

# *Journal of Health Disparities Research and Practice*

---

Volume 12, Issue 4

2018

Article 4

2019 STEP-UP SPECIAL ISSUE

---

## Development of the Family Poverty Index (FPI): A Novel Index to Measure Socioeconomic Status

Ozi Amuzie\*

Joseph Rigdon, PhD<sup>†</sup>

FeiFei Qin, MPH<sup>‡</sup>

Cynthia R. Rovnaghi, M.S.\*\*

Kanwaljeet S. Anand, M.D.<sup>††</sup>

\*

†

‡

\*\*

<sup>††</sup>Quantitative Sciences Unit and Pain/Stress Neurobiology Laboratory, Stanford University School of Medicine

Copyright ©2018 by the authors. *Journal of Health Disparities Research and Practice* is produced by The Berkeley Electronic Press (bepress). <https://digitalscholarship.unlv.edu/jhdrp>

# Development of the Family Poverty Index (FPI): A Novel Index to Measure Socioeconomic Status

Ozi Amuzie; Joseph Rigdon, PhD; FeiFei Qin, MPH; Cynthia R. Rovnaghi,  
M.S.; and Kanwaljeet S. Anand, M.D.

## Abstract

The CANDLE Study aims to uncover factors experienced during pregnancy and early life that affect cognition, behavior, and health of children. External stressors and socioeconomic status (SES) influence the fetus through “prenatal programming”. However, comprehensive measures of SES do not exist, except those based on income and education.

We selected 53 variables from the CANDLE study including annual household income, headcount, marital status, health insurance, parental occupation and education. Singular value decomposition imputation (SVDI), a principal components analysis approach unaffected by the 24.4% missing data in our variables, was applied to all 53 variables (Troyanskaya, 2001).

All variables were distilled into 3 principal components explaining 93% of the variability. These components were combined to develop the Family Poverty Index (FPI, range 1-10). All subjects were separated into deciles based on FPI scores. Individuals with FPI=1 were the “poorest” with 79% individuals having annual incomes <\$15,000. Those with FPI=9 or 10 were “rich”, since most individuals (98.7%, 73.3%) had annual incomes >\$55,000. With FPI=1-3, 95% had Medicaid insurance and 4.8% had employer/private insurance, whereas with FPI=8-10, 86% had employer/private insurance and 11.8% had Medicaid. Other variables showed similar distributions across FPI categories.

FPI appears to be a robust measure of SES in the CANDLE Study population. Further research should test the validity of the FPI in other datasets.

**KEYWORDS:** Family Poverty Index; prenatal programming; singular value decomposition imputation (SVDI)



**Journal of Health Disparities Research and Practice**  
**Volume 12, STEP-UP Special Issue, Summer 2019, pp. 8-9**

© 2011 Center for Health Disparities Research

School of Public Health

University of Nevada, Las Vegas

## **Development of the Family Poverty Index (FPI): A Novel Index to Measure Socioeconomic Status**

Ozi Amuzie

Joseph Rigdon, PhD

FeiFei Qin, MPH

Cynthia R. Rovnaghi, M.S.

Kanwaljeet S. Anand, M.D., Quantitative Sciences Unit and Pain/Stress Neurobiology Laboratory,  
Stanford University School of Medicine

**Coordinating Center:** Stanford University

### **ABSTRACT**

The CANDLE Study aims to uncover factors experienced during pregnancy and early life that affect cognition, behavior, and health of children. External stressors and socioeconomic status (SES) influence the fetus through “prenatal programming”. However, comprehensive measures of SES do not exist, except those based on income and education.

We selected 53 variables from the CANDLE study including annual household income, headcount, marital status, health insurance, parental occupation and education. Singular value decomposition imputation (SVDI), a principal components analysis approach unaffected by the 24.4% missing data in our variables, was applied to all 53 variables (Troyanskaya, 2001).

All variables were distilled into 3 principal components explaining 93% of the variability. These components were combined to develop the Family Poverty Index (FPI, range 1-10). All subjects were separated into deciles based on FPI scores. Individuals with FPI=1 were the “poorest” with 79% individuals having annual incomes <\$15,000. Those with FPI=9 or 10 were “rich”, since most individuals (98.7%, 73.3%) had annual incomes >\$55,000. With FPI=1-3, 95% had Medicaid insurance and 4.8% had employer/private insurance, whereas with FPI=8-10, 86% had employer/private insurance and 11.8% had Medicaid. Other variables showed similar distributions across FPI categories.

FPI appears to be a robust measure of SES in the CANDLE Study population. Further research should test the validity of the FPI in other datasets.

**Keywords:** Family Poverty Index, prenatal programming, singular value decomposition imputation (SVDI)

Journal of Health Disparities Research and Practice Volume 12, STEP-UP Special Issue,  
Summer 2019

<http://digitalscholarship.unlv.edu/jhdrp/>

Follow on Facebook: Health.Disparities.Journal

Follow on Twitter: @jhdrp

**ACKNOWLEDGEMENTS**

The STEP-UP HS program is supported by the National Institute of Diabetes and Digestive and Kidney Diseases of the National Institutes of Health Grant #: 2R25DK078382-12

**REFERENCES**

Troyanskaya, et al. Missing value estimation methods for DNA microarrays. *Bioinformatics* 2001;17(6):520-5.