**James P. Scanlan**
**Attorney at Law**
**1529 Wisconsin Avenue, NW**
**Washington, D.C.  20007**
**(202) 338-9224**
**jps@jpscanlan.com**

September 8, 2015

DJ Patil, Ph.D.
Deputy Chief Technology Officer for Data Policy
  and Chief Data Scientist
Office of Science and Technology Policy
Executive Office of the President
Eisenhower Executive Office Building
1650 Pennsylvania Avenue
Washington, DC 20504

Re:     Fundamental Unsoundness of Analyses of Differences in Outcome Rates by
        Agencies of the United States Government – Issue 1:  Failure of Government
        Agencies to Understand That Reducing the Frequency of an Outcome
        Tends to Increase Relative Differences Between Rates of Experiencing the
        Outcome

Dear Dr. Patil:

        This is the first of what I expect to be two or more letters bringing to the attention of the
Chief Data Scientist fundamental problems in analyses of differences in outcome rates by
agencies of the United States Government.  These problems arise from the failure of federal
agencies to understand patterns by which measures of such differences tend to be systematically
affected by the frequency of an outcome.  Most of the issues I expect eventually to address in
such letters are discussed or touched upon in my Statistician's View column in the December
2012 issue of *Amstat News* titled "Misunderstanding of Statistics Leads to Misguided Law
Enforcement Policies"[1] my article in the July/August 2014 issue of *Society* titled "Race and
Mortality Revisited," and my November 17, 2014 amicus curiae brief in *Texas Department of
Housing and Community Development, et al. v.  The Inclusive Communities Project, Inc*.,
Supreme Court No. 13-1731 (TDHCD brief).

---

[1] To facilitate consideration of issues raised in letters such as this I include links to referenced materials in electronic
copies of the letters.  Such copies may be found by means of the Institutional Correspondence subpage of the
Measuring Health Disparities page of jpscanlan.com.  Links to recent letters, including this one, are also posted on
the ASA Connect section of the American Statistical Association (ASA) website, though access to that section is
limited to ASA members.

This letter is largely limited to discussion of the principal subject of the *Amstat News* column. That subject concerned anomalies in the enforcement of civil rights laws covering lending and school discipline practices resulting from the failure of the government to understand that reducing the frequency of an outcome tends to increase relative racial and other demographic difference in rates of experiencing the outcome.

By way of summary, for at least 20 years, federal agencies involved in the enforcement of fair lending laws have been encouraging lenders to relax lending standards, and otherwise reduce the frequency of adverse borrower outcomes like rejection of mortgage loan applications, in order to reduce relative racial or ethnic differences in rates of experiencing the outcomes. For at least several years, the Departments of Justice and Education, and over the last year the Department of Health and Human Services, have been encouraging public schools to relax standards, and otherwise reduce the frequency of adverse school discipline outcomes, in order to reduce relative racial/ethnic or other demographic difference in rates of experiencing those outcomes.[2] In addition, as discussed in "Race and Mortality Revisited" (at 342), since 2004, the Individuals with Disabilities Education Act has required that when there exist "significant discrepancies" respecting long-term suspensions of disabled students within a school district – a matter generally quantified in terms of relative differences in suspension rates – the district shall implement the types of practices that tend to reduce overall suspension rates.

But the belief that generally reducing an adverse outcome will tend to reduce relative demographic differences in rates of experiencing the outcome is the exact opposite of reality. While reducing the frequency of an outcome tends to reduce relative differences in rates of

---

[2] The government's encouragements of lenders and public schools to relax standards and generally reduce the frequency of adverse borrower or school discipline outcomes are summarized in the December 2012 *Amstat News* article and are well known. But a few more recent developments warrant mention. Regarding lending, in February 2013, the Department of Housing and Urban Development (HUD) issued its final rule titled "Implementation of the Fair Housing Act's Discriminatory Effects Standard," which specified that a practice with a disparate impact on a protected group can be upheld only if there exists no less-discriminatory alternative that equally serves the covered entity's legitimate business interest. That provision would seem to put additional pressures on lenders to relax standards and otherwise reduce the frequency of adverse borrower outcomes. See my "The Perverse Enforcement of Fair Lending Laws," *Mortgage Banking* (May 2014), and "Is HUD's Disparate Impact Rule Unconstitutionally Vague?, *American Banker* (Nov. 10, 2014), as well as the above-mentioned TDHCD brief. In July 2015 HUD issued its final rule titled "Affirmatively Furthering Fair Housing," which specifically applies the disparate impact doctrine to public housing location issues. Because such issues tend to be analyzed in terms different from comparisons of favorable or adverse outcome rates of advantaged and disadvantaged groups, I am at this time uncertain of the specific pertinence of the subject of this letter to such issues. But see the LIHTC Approval Disparities subpage of the Scanlan's Rule page of jpscanlan.com

Regarding school discipline, in January 2014 the Departments of Justice and Education jointly issued a "Dear Colleague Letter on the Nondiscriminatory Administration of School Discipline," and in December 2014 the Departments of Health and Human Services and Education jointly issued a "Policy Statement on Expulsion and Suspension Policies in Early Childhood Settings." Both documents encourage general reductions in discipline rates, and, in doing so, lead readers to believe that reducing the frequency of adverse discipline outcomes will tend to reduce relative demographic differences in discipline rates and/or the proportion disadvantaged groups make up of persons experiencing those outcomes.

avoiding the outcome, it tends to increase relative differences in rates of experiencing the outcome.  Unaware of the latter pattern, however, federal enforcement agencies encouraging covered entities to reduce adverse outcomes continue to monitor the fairness of practices on the basis of relative differences in adverse outcomes.  Thus, by complying with federal government encouragements to relax standards, and otherwise reduce the frequency of adverse borrower or school discipline outcomes, lenders and public schools increase the chances that the federal government will sue them for discrimination.

Further, in a March 4, 2015 report titled "Investigation of the Ferguson Police Department," the Department of Justice (DOJ) found that what it deemed to be over policing and unduly harsh court procedures of Ferguson, Missouri had a disparate impact on the city's African American residents.  It did so in significant part on the basis of the high African American representation among persons experiencing adverse interactions with the police and courts.  But in reaching that conclusion, the DOJ was unaware that reducing the frequency of those interactions in fact will tend to increase the proportion African Americans make up of persons experiencing them.  Presumably, the DOJ will be applying similar statistical reasoning in investigations of police and court practices of other jurisdictions.  Also, in light of the DOJ report on the disparate impact of practices in Ferguson, Missouri, jurisdictions concerned about DOJ scrutiny may attempt to reduce adverse interactions between the jurisdictions' police/courts and their residents while mistakenly believing that doing so will reduce, rather than increase, the chances that the DOJ will find the jurisdictions' practices to have disparate impacts on racial minorities.

With regard to each of the above matters, the lack of statistical understanding by federal agencies does more than create the anomaly whereby an entity's following governmental guidance increases the chances that the government will accuse the entity of (or find the entity guilty of) violating federal laws.  It also creates a situation where entities that rely on the presumed statistical expertise of the federal government are led to take actions that tend to have results that are the exact opposite of what the federal government maintains they will have, as is in fact being demonstrated across the country in the case of jurisdictions that have generally reduced school discipline rates.  Apart from being remarkable in itself, such situation has the potential to undermine public confidence in the federal government's expertise regarding matters of greater complexity than the elementary statistical issues addressed here.

I have previously brought to these issues to the attention of arms of the federal government (or a federal contractor providing guidance on the measurement of disproportionality in educational settings) in the following letters:  United States Department of Education (Apr. 18, 2012), United States Department of Justice (Apr. 23, 2012), Board of Governors of the Federal Reserve System (Mar. 4, 2013), Senate Committee on Health, Education, Labor and Pensions (Apr. 1, 2013), Investigations and Oversight Subcommittee of House Finance Committee (Dec. 4, 2013), IDEA Data Center (Aug. 11, 2014), Senate Committee on Health, Education, Labor and Pensions II (Mar. 20, 2015), Financial Markets and Community Investment Program, Government Accountability Office (Sept. 9, 2014), United States Department of Justice (and City of Ferguson, Missouri) (Mar. 9, 2015), Department of

Health and Human Services (HHS) and Department of Education (DOE) (Aug. 24, 2015).  None of the recipient entities, however, has shown that it understands the pertinent issues or intends to take corrective action.

These issues are discussed further below.  One or more subsequent letters will address related matters, including the misunderstandings of federal agencies regarding the measurement of health and healthcare disparities.  The health and healthcare disparities measurement issues are addressed in a July 1, 2014 letter to the Agency for Healthcare Research and Quality (AHRQ) and touched upon in the above-mentioned August 25, 2015 letter to HHS and DOE (at 12).  They are also addressed at length in the above-mentioned "Race and Mortality Revisited" and my Federal Committee on Statistical Methodology 2013 Research Conference paper "Measuring Health and Healthcare Disparities" (FCSM paper).

But regardless of when I address such issues in subsequent letters to the Chief Data Scientist (or to the pertinent agencies), or whether I in fact am able to do so, I urge the Chief Data Scientist to carefully review the materials referenced in the preceding paragraph and to devote the resources necessary to mastering the issues raised in those materials.  For, as the materials should make clear, currently the billions of dollars the federal government devotes to the study of demographic differences in health and healthcare outcomes each year produce little of value with respect to such issues as whether the forces causing those differences are increasing or decreasing, while producing a great deal about such issues that is misleading or incorrect.[3]  The same may be said of the value of federal government efforts, and federally funded efforts, to examine demographic differences in educational outcomes, as discussed in pages 9-11 of the letter to HHS and DOE.

Even with respect to the types of civil rights issues specifically addressed in this letter, the material below merely scratches the surface of the problems in standard analyses of such issues.  See the treatments of such issues, and closely related matters, in the TDHCD brief mentioned above, as well as in my "The Perverse Enforcement of Fair Lending Laws," *Mortgage Banking* (May 2014), and  my September 20, 2013 University of Kansas School of Law Faculty Workshop paper titled "The Mismeasure of Discrimination" (Kansas Law paper).  See also my January 20, 2015 methods workshop at the University of California, Irvine's Center for Demographic and Social Analysis, which is also titled "The Mismeasure of Discrimination."

In sum, a great deal of the federal government's interpretations of data on group differences is seriously flawed.  Ensuring that those interpretations have a sound statistical foundation is a pressing matter.  While that may be a long-term undertaking, the government at

---

[3] The same failure of understanding that undermines health and healthcare disparities research activities undermines many government activities regarding oversight of clinical trials and regulation of therapeutic interventions.  See "Race and Mortality Revisited" (at  339-340) regarding the unsoundness of the rate ratio as a measure of association and implications of that unsoundness with respect to interpretation of subgroup effects.  See also the Subgroup Effects subpage of the Scanlan's Rule page of jpscanlan.com and my May 16, 2014 Comments on Federal Drug Administration proposed subgroup regulations.

least can immediately cease to lead the Congress, the public, and entities covered by federal civil rights law to erroneously believe that reducing the frequency of adverse outcomes will tend to reduce relative differences in rates of experiencing those outcome.

**The Pattern Whereby the Rarer an Outcome the Greater Tends to Be the Relative Difference in Experiencing It and the Smaller Tends to Be the Relative Difference in Avoiding It**

There are four principal measures of differences between outcome rates:  relative differences in adverse outcomes; relative differences in the corresponding favorable outcomes; absolute differences; and odds ratios.  Each measure is problematic for appraising the difference in the circumstances of two groups reflected by those outcome rates because, for reasons inherent in the underlying risk distributions, each measure tends to be systematically affected by the frequency of an outcome.[4]

The pattern by which measures tend to be affected by the frequency of an outcome that is most pertinent to the subject of this letter is that whereby the rarer an outcome the greater tends to be the relative difference in experiencing it and the smaller tends to be the relative difference in avoiding it.[5]  The pattern can be easily illustrated with hypothetical test score data, which show that lowering a test cutoff, while reducing relative differences in pass rates, increases relative differences in failure rates.

Table 1 below, which it a modified version of Table 1 in "Race and Mortality Revisited" and Table 1 in the TDHCD brief and which reflects the same example described in the *Amstat News* column, is based on a situation where the means of normal test score distributions of an advantaged group (AG) and a disadvantaged group (DG) differ by half a standard deviation and both distributions have the same standard deviation.  In such circumstances, at the cutoff where 80% of AG passes the test, approximately 63% of DG would pass the test (with corresponding failure rates of 20% for AG and 37% for DG).  The ratio of AG's pass rate to DG's pass rate would thus be 1.27 while the ratio of DG's fail rate to AG's fail rate would be 1.85.[6]

---

[4] While this letter focuses on the pattern by which the two relative differences tend to be affected by the frequency of an outcome, it should not be read to suggest that patterns by which other measures tend to be affected by the frequency of an outcome are unimportant.  Such matters are quite important, especially in the case of reliance on the absolute differences to measure healthcare disparities and disparities in achieving certain levels of school proficiency.  Such matters are treated at length in "Race and Mortality Revisited" and the FCSM paper, as well as the July 1, 2014 letter to AHRQ.  See also pages 9-10 of the letter to HHS and DOE and the Educational Disparities page of jpscanlan.com and its subpages.

[5]  A more precise description of the pattern would state, rather than "the rarer an outcome," "the more the outcome is restricted toward either tail of the overall distribution." But I have characterized the pattern in the manner done in the text above for some time and those discussing it have not been confused by these usage issues.  Thus, I am not at this time inclined to depart from the usage in the text.

[6] While I commonly refer to patterns of relative differences in this letter, the table actually presents rate ratios.  The relative difference is the rate ratio minus 1 where the rate ratio is above 1 and 1 minus the rate ratio where the rate

When the cutoff is lowered to the point where the pass rate for AG is 95%, the pass rate for DG would be approximately 87% (with corresponding failure rates of 5% for AG and 13% for DG).  The ratio of AG's pass rate to DG's pass rate would thus decrease to 1.09, while the ratio of DG's fail rate to AG's fail rate would increase to 2.60.   That is, the relative difference in the outcome that was reduced in frequency (test failure) increased, while the relative difference in the opposite outcome (test passage, which increased in frequency) declined.

**Table 1.  Illustration of effects on relative differences in pass and fail rates of lowering a cutoff from a point where 80% of the advantaged (higher-scoring) group passes to a point where 95% of the advantaged group passes (when mean scores differ by approximately half a standard deviation)**

| Cutoff | AG Pass Rate | DG Pass Rate | AG Fail Rate | DG Fail Rate | AG/DG Pass Ratio | DG/AG Fail Ratio |
|--------|--------------|--------------|--------------|--------------|------------------|------------------|
| High   | 80%          | 63%          | 20%          | 37%          | 1.27             | 1.85             |
| Low    | 95%          | 87%          | 5%           | 13%          | 1.09             | 2.60             |

It may warrant note here that, as discussed in the *Amstat News* column, the fact that lowering a cutoff tends to reduce relative differences in pass rates is widely known.  Such knowledge underlies the common notion that lowering a cutoff generally reduces the disparate impact of an employment test on which some groups outperform others, which impact is commonly measured in terms of relative differences in pass rates.[7]  That notion may well underlie the federal government's belief that relaxing standards will tend to reduce the racial impact of stringent lending or school discipline standards.  But the government failed to recognize that relaxing standards has an effect on relative differences in adverse outcomes that is the opposite of the effect on relative differences in the corresponding favorable outcomes.

The pattern whereby reducing the frequency of an outcome tends to increase relative differences in experiencing it, while reducing relative differences in avoiding it, can be illustrated with virtually any data that allow one to examine various points on a continuum of quantifiable factors associated with experiencing an outcome or its opposite.  To take examples of particular pertinence to the lending context, the lower an income or credit score requirement, the greater will tend to be relative differences in failing to meet it while the smaller will tend to be relative differences in meeting it.  Regarding income, see Table 1 of "Can We Actually Measure Health Disparities?," *Chance* (Spring 2006); regarding credit scores, see Figure 1 (at 4)

---

ratio is below one.  One should be careful not to mistakenly refer to the rate ratio as the relative difference.  But the distinction between the two terms is not pertinent to the discussion here of patterns by which relative differences tend to be affected by the frequency of an outcome.

[7] Whether relaxing a standard in fact reduces the standard's impact, properly measured, is a complex subject.  See Section E (at 27-32) of the Kansas Law paper.  See also the Four-Fifths Rule subpage of the Disparate Impact page of jpscanlan.com regarding the problematic guidance on appraising disparate impact in the Uniform Guidelines on Employee Selection Procedures.

of the above-mentioned March 4, 2013 letter to the Federal Reserve Board and the Credit Score Illustrations subpage of the Scanlan's Rule page of jpscanlan.com.

The pattern whereby the rarer an outcome the greater tends to be the relative difference in experiencing it is also evident in a wide range of situations where reductions in the frequency of an outcome have in fact been accompanied by increased relative differences in rates of experiencing it or where the setting with the lower frequency of the outcome shows the larger relative difference in experiencing it.[8] For example, recent reductions in discipline rates have generally been accompanied by increased relative racial/ethnic differences in discipline rates. Data showing these patterns are discussed on the following subpages of the Discipline Disparities page of jpscanlan.com (with jurisdiction indicated in the title of the subpage): Los Angeles SWPBS, Denver Disparities, Florida Disparities, Maryland Disparities, California Disparities, Connecticut Disparities, Maryland Disparities, Minnesota Disparities, Rhode Island Disparities, St. Paul Disparities, Minneapolis Disparities, Beaverton (OR) Disparities, Portland (OR) Disparities, Montgomery County (MD) Disparities, and Henrico County (VA) Disparities.

Similarly, relative racial differences in suspensions are larger in pre-school (where suspension rates are lower than in K-12) than they are in K-12. See Table 8 of "Race and Mortality Revisited," which is based on data released by the Department of Education in March 2014.[9] Relative racial differences in suspension rates tend to be larger in suburban schools (where discipline rates tend to be lower than in urban schools) than they are in urban schools. See the Suburban Disparities subpage of the Discipline Disparities page. And notwithstanding the claims of the Departments of Justice and Education that zero tolerance policies are responsible for large relative racial differences in adverse discipline outcomes, data in the DOE's November 2012 report titled "Helping to Ensure Equal Access to Education: Report to the President and Secretary" show that relative racial differences in expulsions are smaller in districts with zero tolerance policies than in districts without such policies. See the DOE Equity Report subpage of the Discipline Disparities page.

In the lending context, one obvious manifestation of the pattern whereby the rarer an outcome the greater tends to be the relative difference in experiencing it and the smaller tends to be the relative differences in avoiding it is the pattern whereby relative demographic differences in mortgage rejection rates tend to be larger, while relative differences in mortgage approval

---

[8] The increases in relative differences in the decreasing outcome typically will be accompanied by decreases in relative differences in rates of avoiding outcome, and the setting with the larger relative difference in the adverse outcome rate commonly will show the smaller relative difference in the corresponding favorable outcome (subject to the points made in Section A.9 of the Scanlan's Rule page of jpscanlan.com). Data on differences in adverse outcome rates, however, are not always presented in a way that allows one to determine the relative difference in avoiding the outcome. One needs the actual rates to derive that information.

[9] This pattern is much discussed in the August 24, 2015 letter to HHS and DOE, which also discusses (at 3-5) the statement in the agency's December 2014 "Policy Statement on Expulsion and Suspension Policies in Early Childhood Settings" that preschool expulsion and suspension rate are "high." In fact, the rates are approximately 1% nationally.

rates tend to be smaller, among higher-income and more creditworthy groups than among lower-income and less creditworthy groups.[10]

Many scores of like illustrations may be found in "Race and Mortality Revisited" and the FCSM paper mentioned above, as well as other articles collected on the Bibliography subpage of the Scanlan's Rule page of jpscanlan.com; the pages and subpages of jpscanlan.com devoted to measurement issues;[11] the 140-plus online comments the Journal Comments subpage of Measuring Health Disparities (MHD); and the 30-plus conference presentations or methods workshop on the Conference Presentations subpage of MHD. Particularly extensive collections of graphical and tabular illustrations may be found in the October 2014 methods workshop at the Maryland Population Research Center of the University of Maryland titled "Rethinking the Measurement of Demographic Differences in Outcome Rates" and the October 2012 applied statistics workshop at the Institute for Quantitative Social Science of Harvard University titled "The Mismeasure of Group Differences in the Law and the Social and Medical Sciences."

The existence of the described pattern is thus hardly open to dispute. See the Consensus Subpage of the Scanlan's Rule page. And while the pattern will not necessarily be observed in every case (for reasons discussed in many place, including "Race and Mortality Revisited" (at 330-31)), there certainly is no basis whatever for anyone to believe, as the federal government has done for many years, that reducing the frequency of an outcome will tend to reduce relative differences in rates of experiencing it.

The above discussion is cast in terms of relative differences. But the "Policy Statement on Expulsion and Suspension Policies in Early Childhood Settings" issued by HHS and DOE in December 2014 that is the subject of the above-mentioned August 24, 2015 letter to those agencies largely cast disparities issues in terms of comparisons of the proportions disadvantaged groups make up of persons potentially experiencing an outcome and the proportions such groups make up of persons who actually experience the outcome. The same holds for the report on the

---

[10] I pointed this pattern out more than two decades ago simply as an illustration of the pattern by which the two relative differences tend to change as the frequency of an outcome changes. See "Bias Data Can Make the Good Look Bad," *American Banker* (Apr. 27, 1992). I did not realize that observers would later find mistaken significance in the fact that relative differences in adverse lending outcomes were larger among higher-income than lower-income applicants. See my "Race and Mortality," *Society* (Jan./Feb. 2000), and "The Perverse Enforcement of Fair Lending Laws," *Mortgage Banking* (May 2014). See also my "Statistical Quirks Confound Lending Bias Claims," *American Banker* (August 14, 2012), regarding the way the complaint underlying the settlement in *United States v. Wells Fargo* highlights the large relative difference in adverse borrower outcomes among applicants deemed "highly-qualified." See "Race and Mortality Revisited" (at 340-41) regarding a situation where observers attached similarly mistaken significance (but to the opposite effect) to the smaller relative racial differences in approval rates among higher-income than lower-income mortgage loan applicants.

[11] The principal measurement pages are: Measuring Health Disparities, Scanlan's Rule, Mortality and Survival, Statistical Reasoning, Immunization Disparities, Educational Disparities, Disparate Impact, Discipline Disparities, Lending Disparities, Employment Discrimination, Feminization of Poverty. The pages have close to 100 subpages.

disparate impact of the police and court practices of Ferguson, Missouri issued by the DOJ in March 2015 that is the subject of the above-mentioned March 9, 2015 letter to DOJ and the City of Ferguson,

But a corollary to the pattern whereby reducing the frequency of an outcome tends to increase relative differences in rates of experiencing the outcome while reducing relative differences in rates of avoiding the outcome is a pattern whereby reducing the frequency of an outcome tends to increase the proportions groups most susceptible to the outcome make up of both (a) persons experiencing the outcome and (b) persons failing to experience the outcome.

The pattern is illustrated in Table 2, which is based on Table 1 above, but with columns added showing the proportion the disadvantaged group makes up of persons passing the test and persons failing the test at each cutoff (based on a situation where the disadvantaged group comprises 50% of persons taking the test).

**Table 2. Illustration of effects on relative differences in pass and fail rates of lowering a cutoff from a point where 80% of AG passes to a point where 95% of AG passes, with proportions DG comprises of persons who pass and of persons who fail (when mean scores differ by approximately half a standard deviation and DG comprises 50% of test takers),**

| Cutoff | AG Pass | DG Pass | AG Fail | DG Fail | AG/DG Pass Ratio | DG/AG Fail Ratio | DG Prop of Pass | DG Prop of Fail |
|--------|---------|---------|---------|---------|------------------|------------------|-----------------|-----------------|
| High | 80% | 63% | 20% | 37% | 1.27 | 1.85 | 44% | 65% |
| Low | 95% | 87% | 5% | 13% | 1.09 | 2.60 | 48% | 72% |

As indicated above, the pattern illustrated in the last two columns of Table 2 is simply a corollary to the pattern of relative differences illustrated by the third and fourth last columns.[12] Thus, all of the above-referenced illustrations of the pattern by which the two relative differences tend to be affected by the frequency of an outcome are effectively illustrations of the pattern by which the proportions the more susceptible group makes up of persons experiencing and failing to experience an outcome are affected by the frequency of an outcome.[13]

---

[12] Determination of which phenomenon is designated the pattern itself, and which is designated a corollary to it, is arbitrary. In early treatments of this topic I focused on misinterpretations of patterns of disproportionality in adverse outcomes, while treating relative difference issues as a secondary matter. See The 'Feminization of Poverty' is Misunderstood," *Plain Dealer* ( Nov 11, 1987); "An Issue of Numbers," *National Law Journal* (Mar. 5, 1990); and "The Perils of Provocative Statistics," *Public Interest* (Winter 1991).

[13] There are problems with appraising disparities on the basis of the proportion a group makes up of persons potentially experiencing an outcome and the proportion it makes up of persons experiencing the outcome apart from those related to the unsoundness of the relative difference as a measure of association. See the IDEA Data Center Disproportionality Guide subpage of the Discipline Disparities page, as well in slides 98 to 117 of the University of Maryland workshop. But such issue are beyond the scope of this letter.

Despite the essential indisputability of the pattern of relative differences described above, it remains largely unknown.  The only federal agency to recognize the pattern is the National Center for Health Statistics, which first recognized it in a document published in 2004.  As discussed in both "Race and Mortality Revisited" (at 332) and throughout the FCSM paper, the NCHS's manner of dealing with that recognition – by recommending that all health and healthcare disparities be measured in terms of relative differences in adverse outcomes – reflects a fundamental misunderstanding of why observers examine the outcome rates of advantaged and disadvantaged groups.  Page 12 of the letter to HHS and DOE discusses that NCHS seems to be reversing itself, and now will recommend that healthcare disparities be measured in terms of relative differences in favorable outcomes.  The reversal is by no means an effective way of dealing with the fact that because each relative difference tends to be affected by the frequency of an outcome, neither is an effective measures of the strength of the forces causing outcome rates to differ.  But such reversal will contribute to the disarray in approaches to the measurement of health and healthcare by federal agencies.  Most pertinent to the instant subject, however, is that, so far as the published record reveals, no other federal agency has shown an awareness that it is even possible for the two relative differences to change in opposite directions as the frequency of an outcome changes, much less that they tend to do so systematically.  Correcting that and related failures of understanding of federal agencies concerning the measurement of differences in outcome rates should be an important priority of the Chief Data Scientist.

The above should not be read to suggest that federal agencies' understanding of the measurement issues discussed or touched upon here is materially inferior to that of academic and other institutions or organizations involved with the interpretation of data on group differences.  As discussed "Race and Mortality Revisited" and the FCSM paper, and many other places, and as reflected in the letters listed in the margin,[14] essentially all such institutions and organizations suffer from failures of understanding similar to those found at federal agencies.  Whatever may be said of the failings of such institutions and organizations, however, the federal government has a special responsibility to ensure the soundness of law enforcement activities and the efficacy of its own and taxpayer funded research, as well as the essential accuracy of everything it leads the public to believe.  The principal pertinence of the failures of understanding by nongovernmental institutions and organizations to the federal government's consideration of

---

[14] Letters to non-federal entities addressing problems with their interpretations of data on group difference, or guidance they provided on such issues, as a result of the failure to understand they ways that measures tend to be systematically affected by the frequency of an outcome include:  Robert Wood Johnson Foundation (Apr. 8, 2009), National Quality Forum (Oct. 22, 2009), Institute of Medicine (June 1, 2010), The Commonwealth Fund (June 1, 2010), Harvard University  (Oct. 9, 2012), Harvard Medical School, Massachusetts General Hospital, et al. (Oct. 26, 2012), Mailman School of Public Health of Columbia University (May 24, 2013), Education Trust (April 30, 2014), Annie E. Casey Foundation (May 13, 2014), Institute of Medicine II (May 28, 2014), Education Law Center (Aug. 14, 2014), Wisconsin Council on Families and Children's Race to Equity Project (Dec. 23, 2014), Portland, Oregon Board of Education (Feb. 25, 2015), Vermont Senate Committee on Education (Feb. 26, 2015),  Texas Appleseed (Apr. 7, 2015), City of Minneapolis, Minnesota (June 8, 2015).

measurement issues discussed in materials referenced above is that, neither in funding research nor in appraising guidance provided by such entities, may the government simply defer to the entities' presumptive expertise.

In any event, the consideration pertinent to the principal subject of this letter is that agencies enforcing civil rights laws do not understand that reducing the frequency of an outcome tends to increase relative differences in rates of experiencing it. In fact, they believe just the opposite and have for years been leading the public and entities covered by civil rights laws to believe that as well. This is a matter warranting immediate attention from the Chief Data Scientist.

Sincerely

**/s/ James P. Scanlan**

James P. Scanlan

**Corrections to the mailed version of this letter:**

Page 2, line 1: "that *Amstat*" changed to "the *Amstat*"
Page 2, line 2: "law" changed to "laws"
Page 3, line 1: "in rate of" changed to "in rates of"
Page 3, first full paragraph, line 1: "an" changed to "a"
Page 3, first full paragraph, second last line: "disparate impact" changed to "disparate impacts"
Page 4, line 3: "corrective actions" changed to "corrective action"
Page 4, first full paragraph, line 3: "healthcare measurement" changed to "healthcare disparities measurement"
Page 4, second last line: "interpretation" changed to "interpretations"
Page 5, first full paragraph, line 2: "adverse outcome" changed to "adverse outcomes"
Page 5, second last line: "63 percent" changed to "63%"
Page 6, second full paragraph, last line: "effect on the corresponding" changed to "effect on relative differences in the corresponding"
Page 6, last paragraph, line 3: "allows one" changed to "allow one"
Page 6, note 7, line 2: "Four-Fifths Rule of" changed to "Four-Fifths Rule subpage of"
Page 7, first full paragraph, line 2: "situation where" changed to "situations where"
Page 7, third last line: close quote added after "Secretary"
Page 7, note 8, line 3: "in corresponding" changed to "in the corresponding"
Page 8, second paragraph, line 6: "conferences presentation" changed to "conference presentations"
Page 10, line 8: "discuss that" changed to "discusses that"