

Does Location Affect Lost to Follow Up?

Introduction/Background

The Virginia EHDI program is a federally funded program designed to improve the development of children with impaired hearing. The goal of the EHDI program is to have infants screened for congenital hearing loss by 1 month, identified/diagnosed with hearing loss by 3 months and assured enrollment in intervention services by 6 months. The stage of interest for this project is enrollment in early intervention services. Early Intervention (EI), more specifically Part C, services are designed to improve educational outcomes through the help of early interventionists.

Objective

The objective for this project are (1) to better understand the geographical landscape of children with hearing loss and (2) determine if EI enrollment is affected by distance from EI services.

Methods

Data Source: Virginia Infant Screening and Infant Tracking System (2009-2015) and Virginia Electronic Birth Certificate Records (EBC) (2009-2015).

Study Population: All infants diagnosed with permanent hearing loss between the years 2009 and 2015 in the state of Virginia.

Study Outcome: (1) The location of children with permanent hearing loss cases (2) EI enrollment percentages for each region from 2009 to 2015.

Statistical Analysis: EI enrollment percentages: Number of infants enrolled in EI / Number of children diagnosed with permanent hearing loss.

Network Analysis: This multi step process started with the abstraction of all permanent hearing loss cases from the years 2009 to 2015. Using EBC derived addresses, each hearing loss case was geocoded and mapped using ArcMap 10.4. After determining the location for all permanent hearing loss cases, all Early Intervention sites were geocoded. Using the Network Analysis extension with ArcGIS, a 15 minute, 30 minute and 45 minute drive time distance were drawn based on current road networks and speed limits. Within each drive time representative distance, both total hearing loss cases and infants enrolled in EI were counted and a rate was determined using (children enrolled in EI) / (children diagnosed with permanent hearing loss).

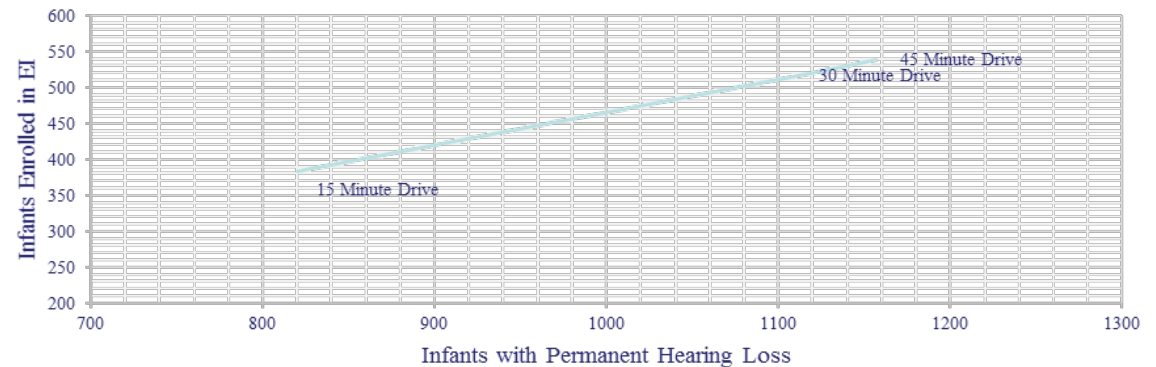


Results

- Total Enrolled in EI over 7 years is 549 children
- Total Infants Diagnosed with Permanent Hearing Loss is 1197
- Enrollment Rate appears to be monotonically increasing .
- 70.8% of children with permanent hearing loss and 71.1% of children enrolled in EI services are within a 15 minute drive of the closest EI facility.
- 95.9% of children with permanent hearing loss and 96.7% of children enrolled in EI services are within a 30 minute drive of the closest EI facility.
- 99.6% of children with permanent hearing loss and 98.2% of children enrolled in EI services are within a 45 minute drive of the closest EI facility.

Conclusion

Location does not appear to affect EI enrollment. This conclusion is based on the monotonicity of the rate of enrollment. Out of the total cases of permanent hearing loss and total infants enrolled in EI, the majority of these cases are within a 15 minute drive to the closest EI facility but given that the rate (total enrolled in EI/total diagnosed with hearing loss) is the same for all 3 drive time distances, we can conclude that distance from EI facility does not appear to affect EI enrollment.



Drive Time	Number of Children with Permanent Hearing Loss	Number of Children Enrolled in EI services	Enrollment Rate (Infants Enrolled/Infants with Permanent Hearing Loss)
15 minutes	820	383	46.7%
30 minutes	1110	516	46.5%
45 minutes	1157	539	46.6%