

# **Opening the Next Chapter:**

## **First-Time Results from Linking Lead Level Data and Rochester City School Pre-K Pupil Achievement Data**

Ralph N. Spezio, Ed.D.

Andrew MacGowan, III

*Rochester City School District*

# Acknowledgements:

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# Five main health issues for Rochester children

- Lead poisoning
  -
- Dental
- Asthma
- Obesity
- Social-Emotional / Stress / Catastrophic life experiences / Trauma

# Continued deterioration of incoming Pre-K and kindergarteners

- 19.5% Neonatal Intensive Care Unit (NICU) hospitalized at birth
- 85% NICU- for more than three days  
*(Early '00s – 14%-15% / 57% more than 3 days)*
- 10% emergency intervention in past 12 months for asthma
- 17% on prescription medication
- 10% physical condition that limits activities
- 30% of Pre-K and 20% of K – never seen a dentist

# Current social-emotional factors

- 27% experienced the death of a close family member;
- Pre-K pupils are not growing socially-emotionally as in years past;
- One in nine arrives with multiple social emotional problems – fewer than ever grow out of it;
- In the national research, incarcerated parent is the No. 1 risk factor for children . . .
- . . . 16% - 21% of our incoming Pre-K and K children have or have had an incarcerated parent

*Source: Parent Appraisal of Children's Experiences (PACE) reporting; RECAP data – Children's Institute – see "Research Library" at [www.childrensstitute.net](http://www.childrensstitute.net)*

# Deterioration in screening results

*preliminary results – not final*

- Vision 13% - 15% range
- Hearing ~14% in Pre-K; ~8% in K
- Motor 23% - 28% range
- Language ~ 43% in Pre-K; ~40% in K
- Cognition Approx. 30%
- Social-emotional: 11% in Pre-K (multiple)
- Over 50% one or more problem

*These are among the highest rates we have seen*

# Lead is a Child's Poison

- Greater absorption
- Greater retention
- Relatively greater brain deposition
- Lead targets developing brain cells

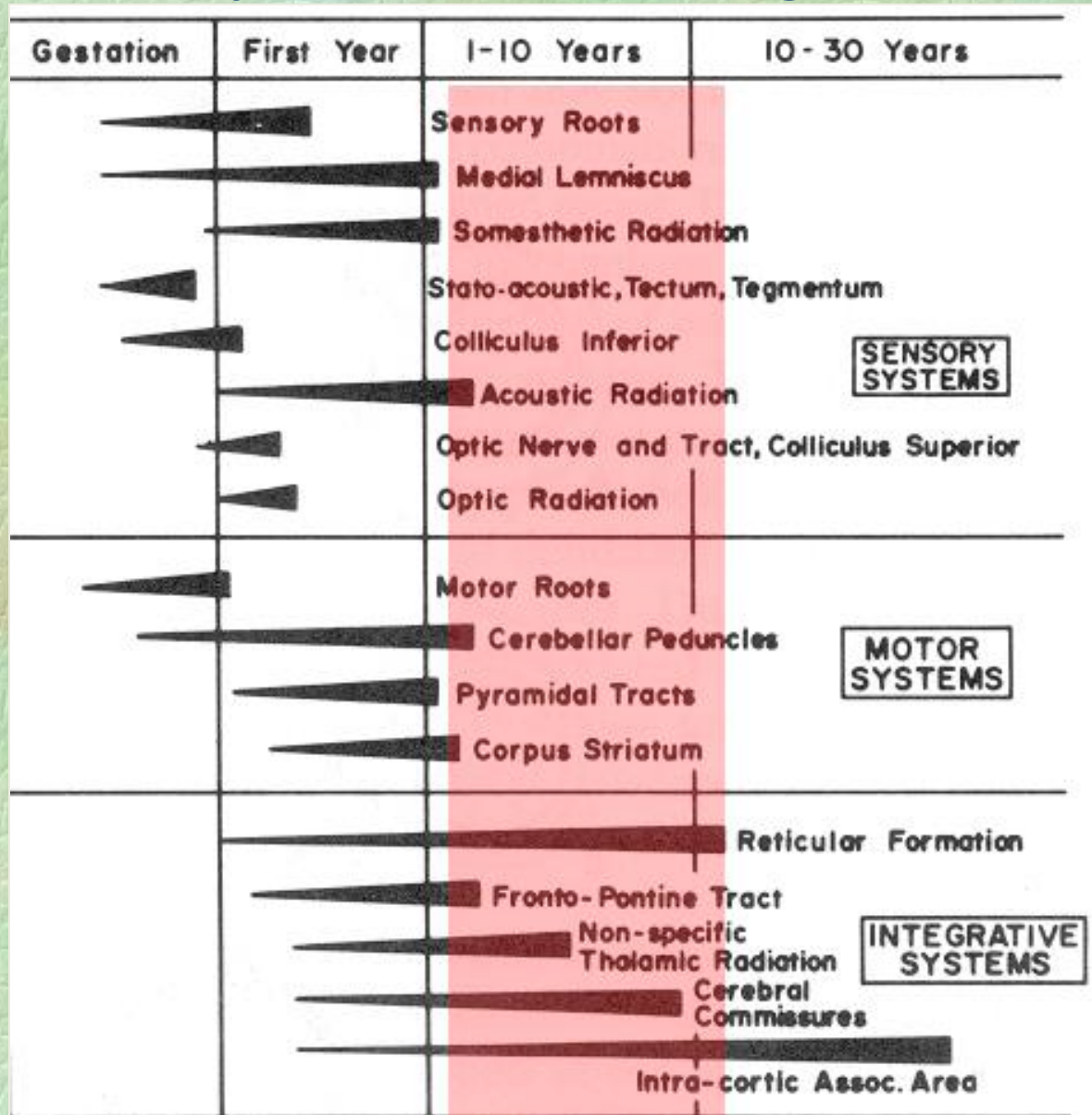
➤ \*\* Dr. Theodore Lidsky

# How lead poisoning effects children

- Hyperactivity and difficulty focusing
- Aggressive, impulsive behavior
- Rigid, inflexible problem-solving abilities
- Problems with social interactions
- Loss of working and functional memory
- Learning problems in school with reading, language, mathematics, writing, abstract and higher-order thinking



# Lead Usually Affects Integrative Systems



# The big breakthrough, 2013

Erin Graupman, RCSD and the Monroe County Department of Public Health worked out legally linking individual lead level data with subsequent school data.

For the first time, we have capabilities as never before.

# Downward trends on lead levels, 2002 – 2014

<u>Year</u>	<u>% with BLL <math>\geq</math> 10 mcg/dL</u>	<u>% with BLL <math>\geq</math> 5 mcg/dL</u>
2002	13.10%	Unknown
2003	10.80%	Unknown
2004	9.95%	Unknown
2005	7.55%	Unknown
2006	6.07%	Unknown
2007	4.57%	Unknown
2008	3.85%	Unknown
2009	3.20%	Unknown
2010	3.66%	Unknown
2011	2.50%	Unknown
2012	2.34%	Unknown
2013	2.45%	8.66%
2014	1.72%	5.73%

*Reflects approximate city zip codes*

# Overall reductions in children

- These figures represent an 86.9% drop in rates of 10 mcg/dL in 13 years;
- The 2014 numbers are 13.1% of 2002 numbers;
- From 2010 to 2014 – the past four years – the rates of 10 mcg/dL *has been cut in half* – 3.66% to 1.72%

# Note on Action for a Better Community/Head Start

The data presented here are similar to the trends being observed at Action for a Better Community / Head Start, who are required by federal law to collect lead level data.

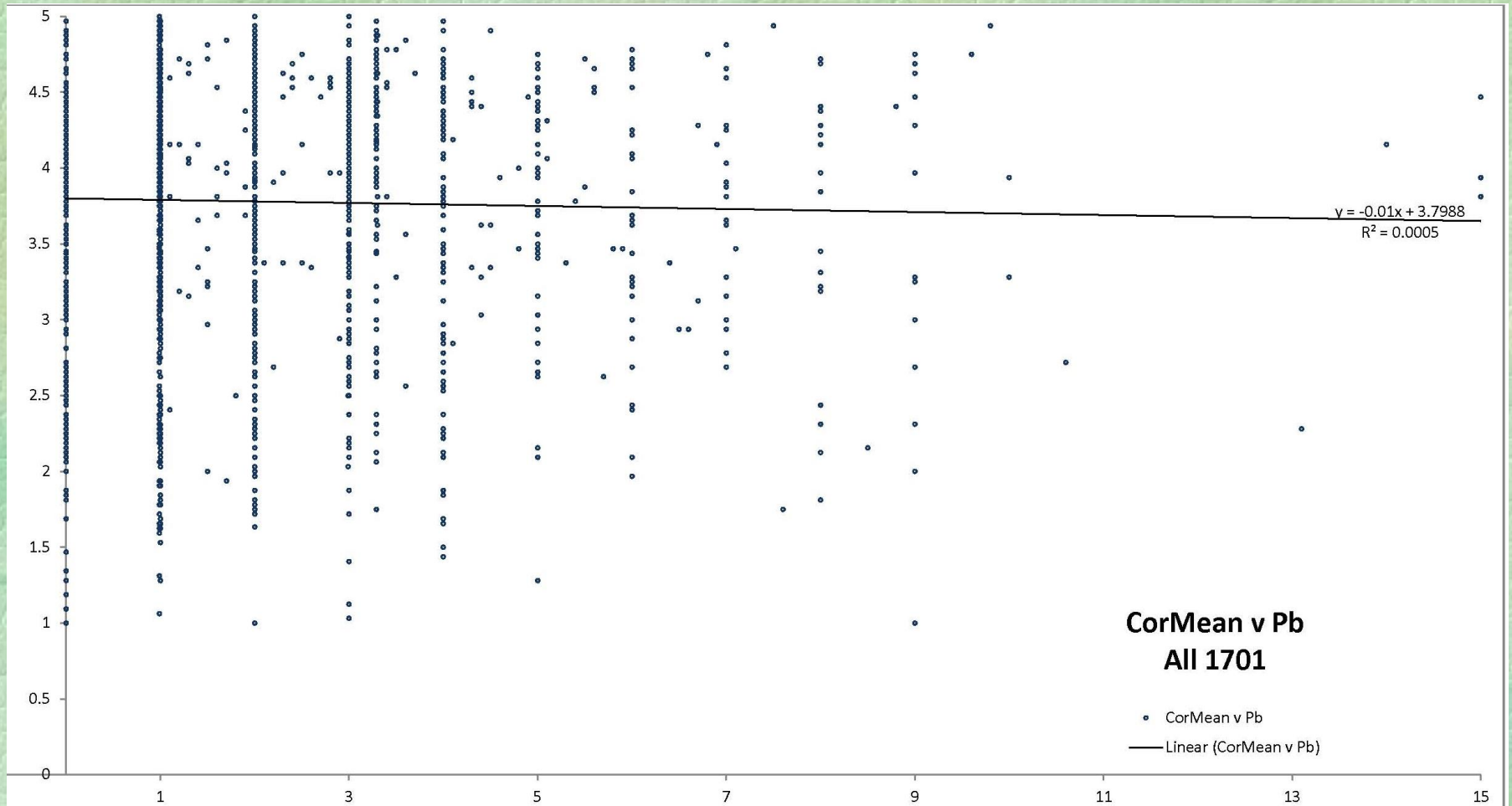
We work closely with Head Start and are in the process of further analyses.

# Linking lead levels to Pre-K achievement data

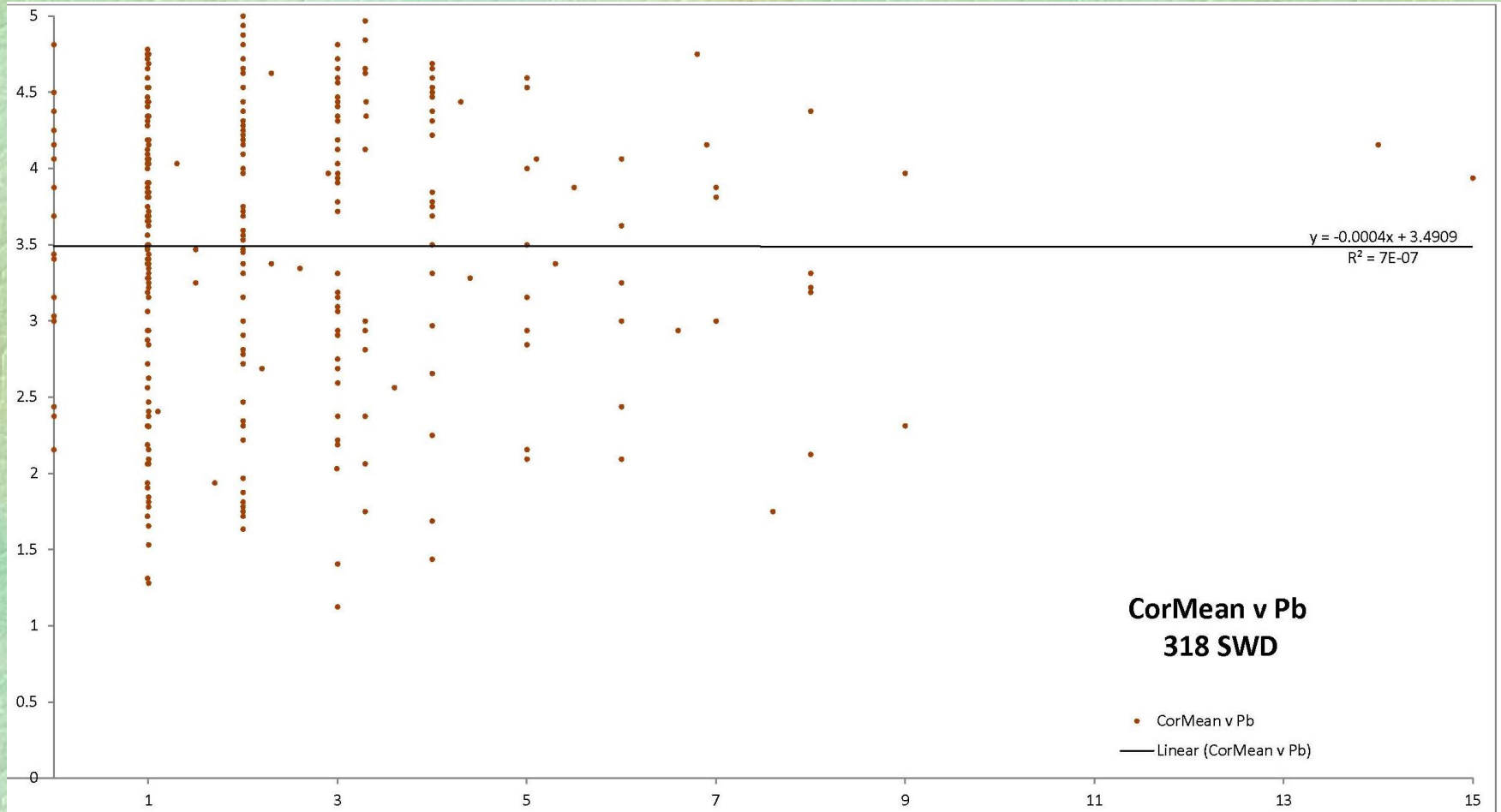
Using the individual lead levels of our Pre-K students (taken when they were 1 or 2 yrs old), we linked these data to their scores on the Child Observation Record (COR), a valid and reliable instrument, administered in both the fall and spring.

We also linked lead level data to general education versus students with disabilities data

# All Pre-K students, end of year

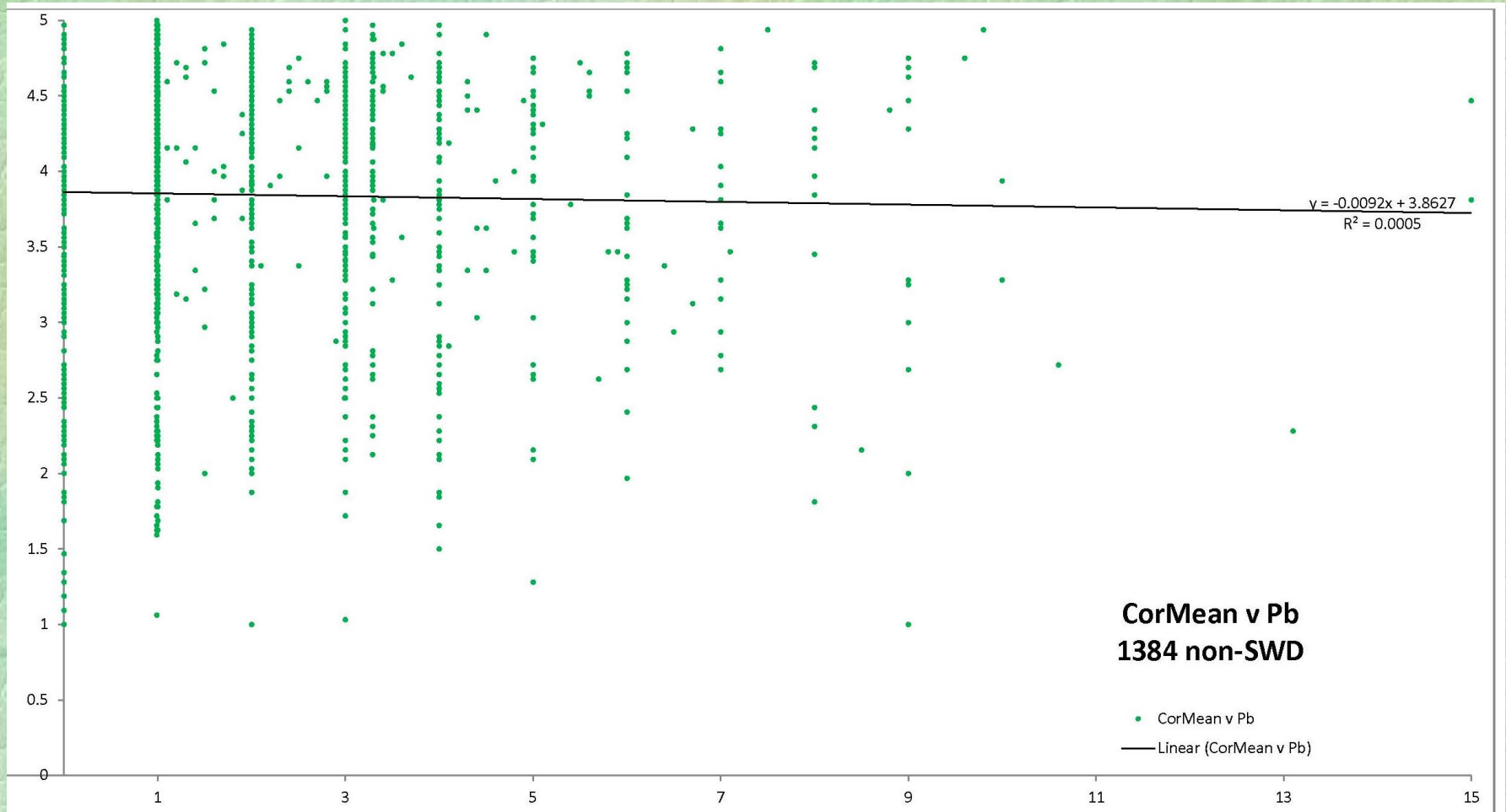


# All Pre-K Students with Disabilities

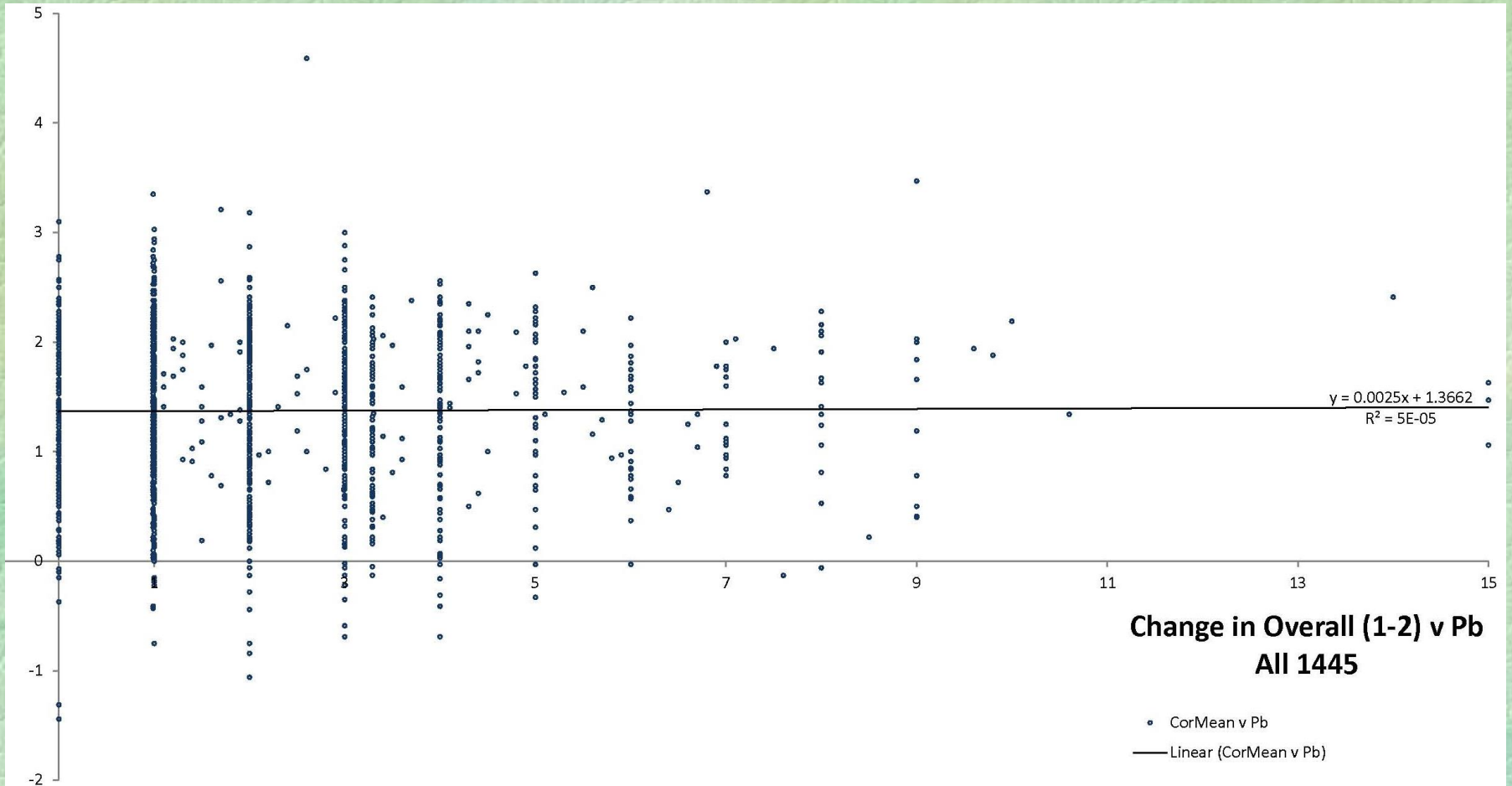




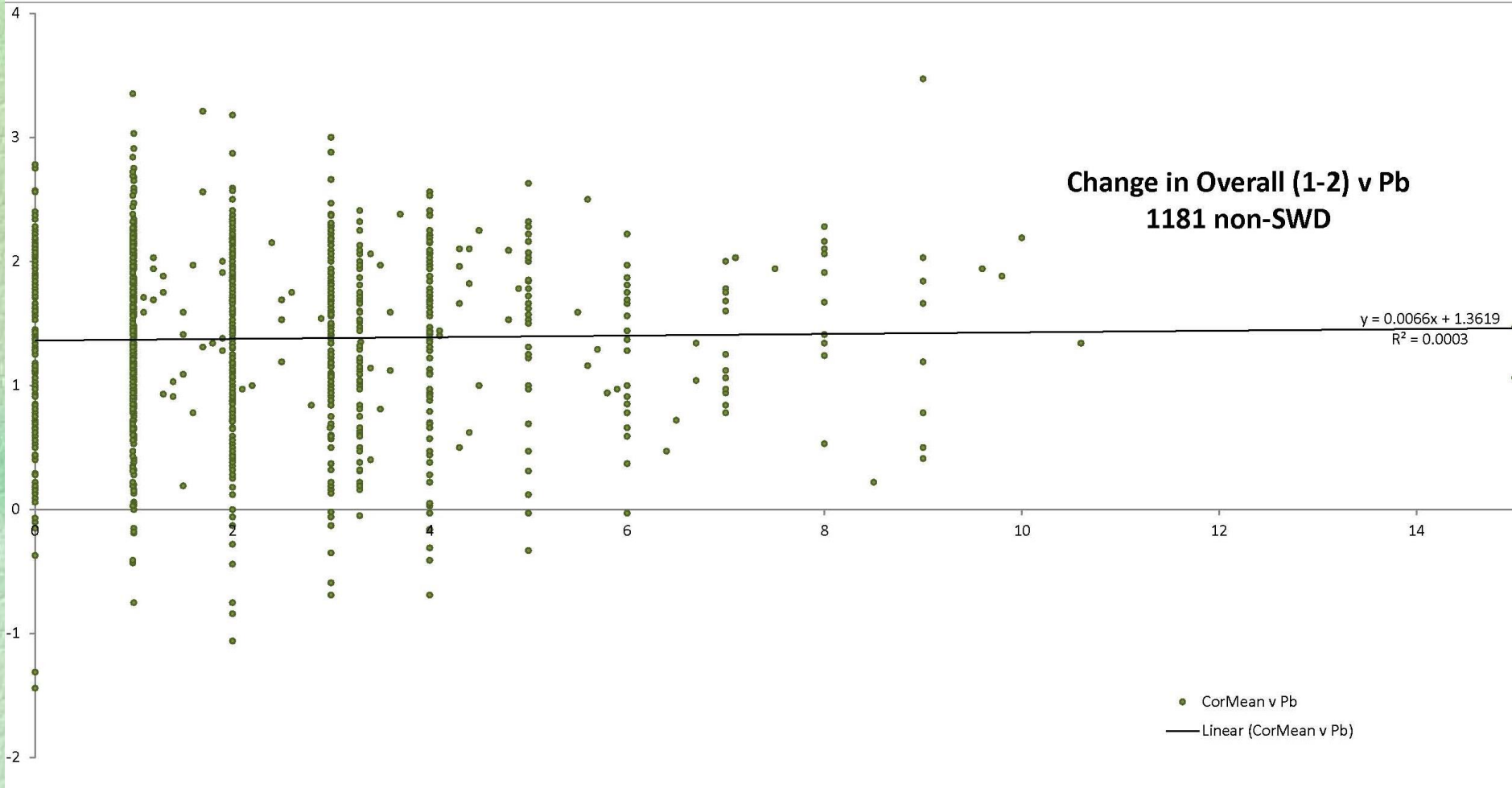
# All general education Pre-K



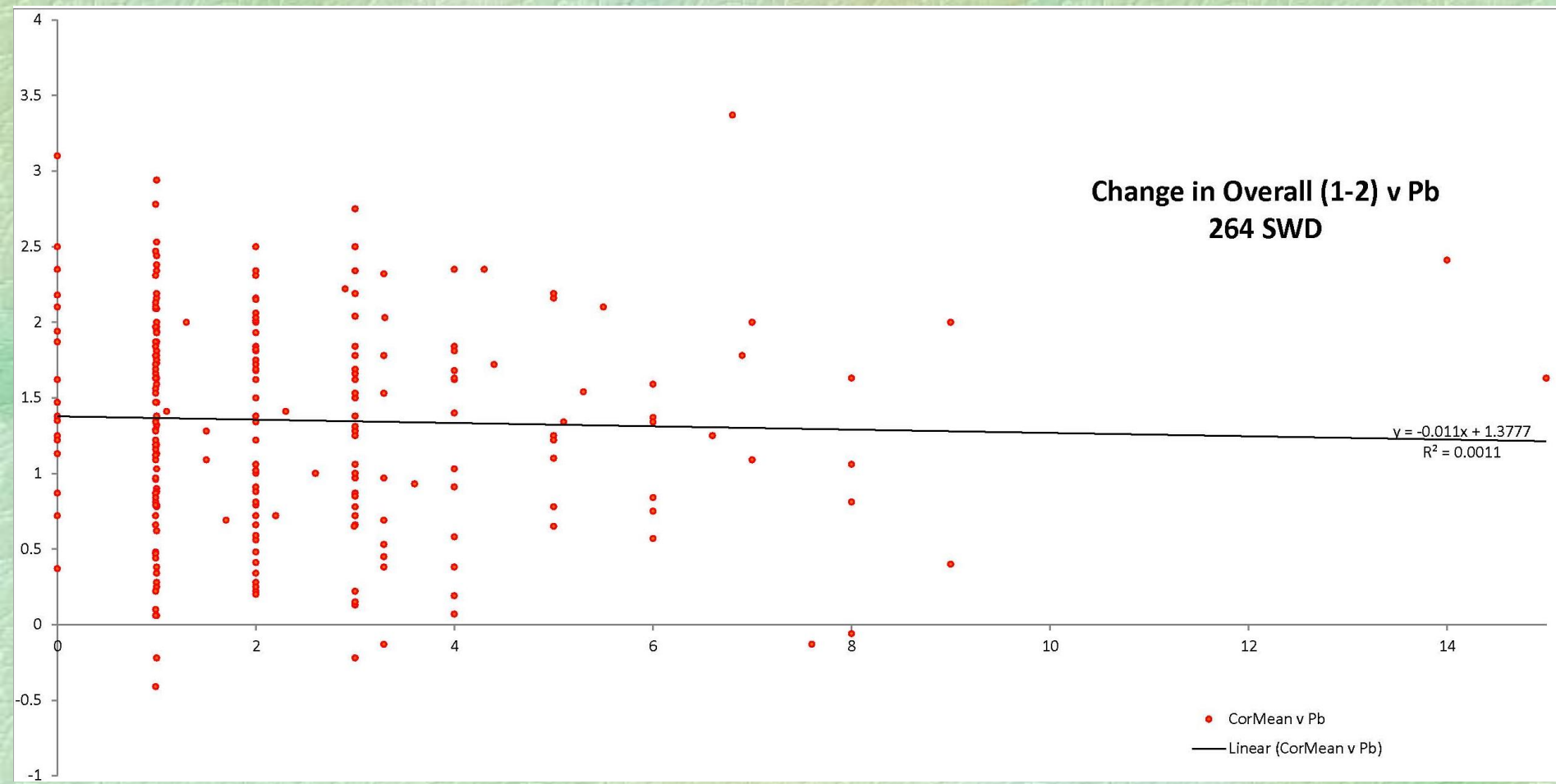
# Growth from fall to spring, all students



# Growth from fall to spring, general education students



# Growth from fall to spring, Students with Disabilities



## Quick review – raw data

- Raw data on 2,011 children from MCDPH
- 229 are at or above 5 mcg/dL – 11.4%; that is more than one child in nine
- Of these 229, we have 15 at or above 10 mcg/dL – 6.5%
- Three (3) with 15 mcg/dL, none higher
- *Note this is preliminary – further analyses required – this is all first time.*

# Proportion of Pre-K pupils

- Most of our 2013-14 pupils are in this database;
- Approximately 85% of students where we have some data;
- Proportions are higher with students with disabilities - nearly all of them;
- Shrinks to 72% due to attrition.

## Looking at other variables . . .

We saw no differences in performance, at various lead levels (0 – 15mcg/dL) regardless of:

- Age
- Gender
- Ethnicity
- General education / Special education

*We do see large differences with these groups of children overall, but not based on lead levels, for 2013-14. We see no differences based on lead levels, no matter how the data are “cut.”*

# Summarizing end-of-year data:

- Lead Levels

COR end of year

0

3.60

1.0 – 1.9

3.83

2.0 – 2.9

3.85

3.0 – 3.9

3.81

4.0 – 4.9

3.69

5.0 – 5.9

3.75

6.0 – 15

3.59



# Limitations

- One year's worth of data (but more is coming) – we really need three years;
- Data on most but not all students;
- We have not yet looked at social-emotional data;
- The effects of lead poisoning are often not seen until the intermediate elementary grades, and we don't have individual data on older children.

## Limitations (continued)

- We're just learning how to conduct these analyses;
- High-poverty urban district = attrition, mobility, missing data, incorrect data . . .
- Research in a high-poverty urban district is the educational research equivalent of a MASH unit – glorious, messy; when effective can possess enormous rewards . . .

# Policy Implications . . .

- That we are actually able to do this work;
- Building on an especially successful coalition;
- Those who have made this possible ought to be recognized and share this new information;
- Start longitudinal tracking of students as they progress up the grades;
- Opportunities for interventions in the coming years;
- May be attractive to funders;
- \_\_\_\_\_ ? (Many more implications)