What "High Utilizers" Can Tell Us About Population Health

NIH Health Care Systems Research Collaboratory
Grand Rounds
David Labby MD PhD
Health Share of Oregon
Providence Center For Outcomes Research and Education
January 20, 2017
“Coordinated Care Organizations”

- Oregon’s “Health Care Transformation” accountable care model
  - Full risk global budgets for physical, behavioral and oral health
  - Manage to agreed upon rate of growth, performance metrics
  - Launch 2012: 16 regional CCOs

- Health Share of Oregon: CCO for tri county area around Portland
  - 240,000 members
  - Non Profit entity formed from:
    - 4 Medicaid Managed Care organizations
    - 3 County Mental Health Organizations
    - 8 Dental Managed Care Organizations,
    - All 5 Major hospital systems,
    - All major independent practices and FQHCs
“Transforming Health Together”

• Initial clinical focus: cost control
  – CMMI Challenge Grant Award: 3 year funding “A regional system of care for high utilizers” (2012-15)

• “Health Commons Initiative”
  – Multiple initiatives with 18 different partners in primary care, ED, hospital, mental health, 911, homeless services, corrections
  – Core component: community outreach to learn and try to address key issues as members see them
What “High Needs / High Cost” Patients Taught Us

• It is not “What’s wrong with them”... but “What has happened to them:”
  – From “High Utilizer” engagement:
    • High prevalence of reported “Adverse Childhood Events”

• Formal qualitative study of “Adverse Life Events”
  – Ongoing research
Adverse Childhood Experiences (ACE) Study

- 1998 Kaiser Permanente & the Centers for Disease Control
  V. Fellitti and R. Anda

- Demographics
  - Average age 57
  - “Solidly middle class”
    - White
    - Attended college
- Surveyed experience up to 18 yo

- “ACE Score” Computed based on positive response to each domain

<table>
<thead>
<tr>
<th>Adverse Childhood Events / Rate:</th>
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<tbody>
<tr>
<td>Substance Abuse 27%</td>
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<td>Parental Separation/Divorce 23%</td>
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<tr>
<td>Mental Illness 17%</td>
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<tr>
<td>Battered Mother 13%</td>
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<td>Criminal Behavior 6%</td>
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<td>Psychological Abuse 11%</td>
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<td>Physical Abuse 28%</td>
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<td>Emotional Neglect 15%</td>
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<td>Physical Neglect 10%</td>
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What we knew….

Adults with “ACE Score” 4+

- Increased risk of liver, lung, heart disease
- 7x increase in alcoholism
- 3x increase in depression in men; 5x in women
- 13x increase in the prevalence of attempted suicide
- 10x increase in use of IV drugs; for males with 6+ACEs 46x increase
- 4.5x increase in intimate partner violence; 5x increase in risk of rape; with ACE 5, 9x
- Increased risk of teen pregnancy, prescription drug use, job loss, homelessness, high school non graduation, incarceration
- 25 year early mortality

http://www.acestudy.org/
http://www.cdc.gov/violenceprevention/acestudy/
What we learned: Life stories with chain reactions of adversity

Miranda

- Tumultuous, violent relationship between parents, unstable housing
- Parents split, dad got “left behind”
- Lived with multiple caretakers in various locations
- First pregnancy/birth, stepbrother is father
- 3 children, still living in abusive household
- Moves back in with mom, daily sexual abuse from stepfather
- Drops out of school
- Begins heavy drug use and selling
- Goes to prison on drug charges
- Suicide attempt
- Heavy alcohol use, drug relapses, cancer, car accidents

Age 47
6 children age 15-32
No GED/diploma, no employment
In recovery from severe substance use
Chronic pain, cancer, multiple surgeries, no teeth or dentures
Multiple psychiatric medications
The Prevalence of Adverse Life Experiences (n=47)

0-6 yo
30% Suffered repeated physical, sexual or emotional abuse in early childhood
22% Had unmet basic needs (food, clothing)
13% Lived with an adult with a substance use issue
17% Were separated from parents

What the Numbers Tell Us
Program participants have led extraordinarily difficult lives:
63% have experienced some form of abuse before the age of 19.

7-19 yo
54% struggled in school
50% dropped out of school
28% Ran away or left home early
30% Became teen parents
15% Became homeless at some point
46% Were substance users

19-30 yo
30% Were arrested or incarcerated at some point
52% Were substance users
26% Were homeless
74% Report job insecurity or become unable to work at all

30+ yo
40% Struggle with mental health
70% Describe struggling to get needed healthcare
30% Struggle to manage their medication
NONE able to work
30% Describe being socially isolated

Lauren Broffman, Center for Outcomes Research and Education (CORE)
### Adverse Life Events In “High Utilizers:”

#### Cumulative Burden Across Life Span

- **Abuse:** Emotional, Physical, Sexual
- **Substance Use:** Drugs, Alcohol
- **Abandonment**
- **Traumatic Loss**
- **School Failure**
- **Job Failure**
- **Homelessness**
- **Incarceration**

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Self reported life events from 30 Medicaid “High Utilizers” enrolled in intensive management program
### Adverse Life Events

#### In “High Utilizers:”

**Cumulative Burden Across Life Span**

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<td>31 M AA</td>
<td>Abuse (e), Neglect, Race</td>
<td>Drugs, Alc, Arrest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50 F H</td>
<td>Abuse (e)</td>
<td></td>
<td>Loss, Disabled</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40 F AA</td>
<td></td>
<td></td>
<td>Injury; unable to work</td>
<td></td>
<td></td>
</tr>
<tr>
<td>62 M AA</td>
<td>Parental SU</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>41 M AA</td>
<td></td>
<td></td>
<td>Arrest</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31 F</td>
<td></td>
<td></td>
<td>Rape, Homeless</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Age Less Than 30

<table>
<thead>
<tr>
<th>Age/Gen Race</th>
<th>0-5</th>
<th>6-12</th>
<th>13-19</th>
<th>20-30</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 F</td>
<td>Parent SU</td>
<td>Abuse (e)</td>
<td>Abuse (s) Bullied, Assaulted</td>
<td>Alc/Drugs Abuse (p)</td>
</tr>
<tr>
<td>29 F</td>
<td>Parental conflicts; family chaos</td>
<td>Parental conflicts; family chaos</td>
<td>Runaway; Traumatic Brain Injury; Quit school; Drugs</td>
<td></td>
</tr>
<tr>
<td>24 F AA</td>
<td>Abuse (v)</td>
<td>Bullying</td>
<td>Self Harm, Quit School</td>
<td>Alc, Self Harm, Loss</td>
</tr>
</tbody>
</table>

Self reported life events from 30 Medicaid “High Utilizers” enrolled in intensive management program.
What Does This Mean For CCO “Population Health” Strategy In Disenfranchised Communities?

Children in low SES households have 5 times the rate of maltreatment than other children: 3 times more likely to be abused, 7 times more likely to be neglected (NIS 2006)
From Intervention To Prevention:

- Cascading adverse life events that derail a healthy life
- Potentially intergenerational
- What can Health Share do?

- Unintended pregnancy
- Chronic illness, Substance use, Mental illness, Criminality, Isolation, Disability
- Job Insecurity
- Social Deprivation
- Risk Behaviors
- Kindergarten School Failure
- Housing Insecurity
- Substance Use Unhealthy Relationships
- Behavioral Problems Skill Deficits
- Unintended pregnancy
- Abnormalities
- Parents not able / ready to “parent”
- Abuse Neglect
- Substance Use Unhealthy Relationships
- Behavioral Problems Skill Deficits
- Unintended pregnancy
- Abnormalities
- Parents not able / ready to “parent”
- Abuse Neglect
- Substance Use Unhealthy Relationships
- Behavioral Problems Skill Deficits
What can we do within current practice?

- Medicaid pays for over 50% of Oregon Births:
  - **For women:** Preventing unintended pregnancies
    - Screen for pregnancy intentions of all women of childbearing age
    - Ensure access to full range of contraception (CCO P4P metric)
      - Support Long Acting Reversible Contraception (LARC) training in primary care (IUDs, Implants)
      - Ensure there are no health plan barriers to effective contraception
  - **For children:** Ensuring developmental risks, delays and disabilities are identified and addressed
    - Improve developmental screening rates (CCO P4P Metric)
    - Improve coordination between primary care, specialty services, and early intervention (Help Me Grow model)
Early neurological development: brain pathways develop in response to how others meet needs

- “Wiring” develops in “use dependent” manner (Perry 2009)
- If others are experienced as unpredictable, a source of pain, anxiety, fear, pathways will develop to monitor for threat, for immediate reaction, to avoid risky attachment

Toxic stress is also thought to drive overproduction of stress hormones (cortisol, norepinephrine, adrenaline) effecting growth of differ parts of the brain.
Stress, Stress Hormones and the Developing Brain

Amygdala:
functions immediately for emotional processing, = hypertrophy, over reactivity, fear, anxiety

Hippocampus:
matures slowly supports memory, learning = ability to put danger in context underdeveloped, misinterpretation of threat

Prefrontal Cortex:
executive function = neuron loss, poor impulse control

(Restak, 1988)
Impact Of Trauma

• Impact on World View:
  • The world is an unsafe place to live in
  • I expect crisis, danger & loss
  • Other people are unsafe and cannot be trusted
  • My own thoughts and feelings are unsafe
  • I have no self-worth and no abilities

• Common Triggers:
  • Authority figures, lack of control, rejection / shaming, surprise / threat, sensory overload

• Impact on Behavior:
  • Emotional reactivity, not following through with plans, helplessness, lack of future thinking, high risk health behaviors
ACE Associated *Health Risk Behaviors*

- School failure, starting in kindergarten
- Early substance abuse, including IVDU, prescription drug use
- Delinquency
- Risky sexual behavior
- Teen pregnancy
- Homelessness – early family and personal
- Depression, anxiety, eating disorders, suicide
- Job and financial problems
- Interpersonal violence
- Incarceration
What Does This Mean For CCO “Population Health” Strategy In Disenfranchised Communities?

Do the different health risks now associated with high ACEs co occur and compound each other in those with the worst health outcomes?

Does society make things better... or worse?
Social Pathways

Creating Healthy Communities...

Birth
- Supportive Parenting

Infancy
- Strong Attachments

Preschool
- Social Skills

K-8

High School
- Ready for kindergarten
- Academic Success

19-30 yo
- Positive Relationships
- Productive Social Role

30 yo +
- Access To Resources
Adverse Social Pathways

Creating Healthy Communities...

Birth
- Supportive Parenting

Infancy
- Strong Attachments

Preschool
- Social Skills

K-8
- Ready for kindergarten

High School
- Academic Success

19-30 yo
- Positive Relationships

30 yo +
- Productive Social Role

Access To Resources

Preschool Suspension

Poor Social-Emotional Regulation
Adverse Social Pathways

Supportive Parenting

Preschool Suspension

Poor Social-Emotional Regulation

Birth

Infancy

Preschool

Supportive Parenting

Adverse Social Pathways

Supportive Parenting

Preschool Suspension

Poor Social-Emotional Regulation

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Supportive Parenting

Adverse Social Pathways

Supportive Parenting

Preschool Suspension

Poor Social-Emotional Regulation

Birth

Infancy

Preschool
Adverse Social Pathways

Creating Healthy Communities...

- **Birth**: Supportive Parenting, Strong Attachments
- **Infancy**: Social Skills
- **Preschool**: Preschool Suspension, Reading Proficiency, Kindergarten Readiness
- **K-8**: Ready for kindergarten, Academic Success
- **High School**: Productive Social Role, Positive Relationships
- **19-30 yo**: Access To Resources
- **30 yo +**
Figure 2, a: Third-Grade Reading Test Scores, All Children
b: Children Not Graduating High School by Third-Grade Reading Test Scores, All Children

Creating Healthy Communities...

- Birth
- Infancy
- Preschool
  - Social Skills
  - Strong Attachments
- Supportive Parenting
- K - 8
- High School
  - Academic Success
  - Ready for kindergarten
- 19-30 yo
- Positive Relationships
- 30 yo +
  - Productive Social Role
- Access To Resources

- Preschool Suspension
- Reading Proficiency
- HS Graduation
  - Trauma Sensitive Schools?
Figure 6: Likelihood of Not Graduating from High School Based on Risk Factors

Not Reading Proficiently

Poor and Not Reading Proficiently

Poor, Poor Neighborhood and Not Reading Proficiently

Life Course Health Study

• Random sample of 9,176 Health Share members by life events survey
  – Weighted response rate of 38% after intensive follow up of 1,579 non responders
  – 100 Question survey covering 5 age bands (0-5, 6-12, 13-18, 19-30, 30+)
    • Questions: ACEs plus school, peer / social relationships, housing insecurity, substance use, employment, incarceration, current health / health care etc

• Matched medical claims data including diagnoses, utilization, costs
Life Course Health Study

• To what extent do ACEs start a cascade of adverse life events that compound each other, making health risk behaviors and poor health outcomes more likely?

  – Are there common, high prevalence adversities that complex/high needs Medicaid members experience?
    • Are there common pathways of adversity leading to poor health?

  – What could this tell us about policies and strategies to improve population health?
    • What are the critical partnership for health care?
    • Could “trauma informed” policies in health care and elsewhere change the health outcomes for those most at risk?
# Health Risk Groupings

<table>
<thead>
<tr>
<th>Complexity Group</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of Medicaid Population</td>
<td>49.58%</td>
<td>40.53%</td>
<td>9.89%</td>
</tr>
<tr>
<td>Age</td>
<td>55.54</td>
<td>55.62</td>
<td>55.79</td>
</tr>
<tr>
<td>Female</td>
<td>57.65%</td>
<td>65.27%</td>
<td>58.50%</td>
</tr>
<tr>
<td>Count of PH Conditions (avg)</td>
<td>0.8</td>
<td>4.7</td>
<td>8.2</td>
</tr>
<tr>
<td>Count of MH / SUD Conditions (avg)</td>
<td>0.3</td>
<td>2</td>
<td>2.4</td>
</tr>
</tbody>
</table>

- Anxiety disorders: 8.21% | 41.30% | 47.45%
- Asthma, COPD, other lung disease: 2.24% | 28.47% | 41.96%
- Depression and depressive disorders: 7.09% | 44.74% | 57.46%
- Diabetes mellitus: 0.37% | 19.81% | 35.80%
- Schizophrenia and Psychotic Disorders: 0.37% | 10.42% | 13.19%
- Substance-use Disorders: 11.57% | 52.37% | 58.52%
# Adverse Life Events and Health

<table>
<thead>
<tr>
<th>Medical Complexity</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACE score</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACEs=0</td>
<td>27.26</td>
<td>16.69</td>
</tr>
<tr>
<td>ACEs&gt;4</td>
<td>32.32</td>
<td>54.77</td>
</tr>
<tr>
<td>Struggle with schoolwork</td>
<td>43.32</td>
<td>62.42</td>
</tr>
<tr>
<td>Did not graduate high school</td>
<td>21.90</td>
<td>29.76</td>
</tr>
<tr>
<td>Substance abuse ever</td>
<td>27.60</td>
<td>59.22</td>
</tr>
<tr>
<td>Homeless ever</td>
<td>26.61</td>
<td>54.72</td>
</tr>
<tr>
<td>Ran away from home</td>
<td>17.84</td>
<td>40.80</td>
</tr>
<tr>
<td>Physical abuse from a loved one</td>
<td>21.93</td>
<td>37.22</td>
</tr>
<tr>
<td>Verbal abuse from a loved one</td>
<td>46.68</td>
<td>70.46</td>
</tr>
<tr>
<td>Jail</td>
<td>24.85</td>
<td>48.05</td>
</tr>
</tbody>
</table>
### High ACEs, Adversity and Health: Highest Rates

<table>
<thead>
<tr>
<th></th>
<th>ACE$_{\geq 4}$ (42.59%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Struggle with schoolwork</td>
<td>64.86</td>
</tr>
<tr>
<td>Did not graduate high school</td>
<td>22.62</td>
</tr>
<tr>
<td>Substance abuse ever</td>
<td>47.5</td>
</tr>
<tr>
<td>Homeless ever</td>
<td>45.12</td>
</tr>
<tr>
<td>Ran away from home</td>
<td>36.52</td>
</tr>
<tr>
<td>Physical abuse from a loved one</td>
<td>46.67</td>
</tr>
<tr>
<td>Verbal abuse from a loved one</td>
<td>66.17</td>
</tr>
<tr>
<td>Jail</td>
<td>35.54</td>
</tr>
</tbody>
</table>
No ACEs, Adversity and Health: Lowest Rates

<table>
<thead>
<tr>
<th>Event</th>
<th>ACE=0</th>
<th>ACE=1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Struggle with schoolwork</td>
<td>24.73%</td>
<td>47.06%</td>
</tr>
<tr>
<td>Did not graduate high school</td>
<td>17.14%</td>
<td>23.12%</td>
</tr>
<tr>
<td>Substance abuse ever</td>
<td>12.4%</td>
<td>24.48%</td>
</tr>
<tr>
<td>Homeless ever</td>
<td>3.39%</td>
<td>13.3%</td>
</tr>
<tr>
<td>Ran away from home</td>
<td>4.26%</td>
<td>9.32%</td>
</tr>
<tr>
<td>Physical abuse from a loved one</td>
<td>1.01%</td>
<td>5.91%</td>
</tr>
<tr>
<td>Verbal abuse from a loved one</td>
<td>11.51%</td>
<td>36.68%</td>
</tr>
<tr>
<td>Jail</td>
<td>12.59%</td>
<td>31.99%</td>
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</tbody>
</table>
ACEs Are Not Destiny

<table>
<thead>
<tr>
<th>Health Risk Group</th>
<th>ACE = 0</th>
<th>ACE 4+</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Low Complex</td>
<td>45.24</td>
<td>25.45</td>
</tr>
<tr>
<td>Med</td>
<td>45.54</td>
<td>60.19</td>
</tr>
<tr>
<td>High</td>
<td>9.22</td>
<td>14.36</td>
</tr>
</tbody>
</table>
Answers and More Questions

• The majority (55%) of medically complex individuals have high ACE / other adversity burdens
  – Complex Care programs will need to address the effects of trauma
  – How do we identify early those with high ACEs most at risk?

• Multiple other social institutions – schools, housing services, criminal justice, community services – likely add to the stress load of this population
  – What are the common pathways that lead to poor health?
  – Are there interventions along the trajectory to poor health that could have made a difference?

• Only a minority of high ACE individuals become medically complex
  – What made a difference for those with good health?
  – What made a difference for those with less complex conditions?
What are the **key partnerships** for clinical systems in vulnerable communities?

*Early child health providers*

*Schools*

*Social Service Organizations*

*Community Based Organizations*

*Peer Support Organizations*

*Criminal Justice*

*Housing Providers...*
Thank You!