Economics Bulletin

Volume 32, Issue 4

An alternative perspective on health inequality

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Abstract

While much attention has focused on health disparities between socio-economic groups, most health inequality actually occurs within socio-economic groups. We examine trends in overall health inequality – measured by realized length-of-life inequality – through the lens of social justice, similar to traditional analysis of income inequality. We find that throughout most of the length-of-life distribution, inequality has declined dramatically over the past century. It has continued to decline even in the past 40 years, a period over which it is generally thought that income inequality has risen considerably. Most of the decline in length-of-life inequality appears to be driven by reductions in inequality within socio-economic groups. Using a reasonable estimate of the value of a quality-adjusted life year (QALY) we find that, on a lifetime basis, the least healthy individuals in society have gained more than eight times as much as the healthiest. In dollar terms, the relative gain for the 10th percentile of health relative to the 90th percentile of health is more than $400,000.

We thank Steve Goss, Michael Morris, and Alice Wade of the Social Security Administration for providing the cohort life tables used in this paper, Brittany Pineros and David Hunter for outstanding research assistance, and an anonymous referee for helpful comments.
Citation: Benjamin Ho and Sita N. Slavov, (2012) ''An alternative perspective on health inequality'', *Economics Bulletin*, Vol. 32 No. 4 pp. 3182-3196.
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Submitted: September 28, 2012.   **Published:** November 19, 2012.

1. Introduction

Income inequality has received a great deal of attention recently, with a number of studies finding a large increase in annual household or individual income inequality since the 1970s (e.g., Picketty and Saez 2003; Autor, Katz, and Kearney 2008; Heathcote, Perri, and Violante 2009; CBO 2011).[1] This increase in inequality has been driven primarily by large gains at the top end of the distribution, and it has been accompanied by stagnating incomes in the bottom and middle of the distribution. However, income is only one component of overall well-being, and there is some evidence to suggest that inequality in overall well-being has not increased much – and may have even decreased – over the same period. For example, Aguiar and Hurst (2008) find that lower income groups have enjoyed disproportionate increases in leisure time, implying that inequality in overall well-being may not have increased to the same extent as income inequality. Moreover, Stevenson and Wolfers (2008) find that overall inequality in self-reported happiness has declined. Finally, there is some evidence that consumption inequality – arguably a better measure of overall well-being than income inequality – has not risen nearly as much as income inequality (e.g., Krueger and Perri 2006; Hassett and Mathur 2012).[2]

Another important dimension of overall well-being is health. Most existing studies of health inequality focus on inequality *between* socio-economic groups defined by race or income. For example, Cristia (2009) examines life expectancy inequality by lifetime income and finds that this differential has increased since the early 1980s. Similarly, other studies have demonstrated that life expectancy differentials by education group (e.g., Meara, Richards, and Cutler 2008; Crimmins and Saito 2001) and socioeconomic status (e.g., Singh and Siahpush 2006) have increased as well.

But this focus on between-group inequality ignores a major source of human inequality because it masks the fact that most health inequality occurs *within* groups. That is, the gap between the best and worst health outcomes within a socio-economic group is far greater than the differences in average health across socio-economic groups. Thus, in contrast to most prior studies, we examine *overall* health inequality, in addition to its within- and between-group components. In other words, we examine whether the least healthy individuals in society have gained ground relative to the most healthy, and we decompose this trend into changes in within-group and between-group inequality. We argue that overall health inequality matters for many of the same reasons that overall income inequality matters. Like income, health is based partly on effort (e.g., diet and exercise), partly on luck of birth (e.g., genes), and partly on random chance (e.g., unexpected events like accidents). From behind a Rawlsian veil of ignorance, a risk-averse individual would, all else equal, be better off if the luck components of either of these forms of inequality were reduced. Indeed, the most widely cited studies of income inequality tend to focus on overall inequality in realized income (e.g., Picketty and Saez 2003). To put it another way, if we are disturbed by overall income inequality, then we should be disturbed by overall health inequality for many of the same reasons.

We measure health outcomes by realized length-of-life. By this measure, those who die at younger ages are "poor," while those who survive until their 80s and beyond are "rich." We

[1] This finding is not without controversy. For example, Burkhouser, Larrimore, and Simon (2011) present an alternative perspective.

[2] Again, this finding is not without controversy. Other studies have found that consumption inequality has followed income inequality (e.g., Aguiar and Bils 2011).

find that throughout most of the length-of-life distribution, inequality has declined dramatically over the past century. It has continued to decline even in the past 40 years, a period over which it is generally thought that income inequality has risen considerably. Using a reasonable estimate of the value of a quality-adjusted life year (QALY) we find that, on a lifetime basis, the least healthy individuals in society have gained more than eight times as much as the healthiest. In dollar terms, the relative gain for the 10th percentile relative to the 90th percentile is more than \$400,000 – a substantial amount compared to most individuals' lifetime incomes. The decrease in overall length-of-life inequality is driven mostly by decreases in inequality within socio-economic groups. It is reasonable to expect that this decline in overall length-of-life inequality has substantially increased the well-being of risk-averse individuals. It is also consistent with the finding that inequality of self-reported happiness has declined greatly despite increases in income inequality.

The remainder of this paper is organized as follows. Section 2 provides a review of the existing literature and introduces our conceptual framework for thinking about health inequality. Section 3 describes our data and methodology, Section 4 presents our results, Section 5 offers a discussion of our results in the context of the literature on income and happiness inequality, and Section 6 concludes.

2. Literature and Conceptual Framework

A handful of prior studies have examined overall, or unconditional, health inequality. Sehili et al. (2005) define health as the number of self-reported physically healthy days; using this measure, they find that health inequality increased between 1993 and 1999. Gakidou and King (2002) propose to measure health inequality by estimating the distribution of the probability of dying before age two across the population. Several other studies have documented that length-of-life inequality has decreased dramatically over the past century, with much smaller decreases (or possibly stagnation) over the past few decades (e.g., Wilmoth and Horiuchi 1999; Edwards and Tuljapurkar 2005; Smits and Monden 2009; Edwards 2010; Shkolnikov, Andreev, and Begun 2003; Fuchs and Ersner-Hershfield 2008). However, these studies generally do not focus on the implications of length-of-life inequality for social justice.

Compared to these earlier studies, we examine length-of-life inequality (and the health inequality it represents) through the lens of social justice. We argue that studying length-of-life inequality in the same way that one traditionally studies income inequality provides an additional dimension to our understanding of human inequality. We also provide a detailed decomposition of within- and between-group length-of-life inequality by race and gender, which allows us to relate our findings to existing studies of health inequality by socio-economic group. While most empirical evidence suggests that income inequality has increased, it is possible that overall inequality may have decreased as a result of decreases in length-of-life inequality. Edwards (2008) demonstrates that increased variance in length-of-life reduces the welfare of risk-averse individuals. In particular, for plausible parameter values, a one-year reduction in the standard deviation of the length-of-life distribution has the same effect on welfare as a half-year increase in life expectancy. This perspective is consistent with the standard approach to income distribution, which invokes Harsanyi (1953) and Rawls (1971) to argue that a policy is fair if it would be chosen by an individual who does not yet know key features of his or her identity, such as race, gender, talent, or income path. Under these circumstances, a risk-averse individual would, all else equal, prefer less income inequality.

On the other hand, Gakidou, Murray, and Frenk (1999) argue that the correct measure of health inequality should focus on the underlying distribution of health risks, rather than inequality in realized health. That is, as long as the underlying health risks are the same for everyone, we should not be concerned with realized health inequality. Such inequality is purely random in the sense that it is uncorrelated with one's identity. If one accepts this argument, then one might view our study as challenge to traditional analysis of income inequality. In other words, if the purely random component of length-of-life inequality does not matter, then it is not clear why the purely random component of realized income inequality does. Yet the typical study of income inequality makes no effort to distinguish between inequality in realized income and inequality in the underlying income generating process.

Our main measure of health status is realized length-of-life. While some have argued that we should draw a distinction between healthy years and unhealthy years (e.g., Gakidou, Murray, and Frenk 1999), we choose length-of-life for its relative precision and simplicity, as well as the greater availability of historic data. Healthcare spending data in the United States suggest that increases in length-of-life have been accompanied by concomitant increases in healthy years of life (see Seshamani and Gray, 2004 for a recent summary), implying that life expectancy in the US is a reasonable proxy for health. However, it is important to acknowledge the limitations of our measure. First, the correlation between life expectancy and health may differ between groups, and that difference is of particular importance to our decomposition. Second, life expectancy potentially has a harder biologically based upper bound than other measures of human welfare. Despite these limitations, length-of-life is an important dimension of health, and understanding the decomposition and the magnitude of life expectancy inequality still is a potentially valuable exercise.

3. Data and Methodology

To explore trends in overall length-of-life inequality, we use the Social Security Administration's (SSA) cohort life tables.[3] These tables are differentiated by gender and year of birth. A cohort mortality table provides age-specific death rates for a particular birth cohort throughout its life. For example, the table for the 1900 birth cohort would include the age-specific death rate at age zero in 1900, at age 1 in 1901, and at age 20 in 1920. For cohorts that are still alive, a cohort life table obviously requires a projection of future death rates. Using the SSA tables, we examine the evolution of the overall length-of-life distribution for birth cohorts from 1900 through 2012, at birth and at age 25. The probability distribution over length-of-life is determined by averaging the unconditional probability of dying at each age for males and females.[4] We define the n^{th} percentile of the life expectancy distribution as the smallest age at which the cumulative probability of death exceeds n. Mean length-of-life (life expectancy) is computed under the assumption that deaths occur exactly halfway through the year. For example, an individual who dies at age 25 (i.e., between his or her 25^{th} and 26^{th} birthdays) is recorded as living to age 25.5.

[3] The SSA tables are used for the intermediate scenario in the 2011 Trustee's report, and the methodology for projecting trends in the age, gender and cause of death adjusted mortality rates underlying their construction is described in Bell and Miller (2005).

[4] We assume equal proportions of males and females. While differential mortality by gender may cause the gender proportions to vary with age, we expect this difference to be slight.

Inequality in length-of-life can be decomposed into two components: inequality in life expectancy between groups and length-of-life inequality within groups. Mathematically,

$$Var(L) = E\big(Var(L|G)\big) + var\big(E(L|G)\big), \tag{1}$$

where G denotes socio-economic group, L denotes length-of-life, $E(\cdot)$ is the expectations operator, and $var(\ \cdot)$ is the variance operator. That is, the overall variance in length-of-life is equal to the sum of the average variance in group-specific length-of-life, and the variance in life expectancy across groups. A reduction in length-of-life inequality may come from a reduction in inequality between groups, or from a reduction in inequality within groups.

We can use the SSA cohort life tables to perform this decomposition by gender. However, cohort life tables that are differentiated by socio-economic group are unavailable. Thus, we use period life table data for this exercise. In contrast to a cohort life table, a period life table provides age-specific death rates during a given year. For example, a period life table for the year 2000 would include the death rate of the 1980 birth cohort at age 20, the death rate of the 1991 birth cohort at age 21, and so on. The length-of-life distribution implied by a period life table is not the distribution for any actual individual, although period life tables can still be used to examine the general trends in life expectancy. We use a set of period life tables that are differentiated by gender and race. For 1970, 1980, and 1990, we use the single year tables from the Berkeley Mortality Database.[5] For 2000, we use tables from Arias, Rostron, and Tejada-Vera (2010), and for 2007, we use tables from Arias and Tejada-Vera (2011).[6] Based on these tables, we examine how the distribution of length-of-life – at birth and at age 25 – has evolved within- and between racial groups. In calculating within- and between-group of inequality, we obtain population shares by race and gender, for each year of analysis, from the Integrated Public Use Microdata Series Current Population Survey (IPUMS-CPS).[7]

4. Results

Table I presents the evolution of the 1st, 10th, 50th, 90th, and 99th percentiles of the length-of-life distribution at birth (top panel) and at age 25 (bottom panel). Each panel also includes several key ratios – the ratios of the 99th and 90th to the 50th percentiles (illustrating inequality in the top half of the distribution), the ratios of the 50th to the 10th and 1st percentiles (illustrating inequality in the bottom half of the distribution), and the ratio of the 90th to the 10th percentiles (illustrating inequality between the top and the bottom of the distribution). Inequality at birth has decreased dramatically since the 1900 birth cohort. Indeed, for the 1900 birth cohort, the bottom 10 percent of the distribution did not survive even for one year. By 2012, however, the 10th percentile had risen to age 64, and the 1st percentile to age 18. In contrast, gains at the upper end of the distribution have been more modest. Thus, the 90-10 ratio has fallen dramatically between 1900 and 1950, and more slowly after. Much of the reduction in inequality at birth is due to reductions in infant mortality. However, even if we ignore infant mortality by looking at

[5] The tables were retrieved from http://www.demog.berkeley.edu/~bmd/states.html.
[6] Arias, Rostron, and Tejada-Vera (2010) provide mortality rates through age 100, while the Berkeley Mortality Database includes mortality rates through age 110. For comparability, we aggregate the mortality rates for ages 100 and above in the Berkeley Mortality Database tables.
[7] King et al. (2010). The population figures are generated using the online data analysis system, available at http://cps.ipums.org/cps/sda.

Table I: Overall Length-of-Life Inequality

Year	1st Percentile	10th Percentile	Median	90th Percentile	99th Percentile	99-50	90-50	90-10	50-10	50-1
					At Birth					
1900	0	0	66	89	99	1.50	1.35	∞	∞	∞
1925	0	13	76	92	100	1.32	1.21	7.08	5.85	∞
1950	0	50	82	95	103	1.26	1.16	1.90	1.64	∞
1975	0	56	85	97	105	1.24	1.14	1.73	1.52	∞
2000	16	62	87	98	107	1.23	1.13	1.58	1.40	5.44
2012	18	64	88	99	108	1.23	1.13	1.55	1.38	4.89
					At Age 25					
1900	27	45	74	91	99	1.34	1.23	2.02	1.64	2.74
1925	31	54	79	93	101	1.28	1.18	1.72	1.46	2.55
1950	32	58	83	95	103	1.24	1.14	1.64	1.43	2.59
1975	34	61	85	97	105	1.24	1.14	1.59	1.39	2.50
2000	35	65	87	98	107	1.23	1.13	1.51	1.34	2.49
2012	36	67	88	99	108	1.23	1.13	1.48	1.31	2.44

mortality at age 25 (bottom panel), inequality has still declined consistently since 1900, with the 10th percentile of length-of-life rising by 22 years and the 90th rising by only 8 years.

Table II is based on the same cohort mortality tables as Table I, and it shows how inequality has evolved between and within groups based on gender alone. Again, the top panel shows the results for length-of-life at birth, and the bottom panel for length-of-life at age 25. Comparing the within- and between-group variance in length-of-life, we can see that most of the inequality in length-of-life – indeed, more than 95 percent in any given year and at either age – comes from within-group variation. Both within- and between-group inequality have fallen considerably. Measured at birth, they have fallen by roughly the same proportion. However, measured at age 25, the between-group variance has fallen by a larger proportion. Thus, not only have gender differences in life expectancy fallen (with men benefiting from more of the gains in overall length-of-life), but also, length-of-life inequality has declined quite dramatically within each gender group.

Table II: Decomposition of Gender Inequality

Year	Within-Group Variance	Between-Group Variance	Overall Variance	Standard Deviation
		At Birth		
1900	1063.55	11.42	1075.00	32.79
1925	738.73	12.72	751.45	27.41
1950	471.34	8.39	479.73	21.90
1975	371.26	5.50	376.75	19.41
2000	290.37	4.18	294.55	17.16
2012	276.34	3.80	280.14	16.74
Change 1900-2012	**-74.0%**	**-66.8%**	**-73.9%**	**-49.0%**
Change 1975-2012	**-25.6%**	**-30.9%**	**-25.6%**	**-13.8%**
		At Age 25		
1900	291.07	9.86	300.92	17.35
1925	230.35	8.80	239.15	15.46
1950	219.46	5.30	224.75	14.99
1975	212.51	3.69	216.20	14.70
2000	202.19	3.16	205.34	14.33
2012	195.93	2.90	198.84	14.10
Change 1900-2012	**-32.7%**	**-70.6%**	**-33.9%**	**-18.7%**
Change 1975-2012	**-7.8%**	**-21.4%**	**-8.0%**	**-4.1%**

Table III shows the percentiles of the length-of-life distribution at birth, broken down by race and gender. These tables are based on period life tables for the years given in the first column. Because we use period life tables, the percentiles shown are generally lower than those in Tables I and II. The ratios in the last four columns indicate that inequality has trended downwards within all race and gender groups. For example, among black males, the 90-10 ratio has declined from 3 in 1970 to less than 2 in 2007. Table IV presents the same data on the length-of-life distribution at age 25. While the decline in inequality is less pronounced at age 25 – and

Table III: Within-Group Length-of-Life Inequality at Birth

Race and Gender	Year	1st Percentile	10th Percentile	Median	90th Percentile	90-50	90-10	50-10	50-1
Black Female	1970	0	41	72	91	1.26	2.22	1.76	∞
	1980	0	48	76	93	1.22	1.94	1.58	∞
	1990	0	50	77	93	1.21	1.86	1.54	∞
	2000	0	52	78	93	1.19	1.79	1.50	∞
	2007	0	54	80	94	1.18	1.74	1.48	∞
Black Male	1970	0	28	63	84	1.33	3.00	2.25	∞
	1980	0	36	67	86	1.28	2.39	1.86	∞
	1990	0	36	68	86	1.26	2.39	1.89	∞
	2000	0	44	71	88	1.24	2.00	1.61	∞
	2007	0	46	73	90	1.23	1.96	1.59	∞
White Female	1970	0	55	79	92	1.16	1.67	1.44	∞
	1980	1	59	81	93	1.15	1.58	1.37	81.00
	1990	15	61	82	94	1.15	1.54	1.34	5.47
	2000	21	62	82	94	1.15	1.52	1.32	3.90
	2007	22	62	83	95	1.14	1.53	1.34	3.77
White Male	1970	0	46	71	86	1.21	1.87	1.54	∞
	1980	0	50	74	88	1.19	1.76	1.48	∞
	1990	3	52	76	90	1.18	1.73	1.46	25.33
	2000	15	54	78	91	1.17	1.69	1.44	5.20
	2007	16	55	79	92	1.16	1.67	1.44	4.94

Table IV: Within-Group Length-of-Life Inequality at Age 25

Race and Gender	Year	1st Percentile	10th Percentile	Median	90th Percentile	90-50	90-10	50-10	50-1
Black Female	1970	30	48	73	91	1.25	1.90	1.52	2.43
	1980	32	53	77	93	1.21	1.75	1.45	2.41
	1990	32	54	78	93	1.19	1.72	1.44	2.44
	2000	33	55	79	93	1.18	1.69	1.44	2.39
	2007	34	57	80	94	1.18	1.65	1.40	2.35
Black Male	1970	26	40	65	85	1.31	2.13	1.63	2.50
	1980	27	44	68	86	1.26	1.95	1.55	2.52
	1990	27	44	69	87	1.26	1.98	1.57	2.56
	2000	29	49	72	88	1.22	1.80	1.47	2.48
	2007	29	51	74	90	1.22	1.76	1.45	2.55
White Female	1970	36	58	79	92	1.16	1.59	1.36	2.19
	1980	38	61	82	94	1.15	1.54	1.34	2.16
	1990	39	62	83	94	1.13	1.52	1.34	2.13
	2000	39	63	83	94	1.13	1.49	1.32	2.13
	2007	39	64	84	95	1.13	1.48	1.31	2.15
White Male	1970	31	52	72	87	1.21	1.67	1.38	2.32
	1980	30	54	74	88	1.19	1.63	1.37	2.47
	1990	31	55	76	90	1.18	1.64	1.38	2.45
	2000	33	57	78	91	1.17	1.60	1.37	2.36
	2007	32	57	79	92	1.16	1.61	1.39	2.47

inequality measured by the 50-1 ratio appears to have stagnated – there is still a downward trend by most measures.

In Table V, we present the results of our variance decomposition by race. We perform the decomposition separately for men and women. Measured at birth, inequality within and between racial groups has declined for both men and women. The decline in between-group inequality comes from a reduction in life expectancy differences between racial groups. Measured at age 25, within- and between-group inequality has stagnated for men, although both types of inequality have fallen for women. Again, most of the inequality in length-of-life comes from within-group, rather than between-group, variation.

Table V: Decomposition of Inequality by Race

Year	Within-Group Variance	Between-Group Variance	Overall Variance	Standard Deviation
		Females at Birth		
1970	330.5	5.6	336.1	18.33
1980	285.2	3.4	288.6	16.99
1990	261.7	3.7	265.5	16.29
2000	236.0	2.8	238.8	15.45
2007	238.4	2.0	240.3	15.50
		Females at Age 25		
1970	187.35	2.96	190.32	13.80
1980	181.44	2.01	183.45	13.54
1990	179.02	2.31	181.33	13.47
2000	170.44	1.87	172.31	13.13
2007	173.91	1.29	175.20	13.24
		Males at Birth		
1970	368.38	6.78	375.16	19.37
1980	328.82	4.97	333.79	18.27
1990	312.36	7.26	319.62	17.88
2000	278.22	4.85	283.08	16.82
2007	287.76	3.92	291.68	17.08
		Males at Age 25		
1970	199.82	3.19	203.01	14.25
1980	199.78	3.05	202.83	14.24
1990	206.88	4.35	211.23	14.53
2000	193.20	3.00	196.20	14.01
2007	203.27	2.47	205.74	14.34

5. Discussion

Our results suggest that human inequality in terms of health in the U.S. has declined in a very real sense. Using these results, we can perform a back-of-the envelope calculation to illustrate the magnitude of these gains. Recent studies suggest that $200,000 is a reasonable value for a QALY (Hirth et al., 2000). This value is also consistent with the Value of Statistical Life (VSL) used by most federal agencies (Appelbaum 2011). For our calculation, we assume that increases in lifespan translate one-for-one into a gains in QALYs. In reality, of course, QALYs are not synonymous with longevity.[8] However, this assumption is convenient and not completely unreasonable for a rough, back-of-the-envelope calculation.

According to Table I, between 1975 and 2012, the least healthy among us (10th percentile) have increased their lifespan by 8 years, from 56 to 64. Viewed from the beginning of life with a real discount rate of 2 percent, the gain in longevity at the 10th percentile is worth $483,344.24 in present value, and is equivalent to an annualized income gain of $13,091.16 over 64 years of life. In comparison, those at the top (90th percentile) improved their lifespan by 2 years, from 97 to 99. In present value terms, this gain is worth $56,880.63, and is equivalent to an annualized income gain of only $1,293.91, over 99 years of life. These gains are based on life expectancy at birth, rather than life expectancy in adulthood. Focusing on the gains at age 25 would suggest a smaller decline in inequality. However, from the perspective of social justice, it is a person's health outcome over a full lifetime that matters. Removing the worst possible health outcomes – represented by childhood deaths – reduces measured health inequality. Moreover, at the beginning of life, an individual would clearly prefer an outcome that reduces childhood mortality.

In comparison, our calculations based on Current Population Survey (CPS) data find that between 1975 and 2010 (the most recent year for which data are available), the bottom 10 percent of households gained only $614.49 in inflation-adjusted income, while the top 10 percent of households gained $42,819.47.[9] While we lack adequate data to provide a reliable estimate of the change in total (income plus health) inequality, we note that rising *equality* in health may offset a significant proportion of rising inequality in income. How much is offset depends on the correlation between mortality and income.

It is also not difficult to reconcile our findings with past work that finds widening disparities in health outcomes between socio-economic groups. That is, there does not have to be a contradiction in that between-group variance can increase while within and overall variance decline. Moreover, our results suggest that since within-group variation dominates between-group variation by race and sex, focusing on between group differences alone may cause us to overlook important policy levers and produce a misleading view of trends in welfare.

Our findings are also notable because one might predict that since income is positively associated with health (Duggan, Gillingham, and Greenless 2006; Backlund, Sorlie, and Johnson 1996), and since healthcare is normally assumed to be a luxury good (Costa-Font, Gemmill, and Rubert 2009), rising income inequality would lead to increased health inequality. The fact that we find the opposite could be attributed to the dramatic decreases in within-group health inequality (which may in turn be due to improvements in medical technology that increased access to basic medical care), to Deaton and Paxson's (2001) suggestion that it is relative

[8] There is a large literature on measuring quality of life – see, for example, Cutler et al. (1997).
[9] We utilize the IPUMS-CPS (King et al. 2010) to perform these calculations.

position that affects health outcomes rather than absolute income, or to the fact that higher income may be earned at the expense of health quality due to work-related stress.

It is possible that other measures of health exhibit different trends in within- and between-group inequality, and that our findings are an artifact of our choice to measure health in terms of longevity. In the past, health policy has targeted infant mortality and between-group disparities in life expectancy; indeed, it is notable that the within-race inequality changes are much more pronounced at birth, compared to at age 25. After reducing between-group differences, it is natural that most of the remaining variation is within-group variation. Moreover, there may be biological limits to human length-of-life as well as decreasing returns to health spending; both of these factors limit the potential gains to length-of-life at higher deciles, so potential gains are relatively larger at lower deciles. Identifying the causes underlying the trends in within- and between-group length-of-life inequality is beyond the scope of our paper. However, better understanding these causes is necessary to extrapolate these trends into the future and to make appropriate policy responses.

6. Conclusions

Inequality and life expectancy are two important indicators for understanding social welfare. We argue for the importance of looking at the length-of-life inequality. In particular, our results demonstrate that most of the variance in length-of-life is found within groups not between them. Moreover, we find that inequality of length-of-life has declined substantially in the United States even in the past several decades, substantially offsetting increases in income inequality over those same years. However, it is important to recognize that length-of-life is but one component of health, and health is but one component of overall human welfare. Hopefully, this project helps to demonstrate the importance of broadening welfare measures in studying and addressing inequality.

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