Health Effects of Exposure to the Aid to Dependent Children Program in Early Childhood

Christopher Lowenstein, PhD MPH[1,2] | David H. Rehkopf, ScD MPH[1,2] | Sepideh Modrek, PhD[3]

MOTIVATION

- Economic conditions and social spending for vulnerable families in early childhood has been shown to improve contemporaneous and long-term health outcomes.[1-3]
- The Aid to Dependent Children (ADC) program was a major component of the 1935 Social Security Act in response to the Great Depression but has been understudied relative to its precursor (Mothers' Pensions[4]) or subsequent welfare reform policies.[5,6]
- Studies suggest that New Deal spending in the 1930s improved contemporaneous health and longer-term human capital outcomes, but lasting health effects of specific policies are unknown.[7,8]
- To our knowledge, only one study has attempted to isolate the effect of ADC on health outcomes and found evidence of reductions in adult and infant mortality 3-5 years after implementation.[9]
- Evidence linking economic deprivation in infancy and early childhood to accelerated aging and premature mortality suggest ADC exposure during the first year of life may delay early mortality.[10-11]

> **Did exposure to ADC within the first year of life improve longevity relative to children who were exposed to ADC later in childhood?**

DATA AND STUDY DESIGN

- The ADC program assisted states in providing support to vulnerable families defined as those with "a child under the age of sixteen who has been deprived of parental support or care."[11]
- Program matched one-third of state expenditures to eligible families up to $18 per child per month and $12 per additional child, but state generosity varied.[12]
- States began adopting ADC policies in 1936; by 1940, all 51 jurisdictions operated some form of ADC program although not all federally supported.
- By 1940, over one-fifth of female-headed households with children (approx. 3% of children nationwide) received ADC benefits.[13]
- Despite requirements to be implemented statewide, various factors contributed to variation in generosity and reach of ADC benefits *within states,* including local economic conditions, lack of state supervision, local political support, and discrimination.[13]
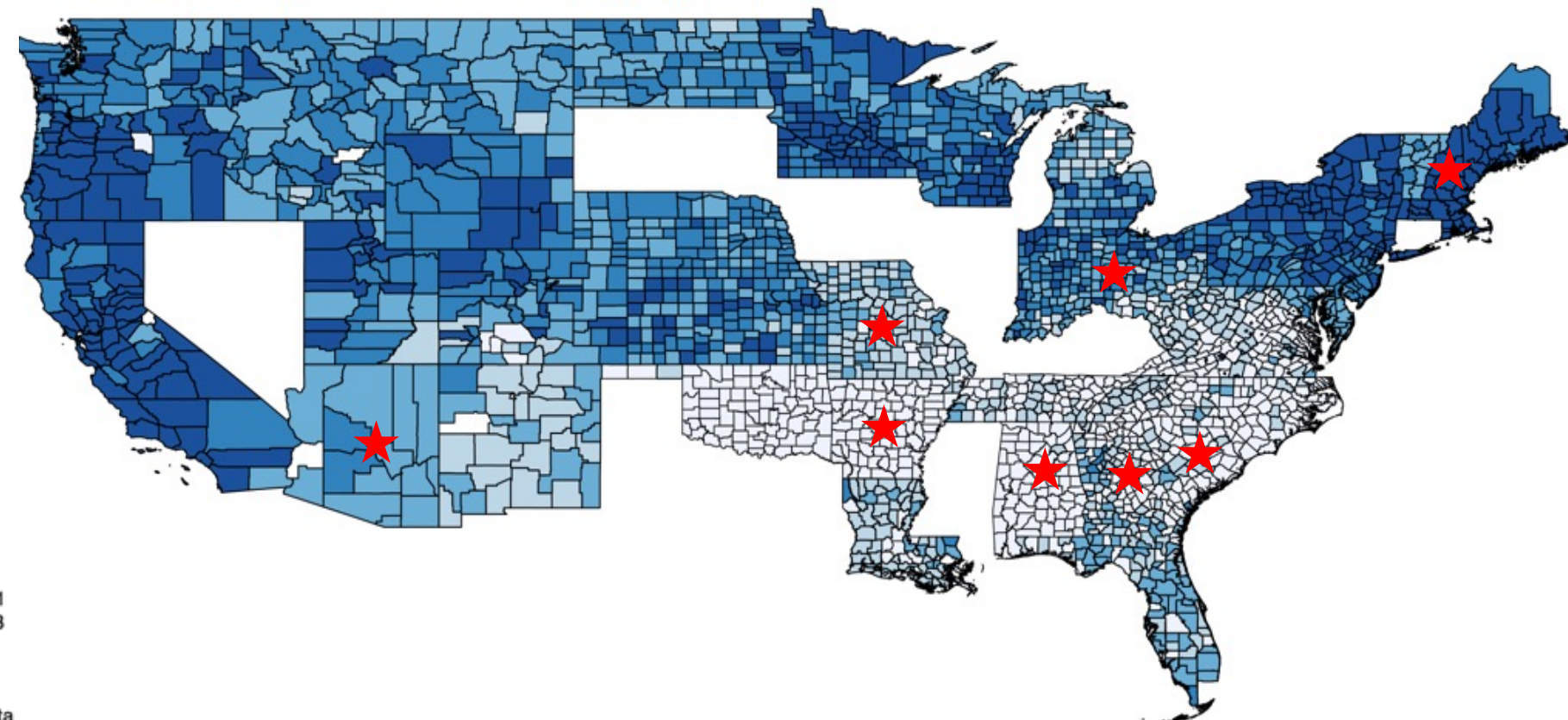
Shading denotes quintiles of average monthly payments per child as reported in December 1939. States without data are those that did not participate in the federal matching program at that time. Stars denote states without Mothers Pensions (MP) programs prior to 1936 or MP programs with very low enrollment.

AID TO DEPENDENT CHILDREN

- Empirical approach is a cohort-based difference-in-differences design that leverages differential exposure to ADC based on timing and location of birth.
- Primary data come from individual-level death records from the SSA Numident file linked with the 1940 Census (Goldstein et al. 2021)[†] restricted to individuals born between 1932–1940 living in a single-parent household.
- Data on ADC implementation, expenditures, and children served extracted from the *1940 Social Security Yearbook,* Children's Bureau, and other historical records.
- Restrict to 8 sample states *without existing Mothers Pension programs* and that received federal matching for ADC in 1939: **AL, AR, GA, IN, MO, NH, NM, and SC**.
- Restrict Numident–Census matches to ages of death *between 56 and 63* to ensure sufficient overlap across cohorts.
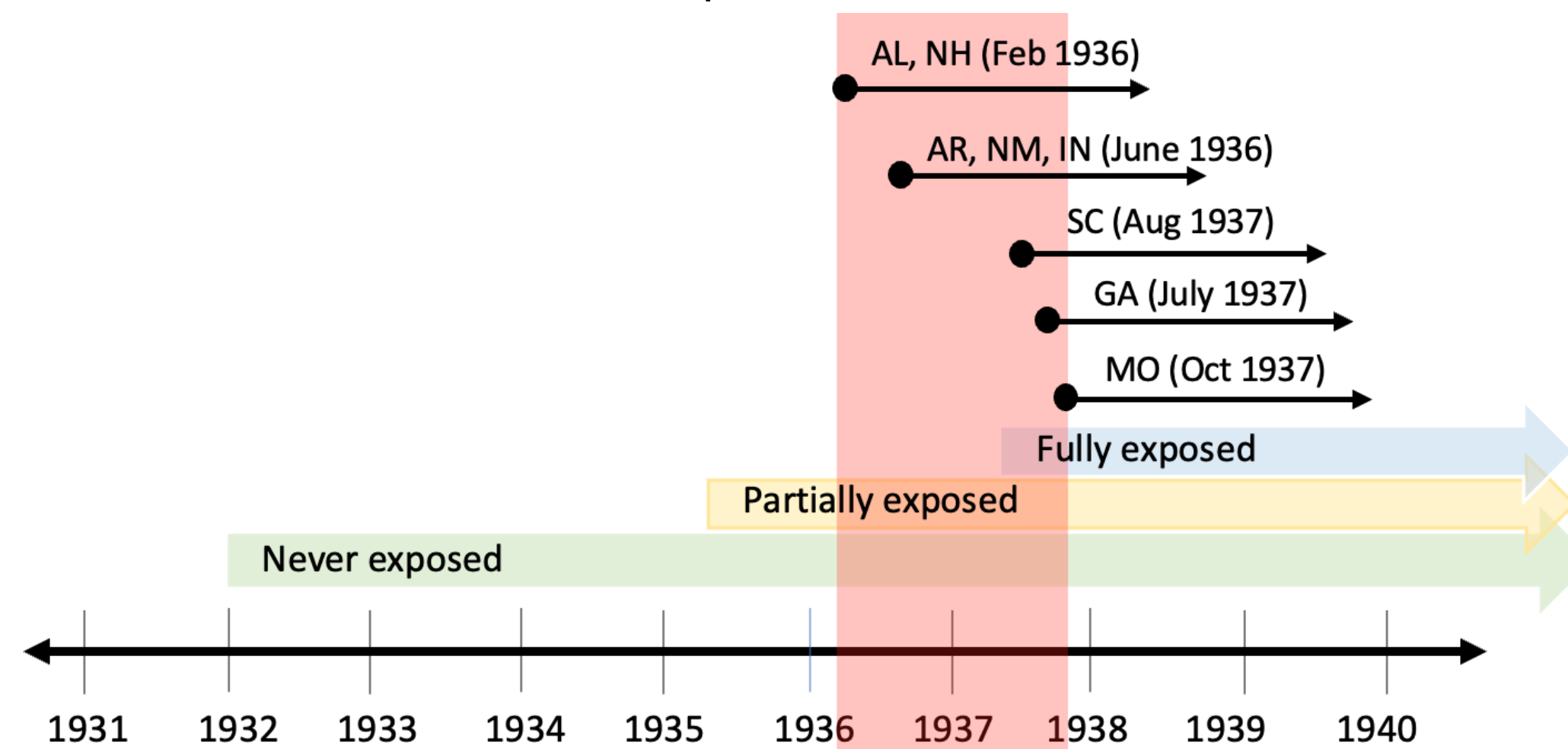
ESTIMATION STRATEGY

- Model 1 exploits temporal variation in ADC exposure driven by month and year of birth to compare age at death among cohorts exposed to ADC in first 12 months of life *relative to older cohorts that experienced ADC later in childhood*:
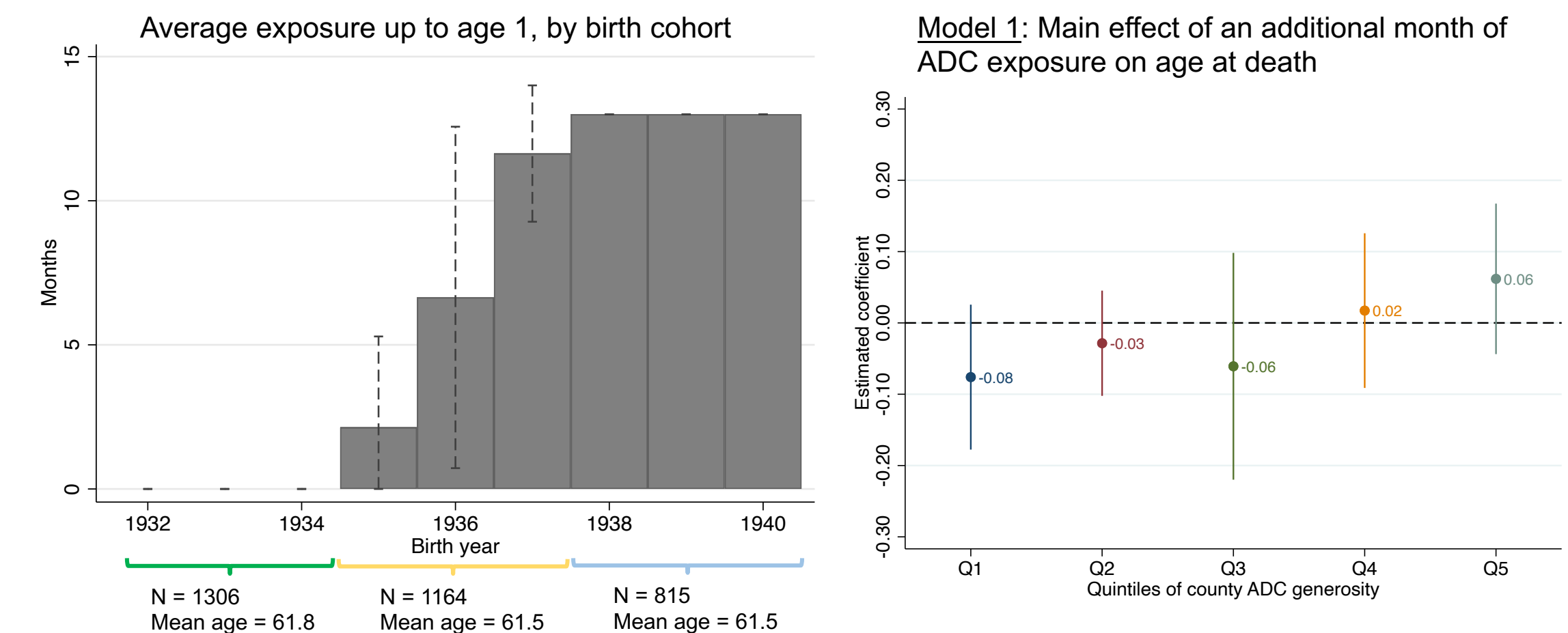
$$Age_{ict} = \alpha + \beta_1 MONTHS_{ct} + \delta \mathbf{X'}_{ict} + \theta_c + \gamma_t + \delta_{st} + \varepsilon_{ict}$$

- Model 2 introduces geographic variation in ADC generosity as measured by quintiles of ADC payments per child recipient in December 1939:

$$Age_{ict} = \alpha + \beta_2 (MONTHS_{ct} \times ADC_c) + \delta \mathbf{X'}_{ict} + \theta_s + \gamma_t + \delta_{st} + \varepsilon_{ict}$$

- β_2 in Model 2 represents the marginal effect of an additional month of exposure in the highest relative to the lowest quintile of ADC exposure (main effects excluded for brevity).
- Both models include year of birth fixed effects and state-by-birth year linear trends (δ_{st}); model 1 includes county fixed effects θ_c while model 2 includes state fixed effects θ_s and county-level controls from the 1940 Census (population share unemployed, Black, foreign born, and share homeowners) and Fishback et al. 2007 (retail sales per capita in 1929, 1929-33 change in retail sales per capita, and infant mortality rate)

MAIN RESULTS

Average exposure up to age 1, by birth cohort

N = 1306	N = 1164	N = 815
Mean age = 61.8	Mean age = 61.5	Mean age = 61.5

Model 1: Main effect of an additional month of ADC exposure on age at death

- Model 1 yields no evidence that an additional month of exposure to ADC in first year of life affects age of death overall (β_1 = 0.01, 95% CI: -0.08, 0.04) or stratified by quintile of county generosity.
- Model 2 suggests **full exposure** in the highest quintile counties increased longevity by 0.57 years, or 0.9% of the mean age at death, relative to the lowest quintile.

Model 2: Differential effect of ADC by level of county generosity

	(2a)	(2b)
Months exposed (cont.)	-0.0610 (0.0416)	
1(12 months exposure)		-1.130 (0.864)
1(5th quintile ADC)	0.420 (0.637)	0.700 (0.643)
Interaction	0.0445* (0.0199)	0.565* (0.270)
Observations	1272	1110

Notes: Months exposed is a continuous variable [1, 12] in Model 2a and a dichotomous variable (1 if full exposure, 0 otherwise) in Model 2b. Mean monthly expenditures per child in the first and fifth quintile are $3.32 and $14.50 per month, respectively). * p < 0.05.

DISCUSSION & LIMITATIONS

- Models are suggestive of **a small significant health benefit of exposure to more generous ADC policy in infancy**, conditional on later life exposure.
- Estimates could be lower bound of true ADC effect if longevity gains are concentrated outside of 56–63-year-old window.
- Identification relies on assumption that adoption and generosity of ADC is exogenous to other determinants of longevity (condition on controls).
- Unable to account for administrative differences across localities that may be correlated with later-life circumstances, including well-documented racial discrimination in receipt of ADC.
- Future work will consider exposure in utero and cumulative exposure across longer sensitive periods of development, as well as intermediary human capital and health outcomes.

Please scan for references