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Elevated Blood Lead Levels as Eligibility Criteria for Early Intervention Programs

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Contents

Introduction

The Campbell family moved to an apartment in the Bronx, New York.[1] After living there for about one year, the Campbell children, Jazmin, Alteasha, and Clarence, recorded blood lead levels ranging from eighteen to twenty-two micrograms per deciliter—levels classified as "lead poisoning" at the time.[2] Once the children began suffering from severe health issues such as attention deficit disorder, developmental delays, and decreases in IQ, Faith Campbell, their mother, brought an action against the owners of the New York building, alleging that deteriorating lead paint caused the deficits.[3] The Second Circuit Court of Appeals decision ultimately favored the Campbells, but the court

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1. Campbell *ex rel.* Campbell v. Metro. Prop. & Cas. Ins. Co., 239 F.3d 179, 180 (2d Cir. 2001).

2. *Id.*

3. *Id.* at 181.

only awarded $300,000 in total to the three children—a sum which was intended to compensate for a lifetime developmental and educational deficits.[4] Even if this amount could adequately compensate the Campbells or any other families for the long-term effects of early lead exposure, relying on the court system to compensate lead-exposed children creates additional problems.[5]

The city of Flint, Michigan gained national attention when public health officials, in cost-cutting efforts, failed to treat corrosive river water that ultimately ended up as highly lead-contaminated drinking water in thousands of homes.[6] However, Flint is not a unique case: thousands of geographic areas in the United States have higher rates of childhood lead poisoning than Flint did at the peak of this crisis in 2014 and 2015,[7] including regions around Cleveland, Ohio.[8]

While prevention from early lead exposure is ideal, prevention efforts frequently fail, as evidenced by the prominence of elevated blood lead levels in American children.[9] The long-term consequences of even minimal early lead exposure are highly detrimental to young children.[10]

4. *Id.* at 187.

5. *See generally* Laura Greenberg, *Compensating the Lead Poisoned Child: Proposals for Mitigating Discriminatory Damage Awards*, 28 B.C. Env't Aff. L. Rev. 429 (2001) (describing the flaws in the judicial damage award system for lead-exposed children who have no current loss of earnings and an injury from exposure that is not yet fully determined).

6. *See* Melissa Denchak, *Flint Water Crisis: Everything You Need to Know*, NRDC (Nov. 8, 2018), https://www.nrdc.org/stories/flint-water-crisis-everything-you-need-know#sec-summary [https://perma.cc/HF4X-7GU6].

7. M.B Pell & Joshua Schneyer, *Reuters Finds 3,810 U.S. Areas with Lead Poisoning Double Flint's*, Reuters (Nov. 14, 2017), https://www.reuters.com/article/us-usa-lead-map/reuters-finds-3810-u-s-areas-with-lead-poisoning-double-flints-idUSKBN1DE1H2 [https://perma.cc/9NUK-S4FM].

8. *See Looking for Lead*, Reuters, https://www.reuters.com/investigates/graphics/lead-water/en/ [https://perma.cc/XS57-S5S3] (last visited January 29, 2021).

9. *See* Pell & Schneyer, *supra* note 7; *see generally* Leland F. McClure et al., *Blood Lead Levels in Young Children: US, 2009-2015*, 175 J. Pediatrics 173 (2016) (indicating that 3% of surveyed American children under the age of 6 had "high" or "very high" blood lead levels).

10. *See* Christine Waternaux, Nan M. Laird, & James H. Ware, *Method for Analysis of Longitudinal Data: Blood Lead Concentrations and Cognitive Development*, 84 J. Am. Statistical Assoc. 33, 33 (1989); *see also* G.O.B. Thompson et al., *Blood-Lead Levels and Children's Behaviour – Results from the Edinburgh Lead Study*, 30(4) J. Child Psych. & Psychiatry 515, 515 (1989) (determining that higher blood lead levels are associated with aggressive, antisocial, and hyperactive activity); Phil A. Silva et al., *Blood Lead, Intelligence, Reading Attainment, and Behaviour in Eleven Year Old Children in Dunedin, New Zealand*, 29 J. Child Psych. & Psychiatry 43, 51 (1988); John Paul Wright et al., *Association of*

The well-known effects on educational outcomes and academic performance are particularly alarming.[11] For this reason, this Note argues for a more widespread use of state early intervention programs as not only a legal remedy for lead-exposed children but also as a way to potentially mitigate adverse educational effects.

This Note discusses how states can, and already do, implement the Individuals with Disabilities Education Act ("IDEA")[12] to mitigate the educational deficits associated with early lead exposure in infants and toddlers. Part I of this Note provides an overview of childhood lead exposure in the United States, including how exposure occurs. Part II explains the educational deficits and adverse academic outcomes connected with early lead exposure.

Part III introduces the IDEA. It discusses the purpose of the law and the IDEA's statutory requirements for Part C implementation at the state level. Part III also reviews national outcomes data and advocates for the use of the IDEA Part C Early Intervention services to mitigate the educational deficits lead-exposed children experience.

Part IV reviews how states incorporate, or fail to incorporate, early lead exposure into IDEA Part C eligibility criteria for infants and toddlers. Part IV then highlights how allowing states to create their own eligibility standards provides different levels of program accessibility for lead-exposed infants and toddlers. Part V argues that all states should model their Part C eligibility criteria after Ohio's approach in order to create automatic eligibility for all lead-exposed infants and toddlers. Part V also addresses one potential critique on the proposal of offering automatic eligibility for all lead-exposed infants and toddlers.

I. Early Lead Exposure

Early childhood lead exposure is a significant problem in the United States.[13] The Centers for Disease Control ("CDC") now estimates that 500,000 children between ages one and five have levels of exposure

Prenatal and Childhood Blood Lead Concentrations with Criminal Arrests in Early Adulthood, 5 PLoS Med. 732, 733 (2008); Aaron Reuben et al., *Association of Childhood Lead Exposure with Adult Personality Traits and Lifelong Mental Health*, 76 JAMA Psychiatry 418, 422-23 (2019).

11. *See* Herbert L. Needleman et al., *The Long-Term Effects of Exposure to Low Doses of Lead in Childhood: An 11-Year Follow-Up Report*, 322 New Eng. J. Med. 83, 83 (1990); *see also* David M. Fergusson, John Horwood, & Michael T. Lynskey, *Early Dentine Lead Level and Educational Outcomes at 18 Years*, 38 J. Child Psych. & Psychiatry 471, 473 (1997).

12. 20 U.S.C. § 1400 *et seq.*

13. *See Blood Lead Levels in Children*, Ctrs. for Disease Control & Prevention, https://www.cdc.gov/nceh/lead/prevention/blood-lead-levels.htm [https://perma.cc/QE89-PJ2A] (last visited Oct. 9, 2021).

above three and one half micrograms of lead per deciliter of blood ("mcg/dL").[14] The CDC recently revised its standards for childhood lead exposure to declare that there is no safe level of lead exposure for children.[15] Until 2012, the CDC used a blood lead level of 10 mcg/dL as the "level of concern" for children.[16] Then, the CDC used five mcg/dL as a reference level to identify children with blood lead levels that are higher than those of most other children in the United States.[17] Five mcg/dL was used until very recently, in October 2021, when the CDC updated its reference level to 3.5 mcg/dL.[18] This updated, decreased reference level will result in more children identified as having elevated lead levels and at risk for associated complications.[19]

Because a major source of exposure is the home, lead exposure can begin prenatally.[20] Postnatally, childhood lead exposure commonly occurs from contact with deteriorated household debris, contact or ingestion of contaminated soil, and drinking water contamination.[21] The older the home is, the more likely it is to have walls and surfaces coated with lead-based paint.[22] When lead-based paint deteriorates, it becomes an exposure hazard for children who ingest the paint chips from walls or windowsills or come in contact with soil contaminated with paint debris.[23] Lead exposure occurs through drinking water when pipes or other plumbing materials containing lead corrode.[24] Corrosion of the

14. *The Number of Young Children With Lead Poisoning May Be About to More Than Double*, NPR (Oct. 28, 2021), https://www.npr.org/2021/10/28/1050200076/children-lead-poisoning-cdc-new-standards [https://perma.cc/RQE4-JBZL].

15. *Blood Lead Levels in Children*, *supra* note 13.

16. *See* CTRS. FOR DISEASE CONTROL & PREVENTION, GUIDELINES FOR THE IDENTIFICATION AND MANAGEMENT OF LEAD EXPOSURE IN PREGNANT AND LACTATING WOMEN (Andrew S. Ettinger & Anne Guthrie Wengrovitz, eds., 2010) [hereinafter GUIDELINES].

17. *Blood Lead Levels in Children*, *supra* note 13.

18. *CDC's Blood Lead Reference Value*, CTRS. FOR DISEASE CONTROL & PREVENTION (Oct. 27, 2021), https://www.cdc.gov/nceh/lead/data/blood-lead-reference-value.htm [https://perma.cc/HW63-445T].

19. *See id.*

20. *See* GUIDELINES, *supra* note 16, at 35.

21. *See Sources of Lead Exposure*, CTRS. FOR DISEASE CONTROL & PREVENTION, https://www.cdc.gov/nceh/lead/prevention/sources.htm [https://perma.cc/CDS7-YJBW] (last visited Oct. 9, 2021).

22. *Protect Your Family from Sources of Lead*, ENV'T PROT. AGENCY, https://www.epa.gov/lead/protect-your-family-sources-lead [https://perma.cc/ZBY2-ZSXE] (last visited Oct. 9, 2021).

23. *Id.*

24. *Basic Information about Lead in Drinking Water*, ENV'T PROT. AGENCY, https://www.epa.gov/ground-water-and-drinking-water/basic-

plumbing is more likely if the water passing through has a high acidity or a low mineral content.[25] While inside the home is a major source of lead exposure, other aspects of a child's environment, such as yards, school, toys, and playgrounds, can result in exposure as well.[26]

II. Educational Deficits Associated with Lead Exposure

Early lead exposure has a variety of associated adverse behavioral,[27] cognitive,[28] and neurological[29] effects that begin in early childhood and that can continue into adulthood if left unaddressed. Most relevant to this Note are the educational deficits associated with early lead exposure. Even low levels of lead exposure are linked with decreased Intelligence Quotients ("IQs"),[30] worsened reading and math scores,[31] and overall poorer academic performance,[32] among other problems.

Herbert Needleman, a prominent scholar on the educational and intellectual effects of childhood lead exposure,[33] and his colleagues

information-about-lead-drinking-water#getinto [https://perma.cc/U5GJ-7L8W] (last visited Oct. 9, 2021).

25. *Id.*

26. *Protect Your Family from Sources of Lead*, *supra* note 22.

27. *See* Joe M. Braun et al., *Exposures to Environmental Toxicants and Attention Deficit Hyperactivity Disorder in U.S. Children*, 114 Env't Health Persp. 1904, 1908 (2006); *see also* Jianghong Liu et al., *Blood Lead Levels and Children's Behavioral and Emotional Problems: A Cohort Study*, 168 JAMA Pediatrics 737, 737 (2014); Wright et al., *supra* note 10.

28. *See* Aaron Reuben et al., *Association of Childhood Blood Lead Levels with Cognitive Function and Socioeconomic Status at Age 38 Years and with IQ Change and Socioeconomic Mobility Between Childhood and Adulthood*, JAMA, 2017, at 8; *see also* Waternaux, Laird, & Ware, *supra* note 10.

29. *See* Kim M. Cecil et al., *Decreased Brain Volume in Adults with Childhood Lead Exposure*, 5 PLoS Med. 0741, 0744 (2008); *see also* Robert A. Goyer, *Results of Lead Research: Prenatal Exposure and Neurological Consequences*, 104 Env't Health Persp. 1050, 1053 (1996).

30. *See* Jianghong Liu et al., *Impact of Low Blood Lead Concentrations on IQ and School Performance in Chinese Children*, PLoS ONE, May 29, 2013, at 6.

31. *See* Anne Evens et al., *The Impact of Low-Level Lead Toxicity on School Performance Among Children in the Chicago Public Schools: A Population-Based Retrospective Cohort Study*, Env't Health Persp., 2015, at 7.

32. *See* K. Chandramouli et al., *Effects of Early Childhood Lead Exposure on Academic Performance and Behaviour of School Age Children*, Archives Disease Childhood, Sept. 21, 2009, at 4.

33. *See* Emily Langer, *Herbert L. Needleman, Pediatrician Who Exposed Dangers of Lead Poisoning, Dies at 89*, Wash. Post (July 20, 2017), https://www.washingtonpost.com/local/obituaries/herbert-l-needleman-

conducted an 11-year study that identified a variety of education-related adverse outcomes associated with early childhood lead exposure. The researchers found that when compared with peers, children exposed to lead had lower IQ scores, poorer teachers' ratings of classroom behavior, a higher risk of dropping out of high school, a higher risk of having a reading disability, lower high school class rankings, increased absenteeism, lower reading scores, and worse general vocabularies.[34] Needleman's study highlights the wide variety of long-term adverse academic effects of early lead exposure, but the consequences of lead exposure manifest early in a child's education as well.

A study conducted by Case Western Reserve University investigated these early consequences.[35] This study sought to clarify the association between blood lead levels and educational progress in Cuyahoga County children attending a Pre-Kindergarten program.[36] The study measured school readiness with tests designed to evaluate the understanding of concepts like colors, letters, numbers/counting, size/comparison, and shapes, upon entering the program and again when completing it.[37] Overall, lead-exposed children performed worse on these tests than non-lead-exposed children, suggesting that, in regards to intellectual development, lead-exposed children are significantly behind their peers.[38] This result demonstrates the early appearance of early educational deficits in affected children.

Another study by Richard Canfield and colleagues assessed the impact of early lead exposure on IQ in children at age five.[39] Blood lead level tests for participants began at six months of age and were conducted consistently up to the age of five.[40] The results of this study showed that as individuals' blood lead levels rose, IQ decreased.[41] Even low blood lead level concentrations had pronounced adverse effects on

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pediatrician-who-exposed-dangers-of-lead-poisoning-dies-at-89/2017/07/20/3bc644ba-6d53-11e7-b9e2-2056e768a7e5_story.html [https://perma.cc/KNJ8-D37D].

34. Needleman et al., *supra* note 11, at 86-87.

35. E.R. Anthony, R. Fischer, & S.J. Kim, The Association Between Elevated Blood Lead and School Readiness Among Children Attending Universal Pre-Kindergarten in Cleveland 2, Case Western Res. U. Ctr. Urban Poverty & Cmty. Dev. (June 2015).

36. *Id.*

37. *Id.*

38. *Id.* at 8.

39. Richard L. Canfield et al., *Intellectual Impairment in Children with Blood Lead Concentrations below 10 μg per Deciliter*, 348 New Eng. J. Med. 1517, 1518 (2003).

40. *Id.*

41. *Id.* at 1517.

IQ.[42] In fact, the most drastic decreases in IQ occurred as blood lead levels increased from 1 to 10 mcg/dL.[43] Overall this study concluded that, even though IQ continues to decline as blood lead levels increase, IQ declines occur most severely at blood lead level concentrations below 10mcg/dL.[44] It also noted that many children as young as five years old have undergone irreversible intellectual damage due to early low-level lead exposure.[45]

Another study involving Chicago Public School third graders found that higher blood levels were significantly related to lower reading and math performance on Illinois standardized tests.[46] In addition, children with higher blood lead levels were more likely to "fail" these standardized tests and be held back in the third grade.[47] These testing performance difficulties were prominent in the blood lead level range of 2 to 9 mcg/dL, but negative effects on school performance measures occurred at levels below 5 mcg/dL.[48] The Chicago study, along with the previously mentioned alarming studies, are just a few examples within a large body of research on the impact of early lead exposure on learning capacity and academic performance.[49]

The long-term adverse educational and non-educational effects of lead exposure are most detrimental to children who experience exposure before the age of six.[50] This is due to the rapid growth and development their bodies are undergoing.[51] A child's brain is the most "plastic" or flexible early in life in order to make sense of the new information an

42. *Id.*

43. *Id.*

44. *Id.*

45. *Id.* at 1525.

46. Evens et al., *supra* note 31.

47. *Id.* at 3.

48. *Id.* at 7.

49. *See* Bruce P. Lanphear et al., *Low-Level Environmental Lead Exposure and Children's Intellectual Function: An International Pooled Analysis*, 113 Env't Health Persp. 894, 894 (2005); *see also* Herbert L. Needleman et al., *Deficits in Psychologic and Classroom Performance of Children with Elevated Dentine Lead Levels*, 300 New Eng. J. Med. 694, 694 (1979); Marie Lynn Miranda et al., *The Relationship between Early Childhood Blood Lead Levels and Performance on End-of-Grade Tests*, 115 Env't Health Persp. 1242, 1242 (2007); D.C. Bellinger, K.M. Stiles, & H.L. Needleman, *Low-Level Lead Exposure, Intelligence, and Academic Achievement: A Long-Term Follow-Up Study*, 90 Pediatrics 855, 855 (1992).

50. *At-Risk Populations*, Ctrs. for Disease Control & Prevention, https://www.cdc.gov/nceh/lead/prevention/populations.htm [https://perma.cc/HCW7-UHLH] (last visited Oct. 9, 2021).

51. *Id.*

infant is constantly exposed to.[52] As depicted in the image below, at age one the brain begins to lose much of its flexibility in order to assume more complex and specialized functions.[53] At this age, there is less of a need to constantly adapt to and make sense of new environmental stimuli.[54] For this reason, it is "easier and more effective to influence a baby's developing brain architecture than to rewire parts of its circuitry in the adult years."[55] Applying this to the effects of early lead exposure suggests that intervening by the age of three will be most effective in mitigating associated educational deficits. Harvard University's Center on the Developing Child illustrates by graph the rapid early brain development undergone by individuals from birth to five years, particularly in the first year of life.[56]

The federal government recognizes the effects of lead on educational success and recognizes how crucial it is to intervene at the right time to prevent further damage.[57] Thus, it has taken initiatives to minimize the educational deficits associated with early lead exposure.[58]

III. Individuals with Disabilities Education Act ("IDEA"), Part C Early Intervention

In this section, this Note advocates for the use of IDEA's Part C Early Intervention programs to address the impact of early childhood lead exposure on educational outcomes. The IDEA is a federal disability law that aims to provide special education and early intervention services to eligible infants, toddlers, and children with disabilities.[59] Part C provides funding to states to implement early intervention programs for infants and toddlers ages one to two.[60]

52. Ctr. on the Developing Child, In Brief: The Science of Early Childhood Development (Harv. U. 2007), https://developingchild.harvard.edu/resources/inbrief-science-of-ecd/ [https://perma.cc/SX35-9NST].

53. *Id.*

54. *Id.*

55. *Id.*

56. *See id.* (portraying, in the graph entitled "Human Brain Development," various aspects of children's brain development over time).

57. Nat'l Ctr. Env't Health, Educational Interventions For Children Affected By Lead (2015).

58. *Id.*

59. *About IDEA*, U.S. Dep't of Educ., https://sites.ed.gov/idea/about-idea/ [https://perma.cc/MX5H-845Q] (last visited Sept. 11, 2021).

60. *Id.*

A. Overview of Part C

In 1986, Congress added Part C to the IDEA,[61] recognizing that developmental delays and intellectual disabilities are best mitigated at early ages when significant brain development is ongoing.[62] While federal law sets out the basic requirements for states to obtain funding, states have a large amount of discretion in how they choose to implement early intervention services.

The IDEA sets out the minimum requirements for what states must include in a statewide early intervention services system.[63] States are required to provide a "rigorous definition of the term 'developmental delay' . . . to . . . identify infants and toddlers with disabilities that are in need of services[.]"[64] In other words, states set the criterion under which infants and toddlers qualify as having a "developmental delay" in order to become eligible for early intervention services.[65] Once a child is identified as having a disability or developmental delay through child find programs,[66] public awareness campaigns,[67] or a primary referral,[68] the IDEA requires states to evaluate each child.[69] After evaluation, the early intervention system identifies the appropriate services needed to meet the individualized needs of each infant and toddler.[70]

61. KYRIE E. DRAGOO, CONG. RSCH. SERV., R43631, THE INDIVIDUALS WITH DISABILITIES EDUCATION ACT (IDEA), PART C: EARLY INTERVENTION FOR INFANTS AND TODDLERS WITH DISABILITIES 2 (2019); *see also* 20 U.S.C. §§ 1431 – 1444.

62. DRAGOO, *supra* note 61.

63. 20 U.S.C. § 1435(a).

64. 20 U.S.C. § 1435(a)(1).

65. DRAGOO, *supra* note 61, at 4-5.

66. Child find programs are procedures put in place by each state to identify infants and toddlers within the state that may need early intervention services. Child find programs generally focus on the identification of disabled infants and toddlers that likely have no other mechanism for referral into early intervention programs (e.g., homeless children or wards of the state). *See id.* at 6-7.

67. Public awareness campaigns seek to inform parents and guardians of infants and toddlers with developmental delays about the existence of early intervention programs. These programs generally provide information about how eligibility into these programs is granted and who to contact if the families suspect their child may need such services. *See id.* at 5-6.

68. Primary referrals occur when a physician, other healthcare provider, or a child care specialist recommends a specific child seek or become eligible for early intervention services. *See id.*

69. 20 U.S.C. § 1435(a)(3); *see also* DRAGOO, *supra* note 61, at 8.

70. 20 U.S.C. § 1435(a)(4); *see also* DRAGOO, *supra* note 61, at 8.

The early intervention system also assesses each child's family to determine the resources and support services needed to enable families to "meet the developmental needs of their infant or toddler with a disability."[71] The constructed plan following assessments of both the child and the child's family is called the individualized family services plan ("IFSP").[72] The IFSP empowers families by helping them to better understand their child so they can, at least in part, provide interventions for their child within their home environment.[73] These in-home interventions can be in the form of medical equipment, such as assistive hearing devices, or treatment-based strategies that guardians can implement at home to supplement treatment infants and toddlers are receiving outside of the home.[74] IFSPs are reviewed every six months to ensure that the services being provided are the best course of action for each child.[75] In addition, infants and toddlers within early intervention systems are re-evaluated each year to ensure that they still qualify for the programs.[76]

Finally, in implementing early intervention systems, the IDEA requires that states create a "central directory that includes information on early intervention services, resources, and experts[,]"[77] and train the personnel responsible for performing early intervention services.[78]

B. Early Intervention Services in Practice

Early intervention services are designed to address five major developmental areas for eligible infants and toddlers: physical development, cognitive development, communication development, social/emotional development, and adaptive development.[79] While early lead exposure can produce adverse effects in each of these five areas,[80]

71. DRAGOO, *supra* note 61, at 8.

72. 20 U.S.C. § 1436.

73. *See* DRAGOO, *supra* note 61, at 9; Richard C. Adams & Carl Tapia, *Early Intervention, Part C Services, and the Medical Home: Collaboration for Best Practice and Best Outcomes*, 132 AM. ACAD. PEDIATRICS e1073, e1078 (2013).

74. *Overview of Early Intervention*, CTR. PARENT INFO. & RES. (Sept. 1, 2017), https://www.parentcenterhub.org/ei-overview/ [https://perma.cc/E8V8-N5WC].

75. DRAGOO, *supra* note 61, at 10.

76. *Id.*

77. 20 U.S.C. § 1435(a)(7).

78. 20 U.S.C. § 1435(a)(8-9).

79. U.S. DEP'T OF EDUC., 41ST ANNUAL REPORT TO CONGRESS ON THE IMPLEMENTATION OF THE INDIVIDUALS WITH DISABILITIES EDUCATION ACT (2019).

80. *See* Cecil et al., *supra* note 29; *see also* Goyer, *supra* note 29; Shuangxing Hou et al., *A Clinical Study of the Effects of Lead Poisoning*

the cognitive development area interventions are most crucial to mitigate educational deficits. IFSPs are tailored to meet the individual needs of a child. Early intervention services can include the following: assistive technology; audiology or hearing services; speech or language services; counseling; family training; medical services; nutrition services; occupational therapy; physical therapy; and psychological services.[81]

While each state evaluates the effectiveness of its own Part C services systems,[82] the Department of Education issues comprehensive annual reports to Congress regarding the national implementation of the IDEA.[83] The 2019 report revealed that 386,155 infants and toddlers received early intervention services in 2017 in the United States and the District of Columbia.[84] Almost 90% of the IFSPs were executed within the child's home environment.[85] Other settings included but were not limited to hospitals, clinics, child care centers, preschools, and community centers.[86] Generally, most children receiving Part C services graduate from early intervention systems and transition into Part B special education programs when they reach the age of three.[87] While data exists for the types of disabilities children ages three to five experience in Part B programming, no such disability-specific information exists for Part C participants in the 2019 report.[88]

State annual reports provide more specific data about the outcomes of and developmental progress made by infants and toddlers who have received early intervention services.[89] Taking a different approach, one study conducted by Donald Bailey, Jr. and colleagues evaluated the effectiveness of early intervention programs from the perspective of

on the Intelligence and Neurobehavioral Abilities of Children, THEORETICAL BIOLOGY AND MED. MODELING, 2013, at 1, 7.

81. *Overview of Early Intervention*, *supra* note 74.

82. *See, e.g.,* COMMONWEALTH OF PA., STATE PERFORMANCE PLAN/ANNUAL PERFORMANCE REPORT: PART C (2020); STATE OF IND., STATE PERFORMANCE PLAN/ANNUAL PERFORMANCE REPORT: PART C (2020); STATE OF OHIO, STATE PERFORMANCE PLAN/ANNUAL PERFORMANCE REPORT: PART C (2020).

83. U.S. DEP'T OF EDUC., *supra* note 79.

84. *Id.*

85. *Id.*

86. *Id.*

87. *Id.* ("*Part B eligible, exiting Part C* accounted for the largest percentage of infants and toddlers.").

88. *See id.*

89. *See, e.g.,* COMMONWEALTH OF PA., *supra* note 82; STATE OF IND., *supra* note 82; STATE OF OHIO, *supra* note 82.

parents and families of infants and toddlers with disabilities.[90] It concluded that parents reported being better able to care for and support their infants and toddlers with disabilities after completing Part C early intervention programming.[91] These parents also reported increased confidence in their ability to work with health professionals as well as to obtain proper services for their children in the future after receiving early intervention services.[92] The results of this study suggest that early intervention services are an effective way to, at the very least, connect parents with the appropriate resources for their child. Bailey's study shows the promise of early intervention services in helping families with lead-exposed infants and toddlers.

Studies like Bailey's are further supported by the Early Childhood Technical Assistance Center ("ECTA"), an organization that gathers and combines state-reported child outcome data to examine the effectiveness of early intervention services on a national level.[93] Child outcomes are measured based on developmental trajectories.[94] States evaluate child outcomes with four progress categories: 1) "did not improve functioning," 2) "improved in functioning, no change in trajectory," 3) "moved closer to functioning like same-aged peers," and 4) "improved functioning to that as same-aged peers."[95] ECTA produced a graph showing the trajectories by which states evaluate child outcomes.[96]

Nationally, for each developmental area, at least 45% of the participating children exited Part C programs at or above age expectations and at least 65% of the participating children achieved greater than expected growth throughout their time in the program.[97] These data show that a large percentage of children receiving early intervention services are either making great developmental progress or actually attaining functioning levels similar to those of their peers.[98] According to ECTA, the national data have been relatively stable even

90. Donald B. Bailey et al., *Thirty-Six Month Outcomes for Families of Children Who Have Disabilities and Participated in Early Intervention*, 116 PEDIATRICS 1346, 1346 (2005).

91. *Id.* at 1350.

92. *Id.* at 1349.

93. *See IDEA Child Outcomes Highlights for FFY2019*, EARLY CHILDHOOD TECH. ASSISTANCE CTR., https://actacenter.org/eco/pages/childoutcomeshighlights.asp [https://perma.cc/TQ4R-4YXQ] (last visited Sept. 30, 2021).

94. *Id.*

95. *Id.*

96. *See id.* (using (e) as the target trajectory, in the graph entitled "OSEP Progress Categories as Developmental Trajectories").

97. *Id.*

98. *Id.*

as multiple states build up their data collection abilities.[99] Because such a large percentage of infants and toddlers with developmental delays have attained the same level of functioning as same-aged peers or at least have made greater than expected improvements, it is important that lead-exposed children have access to early intervention services.

IV. State Implementation of Early Intervention Programs

Early intervention services show promise in mitigating the educational consequences of early lead exposure. However, to obtain this help, children must have access to or be eligible for early intervention services. Allowing states to define "developmental delay" as they wish gives them the power to determine which infants and toddlers are eligible for state early intervention services. This presents the possibility that states may choose to provide eligibility for toddlers and infants that are "at-risk for experiencing substantial developmental delays" in addition to those children already exhibiting symptoms of a developmental delay.[100]

Several states provide eligibility to infants and toddlers who do not show a visible or diagnosable developmental delay but have a condition with a "high probability of a resulting developmental delay."[101] Early lead exposure generally leads to "a high probability of a resulting developmental delay." Thus, eligibility for infants and toddlers with early lead exposure is usually derived from individual states' definitions of that language.

Many states, however, do not offer early intervention program eligibility to lead-exposed infants and toddlers.[102] Only nineteen states currently provide automatic eligibility to lead-exposed children with elevated blood lead levels above a certain baseline.[103] The Georgetown University Health Policy Institute categorized states' legislative approaches to the eligibility of lead-exposed infants and toddlers[104] and

99. *Id.*

100. Dragoo, *supra* note 61, at 5.

101. *See* Ohio Admin. Code § 5123-10-02(C)(1)(a) (2021); N.Y. Comp. Codes R. & Regs. tit. 10, § 69-4.1(j) (2021); 511 Ind. Admin. Code 7-32-50 (2021).

102. Leah Bartlo, *LEAD716: An Innovative Program Working to Minimize the Effects of Lead on Children*, Peter & Elizabeth C. Tower Found. (Jan. 20, 2020), https://thetowerfoundation.org/2020/01/20/lead716-an-innovative-program-working-to-minimize-the-effects-of-lead-on-children/ [https://perma.cc/K9CB-C5LZ].

103. *Id.*

104. Alexis Bailey & Alex Zimmerman, *Legislative Victory to Ensure Automatic Early Intervention Eligibility for Illinois' Lead-Poisoned Children*, Geo. Univ. Health Pol'y Inst. (July 29, 2019),

found that Illinois, Michigan, and Ohio offer automatic eligibility for children with a blood lead level above 5 mcg/dL[105] —the best and most inclusive approach for helping lead-exposed infants and toddlers.

Several other states, including Connecticut, Iowa, Maryland, Minnesota, Missouri, Oregon, Rhode Island, Tennessee, West Virginia, and Wisconsin, all utilize a similar automatic eligibility approach, but have higher qualifying blood lead levels.[106] Still other states permit automatic eligibility, but only for infants and toddlers that have recorded blood lead levels so high that they were diagnosed with lead poisoning or had to undergo chelation.[107] The states that have adopted the high-lead level approach are Colorado, Delaware, Florida, Kansas, Louisiana, and New Hampshire.[108] The automatic eligibility in these approaches is commendable, but the requirement that infants and toddlers show an elevated blood lead level greater than 15 mcg/dL is problematic, as the adverse effects of lead exposure begin at levels far below this.[109]

Many other states provide no automatic eligibility for elevated blood lead levels, even at extremely high levels.[110] Massachusetts, Mississippi, and New York identify elevated blood lead levels as a risk factor for developmental delays, but elevated blood lead levels alone do not qualify infants and toddlers for early intervention services.[111] Idaho and New Mexico vaguely mention lead poisoning as potential criterion for eligibility, but again, do not guarantee eligibility even for lead poisoned children.[112] Alabama, Arizona, Arkansas, Hawaii, Indiana, Maine, Montana, Nebraska, Nevada, New Jersey, North Dakota, South Carolina, Vermont, Washington, and Wyoming all mention "toxic

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https://ccf.georgetown.edu/2019/07/29/legislative-victory-to-ensure-automatic-early-intervention-eligibility-for-illinois-lead-poisoned-children/ [https://perma.cc/KQR6-CA3C].

105. *Id.*

106. *Id.*

107. *Id. See* Adam Husney, *Chelation Therapy: Topic Overview*, UNIV. MICHIGAN HEALTH (Sept. 23, 2020), https://www.uofmhealth.org/health-library/ty3205spec [https://perma.cc/B37E-6GTA] (Chelation therapy is the process in which a synthetic solution "is injected into the bloodstream to remove heavy metals and/or minerals from the body." When the solution enters the body, it "grabs" heavy metals, such as lead, and removes them from the body.).

108. Bailey & Zimmerman, *supra* note 104.

109. *See, e.g.,* Canfield et al., *supra* note 39, at 1525; *see also* Evens et al., *supra* note 31.

110. Bailey & Zimmerman, *supra* note 104.

111. *Id.*

112. *Id.*

substance" exposure as eligibility criteria.[113] It is unclear as to whether the toxic substance language includes lead, and if so, at what level of exposure eligibility is guaranteed; but, if it does, at what level of exposure is eligibility guaranteed, if any? In all of these approaches, although lead exposure (or toxic substance exposure) is specifically mentioned, symptoms or signs of a developmental delay likely need to be present before affected infants and toddlers become eligible.[114] For this reason, these approaches are inadequate. By the time infants and toddlers become eligible for services, too much damage has already been done.

Most disturbingly, Alaska, California, Georgia, Kentucky, North Carolina, Oklahoma, Pennsylvania, South Dakota, Texas, and Utah provide no avenue for infants and toddlers with elevated blood lead levels to be eligible for early intervention services.[115] Unlike the states discussed above that at least offer the potential for eligibility, these states provide lead-exposed infants and toddlers with essentially no access to early intervention services unless a qualifying, visible deficit associated with the exposure is already present.

A. Evaluating Eligibility-Creating Legislative Approaches

Automatic eligibility for recorded elevated blood lead levels is the best approach to crafting a system of eligibility for children affected by early lead exposure. Ohio's approach of offering automatic eligibility for infants and toddlers that have blood lead level measurements greater than or equal to 5 mcg/dL[116] is one of the best legislative approaches currently utilized in the United States for providing access to early intervention services. As noted above, Michigan and Illinois have also adopted versions of this approach; however, for the sake of brevity, this Note only details Ohio's regulations.

1. Ohio

Ohio describes eligible individuals as those "[c]hildren who have a documented diagnosed physical or mental condition with a high probability of resulting in a developmental delay."[117] Ohio then provides

113. *Id.*

114. For a discussion of the inadequacy of Michigan's former approach, *see* Karen Syma Czapanskiy, *Preschool and Lead Exposed Kids: The IDEA Just Isn't Good Enough*, 35 Touro L. Rev. 171, 192 (2019) (explaining that due to Michigan's eligibility approach, lead-exposed children have little access to Part C services because of their "delayed onset of identifiable symptoms").

115. Bailey & Zimmerman, *supra* note 104.

116. Ohio Admin. Code 5123-10-02 App. C (2020).

117. *Id.* 5123-10-02(C)(1)(a).

an exhaustive list of qualifying conditions.[118] This list includes "blood lead level of five micrograms per deciliter or greater."[119] Thus, any infant or toddler with a blood lead level of 5 mcg/dL or higher will be eligible for Ohio early intervention services, regardless of whether or not they are exhibiting physical symptoms or cognitive deficits.

Ohio's approach utilizes the CDC reference level of concern, 5 mcg/dL, for automatic eligibility.[120] Considering the extensive research regarding lead exposure's adverse long-term effects on educational outcomes,[121] this is the most effective remedial approach. Lead-exposed infants and toddlers who receive early intervention services at ages one to three have the best chance to avoid the adverse effects of lead exposure, considering that neural circuits are most flexible during the first three years of life.[122] Waiting to offer eligibility until after symptoms present or visible developmental delays arise is insufficient considering that neurological foundations for learning and behavior become more difficult to change after the first three years of life.[123]

2. New York

New York identifies blood lead levels greater than or equal to 15 mcg/dL as a risk factor for infants and toddlers, but elevated blood lead levels at this baseline do not automatically lead to eligibility.[124] More specifically, New York defines an "[e]ligible child" as "any infant or toddler from birth through age two years who has a disability" with children three years of age having the potential to be included as well.[125] Disability is then defined as "a developmental delay or a diagnosed physical or mental condition that has a high probability of resulting in developmental delay."[126] The enumerated conditions that have a high probability of resulting in a developmental delay do not include lead or toxic substance exposure.[127] However, New York does require that

118. *Id.* 5123-10-02 App. C.

119. *Id.* 5123-10-02 App. C(4)(d).

120. *Blood Lead Levels in Children*, *supra* note 13.

121. *See* Lanphear et al., *supra* note 49; *see also* Needleman et al., *supra* note 49; Miranda et al., *supra* note 49; Bellinger, Stiles, & Needleman, *supra* note 49.

122. The Importance of Early Intervention for Infants and Toddlers with Disabilities and their Families, Nat'l Early Childhood Technical Assistance Ctr. (Sue Goode et al. eds., 2011).

123. *Id.*; *see supra* Part II (discussing brain plasticity and the timeline for the human brain's neural connections development).

124. Bailey & Zimmerman, *supra* note 104.

125. N.Y. Comp. Codes R. & Regs. tit. 10, § 69-4.1(n) (2018).

126. *Id.* § 69-4.1(j).

127. *Id.* § 69-4.3(f).

referrals be made for infants or toddlers that have "elevated venous blood lead levels (at or above 15 mcg/dl)."[128] Referrals do not automatically trigger eligibility for early intervention services; rather, referrals may help establish that a child is eligible for intervention.[129]

New York does not offer automatic eligibility to lead-exposed infants and toddlers, but it requires that they be at least considered for eligibility for early intervention services. This approach at least identifies lead-exposed children and creates the potential for them to receive early intervention services. While this is better than requiring physical symptoms of developmental delays, it is not as effective as automatic eligibility.

3. Indiana

Indiana references "severe toxic exposure" as a criterion that *may* trigger eligibility for early intervention services.[130] Indiana defines an "[i]nfant or toddler with a disability" as "an individual under three (3) years of age who needs early intervention services."[131] Such individuals include those with "a diagnosed physical or mental condition that has a high probability of resulting in developmental delay."[132] One of the conditions listed is "severe toxic exposure, including prenatal exposure."[133] As lead exposure is also called lead toxicity,[134] lead would likely qualify as a toxic substance for this Indiana criterion.

Assuming lead exposure is considered "severe toxic exposure," problems with this approach still exist. For example, at what level is the exposure "severe"? The term "severe" insinuates extremely high levels of exposure, usually requiring chelation therapy or other medical interventions.[135] Without a definite elevated blood lead level, the fallback will likely be to look at a child's physical and visible symptoms. The vagueness of Indiana's legislative approach creates uncertainty as

128. *Id.* § 69-4.3(g)(2)(iii).

129. *See id.* § 69-4.3(e).

130. Bailey & Zimmerman, *supra* note 104.

131. 511 Ind. Admin. Code 7-32-50 (2018).

132. *Id.*

133. *Best Practices in Early Intervention*, Ind. First Steps Sys. (2006), https://www.in.gov/fssa/firststeps/files/BestPractice_July_2006.pdf [https://perma.cc/JE46-4ML2].

134. *See Lead Toxicity: Who Is at Risk of Lead Exposure?*, Agency for Toxic Substances & Disease Registry (June 12, 2017), https://www.atsdr.cdc.gov/csem/leadtoxicity/who_at_risk.html [https://perma.cc/RZ8W-98JM].

135. *See* Alicia P. Schroder, Jennifer A. Tilleman & Edward M. Desimone II, *Lead Toxicity and Chelation Therapy*, U.S. Pharmacist (May 15, 2015), https://www.uspharmacist.com/article/lead-toxicity-and-chelation-therapy [https://perma.cc/76BM-VVME].

to whether or not lead-exposed infants and toddlers will be eligible for early intervention services. For this reason, such an approach is likely inadequate to mitigate the adverse educational effects of early lead exposure.

4. Pennsylvania

Pennsylvania does not identify lead exposure or any related toxic substance exposure language in its definitions that create eligibility for early intervention services.[136] Pennsylvania defines "[h]andicapped infants and toddlers" as those who need early intervention services.[137] The Pennsylvania statute[138] then establishes that the need for early intervention services is derived from either "experiencing developmental delays" or having "a diagnosed physical or mental condition which has a high probability of resulting in developmental delay."[139] Thus, Pennsylvania law does not deem lead-exposed infants or toddlers that are not experiencing an enumerated condition or visible developmental delay eligible.

Children with early lead exposure are likely to exhibit one or more of the conditions exhaustively listed in the Pennsylvania statute, but usually not at ages one to three when intervention to mitigate the adverse effects of such conditions is critical. Thus, Pennsylvania denies infants and toddlers early intervention services because no harmful effects have already befallen them. This is the most inadequate type of eligibility legislation for lead-exposed infants and toddlers, as it essentially excludes them entirely from being considered for early intervention services.

136. Bailey & Zimmerman, *supra* note 104.

137. 212 Pa. Cons. Stat. § 103 (1990).

138. *Id.*

139. *Id.*; *but see* Letter from Terry Shaner Wade, Acting Deputy Sec'y, Office of Child Development & Early Learning to Infant/Toddler and Preschool Early Intervention (EI) Leadership (Aug. 31, 2016) (on file with author) (clarifying in a non-binding internal Pennsylvania Department of Education memorandum that infants and toddlers with a blood lead level of 5 mcg/dL automatically qualify for early intervention services). This Pennsylvania guidance memorandum recognizes that lead-exposed children can benefit from early intervention programs and that automatic eligibility is the best way to access those benefits. However, because the guidance is non-binding, out-of-date, and not well circulated, in practice, Pennsylvania does not provide automatic eligibility for lead-exposed infants and toddlers. *See* Bailey & Zimmerman, *supra* note 104; *see also* Michael Ollove, *Kids with Lead Poisoning Will Get Early Help in These States*, PEW (Aug. 15, 2019), https://www.pewtrusts.org/en/research-and-analysis/blogs/stateline/2019/08/15/kids-with-lead-poisoning-will-get-early-help-in-these-states [https://perma.cc/AQM7-5R3V].

B. State Outcomes for Early Intervention Services

In the annual state reports, the outcome data from Part C services is not broken down by type of disability. Thus, it is not possible to ascertain whether one group of disabled individuals (*i.e.*, those with intellectual disabilities versus physical disabilities) has better overall outcomes than another. For this reason, this Note evaluates several states' Part C outcomes data and hypothesizes that the general outcomes would remain similar if lead-exposed infants and toddlers became part of the dataset in states that do not already render them eligible to receive Part C services.

As described above with respect to the ECTA data, states use a trajectory method to measure the improvement of infants and toddlers in early intervention programs compared to same age peers.[140] The trajectories used for individual measurement in the state reports are 1) "[i]nfants and toddlers who did not improve functioning," 2) "[i]nfants and toddlers who improved functioning but not sufficient to move nearer to functioning comparable to same-aged peers," 3) "[i]nfants and toddlers who improved functioning to a level nearer to same-aged peers but did not reach it," 4) "[i]nfants and toddlers who improved functioning to reach a level comparable to same-aged peers," and 5) "[i]nfants and toddlers who maintained functioning at a level comparable to same-aged peers."[141] These trajectories are used to measure infants' and toddlers' improvements in three developmental categories. States place individuals along these trajectories in the three categories to evaluate Part C participants and track improvements over time.[142] The three categories are: "[p]ositive social-emotional skills (including social relationships);" "[a]cquisition and use of knowledge and skills (including early language/communication);" and "[u]se of appropriate behaviors to meet their needs."[143]

Ohio's annual performance report for the period beginning on July 1, 2018 and ending June 30, 2019 listed 7,578 total infants and toddlers with outcome data.[144] For the "positive social-emotional skills" category, nearly 45% of participants achieved and "maintained functioning at a level comparable to same-aged peers."[145] Just over 20% "improved to a functioning to reach a level comparable to same-aged peers."[146] About 9% of participants "improved functioning to a level

140. *IDEA Child Outcomes Highlights for FFY2019*, *supra* note 93.

141. COMMONWEALTH OF PA., *supra* note 82; STATE OF IND., *supra* note 82; STATE OF OHIO, *supra* note 82.

142. *IDEA Child Outcomes Highlights for FFY2019*, *supra* note 93.

143. *Id.*

144. STATE OF OHIO, *supra* note 82.

145. *Id.*

146. *Id.*

nearer to same-aged peers but did not reach it."[147] Approximately 25% of individuals "improved functioning but not sufficient to move nearer to functioning comparable to same-aged peers."[148] These outcomes are promising—the majority of infants and toddlers showed improvement in functioning, and only 0.9% showed no improvement at all.[149]

For the "acquisition and use of knowledge and skills" category, in Ohio, nearly 30% of infants and toddlers "maintained functioning at a level comparable to same-aged peers."[150] Just over 28% improved to reach, but not maintain a comparable level as same-aged peers and about 15% improved to a level nearer to same-aged peers but did not reach such a level.[151] About 26% improved functioning but did not reach a level "sufficient to move nearer to functioning comparable to same-aged peers."[152] Only 0.79% of infants and toddlers did not improve functioning at all in this category.[153]

Finally, in the "use of appropriate behaviors to meet their needs" category, just over 21% of Ohio Part C infants and toddlers maintained functioning at the level of their peers and nearly 35% improved functioning to a level comparable to peers.[154] About 15% of individuals improved to a level near peers but did not reach such a level, while almost 28% of children improved functioning but not comparable to the level of same-aged peers.[155] Only 0.67% of participants did not improve functioning at all.[156]

Indiana's annual report for 2018 states that 2,586 infants and toddlers had reportable outcome data. For the "positive social-emotional skills" category, almost 22% reached and maintained a functioning level comparable to that of same-aged peers, while about 37% reached, but did not maintain a functioning level comparable to that of peers.[157] About 7% improved functioning nearer to the level of same-aged peers but did not reach such a level.[158] About 32% of infants and toddlers improved their own functioning but not to a level that was

147. *Id.*

148. *Id.*

149. *Id.*

150. *Id.*

151. *Id.*

152. *Id.*

153. *Id.*

154. *Id.*

155. *Id.*

156. *Id.*

157. STATE OF IND., *supra* note 82.

158. *Id.*

similar to same-aged peers.[159] Still, only 1.16% of participants showed no improvement in functioning at all.[160]

For the "acquisition and use of knowledge and skills" category, Indiana reported over 50% of participants reaching and maintaining a functioning level comparable to that of same-aged peers.[161] Approximately 22% reached a level of functioning similar to peers, but did not maintain it.[162] About 6% improved to a level nearer to peer functioning, while almost 20% improved their own functioning but not to a level that was comparable to same-aged peers.[163] In this category, only 0.93% of reported participants showed no improvement.[164]

For the "use of appropriate behaviors to meet their needs" category, 38% of Indiana infants and toddlers maintained the level of functioning of same-aged peers.[165] About 27% improved functioning to reach but not maintain the level of same-aged peers, while just over 6% improved to a level nearer to peers but never reached such a level.[166] Over 27% improved but not to a degree that makes them comparable to same-aged peers and 1.16% of infants and toddlers showed no improvement at all.[167]

Pennsylvania, reporting for 2018, listed 13,114 infants and toddlers as returning reportable outcome data—the largest data sample of the three states. For the "positive social-emotional skills" category, almost 30% of infants and toddlers reached and maintained a functioning level that was similar to level of functioning for same-aged peers.[168] Almost 29% improved functioning to a level comparable to peers, while almost 19% improved to a level nearer to peers but not necessarily one that was comparable to peer functioning.[169] About 22% showed personal improvements, but were still behind peers.[170] Only 0.50% showed no improvements at all.[171]

For the "acquisition and use of knowledge and skills" category, only 0.47% of Pennsylvania infants and toddlers showed no improvement at

159. *Id.*

160. *Id.*

161. *Id.*

162. *Id.*

163. *Id.*

164. *Id.*

165. *Id.*

166. *Id.*

167. *Id.*

168. COMMONWEALTH OF PA., *supra* note 82.

169. *Id.*

170. *Id.*

171. *Id.*

all.[172] Almost 50% of the other infants and toddlers either reached or completely maintained a functioning level comparable to the functioning level of same-aged peers for this category.[173] For the "use of appropriate behaviors to meet their needs" category, about 57% of infants and toddlers either reached or completely maintained a functioning level similar to that of same-aged peers.[174] In this category, only 0.44% showed no improvements in functioning at all.[175]

These three states, although they have very different legislative approaches for offering eligibility to lead-exposed individuals, report similar outcome data for the effectiveness of their Part C services. Overall, an extremely small portion of infants and toddlers demonstrated no improvement throughout the three developmental categories. Thus, most children enrolled in Part C services who have personalized IFSPs show personal developmental improvement.[176] Even more impressive, many infants and toddlers attain functioning levels at or close to their peers.[177] These promising outcome data further highlight why lead-exposed infants and toddlers need access to Part C early intervention services.

V. Proposed Approach: Automatic Part C Eligibility

Automatic eligibility for a defined elevated blood lead level is the best way to ensure that lead-exposed infants and toddlers can receive early intervention services. Ohio sets one of the best examples for Part C legislation. An elevated blood lead level of 5 mcg/dL, based on the relevant research, is a good indicator of a high likelihood of experiencing long-term adverse effects.[178] This baseline allows for all lead-exposed infants and toddlers to be eligible for early intervention services to mitigate such effects, regardless of whether a visible developmental delay is already evident. Other states should consider replicating Ohio's approach of including a "blood lead level of five micrograms per deciliter or greater" in their list of qualifying conditions.[179]

A potential roadblock to this proposal is the large number of lead-exposed infants and toddlers that exist in this country. Prior to the CDC's updated blood lead reference value, the number of young

172. *Id.*

173. *Id.*

174. *Id.*

175. *Id.*

176. *See id;* State of Ind., *supra* note 82; State of Ohio, *supra* note 82.

177. *See* Commonwealth of Pa., *supra* note 82; State of Ind., *supra* note 82; State of Ohio, *supra* note 82.

178. *See* Miranda et al., *supra* note 49, at 1246-47.

179. Ohio Admin. Code 5123-10-02 App. C(4)(d) (2020).

children estimated to have blood lead levels higher than 5 mcg/dL was 200,000.[180] Now, with a blood lead reference value of 3.5 mcg/dL, the estimated number of children between the ages of one and five that surpass that value is 500,000.[181] Given this data, the question causing concern is how state Part C programs can sustain the increased number of infants and toddlers that would be automatically eligible without detracting from the efficacy of the services provided. While the allocation of more federal funding is one possible solution to this roadblock, states currently successfully offer automatic eligibility for lead-exposed infants and toddlers without such funding.

Ohio, for example, implemented automatic eligibility for children with blood lead levels at or above 5 mcg/dL in 2019[182] without substantially increased funding from the federal government.[183] In 2019, the federal government allocated Ohio $15,504,696 in funding for Part C programs.[184] In 2018 and 2017, Ohio was allocated $15,516,355 and $15,172,048, respectively.[185] The 2020 federal financial data is not yet available,[186] but the 2019 information suggests that Ohio was able to provide automatic eligibility for lead-exposed infants and toddlers without considerably increased federal financial assistance.

In its legislative materials, Ohio recognized that implementing automatic eligibility would increase the number of children served by the early intervention program, and therefore, would increase the overall cost of the program.[187] Ohio justified this increased cost, even though the amount of increase was practically inestimable at the time the automatic eligibility went into effect.[188] Ohio legislators suggested that "[s]ome or all costs associated with providing Early Intervention

180. *The Number of Young Children With Lead Poisoning May Be About to More Than Double, supra* note 14.

181. *Id.*

182. Ollove, *supra* note 139.

183. *Budget History Tables*, U.S. Dep't Educ. (March 29, 2021), https://www2.ed.gov/about/overview/budget/history/index.html [https://perma.cc/FTC7-HX8M] (This webpage houses excel documents with budgetary information.).

184. *Id.*

185. *Id.*

186. *Id.*

187. Ohio Dep't of Developmental Disabilities, Rule Summary and Fiscal Analysis, 5123-10-02, at B-1 (2019).

188. *Id.* at B-1 ("The costs associated with these activities (i.e., staff time) will vary based on the number and nature of children/families served by a county board of developmental disabilities and are unknown by the Department.").

services to children with [lead exposure] will offset spending by state and local entities in future years to serve these children."[189]

Even though states have implemented automatic eligibility for lead-exposed children without increased federal funding,[190] evidence exists to support allocating more financial assistance to state Part C programs whether that assistance comes from state or federal funding. As Ohio recognized when it adopted automatic eligibility for lead-exposed infants and toddlers,[191] there are long-term economic benefits that result from investing in early intervention services. Multiple studies show the possible benefits of early interventions for infants and toddlers, including higher achievement in school, decreased economic costs of supporting an adolescent or adult with developmental issues, and stronger economic contributions to their community.[192]

Longitudinal studies clearly show the positive developmental outcomes and economic benefits of early intervention programs similar to Part C services.[193] Harvard University's Center on the Developing Child has compiled and graphed a few of the studies portraying the economic benefits of early childhood interventions.[194]

189. *Id.*

190. *Budget History Tables, supra* note 183.

191. Ohio Exec. Order No. 2019-02D (2019) ("[R]esearch conducted by the National Forum on Early Childhood Policy and Programs has shown that every dollar invested in high-quality early childhood programming yields up to nine dollars in future return[.]").

192. Adams & Tapia, *supra* note 73, at 1075.

193. *See* Arthur J. Rolnick & Rob Grunewald, *Early Childhood Development on a Large Scale*, FED. RESERVE BANK MINNEAPOLIS (June 1, 2005), https://www.minneapolisfed.org/article/2005/early-childhood-development-on-a-large-scale [https://perma.cc/3XG5-BM2Q] (demonstrating that one early intervention program generated a $3-9 return for every $1 invested in the program); Arthur J. Reynolds et al., *Long-term Effects of an Early Childhood Intervention on Educational Achievement and Juvenile Arrest: A 15-year Follow-up of Low-Income Children in Public Schools*, 285 JAMA 2339, 2339 (2001) (finding in a 15-year follow-up study that one early intervention program was associated with lower juvenile arrests and lower high school dropout rates), and; Lynn A. Karoly et al., *Assessing Costs and Benefits of Early Childhood Intervention Programs: Overview and Applications to the Starting Early Starting Smart Program*, RAND CORP. (2001) (creating cost and outcome analysis frameworks to determine monetary savings early intervention programs can generate).

194. *See InBrief: Early Childhood Program Effectiveness*, HARV. UNIV.: CTR. ON THE DEVELOPING CHILD, https://46y5eh11fhgw3ve3ytpwxt9r-wpengine.netdna-ssl.com/wp-content/uploads/2015/05/inbrief-programs-update-1.pdf [https://perma.cc/2977-UHFH] (last visited Feb. 20, 2022) (depicting by graph the cost-benefits of early intervention programs by total return per $1 invested).

Investing in early childhood interventions like Part C programs not only produces favorable developmental and educational outcomes for the infants and toddlers receiving the services,[195] but also will likely benefit the community economically in the future.[196] Economic analyses demonstrate that investments in education and development in the earliest years of life produce the greatest returns, usually ranging from $4 to $9 per dollar invested.[197] These returns are in the form of reduced crime, welfare, and educational remediation, as well as, increased tax revenues due to the overall higher incomes of early intervention program participants.[198]

These economic benefits strongly support increasing accessibility to early intervention services, and if necessary, increased funding to support the program participants. Ohio has done this with its 2019 legislation.[199] States should strongly consider mimicking not only Ohio's legislative approach in offering automatic eligibility, but also its financial approach in light of the economic returns of investing in early childhood interventions like Part C services. Whether by requesting increased federal assistance or reallocating internal state funds, allotting more money to Part C services will make the programs more accessible for at-risk infants and toddlers—a result that is highly beneficial in the short-term for the children and in the long-term for their community.

Conclusion

Geographic location should not affect infants' and toddlers' access to early intervention services that could mitigate the long-term effects of early lead exposure. Therefore, this Note proposes that all states imitate Ohio by offering automatic eligibility for any infant or toddler with a blood lead level at or above 5 mcg/dL. Such uniform criteria will ensure that more lead exposed children have access to early intervention services, which will put them in the best position to succeed academically.

195. *See supra* Part IV(B).

196. *InBrief: Early Childhood Program Effectiveness*, *supra* note 194.

197. *Id.*

198. *Id.*

199. Ohio Rev. Code. Ann. § 5123-10-02 (LexisNexis 2021); Ohio Exec. Order No. 2019-02D (2019).