Age 37 Economic Returns to Physical Health in the CPC Preschool Program

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Abstract

- Although high quality early childhood programs have been found to reduce achievement and health gaps, effects on adult physical health are understudied. In this study, we examine recently-collected survey responses from a cohort of adults at ages 35-37 in the Chicago Longitudinal Study of the **Child-Parent Centers** (CPC).
- Two previous cost-benefit analyses of the CPC Program at age 21 (Reynolds et al., 2002) and age 26 (Reynolds et al., 2011) reported benefit-cost ratios ranging from **$7 to $11 of benefits per $1 of costs**.
- While health benefits due to reduced substance abuse and depression treatment were included, cardiovascular risks were not considered. Many of these benefits occur in mid-life, which was beyond the scope of prior studies.
- This study examines the health benefits of preschool on obesity, diabetes, hypertension, smoking, and substance abuse.
- We also present a comparison of health benefits versus intervention costs as a partial **cost-benefit analysis**.

Data

Sample Size

Age 3	Age 37
Total: 1539	Total: 1125
Program: 989	Program: 741
Comparison: 550	Comparison: 384

Program	Center-based early childhood intervention that provides comprehensive, continuous educational and family-support services from **preschool through third grade**.
Comparison	Kids enrolled in publicly funded all-day kindergarten in a matched set of similar high-poverty schools.

Estimation Methodology

Inverse Probability Weighting (IPW)

- Adjusted for **treatment** and **attrition** using **probit.**
  As a double adjustment, weights were multiplied together.
  Standard errors were clustered at school level.

Linear Regression with IPW weights

- Adjusted for risk indicators, race/ethnicity, gender, and participation in school-age program

Cost Benefit Analysis

Estimates are converted to **2019 dollars** using the Bureau of Labor Statistics' Consumer Price Index

Annual **discount rate of 3%** is used to calculate the Present Value (PV) at age 3.

Benefits are projected through **age 65** for lifetime outcomes.

Program Cost

The present-value average cost per child of the CPC preschool program was estimated to be **$10,585** for an average of 1.5 years of program.

Summary of Impact on Health Outcomes

Self-Reported Health Outcome	Sample Mean (Sample Size)	Unadjusted group difference (Standard Error)	IPW adjusted Regression estimate (Robust SE)
Smoking (Current)	0.215 (n=1100)	-0.052** (0.026)	-0.058* (0.031)
Hypertension	0.169 (n=1096)	-0.004 (0.024)	-0.0001 (0.027)
Body Mass Index	30.37 (n=1042)	-0.575 (0.444)	-1.071** (0.533)
Obesity	0.449 (n=1042)	-0.028 (0.033)	-0.044 (0.036)
Diabetes	0.054 (n=1097)	-0.036** (0.014)	-0.037** (0.017)
Drug Use	0.058 (n=1097)	-0.025* (0.015)	-0.025 (0.018)
Depression	0.067 (n=1098)	0.001 (0.016)	0.002 (0.020)

*Significant at 10% level; **Significant at 5% level

Benefits (Physical Health)

Benefits from reduced diabetes

- Savings in direct medical costs and lost productivity due to diabetes are estimated to be **$5,618** per participant.

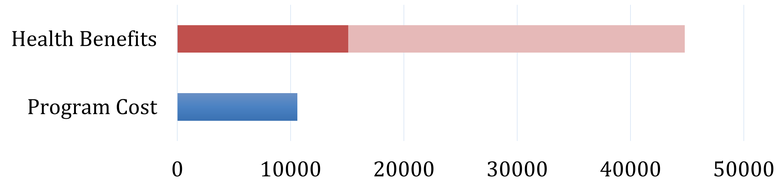
Benefits from reduced smoking

- Savings in direct medical costs and lost productivity due to smoking are estimated to be **$5,895** per participant.
- Savings from reduced mortality costs related to smoking are estimated to be between **$3,580** to **$33,272** per participant.

Total Health Benefits

- **$15,093 to $44,785** per participant

Benefit-Cost Ratio = 1.43 to 4.23



Conclusion

Novelty

Most studies of the benefits of early intervention do not utilize data on these outcomes.

Benefits > Cost

Health impacts of early educational intervention are significant and may by themselves **offset the costs of the intervention**, even if no other benefits were observed.

Advocacy

The existence of these additional benefits are likely to further amplify the rationale for government investments in early education.

Next Steps

- **Sensitivity analysis** — Using a range of discount rates
- **Uncertainty** — Model for uncertainty using Monte Carlo simulations
- **Full CBA** — Complete age-37 CBA including all outcome measures

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