Improving the Life-Chances of Socially Disadvantaged Children and Families

David Olds, PhD

Professor of Pediatrics, Psychiatry, Nursing, and Public Health

University of Colorado Health Sciences Center

March 4, 2011
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High-Risk Neighborhoods

- No sources of healthy food
- Unemployment
- No decent housing
- Unsafe play areas
- Crime
NURSE FAMILY PARTNERSHIP

- Prenatal and infancy home visiting
- Activates parents’ instinct to protect
  - Makes sense to parents
  - Nurses bring caring, competence, & respect
  - Program model focuses on critical influences on early development
- Rigorously tested
FAMILIES SERVED

• Low income pregnant women
  – Usually teens
  – Usually unmarried

• First-time parents
NURSE FAMILY PARTNERSHIP’S THREE GOALS

1. Improve pregnancy outcomes
2. Improve child health and development
3. Improve parents’ economic self-sufficiency
TRIALS OF PROGRAM

Elmira, NY 1977
- Low-income whites
- Semi-rural

N = 400

Memphis, TN 1987
- Low-income blacks
- Urban

N = 1,138 and N=743

Denver, CO 1994
- Large portion of Hispanics
- Nurse versus paraprofessional visitors

N = 735
CONSISTENT RESULTS ACROSS TRIALS

- Improvements in women’s prenatal health
- Reductions in children’s injuries
- Fewer subsequent pregnancies
- Greater intervals between births
- Increases in employment
- Reductions in welfare and food stamps
- Improvements in school readiness (low-resource mothers)
- Effects greatest for most susceptible
Indicated Cases of Child Abuse and Neglect – 0 to 2 Years Elmira

*P*=.07

*Pediatrics, 1986:78(1), 65-78.*
Indicated Cases of Child Abuse and Neglect 0 to 15 Years - Elmira

P = .03

*P = .03

JAMA, 1997;278:637-643
Maltreatment Reports Involving the Study Child by Treatment Status and Domestic Violence

Number of CPS Reports

Comparison
NV Preg+Inf

Simultaneous Region of Treatment Differences (p < .05)

Domestic Violence

JAMA, 2000; 284: 1385-1391
Months Between Birth of First and Second Child (Poor Unmarried Mothers) - 0-15 Years Elmira

*P = .001

JAMA, 1997; 278: 637-643
Months of Receiving Cash Assistance Welfare for Poor Unmarried Mothers 0-15 Years Elmira

*P=.005

JAMA, 1997; 278: 637-643
Count of Subsequent Pregnancies
0-15 Years Elmira

*P = .01

JAMA, 1997; 278: 637-643
Counts of Arrests 0-15 Years Elmira

*P=.03

JAMA, 1998:280(14), 1238-1244
Counts of PINS Records
0-15 Years Elmira

*P = .002

JAMA, 1998:280(14), 1238-1244
Number of Life-Time Arrests
Elmira Youth - Age 19

Comparison Nurse

P = .02, IR = 0.49
No Program Effects in Elmira on 19-Year Olds’:

- Illegal drug use
- SR delinquency
- HS graduation
- Economic productivity
- Teen parenthood
- Use of welfare

Memphis Design

- Urban Setting
- Sample (N = 1138 for prenatal and N = 743 for postnatal)
  - 92% African American
  - 98% Unmarried
  - 85% < Federal Poverty Index
  - 64% < 19 years at intake
  - 2.4 SD above mean neighborhood adversity
Memphis Program

- Registered nearly entire population (88%)
- Memphis/Shelby County Health Department
- Conducted at height of nursing shortage
Memphis Program Effects on Childhood Injuries (0 - 2 Years)

- 23% Reduction in Health-Care Encounters for Injuries & Ingestions
- 80% Reduction in Days Hospitalized for Injuries & Ingestions

*JAMA* 1997; 278: 644-652.
Diagnosis for Hospitalization in which Injuries and Ingestions Were Detected Nurse-Visited (n=204)

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Age (in months)</th>
<th>Length of Stay</th>
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<tbody>
<tr>
<td>Burns (1(^0) &amp; 2(^0) to face)</td>
<td>12.0</td>
<td>2</td>
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<tr>
<td>Coin Ingestion</td>
<td>12.1</td>
<td>1</td>
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<tr>
<td>Ingestion of Iron Medication</td>
<td>20.4</td>
<td>4</td>
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*JAMA 1997; 278: 644-652.*
## Diagnosis for Hospitalization in which Injuries and Ingestions Were Detected - Comparison (n=453)

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<thead>
<tr>
<th>Diagnosis</th>
<th>Age (in months)</th>
<th>Length of Stay</th>
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<tbody>
<tr>
<td>Head Trauma</td>
<td>2.4</td>
<td>1</td>
</tr>
<tr>
<td>Fractured Fibula/Congenital Syphilis</td>
<td>2.4</td>
<td>12</td>
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<tr>
<td>Strangulated Hemia with Delay in Seeking Care/ Burns (1° to lips)</td>
<td>3.5</td>
<td>15</td>
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<tr>
<td>Bilateral Subdural Hematoma</td>
<td>4.9</td>
<td>19</td>
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<tr>
<td>Fractured Skull</td>
<td>5.2</td>
<td>5</td>
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<tr>
<td>Bilateral Subdural Hematoma (Unresolved)/Aseptic Meningitis - 2nd hospitalization</td>
<td>5.3</td>
<td>4</td>
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<tr>
<td>Fractured Skull</td>
<td>7.8</td>
<td>3</td>
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<tr>
<td>Coin Ingestion</td>
<td>10.9</td>
<td>2</td>
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<tr>
<td>Child Abuse Neglect Suspected</td>
<td>14.6</td>
<td>2</td>
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<tr>
<td>Fractured Tibia</td>
<td>14.8</td>
<td>2</td>
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<tr>
<td>Burns (2° face/neck)</td>
<td>15.1</td>
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<tr>
<td>Burns (2° &amp; 3° bilateral leg)</td>
<td>19.6</td>
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<tr>
<td>Gastroenteritis/Head Trauma</td>
<td>20.0</td>
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<tr>
<td>Burns (splinting/grafting) - 2nd hospitalization</td>
<td>20.1</td>
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<tr>
<td>Finger Injury/Osteomyelitis</td>
<td>23.0</td>
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Nurse

Simultaneous Region of Treatment Differences (p < 0.05)

Comparison

No. Days Hospitalized with Injuries/Ingestions

Mothers’ Psychological Resources
Intellectual Functioning
KABC MPC – Age 6
(Born to Low-Resource Mothers)

p = .03, Effect Size = 0.25

Pediatrics, 2004;114; 1550-1559.
% Behavioral / Mental Health Problems
Age 6 - CBCL

P = .04, OR = .32

Percentiles of Reading & Math Achievement Test Scores - Grades 1-3
(Born to Low-Resource Mothers)

\[ p = 0.002, \text{ Effect Size} = 0.33 \]

Percent of Mothers with Role Impairment due to Alcohol or Drug Use – Child Age 12

P = .04

Arch Pediatr Adolesc Med, 164(5) 419-424
Duration of Partner Relationship (Months)  
Child Age 12

P=.02, Effect Size = 0.18

Arch Pediatr Adolesc Med, 164(5) 419-424
Reading & Math Achievement—Age 12
(Born to Low-Resource Mothers)

p = .009, Effect Size = 0.25

Arch Pediatr Adolesc Med, 164(5) 412-418
Percent of Children Who Used Tobacco, Alcohol, or Marijuana (Last 30 Days) Memphis – Child Age 12

P = .04   OR = 0.31

Arch Pediatr Adolesc Med, 164(5) 412-418
Percent of Children with Depression-Anxiety – Child Age 12

P = .04   OR  = 0.63

Arch Pediatr Adolesc Med, 164(5) 412-418
Total Discounted Government Spending (2006 US dollars) after Birth of First Child for Food Stamps, Medicaid, & AFDC/TANF
Memphis - Age 17 Follow-up

- Language, cognitive, and academic functioning
- MDD and GAD
- Conduct problems, arrests, violence, gangs
- Substance use and disorders (urine screens)
- Risky sexual behavior
- STI’s (urine screens)
- Pregnancies
- Moderation of TX impact by genetic vulnerability
- Subsequent children supplement
- Economic analysis supplement
Pattern of Denver Program Effects

Maternal and Child Functioning

Comparison  Para  Nurse
Change in Cotinine From Intake to End of Pregnancy

Control -36.6

Para -73.8

Nurse -235.6*

* P< .05

Pediatrics, 2002;110: 486-496.
Total Preschool Language Scale
4 Years
(Born to Low-Resource Mothers)

$P_{C-P} = .13, \ ES = .23; \ P_{C-N} = .04, \ ES = .31$  *Pediatrics*, 2004;114: 1560-1568.
Executive Functioning Index - 4-Years (Born to Low-Resource Mothers)

\[ P_{c-p} = .06, \ ES = .29; \ P_{c-n} = .000, \ ES = .47 \]

Nurse Family Partnership produced large return on investment:

- Implementation costs $9,118
- Benefits $26,298
- Return on investment $17,180

NATIONAL REPLICATION

Now operating in over 380 counties in 32 states, serving over 22,000 families per day.
Nurturing Community, Organizational, and State Development
Training and Technical Assistance
Program Guidelines
Clinical Information System
Assessing Program Performance
Continuous Improvement
International Replication

• No presumptions
• Adaptation
• Pre-test and small-scale trial
• Larger trial
• Faithful replication of adapted program
• International work:
  – England
  – Australia
  – Netherlands
  – Canada
ACA Maternal, Infant, and Early Childhood Home Visiting Program

- $1.5 Billion over 5 years awarded to states through MCH
- Focus on high-risk communities
- 75% of funding must go to programs that met legislative evidence threshold
- Extensive review of evidence by Mathematica
- 7 Home Visiting Programs met that threshold
- States must show plans for adherence to evidence-based program models and outcome benchmarks
ACA Home Visiting Outcome Domains

- Maternal health
- Child health
- Child development
- Prevention of injuries and child maltreatment
- Parenting skills
- Reductions in crime or domestic violence
- Family economic self-sufficiency
- Referrals for other services
Legislative Mandated Evidence Threshold for Funding

• At least one high or moderate quality impact study found significant impacts on 2 or more outcome domains

• At least 2 high or moderate quality impact studies found significant impacts on the same domain
Mathematica Review

• Systematic review

• What Works Clearing House standards

• RCT’s had to meet additional criteria:
  – Effects sustained for at least one year
  – Results published in peer reviewed journal

• Quality of measures, duration of impacts, replication of impacts, subgroup effects, unfavorable or ambiguous impacts, evaluator independence, and magnitude of effects

• Implementation capacity
Research to Improve NFP Program Model and Implementation

• Develop and test model to improve participant retention

• Develop and test model for nurses to use in addressing intimate partner violence

• Develop and test new method for nurses to use in observing caregiver-child interaction

• Develop new methods for nurses to use in promoting competent care-giving
Model Development

Original Trials
- Trial 1
- Trial 2
- Trial 3

Articulate Essential Model Elements

Develop/Test Model Innovations

Studies of Implementation Process

US Community Replication
- Community Preparation
- Training/Coaching of Nurses
- Performance Monitoring
- Continuous Quality Improvement

International Replication
- Adapt and Test Original Model