Numeracy
Advancing Education in Quantitative Literacy

Volume 14 | Issue 1 Article 9

2021

How *Social Workers Count: Numbers and Social Issues* Came to Be

Michael A. Lewis
Hunter College School of Social Work, michael.a.lewis@hunter.cuny.edu

Recommended Citation

Lewis, Michael A.. "How *Social Workers Count: Numbers and Social Issues* Came to Be." *Numeracy* 14, Iss. 1 (2021): Article 9. DOI: https://doi.org/10.5038/1936-4660.14.1.1376

How *Social Workers Count: Numbers and Social Issues* Came to Be

Abstract

Lewis, Michael Anthony. 2019. *Social Workers Count: Numbers and Social Issues* (New York: Oxford University Press) 224 pp. ISBN 978-0190467135.

This essay introduces *Social Workers Count: Numbers and Social Issues* by Michael Anthony Lewis. Inspired by the seminal work of Bennett and Briggs, Lewis shares how he came to write a math book for social workers to meet new demands as the field has developed to include more quantitative concepts. The result is a book that may be of interest to many in the quantitative reasoning movement in the social sciences and beyond.

Keywords

social work, quantitative literacy, public policy

Cover Page Footnote

Michael Anthony Lewis is Professor at the Silberman School of Social Work at Hunter College. He is the co-author of *Economics for Social Workers*, co-editor of *The Ethics and Economics of the Basic Income Guarantee*, and author of *Social Workers Count*.

My formal training is in social work (master's) and sociology (PhD), although much of my writing intersects with economics. For over 20 years, I've been teaching students working on master's degrees or PhDs in social work; I teach courses in public policy, economics of public policy, and statistics/causal inference.

Social work is a profession concerned with providing people the goods and services they need in order to live well or at least live better. Social workers do this by providing counseling or therapy to individuals, groups, and families by helping to mobilize communities to obtain necessary goods and services from "the powers that be," by running social service organizations, and by working to enact laws that better meet people's needs in the public policy arena.

Even though I'm not employed in a mathematics department, I've always had an interest in mathematics. This interest, though, isn't the same as one is likely to find in a pure mathematician. Although I appreciate the importance of proving theorems, that's not something I'm very interested in doing. I know that there are applied mathematicians, but even they appear to be much more interested in proving things than I am—just things about the kinds of mathematics used in science or other areas. My interest in mathematics is mainly how it can be used to address problems in social work as well as the social sciences.

Mathematics is related to social work in a number of ways. Statistics is related to evaluating the effectiveness of counseling, therapy, and various kinds of public policy interventions. Measurement theory is related to the calculation of poverty rates, the adjustment of government-provided income support for inflation, the measurement of well-being, and a host of other issues. Mathematical demography is related to the solvency of the public retirement pension program known as Social Security, a program of great interest to social workers. Probability theory is related to decision making in child welfare, an arena in which social workers are heavily involved.

Well over a decade ago, after I had completed a co-authored book on economics for social workers, I considered writing one on mathematics for social workers. I contacted my editor at the time to discuss the idea with her. She thought it was very intriguing but was also utterly convinced that there was no market for such a book. Disappointed, I dropped the idea and moved on to other things.

Fast forwarding to about five years ago, I was talking to a couple of colleagues, James Mandiberg (Silberman School of Social Work at Hunter College) and Kristin Ferguson (School of Social Work at Arizona State University), about the importance of mathematics to the concerns of social workers and lamenting the fact that there isn't much math, other than statistics, in our curriculum. I also told them about my idea to write a math book for social workers, as well as how it was "shot down" by that editor.

They both did something that surprised me: they encouraged me to write the book. Both of them made a convincing case that the field of social work had

changed, since I had initially come up with the idea, and that there is now a market for such a book.

I was inspired to write the book not only by reflecting on the kinds of problems social workers deal with and receiving encouragement from my colleagues. I was also "encouraged" by two others, although I suspect that they have no idea of this: Jeffrey Bennett and William Briggs.

Between the time when I had initially come up with the idea to write a book on math for social workers and the point at which I'd finally decided to do it, I'd read a book by Bennett and Briggs called *Using and Understanding Mathematics: A Quantitative Reasoning Approach* (UUM). After finishing it, I thought that much of its content is relevant to social workers. But UUM is long and comprehensive; it's also targeted at undergraduate non-math majors required to take a course in mathematics. I didn't think it was the best fit for social workers who aren't required to take math but who still need to understand how math is relevant to their field.

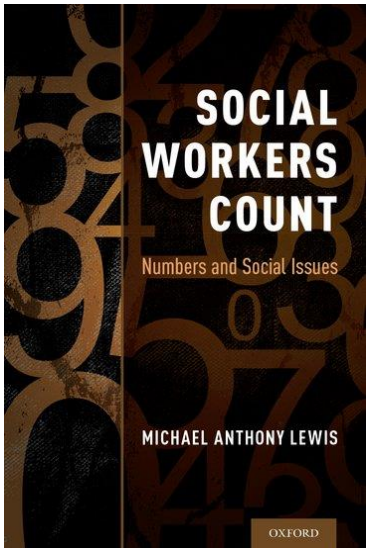
After that encouraging talk from my colleagues, as well as reflecting back on what I had read in UUM, I realized what I needed to do: write a book that would be similar to UUM but much shorter and targeted mainly at graduate social work students, as well as professional social workers. However, I did have a broader secondary audience in mind.

I knew that students in the health sciences, as well as some in the social sciences, have similar interests to social workers, so even though I focused on topics and examples that social workers could relate to, I also chose ones which I thought could appeal to students/professionals in these other disciplines as well. The result was *Social Workers Count: Numbers and Social Issues* (SWC).

While writing SWC, I didn't think that it would get much attention beyond social workers and, perhaps, a few folks in the health and social sciences. Even before reading Bennett and Briggs' book, I was aware of and quite interested in the numeracy/quantitative literacy movement. One could say that I had been a part of that movement for many years, although off in a relatively unknown corner of it. I have an applied mathematician friend, Steven Strogatz (Cornell University), who was generous enough to read and do a blurb for SWC. After reading it, he told me that he thought it might reach a broader audience than I was expecting; I wondered if Steve might be right. Given the fact that I'm writing this essay in this journal, perhaps he was. If so, given my long-time interest in the numeracy/quantitative literacy movement, that would be very gratifying.

Excerpt from *Social Workers Count*[1]

Life Expectancy, the Dependency Ratio, and Social Security



Available from Oxford University Press

Recall that Social Security is a federal program, which provides income to people upon retirement as long as they've worked for at least 10 years and have met other conditions of eligibility. The benefits received depend on how much one made while working. The higher a person's earnings when they were working, the lower the proportion of those earnings they received in benefits.

Even though *Social Security* provides benefits only to those who've retired, people have a certain degree of choice when it comes to when they retire. The age at which someone can retire at full benefits depends on when they were born. Someone born in 1937 or earlier can get full benefits at age 65. Those born between 1943 and 1954 can receive full benefits at the age of 66. And those born after 1960 can't receive full benefits until age 67. A person can retire at age 62 or at any other time before their "full benefits retirement age." If they do, however, their monthly benefits will be reduced below the amounts they'd receive if they waited.

When it comes to financing, Social Security is a "pay as you go" program. This means that current workers and employers are taxed by the federal government, and those tax revenues are transferred to current Social Security recipients.

At this point, you might be wondering why I'm bringing up Social Security in a chapter on demography. The reason is simple: two fundamental demographic concepts are intimately related to this program: *life expectancy* and the *aged dependency ratio*.

Life expectancy, at a given age, is the average number of years someone who's reached that age can expect to live. For example, in the United States, life expectancy at birth (meaning someone between 0 and 1 year old) might be about 79 years. In other words, an infant born in the United States could expect to live to about 79 years. Life expectancy for someone between 50 and 51 years old might be about 31 years, meaning that such a person could expect to live to be 81 years.

---

[1] This material was originally published in *Social Workers Count: Numbers and Social Issues* by Michael Anthony Lewis, and has been reproduced by permission of Oxford University Press https://global.oup.com/academic/product/social-workers-count-9780190467135?cc=us&lang=en&. For permission to reuse this material, please visit http://global.oup.com/academic/rights.

Life expectancy, like infant mortality, varies by race. It also varies by gender. The table here illustrates some of this variation.

Group	Life expectancy starting from age 65–66 (rounded to whole number ages)
Males	18
Females	20
Whites	19
White Males	18
White Females	20
Blacks	18
Black Males	16
Black Females	19
Hispanics/Latinos	21
Hispanic/Latino Males	19
Hispanic/Latino Females	22

It's clear from this table that females aged 65–66 have more years ahead of them than do males, whites have more years ahead of them than do blacks, and black males in this age range have fewer years ahead of them than do any other group in the table.

Even though members of some groups have higher life expectancies than those others, life expectancy in the United States, overall, has been on the rise. Over the course of the twentieth century, life expectancy almost doubled, and increasing life expectancy is predicted to continue during the twenty-first century.

The age dependency ratio is another measure relevant to Social Security. It takes the following form:

$$Aged\ dependency\ ratio = \frac{Total\ number\ of\ persons\ in\ a\ given\ year\ over\ 65\ years\ old}{Total\ number\ of\ persons\ in\ a\ given\ year\ between\ 15\ and\ 64\ years\ old} * 100$$

The numerator of this ratio is meant to capture the magnitude of the elderly population, while the denominator is intended to capture that of the working-age population. Multiplying the ratio by 100 gives us "the number of aged people per hundred people of working age" (Rowland 2003, 86).

The importance of life expectancy and the dependency ratio to Social Security has to do with how these interact with an aging "baby boomer" generation. "Baby boomer" is a term demographers use to refer to those born in the United States between the years of about 1946 in 1964. The issues baby boomers raised for Social Security are (1) there are a lot of them; (2) they're entering their retirement years; (3) given what I said about life expectancy, they'll probably live longer than elderly people of previous generations did; and (4) because the number of new entrants into the workforce isn't expected to grow enough to keep pace with the retirement of baby boomers, the dependency ratio is expected to increase. This last point may need some elaboration.

Take a look at the age dependency ratio again:

$$Aged\ dependency\ ratio = \frac{Total\ number\ of\ persons\ in\ a\ given\ year\ over\ 65\ years\ old}{Total\ number\ of\ persons\ in\ a\ given\ year\ between\ 15\ and\ 64\ years\ old} * 100$$

In this formula, more people entering the workforce would increase the denominator. More people entering retirement and living longer would increase numerator. If demographers are right that growth in the number of retirees will exceed growth in the workforce, this means that the numerator of the aged dependency ratio will grow more than the denominator. If the numerator of a ratio increases by more than its denominator does, this results in a bigger ratio. And a bigger ratio here would mean slower growth in the number of people paying for benefits, while there would be faster growth in the number of people requiring those benefits.

There have been several proposals made to address this problem. Since you're likely to encounter these in your policy course, I won't say much about the details of these proposals here. I'll discuss one, though, that's related to the mathematics we've been discussing.

Some have argued that we can address the increasing dependency ratio problem by raising the retirement age, perhaps to as high as 70 years. Doing this would change the age range of the denominator of the dependency ratio from 15–64 years old to 15–70 years old. Since people would be working longer, this would tend to increase the denominator of the ratio and decrease the numerator. A bigger denominator and smaller numerator would mean a smaller ratio. And a smaller ratio would mean a more manageable program from a financial perspective.

Even though raising the retirement age would lead to a more financially manageable program, that, by itself, doesn't mean we ought to do this. Maybe we should let people enjoy their longer, healthier lives by allowing them more "golden years" to play, instead of expecting them to work until they almost drop.

Given what I've said earlier about race and life expectancy, the increases in health and longevity mentioned earlier might not be evenly distributed by race. That is, perhaps "persons of color" won't enjoy as much of an increase in life expectancy in relatively good health as Whites will. Would it be fair to tell them they have to work until they're 70 years old when they, on average, have fewer years to live after retirement?

References

Bennet, Jeffrey and William Briggs. 2008. *Understanding and Using Mathematics: A Quantitative Reasoning Approach*. New York: Pearson Addison Wesley.

Rowland, Donald T. 2003. *Demographic Methods and Concepts*. New York: Oxford University Press.