

# Impact of the Pandemic on 3<sup>rd</sup> Grade Reading Levels for Children who are Deaf/Hard of Hearing: Is EI by 6 months protective?

Jareen Meinzen-Derr, **Susan Wiley**, Elodie Betances



Department of  
Developmental Disabilities



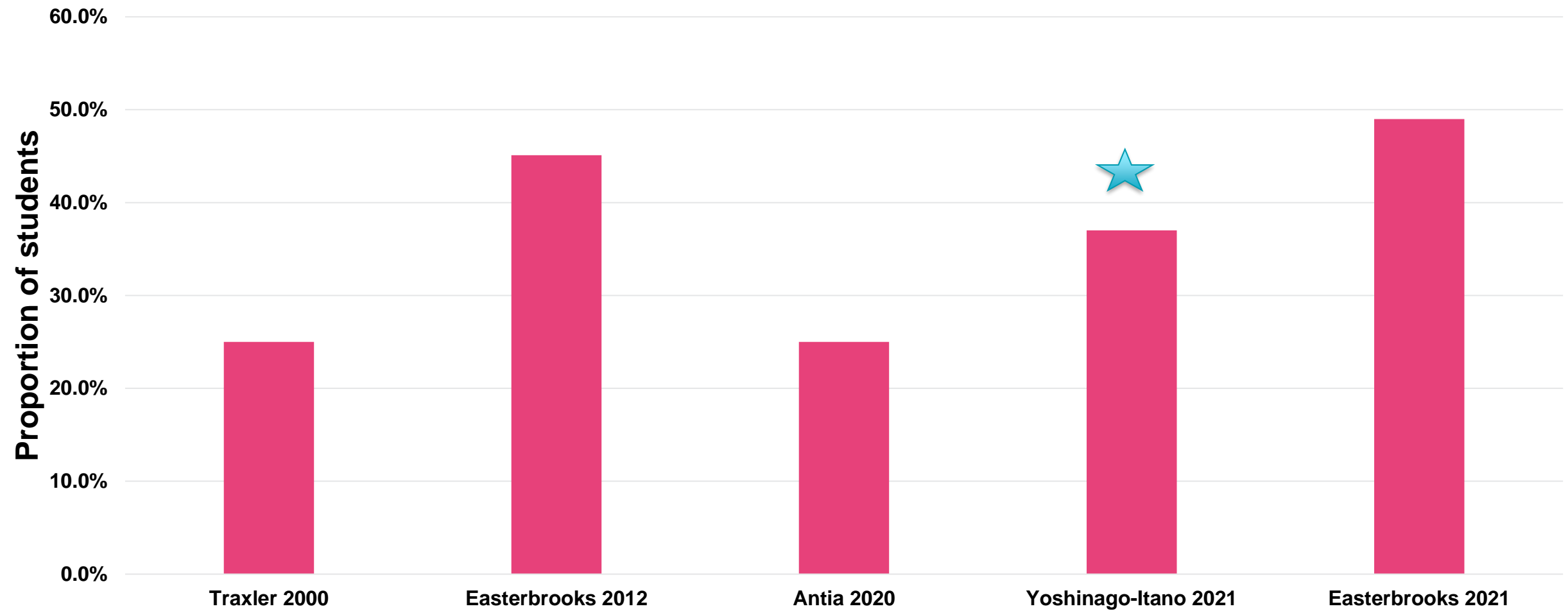
# Disclosure

- No financial disclosures
- Research funded by CDC-funded Disability Research and Dissemination Center grant U01DD001007 and U19DD001218; NIDCD R01DC018550

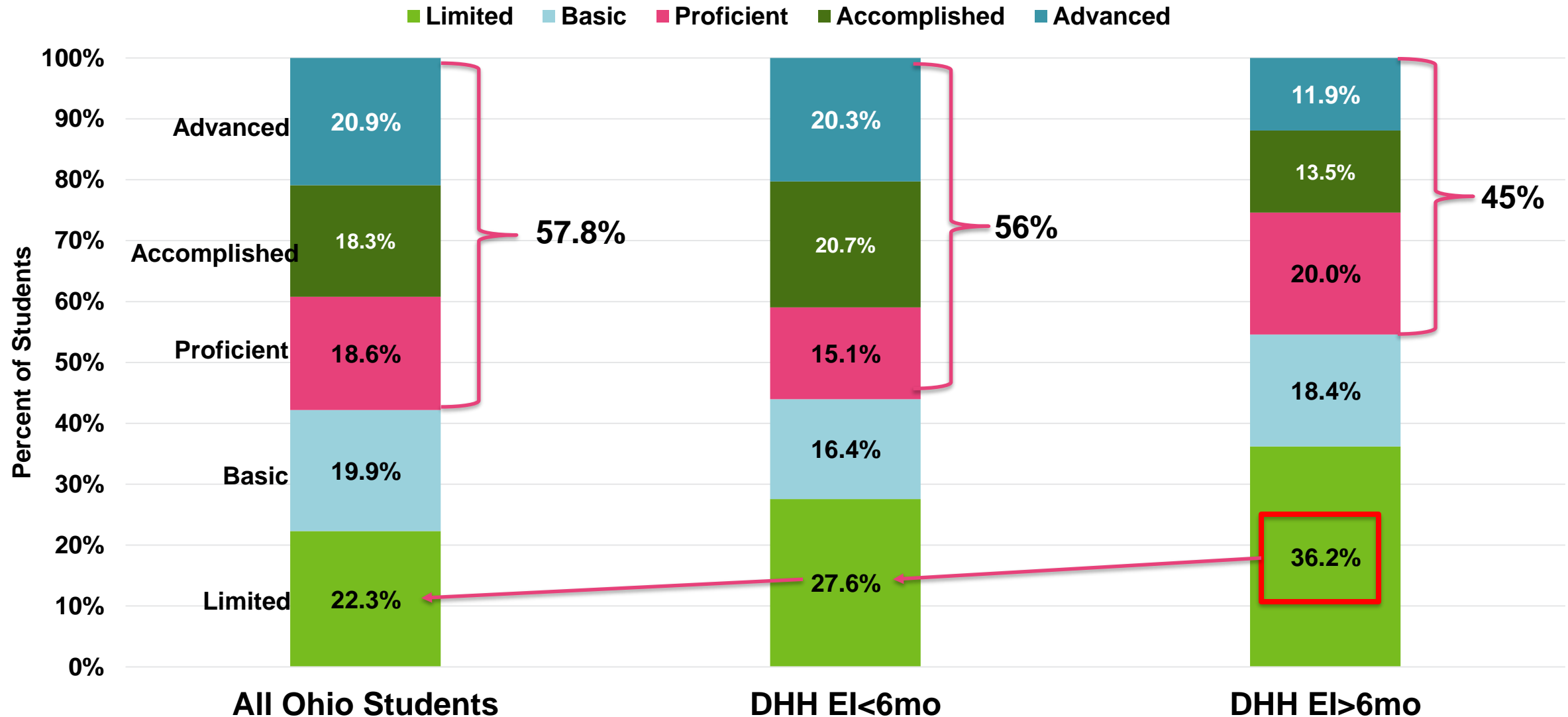
# Early Intervention and Literacy in DHH

- EHDI benchmarks screening by 1 month, diagnosis by 3 months, Early Intervention (EI) by 6 months
    - Majority of evidence supports early access to EI and language development in first 36 months
  - Emerging evidence suggests early EI enrollment is associated with pre-literacy skills in preschool and kindergarten readiness
    - *Meinzen-Derr et al 2020; Meinzen-Derr et al 2022*
  - Literacy is important to access information across all aspects of our lives.
    - Critical for full participation in education and employment
- 
- Literacy skills need to explicitly be taught

# Reading proficiency among young DHH students



# Reading proficiency of DHH 3<sup>rd</sup> graders who received EI and for all Ohio students



# Impact of pandemic on literacy

- Abrupt school closures in spring of 2020 led to a stall in basic reading skills for all children
  - Lower SES background had lower reading scores after a year of remote learning
- Recovery did not make up initial loss
  - Disparity in reading scores doubled between low and high SES groups
- Remote learning solutions were often inadequate, failing to meet needs of all students, especially those requiring specialized support

# Impact of pandemic on literacy

- Students experienced a notable decline in reading skills, reflecting a loss of roughly one-third of a year's learning
- Kindergarten and preschoolers saw a significant slowdown, with a 31% decrease in reading growth
- Oral reading fluency diminished for 2nd and 3rd graders, particularly within specific subgroups
- The pandemic exacerbated existing reading skill gaps, almost doubling the disparities

*Ludewig et al, 2022 Frontiers in Psychology, 13; Dell et al, 2021 AERA Open, 8; Shaul et al, 2024 Frontiers in Psychology, 15*

# Objective

**Evaluate the impact of the pandemic on reading among DHH 3<sup>rd</sup> graders**

**Evaluate whether this differed by early intervention enrollment age**



# Methods – Ohio birth cohort

- This study leverages the Ohio EHDI Data Linkage Project of **1262 DHH Infants (born 2008-2014) and enrolled in EI**
  - Hearing screening and birth data, EI data, Educational records from preschool to 5<sup>th</sup> grade
- Analysis included data on 417 DHH had completed 3<sup>rd</sup> grade; 56% (232) who enrolled in EI by age 6 months
- Defined pre-pandemic 2016-2019 and pandemic 2020-2021

# Reading proficiency assessment in Ohio

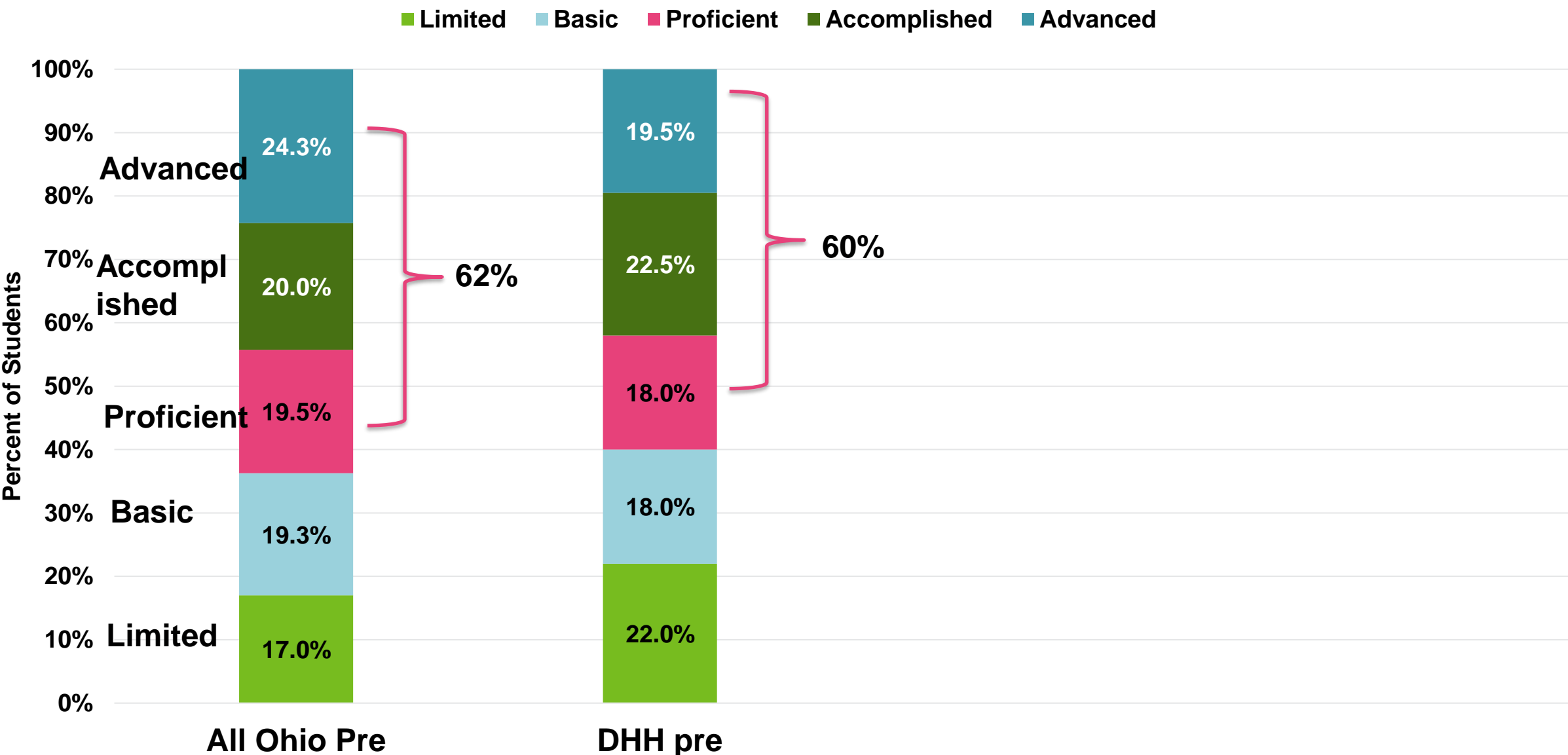
- Every district and school in Ohio must administer standardized reading diagnostic assessment by Sept 30 for grades 1-3 (test is also taken in Spring)
- State-approved list or state-developed diagnostic tool
  - Assess informational and foundational skills
    - Key ideas and details, fluency, phonics and word recognition
- Limited → Basic → Proficient → Accomplished → Advanced

# Characteristics of DHH 3rd Graders

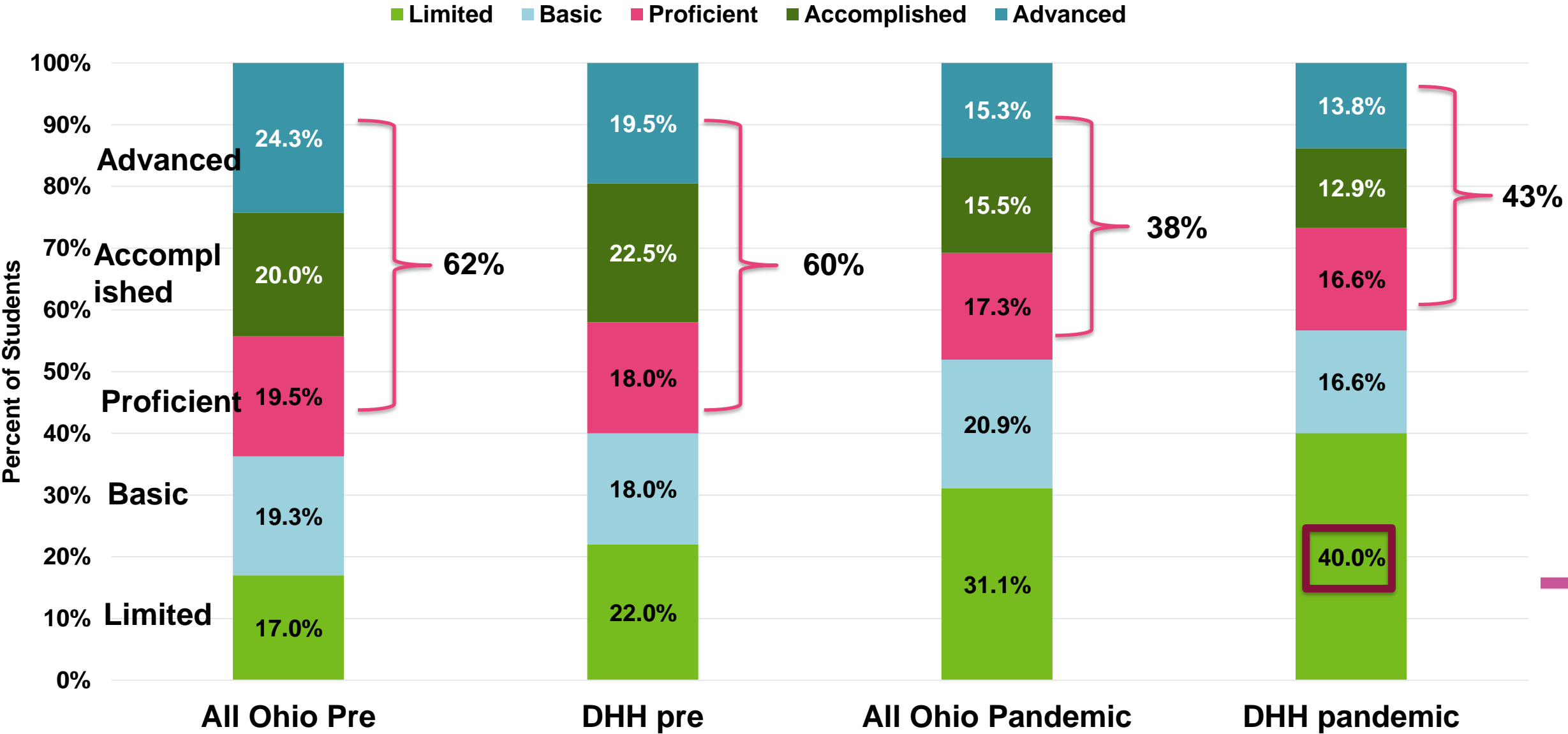
Characteristic	Enrolled EI Early N=232 (55.6%)	Enrolled EI Later N=185 (44.4%)	p-value
Gender at birth, Female – n (%)	104 (44.8%)	90 (48.7%)	0.44
Race			0.12
Black/African American	25 (10.8%)	31 (16.8%)	
White	197 (84.9%)	140 (75.7%)	
Other*	6 (2.6%)	9 (4.9%)	
Unknown	4 (1.7%)	5 (2.7%)	
Ethnicity, Hispanic –n(%)	3 (1.3%)	4 (2.2%)	0.7
Premature birth -n(%)	45 (19.9%)	36 (20.1%)	0.96
Age hearing difference confirmed-median [IQR]	2.3 [1.4-4.4]	6.1 [3.4-13.5]	<0.001
Has risk indicator for hearing difference - n (%)	106 (45.7%)	60 (32.4%)	0.006
Developmental delay in at least one of 5 domains n(%)	41 (17.7%)	48 (26.0%)	0.04
Disability diagnosis -n(%)	82 (35.3%)	33 (17.8%)	<0.001
Parent has some college education – n(%)	155 (66.8%)	84 (56%)	0.002
Receive private insurance -n(%)	142 (63.7%)	86 (48.3%)	0.002
Bilateral hearing difference -n (%)	168 (72.4%)	149 (80.5%)	0.05
Severe to profound hearing levels -n(%)	78 (33.6%)	51 (27.6%)	0.18

\*Asian, Middle Eastern, Pacific Islander

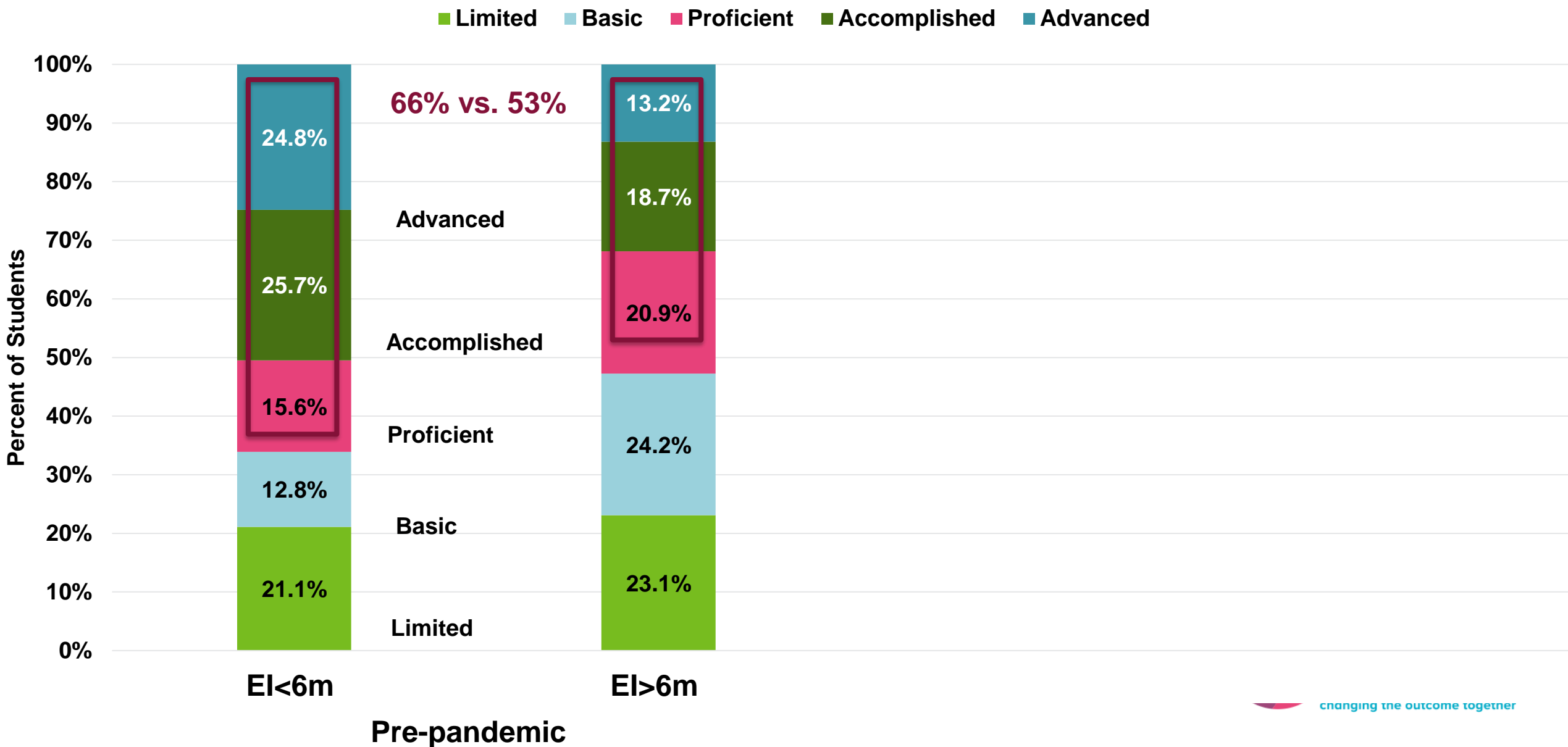
# Reading for all Ohio 3<sup>rd</sup> graders by pandemic era



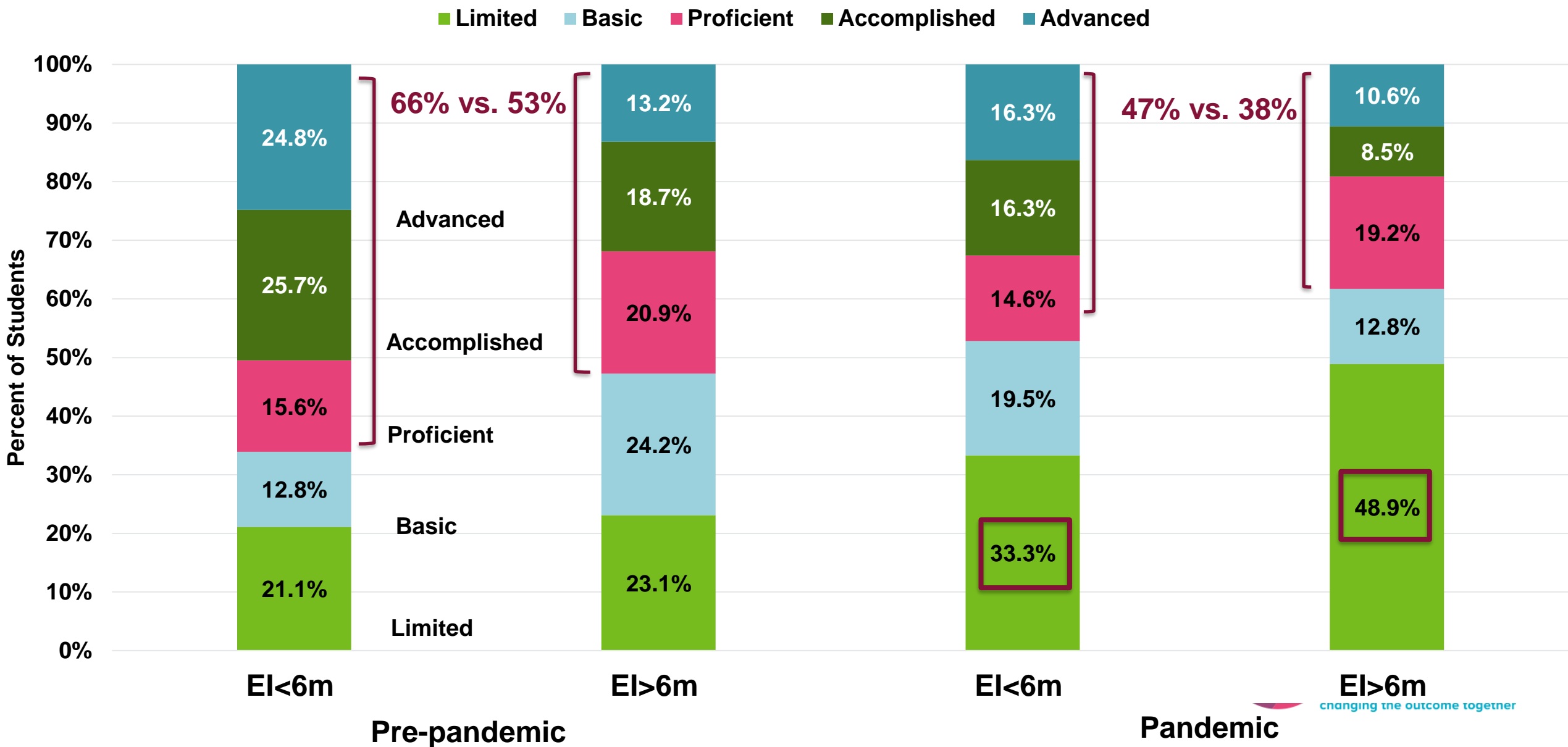
# Reading for all Ohio 3<sup>rd</sup> graders by pandemic era



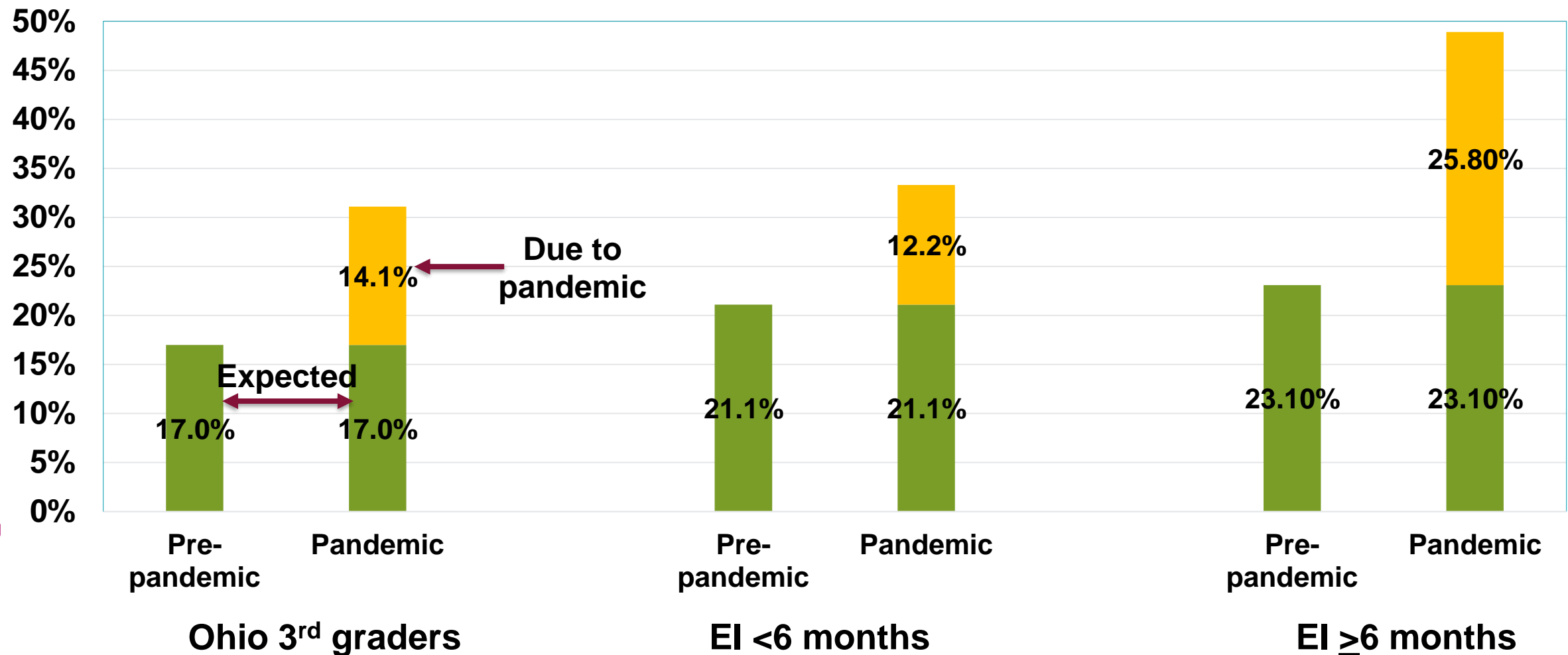
# Reading for DHH Ohio 3<sup>rd</sup> graders by pandemic era



# Reading for DHH Ohio 3<sup>rd</sup> graders by pandemic era

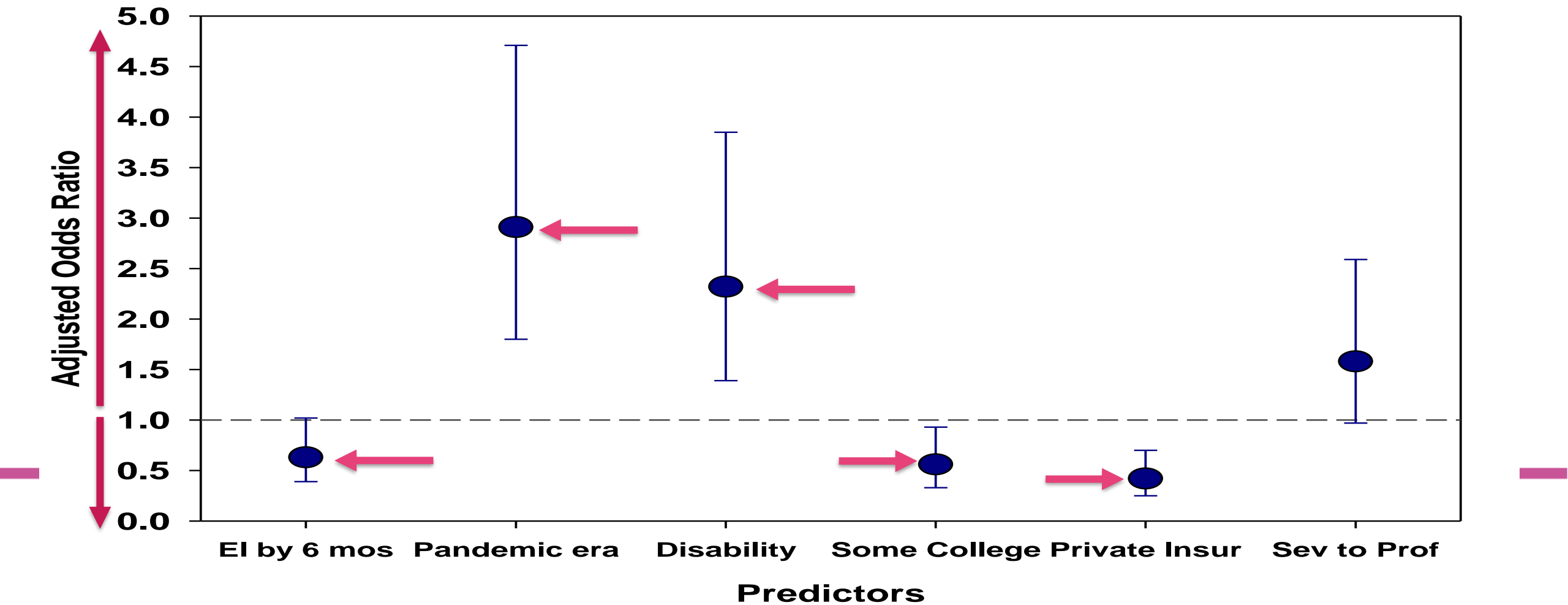


# Limited Reading Level as a Function of EI Age

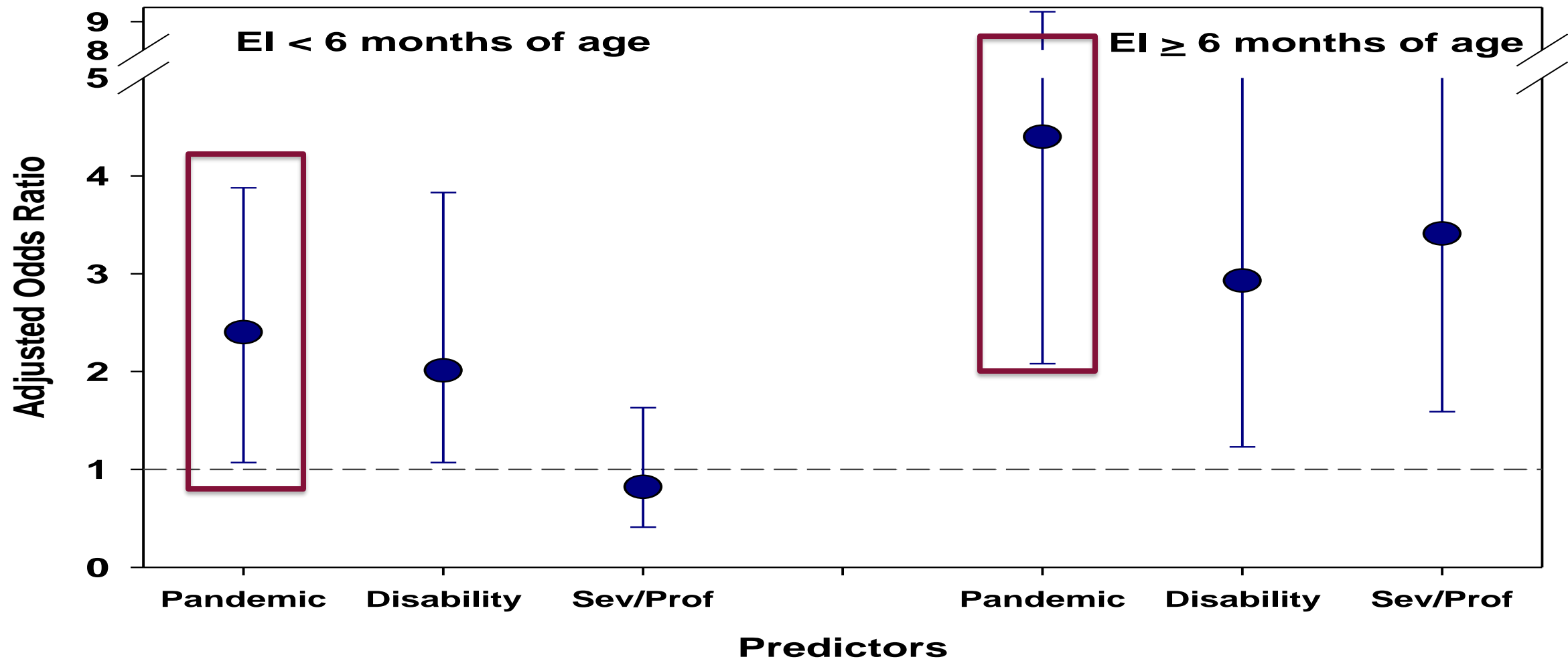




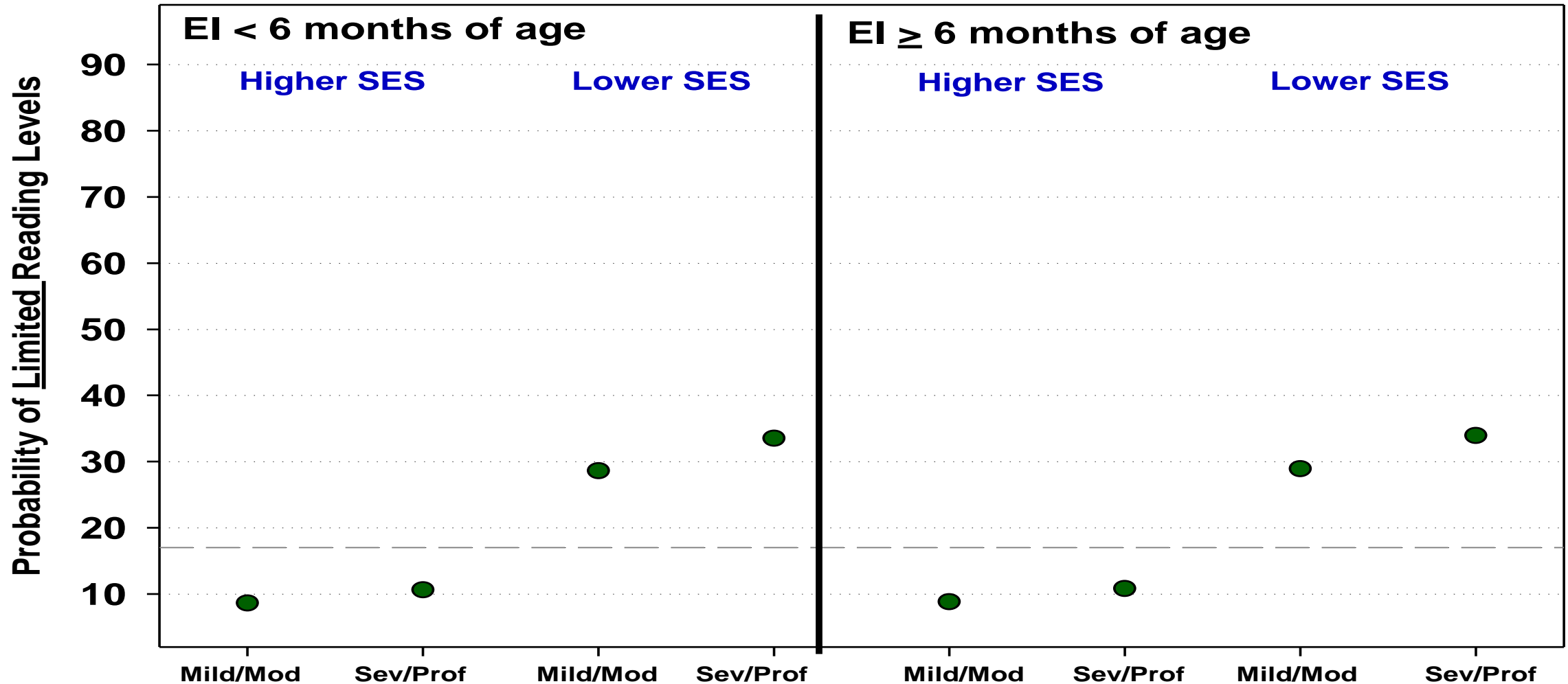
# Factors associated with limited reading proficiency



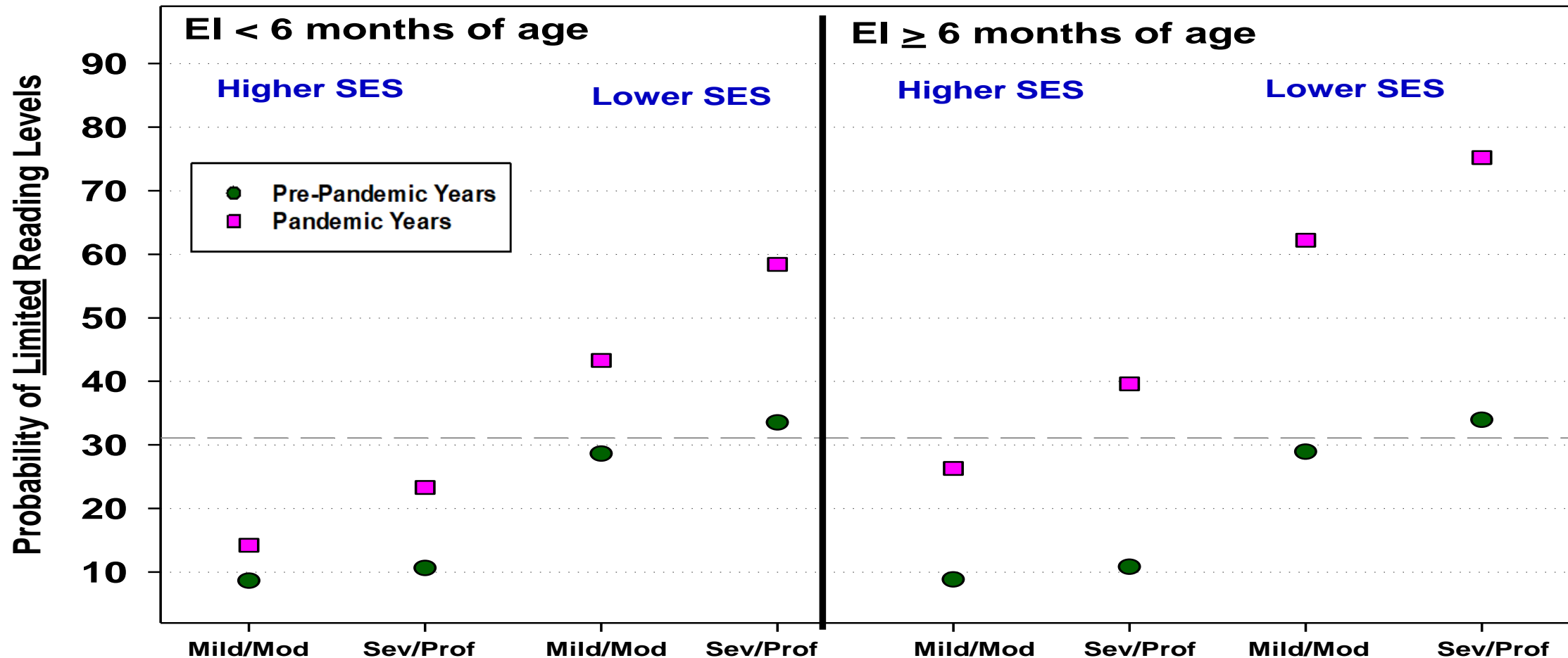
# Impact of pandemic by enrollment age



# Estimated probabilities of limited reading proficiency during pre-pandemic era



# Estimated probabilities of limited reading proficiency for pre-pandemic and pandemic eras



# Limitations

- Dichotomized EI entry at 6 months (not look at ideal cutoffs)
- Lacking information on
  - use of hearing technologies
  - classroom specifics
  - Language access
  - Hearing differences
- No great information on true SDoH (just poor proxies with parental education, insurance status)

# In summary

- Children who had enrolled in EI after 6 months of age had a high risk of limited reading proficiency in 3<sup>rd</sup> grade
- Other factors, such as degree of hearing differences, disability, social determinants of health play a role in outcomes
- Evaluating long-term outcomes is vital as gaps may widen

# Finally

- Consider what is in our sphere of influence - how can we get more children to benefit from early EI access
- Consider staying curious with families so we can help support families where they are



[jareen.meinzen-derr@cchmc.org](mailto:jareen.meinzen-derr@cchmc.org)