The Science of Inequality
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Agenda

- What is Inequality
- Solid Waste Facility Impacts
- The Math
- Factors which Influence Inequality
- Additional Considerations
- Final Thoughts
What is Inequality?

**inequality**

*noun*  
in·e·qual·i·ty 
\ˌi-ni-ˈkwä-i-əl-tē\

1: the quality of being unequal or uneven: as

*a*: lack of evenness

*b*: social disparity

*c*: disparity of distribution or opportunity

Source: *Merriam-Webster's Learner’s Dictionary*
Impacts from Solid Waste Facilities

• Common Actual Impacts
  – Traffic
  – Noise
  – Odors
  – Visual/Intrusive

• Common Perceived Impacts
  – Emissions
  – Health Risk
  – Asthma

On or offsite depending on facility type
Impact Sequence

- Zoning
- Site Selection
- Technology Selection
- Construction
- Operation
Environmental Assault or Economic Deprivation?

- EJ community issues tend to be characterized as environmentally related.

- New York Times Article, “Income Gap, Meet the Longevity Gap”, 3/16/14:
  - Evaluated Fairfax, Virginia (DC Suburb) and McDowell County, West Virginia (coal)
    - Median Household Income: $107,000 vs. $22,000
    - Life Expectancy Fairfax Men: 82 years
    - Life Expectancy Fairfax Women: 85 years { akin to Iraq
    - Life Expectancy McDowell Men: 64 years
    - Life Expectancy McDowell Women: 73 years

- Individuals with lower income have more stress and less access to the health care system.
U-Index Subjective Wellbeing by Household Income


Note: Subjective wellbeing indices are an emerging analytical tool; hence, these data should be considered to be in beta mode.
Life Expectancy by Income

**Increasing life expectancy and healthy life expectancy**

2010 versus 2012

The Math of Inequality

Exponential Distribution of Income

U.S. Annual Income in 2013 (thousands of dollars)

Data: U.S. Census Bureau, Survey of Income and Program Participation
Source: Scott Lawrence and Victor Yakovenko/U.Maryland

Source: Cho, Adrian *Science*, May 23, 2014
Changes in real wage levels of full-time U.S. workers by sex and education, 1963–2012

Real weekly earnings relative to 1963 (men)

A

Real weekly earnings relative to 1963 (women)

B

Fig. 6. Change in real wage levels of full-time workers by education, 1963–2012. (A) Male workers. (B) Female workers. Data and sample construction are as in Fig. 3.

Source: Author, David H. Science, May 23, 2014
PhD Earnings Distribution

Earnings by Institution

Gini Index (world map chart)
By definition, capitalist-based systems result in more people at the bottom than the top, by an exponential quantity.

Skill-based, economic reward is based on both the value of those skills and the market-based scarcity of those skills.

Mobility between economic classes is fairly limited.

Capital, by definition, outperforms labor as a function of time.
Factors Which Reduce Inequality

• War or other catastrophic event

• Social policies which redistribute wealth – education assistance, basic living assistance, pensions

• Trade unions
How Society Can Respond to Inequality

- Determine the extent of social policies which transfer wealth
- Establish a higher minimum wage; raise it consistent with inflation
- Provide universal Pre-K
- Have a PK-12 program which focuses on skill development, communication, personal financial management
- Provide excellent prenatal and natal care
- Provide excellent health care support mechanisms for PK-12 development
- Celebrate individual successes in the community
Fig. 2. Number of months of math knowledge children gained across the school year (1 equals 9 months or one school year) as a function of average weekly app use and parents’ math anxiety.

How Corporations/Institutions Can Respond to Inequality

- Have a fair hiring, wage, and progression system
- Adhere to your responsibilities inside and outside the fence line, whether emissions, discharges, ethics, etc.
- Have a fair host community/tax relationship with the community
- Have programs to assist with skill development in the community
- Have programs to address identified community needs
How Individuals and Families Can Respond to Being Low on the Economic Ladder

- Enhance skill development, communications capacity; adopt a “work hard” attitude
- Seek to “move up” to a “better” neighborhood
- Forgo some consumption (save money) to enable equity and non-equity investments, thereby participating in the enhanced return offered by capital investment
- Learn money management skills, inclusive of an understanding of the compound interest rate formula
- Pay attention to one’s physical and mental health
Graphic Depiction of Cumulative Investment of $1,000/yr

Invest $1,000/yr for 40 yr at 7%

$213,610
Additional Considerations

- Warren Buffet’s “The Giving Pledge”
- A greater redistribution of higher incomes would decrease the will for higher incomes
- Difficult to address relative frugality differential performance within a redistribution matrix
Final Thoughts

- Total equality exists in no society, nor will it.
- Society must decide and balance capitalist success drives with redistribution. There will always be, and should be, some redistribution.
- Social/societal institutions have evolved with changes in industrial and economic development. We should both learn from the past and not be bound by it. Social institutions will continue to evolve.
- To the extent we can use quantitative methods to evaluate policy and alter our course based on those methods, we will enhance our capability to walk into the future while addressing the needs of those on the bottom of the ladder.
- Consider age 0 to 18 relative health parity; PK-12 skill development parity
Have a nice day…
and a pleasant tomorrow