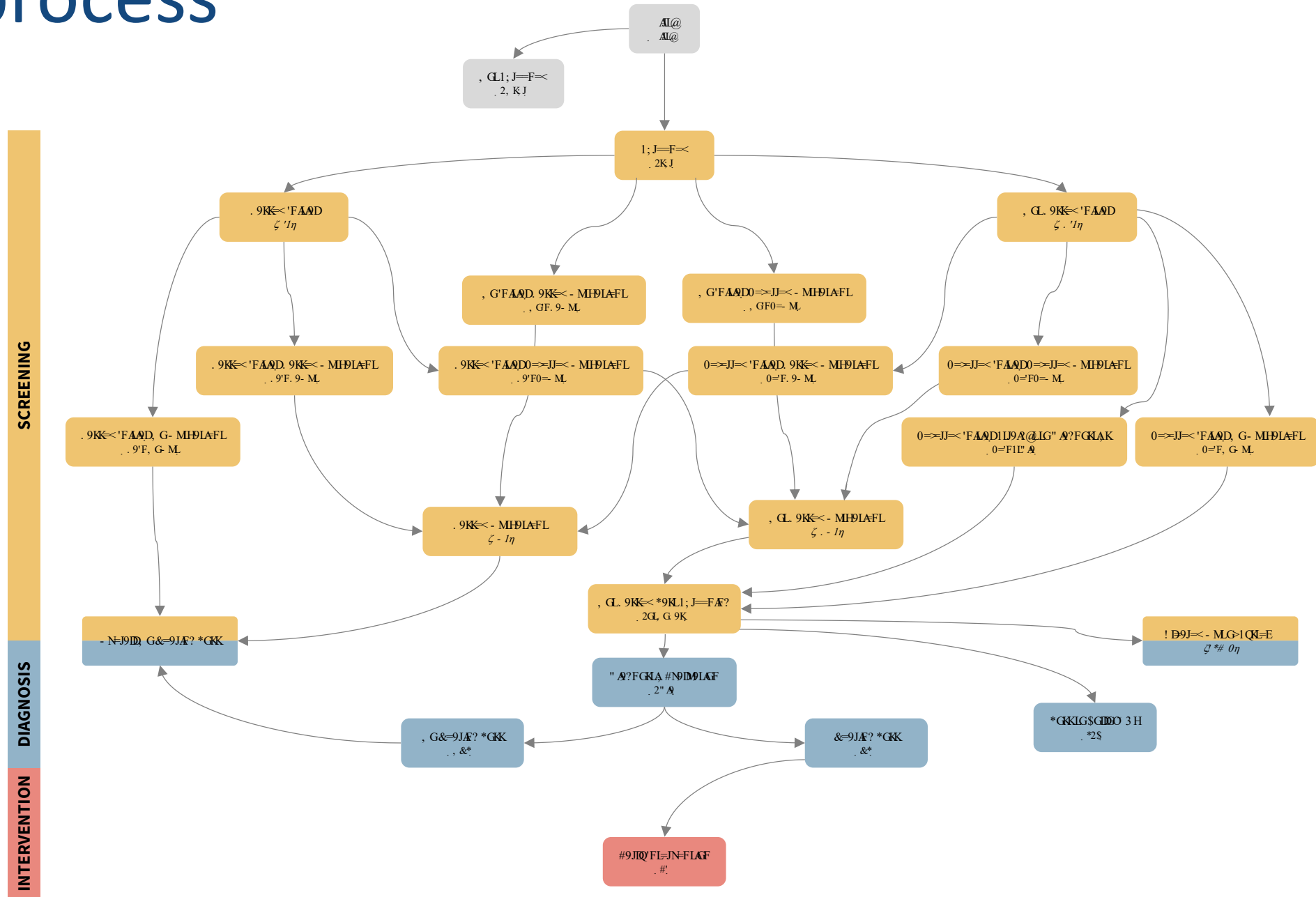
# EHDI process





# EHDI process

## Early Hearing Detection and Intervention Flow Diagram

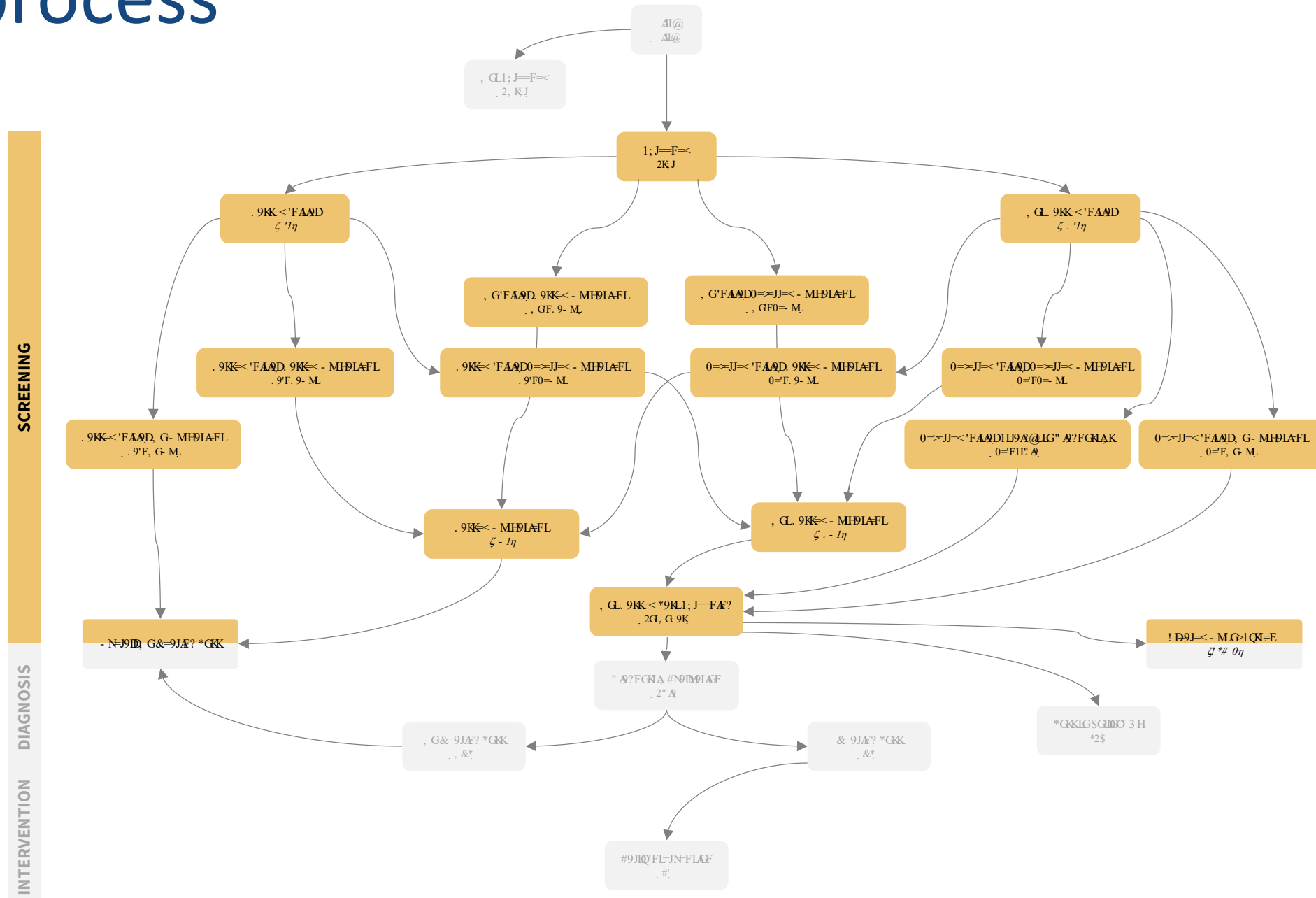


+ =UAKJ=HJ=KFLIC9D GMIFAK =BO : @JL9K=JGE : 9: AK : Al@IG=FI=JAF? l@=#&" HIG=KK9L1; J=FAF? l@GM@" A?FGKK9F<'FI=JN=FLAF' . : J=N9L=>E=JA F9E =KGJ l@GK=HIGN=>A GM<919K=L A9DAR=>E=JAKFL9NAD: BCF! . O=: KA=A 4KAGM O=: KA= #&"!<919 OMKD=>M! GF19; LMK #&"!<919c OMKD=>M



# EHDI process

## Early Hearing Detection and Intervention Flow Diagram

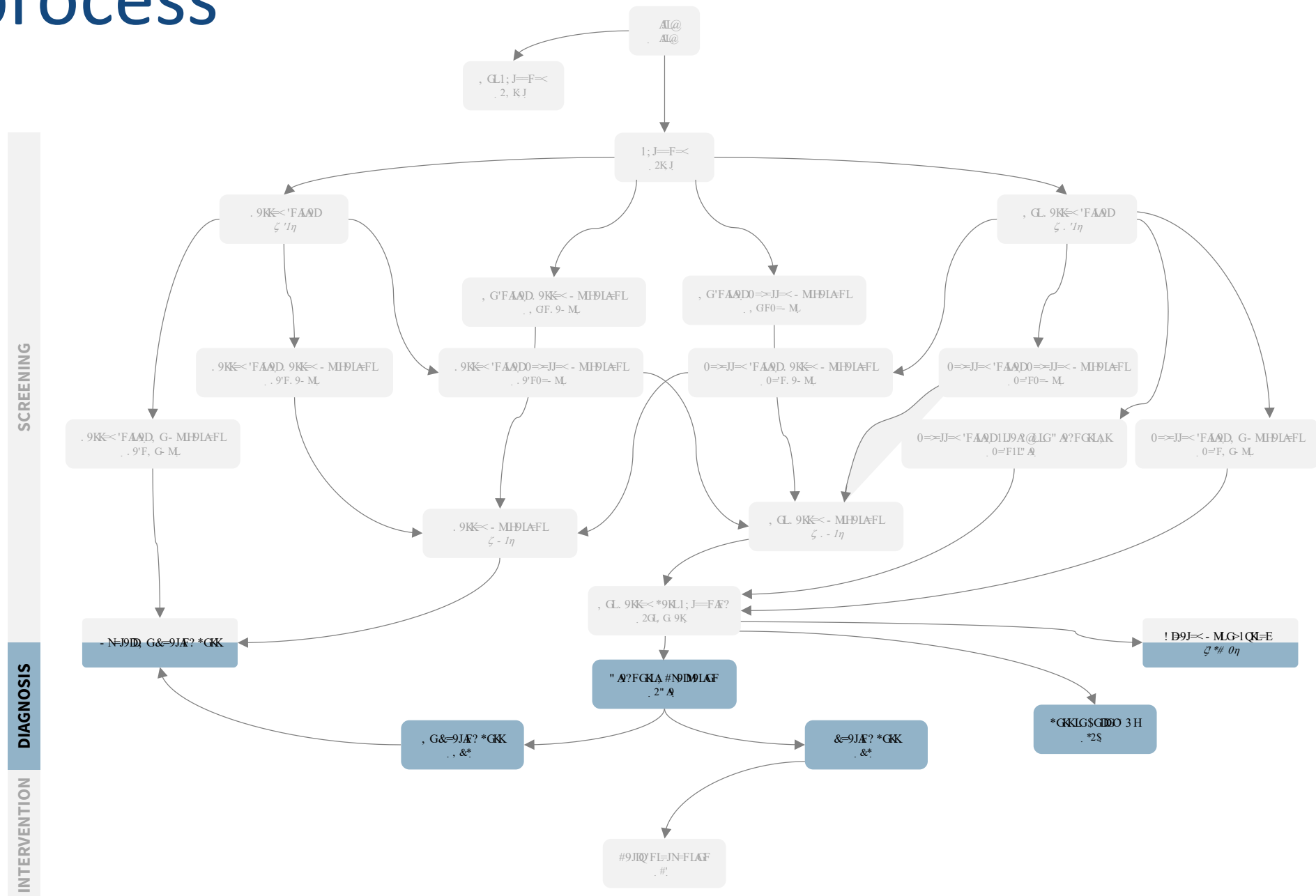


+LAKJ=HJ=KFLIC9D GMFKF 300; @JL9K3GE : 9: AK: AL@IG=FI=JAF? L@#&'' HIG=K9L1; J=F? L@GM@'' A?FCKK9F<'FI=IN=FLAF'  
 .: J=N9L<E=LJA F9E =KGI L@K=HIGN<=A GM<919K&L A9DAR<E=LAKFL9NAD: BCF!''! O= KA=A 4KAGM O= KA= #&''<919 OMKD<M! GF19; LMK #&''<919c OMKD<M



# EHDI process

## Early Hearing Detection and Intervention Flow Diagram

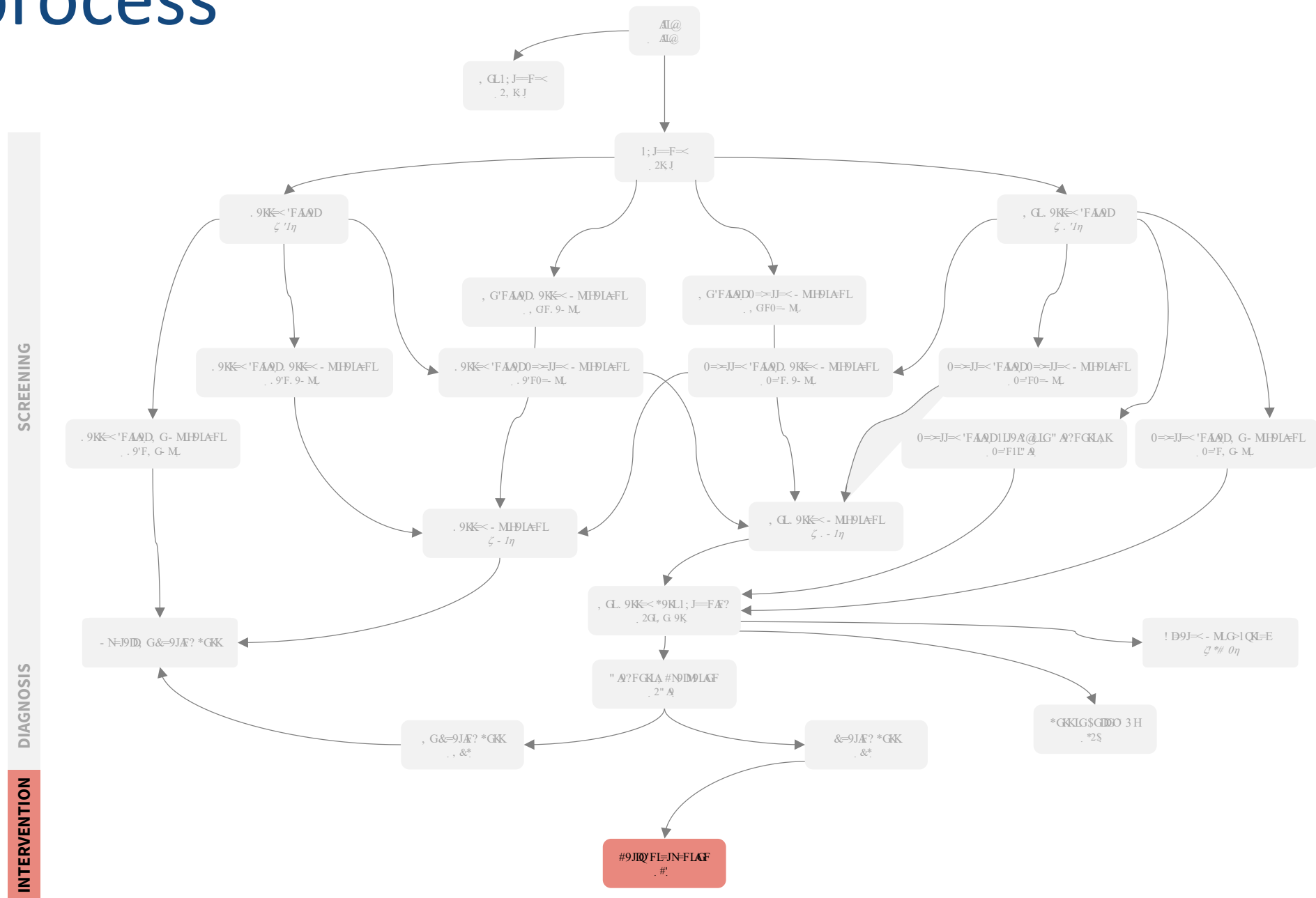


+ =UAKJ=HJ=K=FLIC9D GMFIK F80; @JL9K3GE : 9: AK: Al@IG=FI=JAF? L@=#&'' HIG=K9L1; J=F AF? L@GM@'' A?FCKK9F<'FI=IN=FLAF'  
 : : J=N9L=< E=JA F9E =KGJ L@GK HIGN=< A GM<919K=L A9DA R=<E=UAKFCL9NAD: B CF!''! O=: KA=A 4KA GM O=: KA: #&''<919 OMKD=<M! GF19; LMK #&''<919c OMKD=<M



# EHDI process

## Early Hearing Detection and Intervention Flow Diagram




+ =UAKJ=HJ=KFLIC9D GMFIK? 00; @JL9K3GE : 9: AK: AI@IG=FI=JF? L@#&'' HIG=K9L1; J=F? L@GM@'' A?FGKK9F<'FI=IN=FLAF'  
 . : J=NVL=< E=JA F9E =KGJ L@GK HIGN=< A GM<919K&L A9DA&=< E=UAKFL9NAD: B CF! ''! O=: KA=A 4KAGM O=: KA= #&''<919 OMKD=<M! GF19; LMK #&''<919c OMKD=<M

# CDC's EHDI Hearing Screening and Follow-up Surveys (HSFS)

## Hearing Loss in Children

Hearing Loss Homepage > Data & Statistics

 Hearing Loss Homepage

What is Hearing Loss? +

Screening & Diagnosis

Types of Hearing Loss

Treatment & Intervention Services +

Data & Statistics -

EHDI Annual Data -

2021

2020

2019

2018

2017

2016

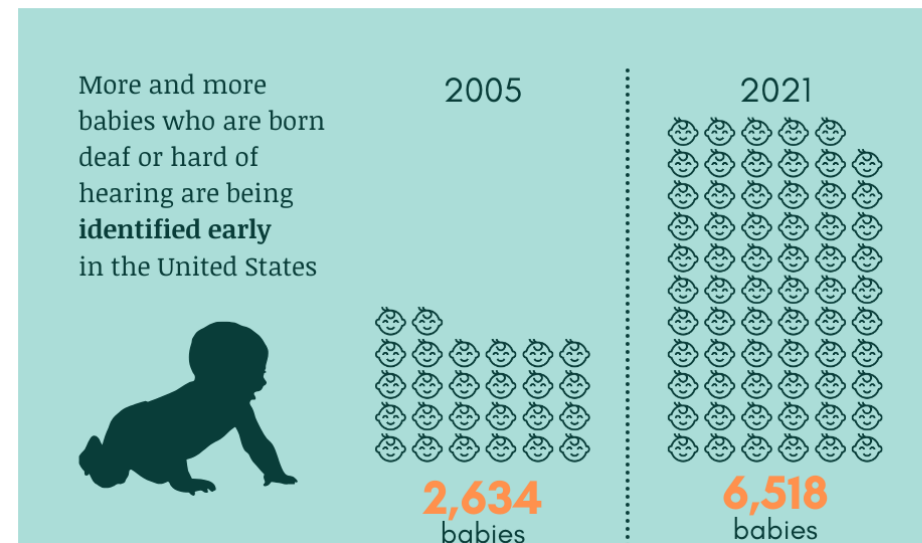
2015

2014

## Annual Data: Early Hearing Detection and Intervention (EHDI) Program

[Print](#)

If you have any questions about these data please email the CDC EHDI program at: [ehdi@cdc.gov](mailto:ehdi@cdc.gov).



# Early Intervention - percent

- Let's say I want to calculate for Missouri for the year 2021, the percent of babies enrolled in early intervention (Part C & Non-Part C) among those with hearing loss

$$\frac{\text{Number of babies enrolled in EI}}{\text{Total with hearing loss}} \times 100$$



# Early Intervention - percent data source

## Hearing Loss in Children

Hearing Loss Homepage > Data & Statistics > EHDI Annual Data > 2021

### 2021 Summary of Early Intervention (EI) Among Infants Identified with Permanent Hearing Loss

[Print](#)

PAGE 10 of 14

[View Table of Contents](#)

September 2023

[Download page](#) [PDF - 170 KB]

Data Source: 2021 CDC EHDI Hearing Screening & Follow-up Survey (HSFS)

State/ Territory (n = 51)	Total Permanent Hearing Loss	Total Enrolled in EI (Part C & Non-Part C)	Percent Enrolled in EI among those with Hearing Loss <sup>1</sup> (Part C & Non-Part C)	Total Enrolled in Part C EI Services	Total from Non-Part C EI Services Only	No EI Services: LFU/LTD				
						Parents / Family Contacted but Unresponsive	Unable to Contact	Unknown	Number LFU/LTD: Due to Contacted but Unresponsive + Unable to Contact + Unknown among Permanent Hearing Loss	Percent LFU/LTD: Due to Contacted but Unresponsive + Unable to Contact + Unknown among Permanent Hearing Loss
Alaska	13	6	46.2	6	0	2	1	0	3	23.1
Arizona	192	111	57.8	111	0	12	4	43	59	30.7
Arkansas	48	35	72.9	12	23	1	0	2	3	6.3
California	884	665	75.2	665	0	24	59	1	84	9.5
Colorado	161	99	61.5	73	26	0	6	47	53	32.9
Commonwealth of the Northern Mariana Islands	1	1	100.0	1	0	0	0	0	0	0.0
Connecticut	95	72	75.8	72	0	8	0	1	9	9.5

<https://www.cdc.gov/ncbddd/hearingloss/2021-data/09-early-Intervention.html>



# Early Intervention - percent, Missouri 2021

$$\frac{\text{Number of babies enrolled in EI}}{\text{Total with hearing loss}} \times 100$$

$$\frac{84}{127} \times 100$$

**66.1%**





# Early Intervention - rate

- Let's say I want to calculate for Missouri for the year 2021, the rate of infants enrolled in early intervention (Part C & Non-Part C) per 1000 screened.

$$\frac{\text{Number of babies enrolled in EI}}{\text{Total screened}} \times 1000$$



# Early Intervention – rate data sources

CDC Centers for Disease Control and Prevention  
 CDC 24/7: Saving Lives, Protecting People™

Search

Hearing Loss in Children

Hearing Loss Homepage > Data & Statistics > EHDl Annual Data > 2021

## 2021 Summary of Early Intervention (EI) Among Infants Identified with Permanent Hearing Loss

[Print](#)

PAGE 10 of 14  
 < View Table of Contents

September 2023

[Download page](#) [PDF - 170 KB]

Data Source: 2021 CDC EHDl Hearing Screening & Follow-up Survey (HSFS)

State / Territory (n = 51)	Total Permanent Hearing Loss	Total Enrolled in EI (Part C & Non-Part C)	Percent Enrolled in EI among those with Hearing Loss <sup>1</sup> (Part C & Non-Part C)	Total Enrolled in Part C EI Services	Total from Non-Part C EI Services Only	No EI Services: LFU/LTD				
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Connecticut	95	72	75.8	72	0	8	0	1	9	9.5

<https://www.cdc.gov/ncbddd/hearingloss/2021-data/09-early-Intervention.html>

CDC Centers for Disease Control and Prevention  
 CDC 24/7: Saving Lives, Protecting People™

Search

Hearing Loss in Children

Hearing Loss Homepage > Data & Statistics > EHDl Annual Data > 2021

## 2021 Summary of Hearing Screening Among Total Occurrent Births

[Print](#)

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September 2023

[Download page](#) [PDF - 218 KB]

Data Source: 2021 CDC EHDl Hearing Screening & Follow-up Survey (HSFS)

State / Territory (n = 55)	Total Occurrent Births		Total Screened	Percent Screened (Based on # of EHDl Births) <sup>1</sup>	Percent Screened (Based on # of Vital Records Births) <sup>2</sup>	No Documented Screening: LFU/LTD				
	Births Reported to EHDl program	Births According to Vital Records				Parents / Family Contacted but Unresponsive	Unable to Contact	Unknown	Number LFU/LTD: Due to Contacted but Unresponsive + Unable to Contact + Unknown among EHDl Births	Percent LFU/LTD: Due to Contacted but Unresponsive + Unable to Contact + Unknown among EHDl Births
Alaska	9,363	9,322	8,833	94.3	94.8	3	0	441	444	4.7
Arizona	78,481	76,952	76,952	98.1	100.0	67	864	15	946	1.2
Arkansas	34,917	35,153	34,451	98.7	98.0	3	2	89	94	0.3
California <sup>3</sup>	414,146	414,146	412,152	99.5	99.5	36	88	0	124	0.0
Colorado	62,995	63,541	61,160	97.1	96.3	0	1	1,041	1,042	1.7
Commonwealth of the Northern Mariana Islands	575	575	569	99.0	99.0	0	0	0	0	0.0
Connecticut	36,949	36,926	36,629	99.1	99.1	134	0	18	152	0.4
Delaware	11,050	10,878	10,780	97.6	99.1	0	0	197	197	1.8

<https://www.cdc.gov/ncbddd/hearingloss/2021-data/09-early-Intervention.html>



# Early Intervention - rate, Missouri 2021

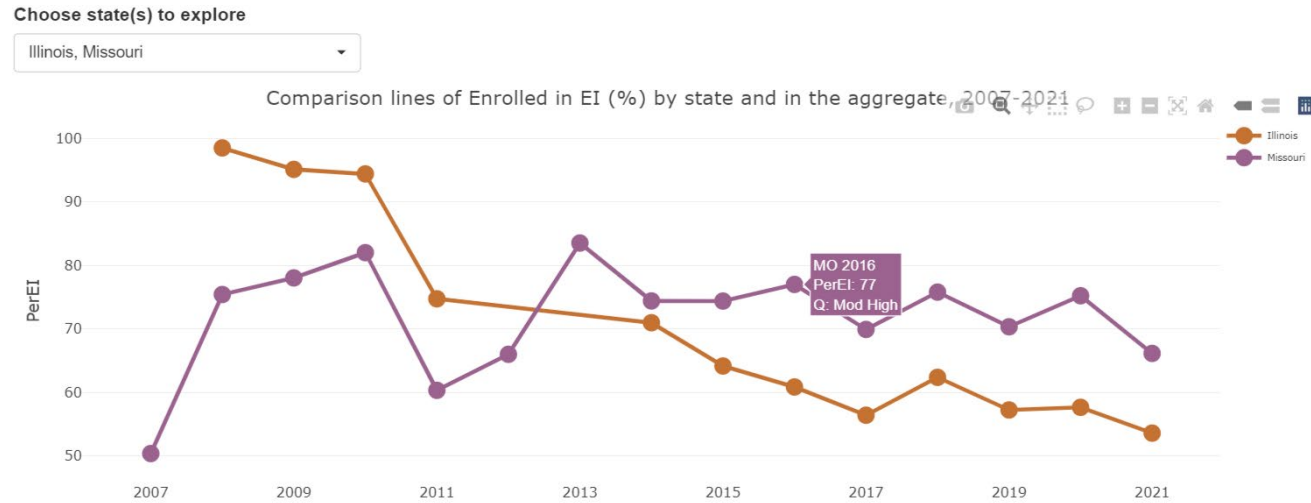
$$\frac{\text{Number of babies enrolled in EI}}{\text{Total screened}} \times 1000$$

$$\frac{84}{67,854} \times 1000$$

**1.24 babies enrolled in EI per 1000 screened**



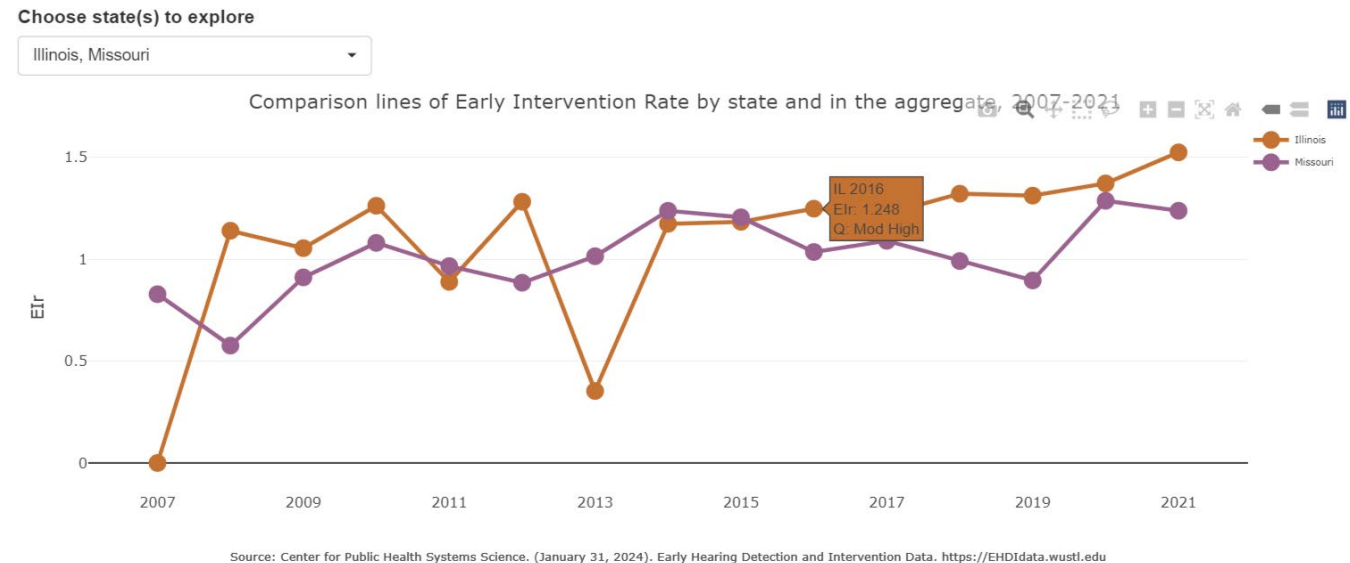
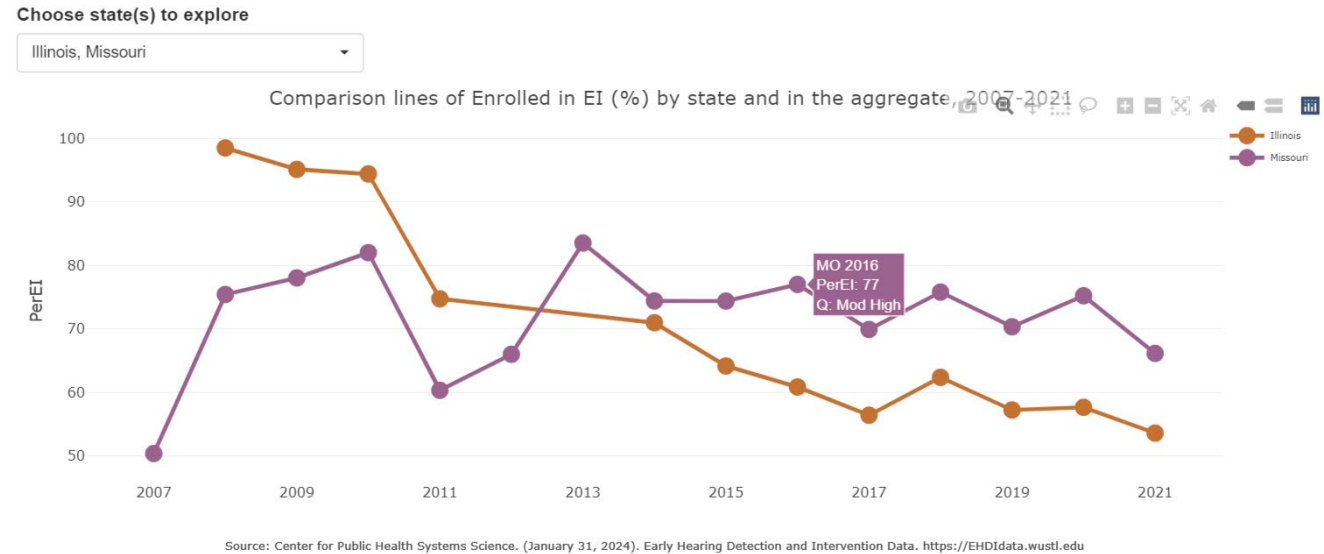
# Early Intervention - chart comparison cont'd



Source: Center for Public Health Systems Science. (January 31, 2024). Early Hearing Detection and Intervention Data. <https://EHDIdata.wustl.edu>



# Early Intervention - chart comparison cont'd



# Data curation

- We collected 23 metrics from the CDC's EHDI website.
- Additionally, we calculated 28 more metrics from the reported data.
- We present all 51 metrics in interactive visualizations on the website.

## FAQ

When did you last update your data? ▼

Where did you get this data? ▲

CDC shared 2014-2020 data with us on October 13, 2022. We supplemented with 2007-2021 data from CDC's website, as described below.

Metrics for 2007-2013 were accessed on September 21, 2023 from PDFs on CDC's website via the following links:

- [https://www.cdc.gov/ncbddd/hearingloss/2007-data/2007\\_Screen\\_Web\\_Rev.pdf](https://www.cdc.gov/ncbddd/hearingloss/2007-data/2007_Screen_Web_Rev.pdf)
- [https://www.cdc.gov/ncbddd/hearingloss/2007-data/2007\\_Screen\\_Pass\\_Web\\_Rev.pdf](https://www.cdc.gov/ncbddd/hearingloss/2007-data/2007_Screen_Pass_Web_Rev.pdf)
- [https://www.cdc.gov/ncbddd/hearingloss/2007-data/2007\\_Screen\\_Not\\_Pass\\_Web\\_Rev.pdf](https://www.cdc.gov/ncbddd/hearingloss/2007-data/2007_Screen_Not_Pass_Web_Rev.pdf)
- [https://www.cdc.gov/ncbddd/hearingloss/2007-data/Diagnosis\\_Summary\\_2007\\_Web\\_Rev.pdf](https://www.cdc.gov/ncbddd/hearingloss/2007-data/Diagnosis_Summary_2007_Web_Rev.pdf)
- [https://www.cdc.gov/ncbddd/hearingloss/2007-data/Diag\\_2007\\_Age\\_Web\\_Rev.pdf](https://www.cdc.gov/ncbddd/hearingloss/2007-data/Diag_2007_Age_Web_Rev.pdf)
- [https://www.cdc.gov/ncbddd/hearingloss/2007-data/2007\\_No\\_Diagnosis\\_Web\\_Rev.pdf](https://www.cdc.gov/ncbddd/hearingloss/2007-data/2007_No_Diagnosis_Web_Rev.pdf)
- [https://www.cdc.gov/ncbddd/hearingloss/2007-data/2007\\_Enrolled\\_Part\\_C\\_EI\\_Web\\_Rev.pdf](https://www.cdc.gov/ncbddd/hearingloss/2007-data/2007_Enrolled_Part_C_EI_Web_Rev.pdf)
- [https://www.cdc.gov/ncbddd/hearingloss/2007-data/2007\\_EI\\_Non\\_Part\\_C\\_Web\\_Rev.pdf](https://www.cdc.gov/ncbddd/hearingloss/2007-data/2007_EI_Non_Part_C_Web_Rev.pdf)
- [https://www.cdc.gov/ncbddd/hearingloss/2008-data/2008\\_Screen\\_Web.pdf](https://www.cdc.gov/ncbddd/hearingloss/2008-data/2008_Screen_Web.pdf)
- [https://www.cdc.gov/ncbddd/hearingloss/2008-data/2008\\_Screen\\_1Month\\_Web.pdf](https://www.cdc.gov/ncbddd/hearingloss/2008-data/2008_Screen_1Month_Web.pdf)
- [https://www.cdc.gov/ncbddd/hearingloss/2008-data/2008\\_LFU\\_Summary\\_Web.pdf](https://www.cdc.gov/ncbddd/hearingloss/2008-data/2008_LFU_Summary_Web.pdf)
- [https://www.cdc.gov/ncbddd/hearingloss/2008-data/2008\\_Diag\\_3-Months\\_Web.pdf](https://www.cdc.gov/ncbddd/hearingloss/2008-data/2008_Diag_3-Months_Web.pdf)
- [https://www.cdc.gov/ncbddd/hearingloss/2008-data/2008\\_EI\\_6\\_Months\\_Web.pdf](https://www.cdc.gov/ncbddd/hearingloss/2008-data/2008_EI_6_Months_Web.pdf)
- [https://www.cdc.gov/ncbddd/hearingloss/2009-data/2009\\_Screen\\_Web.pdf](https://www.cdc.gov/ncbddd/hearingloss/2009-data/2009_Screen_Web.pdf)
- [https://www.cdc.gov/ncbddd/hearingloss/2009-data/Screen\\_2009\\_1Month\\_web\\_508.pdf](https://www.cdc.gov/ncbddd/hearingloss/2009-data/Screen_2009_1Month_web_508.pdf)
- [https://www.cdc.gov/ncbddd/hearingloss/2009-data/2009\\_LFU\\_Summary\\_Web.pdf](https://www.cdc.gov/ncbddd/hearingloss/2009-data/2009_LFU_Summary_Web.pdf)
- [https://www.cdc.gov/ncbddd/hearingloss/2009-data/Diag\\_2009\\_3Month\\_web\\_508.pdf](https://www.cdc.gov/ncbddd/hearingloss/2009-data/Diag_2009_3Month_web_508.pdf)
- [https://www.cdc.gov/ncbddd/hearingloss/2009-data/EI\\_2009\\_6Month\\_web\\_508.pdf](https://www.cdc.gov/ncbddd/hearingloss/2009-data/EI_2009_6Month_web_508.pdf)
- [https://www.cdc.gov/ncbddd/hearingloss/2010-data/Screen\\_2010\\_web\\_508.pdf](https://www.cdc.gov/ncbddd/hearingloss/2010-data/Screen_2010_web_508.pdf)
- [https://www.cdc.gov/ncbddd/hearingloss/2010-data/Screen\\_2010\\_1Month\\_web.pdf](https://www.cdc.gov/ncbddd/hearingloss/2010-data/Screen_2010_1Month_web.pdf)



# Website exploration (I)

[EHDIdata.wustl.edu](http://EHDIdata.wustl.edu)



# Homepage



## EHDI in the US: How are we doing as a nation?

1.858

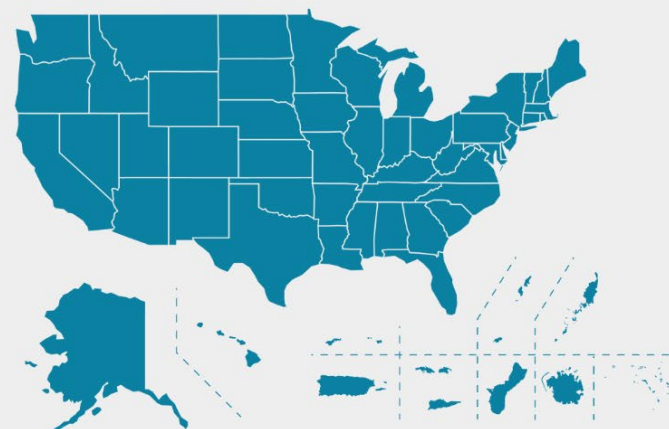
babies diagnosed with  
hearing loss out of 1000  
screened

98%

of babies born enter the  
EHDI program

1.119

babies enroll in EI out of  
1000 screened



2021 US data represent states, territories, and District of Columbia.

Live website portion

Explore curated multi-year CDC EHDI data







# EHDI Data Hub

## EHDI Data Hub

The EHDI Data Hub provides visualizations to compare metrics of EHDI programs across the United States.

### Learn more about the data

Learn more about the data curation and the metrics available for exploration by visiting the [Data Description](#) page.

### Explore a metric

We compare all available data for each state, the US (states, District of Columbia, and territories), and state summaries (average, median, and standard deviation across states and District of Columbia) in each year from 2007 to 2021.

Figures are interactive and allow you to focus on portions or download a PNG.

You can explore 51 metrics: 28 metrics were calculated from 23 metrics reported to the CDC. Calculated metrics include prevalence, rate, percentage, and total count.

Click to explore:



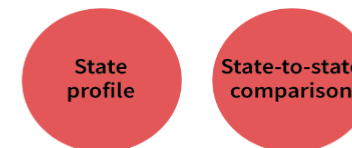
### Explore a state

Check out a state's profile: how a particular state has been doing over the years across the 8 key metrics. We also highlight how the US (states, DC, and territories) is doing.

Compare two states: select two states to explore and compare their trends over the years across the 8 key metrics.

Figures are interactive; you can also download a PNG of the profile/comparison.

Click to explore:



### Download the data

[Description of the data](#)[Download data](#)[Download data codebook](#)

## Key Metrics (1)

Explore 8 metrics that are key to EHDI.

### How to interact with figures

- Click the **dropdown** to select a metric to explore.
- **Mouse/hover** over plot elements for more information.
- **Click and drag mouse** to zoom into area of a plot. **Double-click** to reset.
- **Access tools** in the upper right of each figure.
- **Click the camera icon** in the tools to download a figure as PNG.

*Page may take a few moments to load. The display may time out and appear gray; if this happens, please refresh the page. Prevalence metric is presented first, followed by rate and percentage. Within each set, metrics are grouped as related to screening, diagnostics, and early intervention. Hearing Loss Prevalence is displayed at default.*

Click the dropdown to select a metric to explore:

Hearing Loss Prevalence

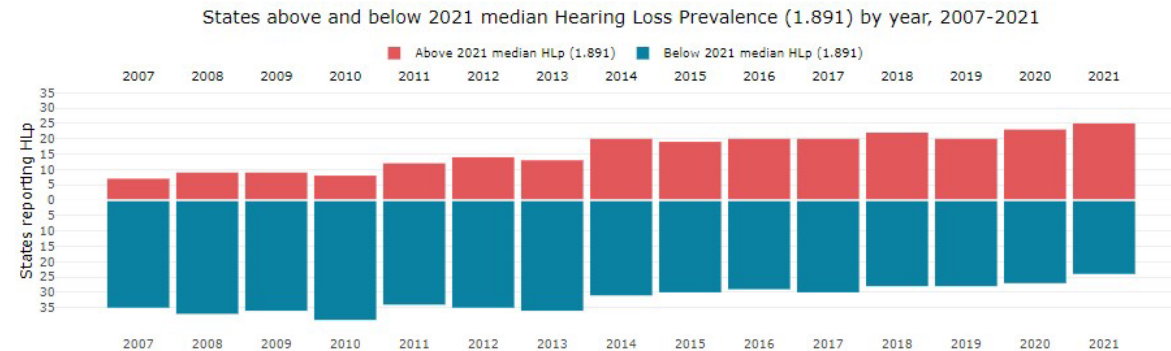
### Hearing Loss Prevalence

This section takes a look at **Hearing Loss Prevalence: Prevalence of permanent hearing loss**. It was calculated using the formula  $HL / Tscr * 1000$ . This metric can easily identify the states with higher/lower hearing loss prevalence, and additionally, this information helps determine the need for additional investment in audiology services.

#### States above and below 2021 median value by year, 2007-2021

Figure displays the numbers of states above and below the 2021 median *Hearing Loss Prevalence* value.

- Mouse/Hover over the bars to see the count (and percentage) of states reporting above or below the 2021 median each year.
- Click and drag mouse to zoom into part of the plot (or among the tools in upper right of plot). Double-click plot to reset (or reset axes among the tools in upper right of plot).
- Download a plot as PNG (among the tools in upper right of plot).



Source: Center for Public Health Systems Science. (January 31, 2024). Early Hearing Detection and Intervention Data. <https://EHDIdata.wustl.edu>



# Key Metrics (2)

## Smoothed line plots

Figure shows the trend in *Hearing Loss Prevalence* metric for each state (red lines) and smoothed trend lines (blue) to discard small year-to-year variations. States are ordered from top to bottom by their latest HLP values. The black dots represent the state median in 2021 for comparison. US represents states, District of Columbia, and territories.

- Mouse/Hover over the lines to see the year.
- Add/Remove either type of line from all states in the figure by clicking on the legend (top).
- Download a plot as PNG (among the tools in upper right of plot).



Source: Center for Public Health Systems Science. (January 31, 2024). Early Hearing Detection and Intervention Data. <https://EHDdata.wustl.edu>

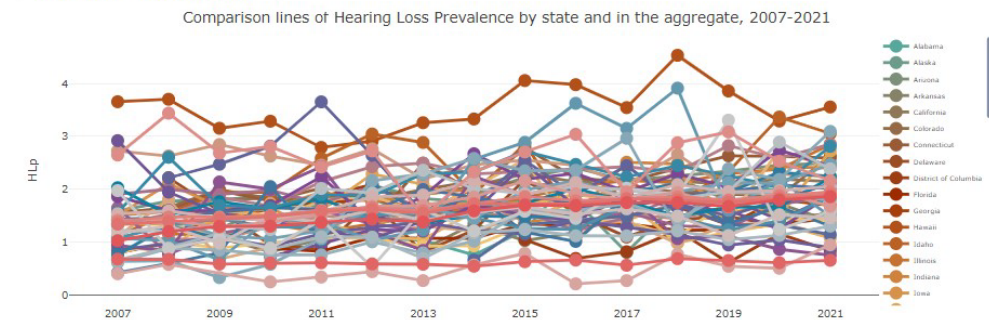
## Comparison line plots

Figure allows detailed comparisons of *Hearing Loss Prevalence* between selected states over time. State values along with which quartile they fall into each year are provided. State average, State median and State SD summarize states and District of Columbia. US represents states, District of Columbia, and territories.

- Choose one or more states to focus on from the dropdown menu.
- Mouse/Hover over a point more information.
- Click on a line or point to highlight a state among the selection. Use "Shift" to select multiple states.
- Click and drag mouse to zoom into part of the plot (or among the tools in upper right of plot). Double-click plot to reset (or reset axes among the tools in upper right of plot).
- Download a plot as PNG (among the tools in upper right of plot).

Choose state(s) to explore

Alabama, Alaska, Arizona, Arkansas, Calif -



Source: Center for Public Health Systems Science. (January 31, 2024). Early Hearing Detection and Intervention Data. <https://EHDdata.wustl.edu>

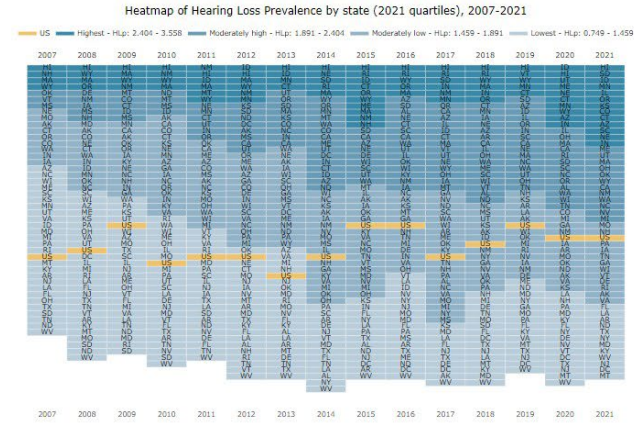


# Key Metrics (3)

## Heatmap

Figure shows how Hearing Loss Prevalence distribution has changed over time. States are ranked and color-coded in four fixed ranges determined by 2021 quartiles. In this way, it is possible to see how the distribution of states (in the fixed intervals defined in the key) has changed over time. States are ordered from highest (top) to lowest (bottom) HLP value. US (states, District of Columbia, and territories) value and position also identified.

- Choose one or more states to focus on from the dropdown menu.
- Click on state(s) to highlight all years for the selection. Double-click white space above/below heat map to reset.
- Click and drag mouse to zoom into part of the heat map (or among the tools in upper right of plot). Reset axes among the tools in upper right of plot.
- Download a plot as PNG (among the tools in upper right of plot).



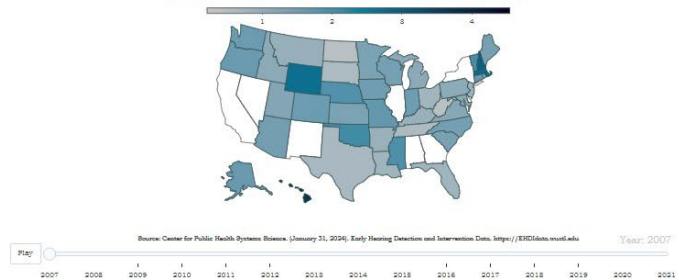
Source: Center for Public Health Systems Science. (January 31, 2024). Early Hearing Detection and Intervention Data. <https://EHIDdata.wustl.edu>

## Annual map comparison

Figure shows US map and distribution of Hearing Loss Prevalence values across states in a year. States are colored based on a range of HLP values over 2007-2021, with legend on the right. Missing data visualized with no color in the map. See table below for available values, or see Data Availability Table for years of missing data for each state/variable.

- Mouse/Hover over a state for more information.
- Click "Play" at the bottom of the map to see how values change over time across the US. Click/Slide to view a single year.
- Download a plot as PNG (among the tools in upper right of plot).

Map showing Hearing Loss Prevalence in each state by year, 2007-2021



Source: Center for Public Health Systems Science. (January 31, 2024). Early Hearing Detection and Intervention Data. <https://EHIDdata.wustl.edu>

## Boxplots

Figure shows the distributions of states' Hearing Loss Prevalence values in boxplots by year. The area in the box begins with the first quartile (25th percentile). The middle line represents the median data point, and the top of the box is the third quartile (75th percentile). The whiskers (lines beyond the box) show the minimum value on the bottom, or the lower fence when outliers are present. The upper fence is at the top of the line. The fence values represent where the minimum and maximum values would be if the distribution were normal. Dots above and below the whiskers represent outliers.

- Mouse/Hover over a point more information.
- Click and drag mouse to zoom into part of the plot (or among the tools in upper right of plot). Double-click plot to reset (or reset axes among the tools in upper right of plot).
- Download a plot as PNG (among the tools in upper right of plot).

State Hearing Loss Prevalence distribution by year, 2007-2021



Source: Center for Public Health Systems Science. (January 31, 2024). Early Hearing Detection and Intervention Data. <https://EHIDdata.wustl.edu>



# Key Metrics (4)

## Values by state and year

Table shows the Hearing Loss Prevalence values for each state by year. States are organized alphabetically from first display, followed by state summaries (average, median, and standard deviation across states and District of Columbia), and US value (states, District of Columbia, and territories).

- Click on a year to sort by that year.
- Search in the upper right to limit display to state(s) or value(s).
- Click on a row to highlight/deselect it.

Search:

Table: Hearing Loss Prevalence values by state and year: 2007-2021

State	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
1 Alabama						1.07	1.033	0.754	1.221	2.31	1.648	1.897		2.003	
2 Alaska	1.585	1.774	1.757	1.877	1.642	2.074	1.823	1.75	1.794	1.776	0.803	1.761	1.711	1.588	1.472
3 Arizona	1.436	1.41	1.282	1.084	1.772	1.824	1.414	1.899	2.223	2.401	2.108	2.256	2.338	2.458	2.466
4 Arkansas	0.898	0.858	1.081	0.818	1.058	1.123	0.859	1.342	1.029	1.182	1.708	2.108	1.708	1.724	1.383
5 California		1.802	1.829	1.818	1.682	1.888	2.054	2.298	2.134	2.188	2.155	2.087	2.19	2.145	
6 Colorado	1.543	1.855	1.993	1.822	1.748	1.804	1.904	2.152						1.858	2.832
7 Connecticut	1.578	1.596	1.971	1.778	2.022	1.365	2.491	1.958	2.789	2.208	2.139	2.308	2.832	2.82	2.894
8 Delaware		2.219		0.983	0.884	1.785	0.807	1.225	2.187	1.938	1.094	1.428	1.488	1.311	1.577
9 District of Columbia		1.178				2.089	1.977	2.009	1.048	0.888	0.815	1.218	0.808	1.151	0.838
10 Florida	0.789	0.885	1.083	0.88	0.823	1.09	1.009	1.071	1.34	1.314	1.345	1.223	1.228	1.331	1.448
11 Georgia			1.471	1.877		1.818	1.819	1.574	1.721	1.717	1.88	1.882	1.328	1.802	1.884
12 Hawaii	3.857	3.704	3.154	3.288	2.791	2.609	3.259	3.33	4.058	3.98	3.545	4.537	3.85	3.281	3.588
13 Idaho	1.111	1.539	1.939	1.842	2.584	3.048	2.888	1.908	2.882	1.419	2.143	1.755	2.331	3.387	3.055
14 Illinois		1.157	1.109	1.337	1.189			1.854	1.845	2.051	2.108	2.119	2.292	2.38	2.845
15 Indiana	1.808	1.578	1.542	1.82	1.943	1.784	1.905	2	1.359	1.531	2.811	2.48	2.189	2.425	2.404
16 Iowa	1.501	2.108	1.881	1.858	1.147	1.288	1.725	1.721	1.741	1.893	1.892	2.32	1.54	1.793	1.824
17 Kansas	1.333	1.341	1.388	1.731	1.804	2.288	2.081	1.787	1.431	1.774	1.408	1.785	1.803	1.462	2.721
18 Kentucky	0.902	0.833	1.593	1.511	1.39	1.091	1.052	1.57	1.889	1.888	1.782	0.888	1.188	1.38	1.073
19 Louisiana	0.791	1.003	0.888	0.888	1.087	1.074	0.92	0.929	1.315	1.441	1.388	1.088	1.785	1.439	1.415
20 Maine	1.387	1.388	1.075	1.38	1.792	1.885	1.543	2.037	2.583	1.088	1.781	1.95	1.423	2.742	2.387
21 Maryland	1.108	1.805	0.878	0.888	1.327	1.122	1.289	1.289	1.508	1.328	1.381	0.878	1.33	1.384	1.188
22 Massachusetts	2.728	2.85	2.848	2.827	2.455	2.785	2.184	2.483	2.581	2.482	2.088	2.858	2.804	2.284	2.247
23 Michigan	1.108	1.854	1.88	1.288	1.48	1.487	1.408	1.548	1.481	1.881	1.838	1.437	1.845	1.844	1.881
24 Minnesota	1.33	1.824	1.845	1.888	2.14	2.425	2.488	2.29			2.425	2.327	2.825	2.88	2.854
25 Mississippi	1.808	1.989	1.9	1.98	1.738	2.048	1.818	1.857	1.574	1.212	1.485	1.87			
26 Missouri	1.844	0.784	1.187	1.317	1.802	1.34	1.215	1.884	1.821	1.345	1.58	1.388	1.274	1.711	1.872
27 Montana	0.937	0.828	2.137	2	2.424	1.204	0.839	2.248	1.878	1.742	1.909	1.084	1.111	0.881	0.749
28 Nebraska	1.859	1.588	1.582	1.98	2.238	1.378	1.888	2.871	2.188	2.301	1.953	2.292	2.038	2.74	2.438
29 Nevada		0.728	0.883	1.238	1.203	1.787	1.488	1.414	1.871	1.549	1.589	1.244	1.887		
30 New Hampshire	2.82	1.944	1.543			1.088	1.388	1.878	2.484	1.889	1.705	1.482	1.829	1.414	1.888
31 New Jersey	0.841	0.974	1.103	0.814	1.188	1.28	1.373	1.225	1.149	1.403	1.282	1.141	0.943	1.04	0.884
32 New Mexico		2.218	2.472	2.818	3.854	2.843	1.835	1.718	2.541	1.887	2.445	1.718	1.484	1.787	2.188
33 New York								0.857	1.323	1.412	1.487	1.884	1.327	1.324	1.143
34 North Carolina	1.434	1.484	1.887	1.88	1.817	1.88	1.993	1.88	1.889	1.778	1.841	1.884	1.955	2.082	2.014
35 North Dakota	0.418	0.582	0.784	2.08	1.033	2.107	1.823	1.882	1.185	1.011	1.887	1.885	1.348	1.887	1.382
36 Ohio	0.78	1.308	1.088	1.341	1.881	1.547	1.823	1.493	1.475	1.491	1.842	2.103	1.845	2.32	2.24
37 Oklahoma	2.028	1.51	1.788	1.028	1.818	1.451	1.388	1.507	1.735	2.012	1.784	1.487	1.858	1.888	2.213
38 Oregon	1.88	2.855	1.883	1.843	1.888	1.888	2.29	2.325	2.718	2.47	2.234	2.449	2.258	2.044	2.812
39 Pennsylvania	1.873	1.318	1.438	1.288	1.288	1.818	1.488	1.457	1.282	1.241	1.878	1.484	1.233	1.387	1.881
40 Rhode Island	1.087	1.028	0.881	1.48	1.374	1.038	1.225	2.888	2.888	3.827	3.153	3.814	1.8	2.184	1.482
41 South Carolina	1.342	1.44	1.114	1.082	1.213	1.817	1.888	1.438	1.888	2.155	1.884	1.949	2.128	2.108	2.472
42 South Dakota	0.834	0.842	0.335	0.878	1.083	2.183	2.288	2.883	2.349	2.288	2.984	1.237	2.383	2.183	3.085
43 Tennessee	0.81	0.878	0.848	0.788	0.784	1.003	0.782	1.018	1.801	1.882	1.728	1.424	1.838	1.917	1.78
44 Texas	0.857	0.888	1.183	0.858	1.1	1.082	0.888	1.17	1.235	1.117	1.118	1.21	1.044	1.123	1.301
45 Utah	1.218	1.203	1.308	1.238	2.013	1.828	2.389	2.015	1.911	2.084	1.889	1.821	1.88	2.382	2.388
46 Vermont	1.873	0.871	1.088	0.883	1.42	0.828	1.813	1.21	1.882	1.447	2.018	1.889	3.308	1.238	1.888
47 Virginia	1.183	1.307	0.878	1.478	1.374	1.814	1.412	1.884	1.888	1.828	1.828	1.482	1.121	1.517	1.488
48 Washington	1.535	1.888	1.481	1.414	1.873	1.888	1.88	2.18	1.887	2.125	1.832	2.087	1.982	1.871	2.084
49 West Virginia	0.388	0.878		0.248	0.338	0.438	0.288	0.888	0.783	0.287	0.288	0.788	0.84	0.582	0.948
50 Wisconsin	1.419	1.424	1.278	1.278	1.828	1.878	1.887	1.883	2.189	1.814	1.804	1.814	1.888	1.948	1.878
51 Wyoming	2.848	3.44	2.888	2.808	2.421	2.724	1.47	2.328	2.708	3.04	1.949	2.881	3.085	2.539	2.182
52 State average	1.388	1.472	1.473	1.488	1.808	1.883	1.883	1.732	1.888	1.78	1.821	1.883	1.785	1.875	1.949
53 State median	1.338	1.388	1.438	1.478	1.877	1.814	1.843	1.715	1.721	1.717	1.818	1.793	1.748	1.823	1.881
54 State SD	0.874	0.871	0.881	0.801	0.808	0.884	0.879	0.841	0.827	0.888	0.888	0.848	0.887	0.887	0.884
55 US	1.825	1.188	1.288	1.3	1.37	1.433	1.378	1.889	1.887	1.887	1.747	1.747	1.874	1.788	1.888

Showing 1 to 55 of 55 entries

Suggested citation: Center for Public Health Systems Science. (January 31, 2024). Early Hearing Detection and Intervention Data. <https://EHDdata.wustl.edu/>

Visit the [Data Description](#) page to learn more about the metrics and how the data were curated.



# FAQ

EHDI DATA HUB

[FAQ](#)

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## FAQ

When did you last update your data?



Where did you get this data?



Can I use information from this website?



Can I get a copy of the data you used in the figures?



I have other questions – can I reach out?



## FAQ

[Privacy/Security Statement](#)



Live website portion

# Explore

- Take a few minutes to explore the pages we just showed
- Pick a metric of interest to you
- Pick a metric you have not really looked at before



# Website exploration (II)

[EHDIdata.wustl.edu](http://EHDIdata.wustl.edu)



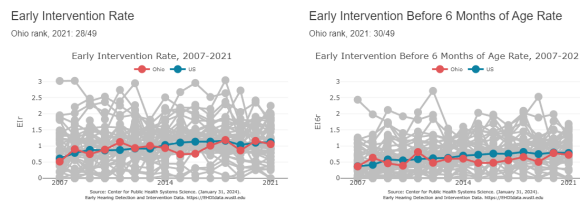
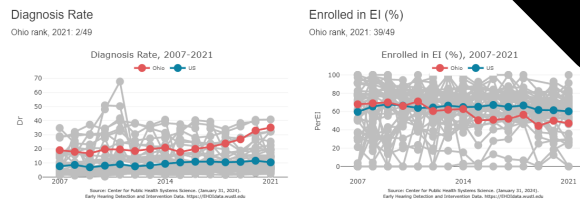
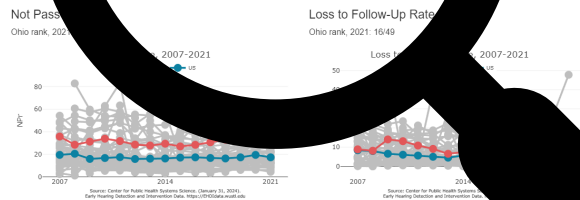
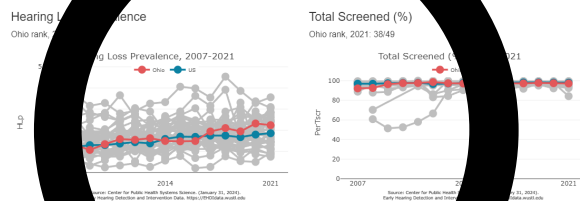


# State Profile

State: Ohio

## Ohio

130,424 BIRTHS, 2021  
 97.2% SCREENED: RANK 38/49  
 2.24 DIAGNOSED HEARING LOSS OUT OF 1000 SCREENED: RANK 17/49  
 1,057 ENROLLED IN EI (PART C AND NON-PART C) OUT OF 1000 SCREENED: RANK 28/49



State highlights shown for the latest year of available data. Rankings are based on only on the distribution of a metric where a higher rank means a higher value.

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State:

Ohio

## Ohio

130,424 BIRTHS, 2021

97.2% SCREENED: RANK 38/49

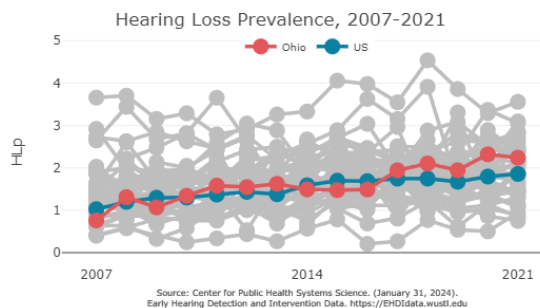
2.24 DIAGNOSED HEARING LOSS OUT OF 1000 SCREENED: RANK 17/49

1,057 ENROLLED IN EI (PART C AND NON-PART C) OUT OF 1000 SCREENED: RANK 28/49



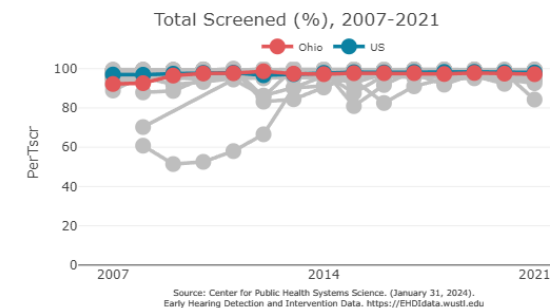
### Hearing Loss Prevalence

Ohio rank, 2021: 17/49



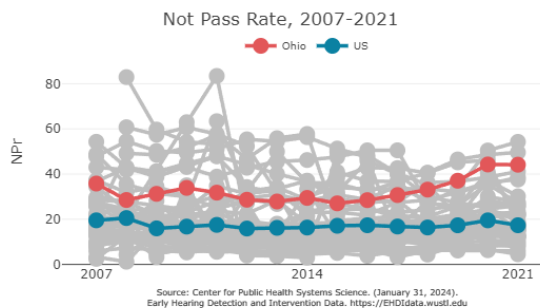
### Total Screened (%)

Ohio rank, 2021: 38/49



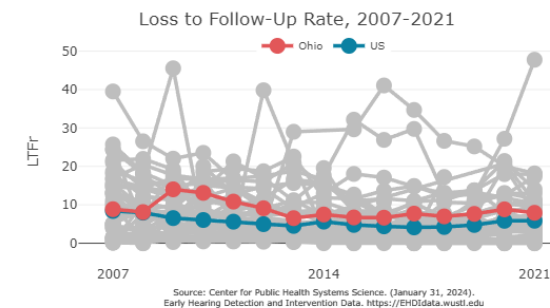
### Not Pass Rate

Ohio rank, 2021: 3/49



### Loss to Follow-Up Rate

Ohio rank, 2021: 16/49



# State Profile cont'd

State:

Ohio

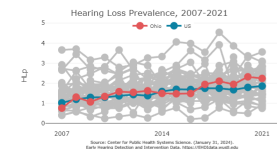
## Ohio

130,424 BIRTHS, 2021  
 97.2% SCREENED RANK 38/49  
 2.24 DIAGNOSED HEARING LOSS OUT OF 1000  
 SCREENED RANK 17/49  
 1,957 ENROLLED IN EI (PART C AND NON-PART C) OUT  
 OF 1800 SCREENED RANK 28/49



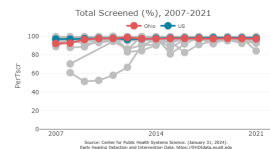
### Hearing Loss Prevalence

Ohio rank, 2021: 17/49



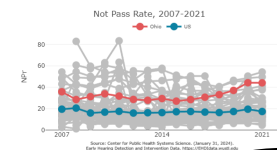
### Total Screened (%)

Ohio rank, 2021: 38/49



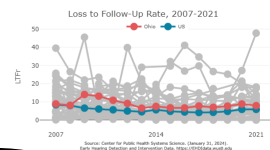
### Not Pass Rate

Ohio rank, 2021: 3/49



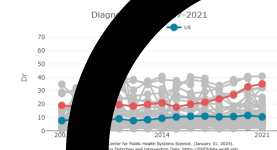
### Loss to Follow-Up Rate

Ohio rank, 2021: 16/49



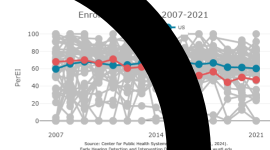
### Diagnosis Rate

Ohio rank, 2021: 2/49



### Enrolled in EI (%)

Ohio rank, 2021: 39/49



### Early Intervention Rate

Ohio rank, 2021: 28/49



### Early Intervention Before 6 Months of Age Rate

Ohio rank, 2021: 30/49

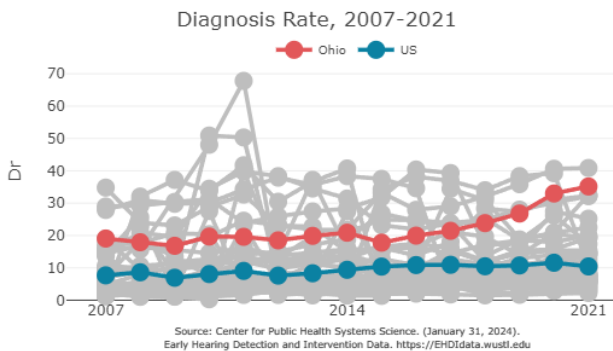


State highlights shown for the latest year of available data. Rankings are based on solely on the distribution of a metric where a higher rank means a higher value.

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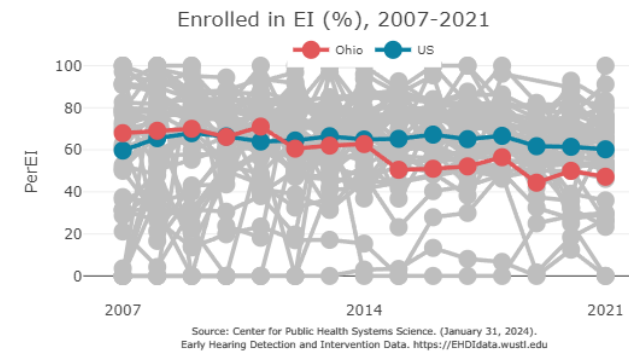
## Diagnosis Rate

Ohio rank, 2021: 2/49



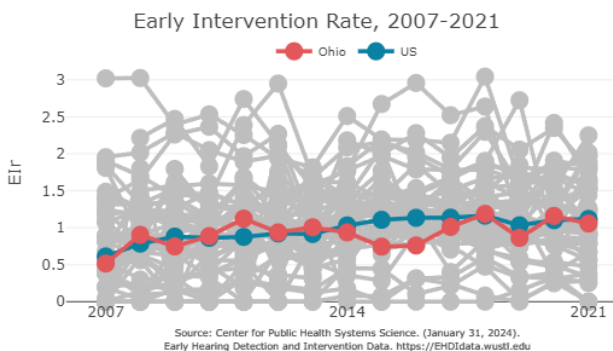
## Enrolled in EI (%)

Ohio rank, 2021: 39/49



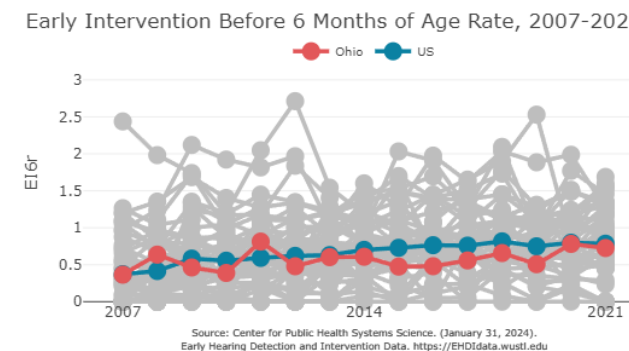
## Early Intervention Rate

Ohio rank, 2021: 28/49



## Early Intervention Before 6 Months of Age Rate

Ohio rank, 2021: 30/49



State highlights shown for the latest year of available data. Rankings are based on solely on the distribution of a metric where a higher rank means a higher value.

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# State-to-State Comparison

State: Missouri | Compare Missouri to: Illinois

**Missouri**  
 48,978 BIRTHS, 2021  
 97.8% SCREENED: RANK 31/49  
 1,872 DIAGNOSED HEARING LOSS OUT OF 1000 SCREENED: RANK 26/49  
 1,238 ENROLLED IN EI (PART C AND NON-PART C) OUT OF 1000 SCREENED: RANK 21/49

**Illinois**  
 128,891 BIRTHS, 2021  
 98.7% SCREENED: RANK 14/49  
 2,845 DIAGNOSED HEARING LOSS OUT OF 1000 SCREENED: RANK 5/49  
 1,524 ENROLLED IN EI (PART C AND NON-PART C) OUT OF 1000 SCREENED: RANK 17/49

**Hearing Loss Prevalence**  
 Missouri rank, 2021: 26/49  
 Illinois rank, 2021: 5/49

**Total Screened (%)**  
 Missouri rank, 2021: 31/49  
 Illinois rank, 2021: 14/49

**Not Pass Rate**  
 Missouri rank, 2021: 30/49  
 Illinois rank, 2021: 33/49

**Loss to Follow-Up Rate**  
 Missouri rank, 2021: 23/49  
 Illinois rank, 2021: 37/49

**Diagnosis Rate**  
 Missouri rank, 2021: 22/49  
 Illinois rank, 2021: 15/49

**Enrolled in EI (%)**  
 Missouri rank, 2021: 22/49  
 Illinois rank, 2021: 33/49

**Early Intervention Rate**  
 Missouri rank, 2021: 21/49  
 Illinois rank, 2021: 17/49

**Early Intervention Before 6 Months of Age Rate**  
 Missouri rank, 2021: 22/49  
 Illinois rank, 2021: 7/49

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State: Missouri

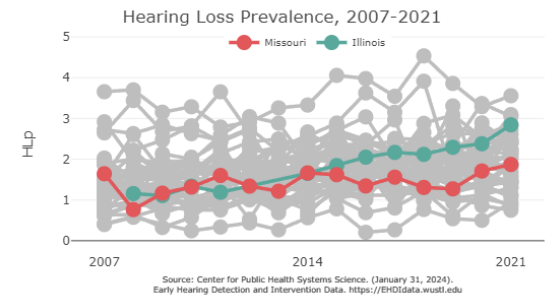
## Missouri

69,378 BIRTHS, 2021  
 97.8% SCREENED: RANK 31/49  
 1,872 DIAGNOSED HEARING LOSS OUT OF 1000 SCREENED: RANK 26/49  
 1,238 ENROLLED IN EI (PART C AND NON-PART C) OUT OF 1000 SCREENED: RANK 21/49



### Hearing Loss Prevalence

Missouri rank, 2021: 26/49  
 Illinois rank, 2021: 5/49



Compare Missouri to: Illinois

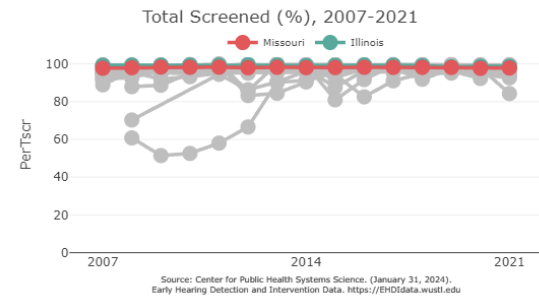
## Illinois

128,891 BIRTHS, 2021  
 98.7% SCREENED: RANK 14/49  
 2,845 DIAGNOSED HEARING LOSS OUT OF 1000 SCREENED: RANK 5/49  
 1,524 ENROLLED IN EI (PART C AND NON-PART C) OUT OF 1000 SCREENED: RANK 17/49



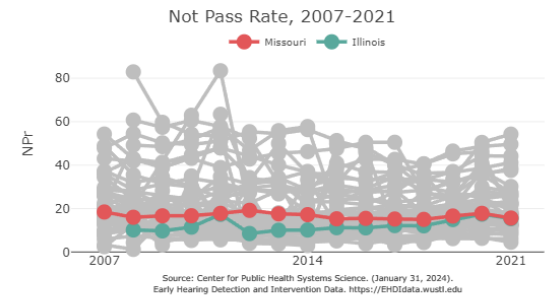
### Total Screened (%)

Missouri rank, 2021: 31/49  
 Illinois rank, 2021: 14/49



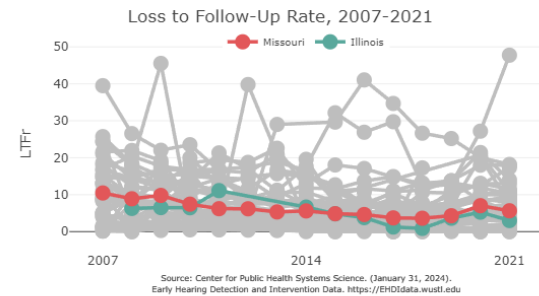
### Not Pass Rate

Missouri rank, 2021: 30/49  
 Illinois rank, 2021: 33/49



### Loss to Follow-Up Rate

Missouri rank, 2021: 23/49  
 Illinois rank, 2021: 37/49



# State-to-State Comparison Cont'd

State: Missouri

Compare Missouri to: Illinois

**Missouri**  
 69,378 BIRTHS, 2021  
 97.6% SCREENED RANK 31/49  
 1,872 DIAGNOSED HEARING LOSS OUT OF 1000 SCREENED RANK 26/49  
 1,236 ENROLLED IN EI (PART C AND NONPART C) OUT OF 1800 SCREENED RANK 11/49

**Illinois**  
 126,891 BIRTHS, 2021  
 99.7% SCREENED RANK 1/43  
 2,845 DIAGNOSED HEARING LOSS OUT OF 1000 SCREENED RANK 6/49  
 1,524 ENROLLED IN EI (PART C AND NONPART C) OUT OF 1,500 SCREENED RANK 17/49

**Hearing Loss Prevalence**  
 Missouri rank, 2021: 26/49  
 Illinois rank, 2021: 5/49

**Total Screened (%)**  
 Missouri rank, 2021: 31/49  
 Illinois rank, 2021: 1/43

**Not Pass Rate**  
 Missouri rank, 2021: 30/49  
 Illinois rank, 2021: 33/49

**Loss to Follow-Up Rate**  
 Missouri rank, 2021: 23/49  
 Illinois rank, 2021: 37/49

**Diagnosis Rate**  
 Missouri rank, 2021: 22/49  
 Illinois rank, 2021: 15/49

**Enrolled in EI (%)**  
 Missouri rank, 2021: 22/49  
 Illinois rank, 2021: 33/49

**Diagnosis Rate, 2007-2021**  
 Missouri rank, 2021: 22/49  
 Illinois rank, 2021: 15/49

**Enrolled in EI (%), 2007-2021**  
 Missouri rank, 2021: 22/49  
 Illinois rank, 2021: 33/49

**Not Pass Rate, 2007-2021**  
 Missouri rank, 2021: 30/49  
 Illinois rank, 2021: 33/49

**Loss to Follow-Up Rate, 2007-2021**  
 Missouri rank, 2021: 23/49  
 Illinois rank, 2021: 37/49

**Diagnosis Rate, 2007-2021**  
 Missouri rank, 2021: 22/49  
 Illinois rank, 2021: 15/49

**Enrolled in EI (%), 2007-2021**  
 Missouri rank, 2021: 22/49  
 Illinois rank, 2021: 33/49

**Early Intervention Rate, 2007-2021**  
 Missouri rank, 2021: 21/49  
 Illinois rank, 2021: 17/49

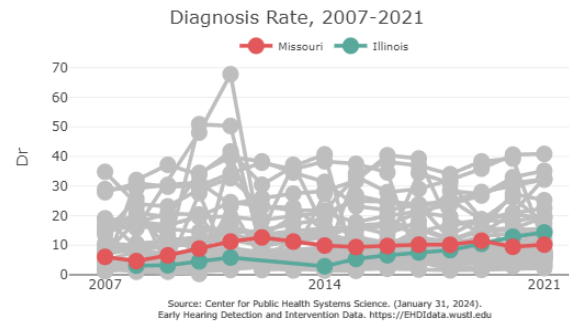
**Early Intervention Before 6 Months of Age Rate, 2007-2021**  
 Missouri rank, 2021: 22/49  
 Illinois rank, 2021: 7/49

Download a screenshot of this page.



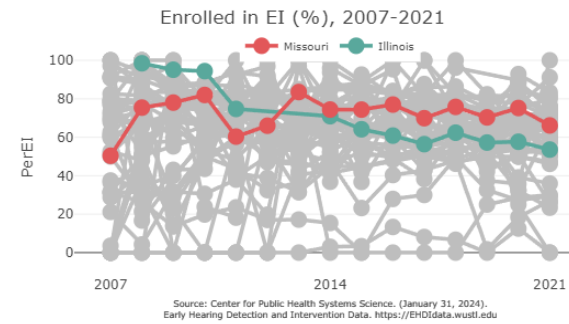
## Diagnosis Rate

Missouri rank, 2021: 22/49  
 Illinois rank, 2021: 15/49



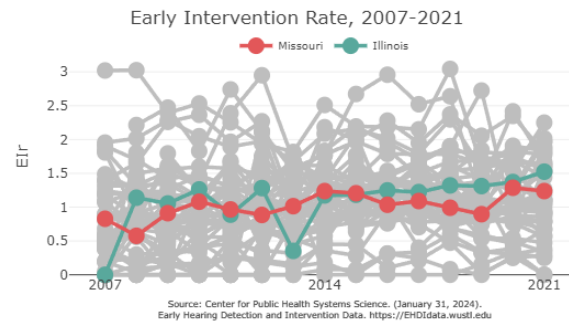
## Enrolled in EI (%)

Missouri rank, 2021: 22/49  
 Illinois rank, 2021: 33/49



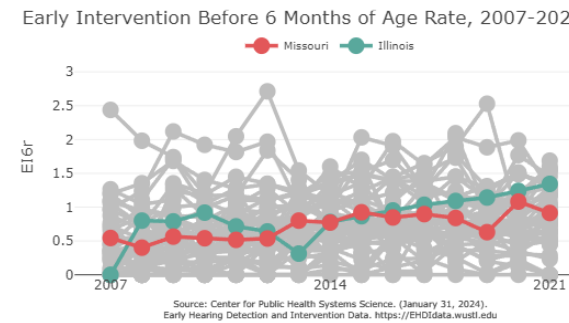
## Early Intervention Rate

Missouri rank, 2021: 21/49  
 Illinois rank, 2021: 17/49



## Early Intervention Before 6 Months of Age Rate

Missouri rank, 2021: 22/49  
 Illinois rank, 2021: 7/49



State highlights shown for the latest year of available data. Rankings are based on solely on the distribution of a metric where a higher rank means a higher value.

Download a screenshot of this page.



# Explore

- Take a few minutes to explore the pages we just showed
- Pick your state
- Pick a state that you think is like your state
- Pick a state you consider “gold standard”



# Open Discussion



# Housekeeping

- No one metric defines the program
- Website is a work in progress
- Share any feedback you have including errors, typos, unclear details (contact us page on the website)
- Quick evaluation of today's session:  
<https://tinyurl.com/EHDIdata>



QR code to evaluation



# Poster tomorrow

- **Poster 2: Key Metrics to Benchmark State-level Early Hearing Loss Detection and Intervention Programs**
  - Monday March 18
  - 12:00 PM – 1:45 PM
  - Centennial Foyer/Ballroom





# Contact Us

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