The Impact of COVID-19 on Newborn Hearing Screening and Early Intervention: A Five-year Comparison

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Objective

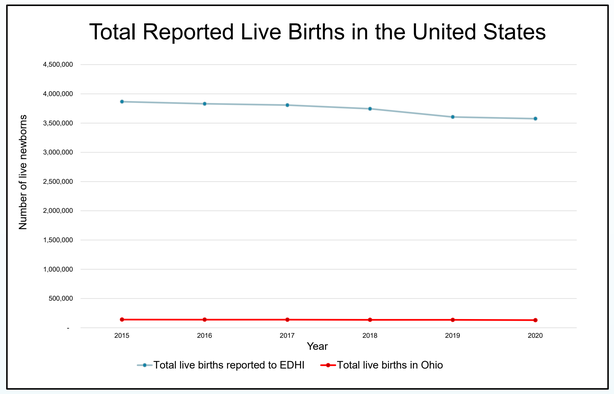
To compare the rates of newborn hearing screenings and referral to early intervention during the years 2015 to 2020. To assess the impact of COVID19 on newborn hearing screening rates and implementation of early intervention for hearing loss patients

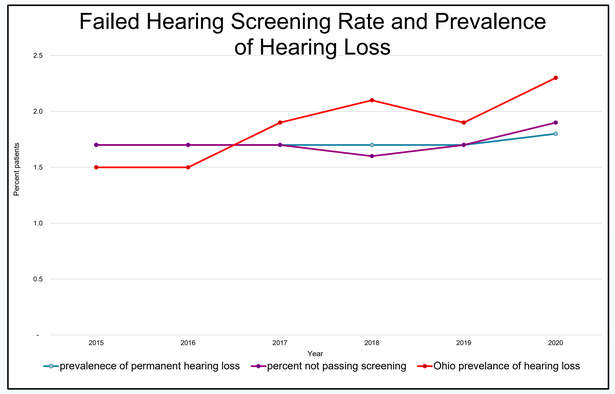
Methods

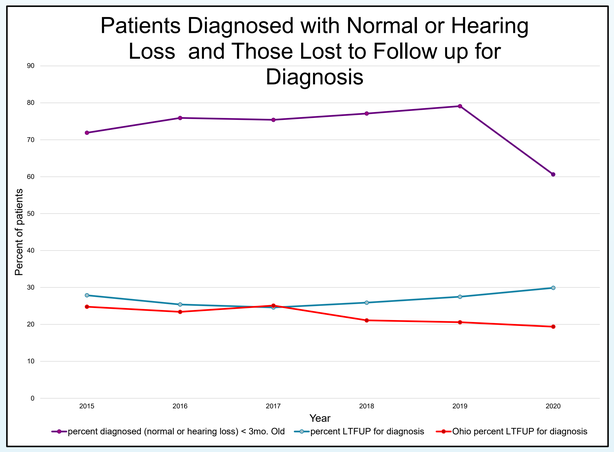
We collected data from the CDC (Center for Disease Control and Prevention) website which reported Early Hearing Detection and Intervention (EHDI) and Hearing Screening & Follow-up Survey (HSFS) data for each year from 2015 to 2020. We analyzed total live births, total patients screened, percent not passing screening, no documented screening, prevalence of permanent hearing loss, percent diagnosed overall, percent diagnosed with hearing loss, percent diagnosed overall less than 3 months old, percent lost to follow up for diagnosis, patients with hearing loss referred to early intervention, patients with hearing loss not referred to early intervention, percent enrolled in early intervention less than 6 months old, and percent lost to follow up for early intervention. These values were compared per year against the year 2020 on a national basis via 2-tailed x2-test (p-value ≤ 0.05).We also plotted Ohio's early hearing detection and intervention data against the national data.

Results

From 2015 to 2020, the total number of live births nationally decreased annually. The percentage of patients less than 1 month old screening for hearing loss improved from 95.5% to 97.2% from 2015 to 2020 (p-value=0.01). The percentage of patients that failed hearing screening was similar for each year, except for in 2020, the percent of patients that failed hearing screening increased to 1.9% compared to an average of 1.7% in prior years (p-value=0.04). The percentage of patients diagnosed overall with normal hearing or hearing loss significantly decreased in 2020 (60.6%) compared to prior years (average 75.9%) (p-value=0.02). The percentage of patients lost to follow up after diagnosis also significantly increased in 2020 (29.9%) compared to prior years (average 26.3%) (p-value=0.04). Patients documented with hearing loss referred to early intervention statistically decreased in 2020 (78.5%) compared to prior years (average 87.5%) (p-value=0.03). Ohio's data had similar trends as the national data over the past 4 years except for the prevalence of hearing loss increased to as high as 2.2 per 1,000 patients compared to a max of 1.8 per 1,000 nationally.







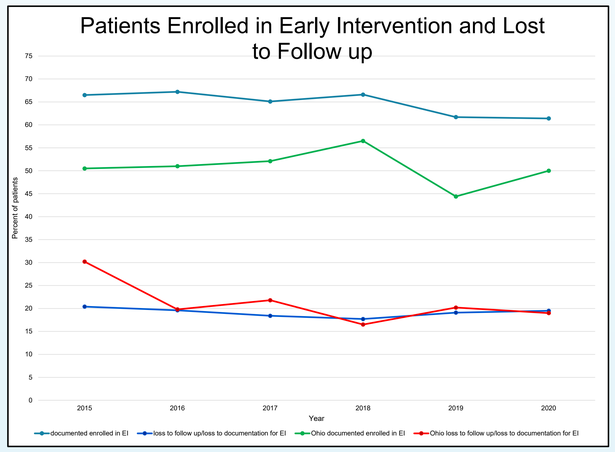


Table 1. Newborn Hearing Screening and Early Detection and Intervention National Data

	2020 (N/%)	2019 (N/%)	2018 (N/%)	2017 (N/%)	2016 (N/%)	2015 (N/%)	Average 2015-2019 (N/%)
Total Live births	3,576,050	3,604,761	3,744,815	3,807,656	3,830,526	3,866,820	3,770,916
Total Patients Screened	3,510,915 (98.2)	3,545,388 (98.4)	3,681,776 (98.3)	3,742,608 (98.3)	3,755,784 (98.0)	3,796,042 (98.2)	3,704,320 (98.0)
Patients Screened < 1 Mo. Old	3,413,238 (97.2)	3,463,600 (97.7)	3,571,658 (97.0)	3,632,795 (97.1)	3,559,949 (94.8)	3,624,044 (95.5)	3,570,409 (96.0)
Patients with no documented screening	65,135 (1.8)	59,373 (1.6)	63,039 (1.7)	65,048 (1.7)	74,742 (2.0)	70,778 (1.8)	66,596 (2.0)
Patients failing hearing screening	68,412 (1.9)	61,475 (1.7)	60,258 (1.6)	62,859 (1.7)	65,156 (1.7)	64,978 (1.7)	62,945 (2.0)
Prevalence of permanent hearing loss	1.8 per 1,000	1.7 per 1,000	1.7 per 1,000	1.7 per 1000	1.7 per 1000	1.7 per 1,000	1.72 per 1,000
Patients diagnosed overall (normal hearing or hearing loss)	42,031 (60.0)	38,127 (62.0)	38,634 (64.1)	40,987 (65.2)	40,835 (62.7)	39,468 (60.7)	39,610 (63.0)
Patients diagnosed overall < 3Mo. Old	25,466 (60.6)	30,170 (79.1)	29,799 (77.1)	30,908 (75.4)	30,983 (75.9)	23,013 (71.9)	28,975 (76.0)
Patients diagnosed LTFUP	20,970 (29.9)	16,893 (27.5)	15,581 (25.9)	15,449 (24.6)	16,522 (25.4)	18,126 (27.9)	16,514 (26.0)
Patients with hearing loss referred to EI	4,941 (78.5)	5,034 (84.8)	5,543 (86.2)	5,937 (90.8)	5,569 (87.9)	5,640 (87.6)	5,545 (87.0)
Patients with hearing loss NOT referred to EI	580 (9.2)	533 (9.0)	626 (9.7)	557 (8.5)	626 (9.9)	797 (12.4)	628 (10.0)
Patients enrolled in EI	3,863 (61.4)	3,662 (61.7)	4,286 (66.6)	4,254 (65.1)	4,260 (67.2)	4,285 (66.5)	4,149 (65.0)
Patients enrolled in EI < 6Mo. old	2,797 (72.4)	2,654 (72.5)	3,003 (70.1)	2,837 (66.7)	2,869 (67.3)	2,799 (65.3)	2,832 (68.0)
Patients LTFUP for EI	1,228 (19.5)	1,135 (19.1)	1,141 (17.7)	1,202 (18.4)	1,239 (19.6)	1,315 (20.4)	1,206 (19.0)

Key: LTFUP (lost to follow up); EI (early intervention); Mo. (months)

Table 2. Newborn Hearing Screening and Early Detection and Intervention Ohio Data

	2020 (N/%)	2019 (N/%)	2018 (N/%)	2017 (N/%)	2016 (N/%)	2015 (N/%)	Average 2015-2019 (N/%)
Total Live Births	130011	135116	135884	137515	138632	140125	116755
Total Patients Screened	126716 (97.5)	132162 (97.8)	132213 (97.3)	134423 (97.7)	135504 (97.7)	136938 (97.7)	132993 (97.6)
Patients Screened < 1 Mo. Old	125001 (98.6)	130185 (98.5)	130158 (98.4)	132414 (98.5)	133594 (98.6)	132308 (96.6)	130610 (98.2)
Patients with no documented screening	3295	2970	3687	3136	3200	3236	3254
Patients failing hearing screening	5608	4898	4308	4129	3857	3704	4417
Prevalence of hearing loss (per 1,000)	2.3	1.9	2.1	1.9	1.5	1.5	1.9
Patients diagnosed LTFUP	1118 (19.4)	1009 (20.6)	923 (21.1)	1036 (25.1)	901 (23.4)	919 (24.8)	984 (19.2)
Patients enrolled in EI	147 (50.0)	114 (44.4)	157 (56.5)	136 (52.1)	103 (51.0)	102 (50.5)	126.5 (50.8)
Patients enrolled in EI <6Mo. old	(67.3)	(58.8)	(55.4)	(55.1)	(63.1)	(65.0)	(60.8)
Patients LTFUP for EI	56 (19.0)	52 (20.2)	46 (16.5)	57 (21.8)	40 (19.8)	60 (30.2)	51.8 (21.3)

Key: LTFUP (lost to follow up); EI (early intervention); Mo. (months); (%)

Conclusion

There was a statistically significant difference in the percent of patients diagnosed overall, the percent of hearing loss and the percent lost to follow-up in the year 2020 compared to the prior 4 years indicating COVID19 had an impact on newborn hearing screening and referral to early intervention. The trends in the state of Ohio were fairly similar to the national trends except for having a higher prevalence of hearing loss. More study is needed to further assess the implications of hearing loss during the pandemic in the newborn population.

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