COMMENTARY

RACIAL DIFFERENCES IN DIABETES AMONG UNION FORCES DURING THE US CIVIL WAR

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Diabetes is the seventh leading cause of death in the United States and disproportionately affects ethnic minorities. While research examining health disparities is well-established, an historical understanding of how the disparities evolved over time may be warranted. This article examined racial differences in prevalence of diabetes and associated mortality in Blacks and Whites during the US Civil War. Data were extracted from the *Medical and Surgical History of the War of Rebellion, 1861–1865,* representing segregated White and Black Union Forces who served during the war. Data were collapsed by war theater (Atlantic, Central, Pacific). Results by race show that, from 1861 to 1866, the rates of Whites diagnosed with diabetes ranged overall from 0% to .11% and was distributed throughout the war theaters as: Atlantic 0.3% to .05%; Central 0.3% to .08%, and Pacific 0% to .11%. For Blacks, Atlantic ranged from .02% to .07% and Central .03% to .06%. None were reported for Pacific. Mortality was approximately .01% for both Blacks and Whites. These data suggest no racial differences in diabetes prevalence and mortality existed between Blacks and Whites during this time, implying that disparities may have evolved more recently. (*Ethn Dis.* 2015;25[1]:104–107)

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INTRODUCTION

Diabetes is the seventh leading cause of death in the United States, affecting more than 25 million people in the US population and 8.3% of adults. According to the CDC, diabetes is the number one cause of kidney failure and a major cause of stroke and heart disease in the United States.[1] Among those diagnosed with type 2 diabetes (T2DM), ethnic minorities are disproportionately represented compared to non-Hispanic Whites and are at an increased risk of developing diabetes related complications. Additionally, ethnic minorities tend to exhibit poorer outcomes than non-Hispanic Whites, with non-Hispanic Blacks demonstrating consistently worse outcomes and control compared to other minority populations or non-Hispanic Whites.[2]

Research looking at diabetes outcomes among ethnic minorities and the health disparities that exist in both the risk and prevalence among disadvantaged populations is well established.[3–5] And, while many factors such as patient activation and psycho-social influence are being examined and incorporated into interventions for ethnic minorities diagnosed with T2DM, additional research examining the history of the disparities is warranted. A recent comparison of health outcomes among ethnic minorities compared to the outcomes of non-Hispanic Whites over the last 20 years found that, despite improvements in medical care and insurance, outcomes for ethnic minorities are still disparate compared to non-Hispanic Whites with the same access to care.[6] This suggests that there are unknown and persistent contributing factors affecting the overall health outcomes of ethnic minorities.

Historical understanding of how these existing health disparities evolved over time may allow for further identification of the contributing factors that serve to maintain the existing gap in health outcomes among ethnic minorities, particularly as it relates to T2DM. However, little is known about the prevalence and outcomes of many medical illnesses in ethnic minorities prior to the US Civil War (1860–1865). During the Civil War era, most documentation of medical illness among ethnic minorities took place primarily in the Union military.[7] African American men who joined the Union forces during the Civil War represented the first large population of Blacks in the world to participate in a systematic scientific medical health tracking effort.

Examination of the documented medical history and treatment for medical illness during this time period will allow for further understanding of the differences that existed in prevalence and outcomes of disease for the African Americans and other ethnic minorities that comprised the "Colored Troops" as compared to non-Hispanic Whites in the Union military. Additionally, the examination of the beginning of medical health tracking of ethnic minorities and non-Hispanic Whites in the Union forces may provide further insight into the cases and subsequent solutions to the current health disparities in the United States. Within this article, we examine racial differences in prevalence of diabetes and associated mortality in Blacks and Whites during the US Civil War using data collected by Union

forces for soldiers during this time period.

METHOD

Empirical data were extracted from *Medical and Surgical History of the War of Rebellion, 1861–1865*, a detailed record of medical illnesses, combat injuries, and behavioral health problems compiled by the Union Army during the US Civil War (1861–1865) and the year after the war ended (1865–1866).[7]

The Data Source

The US War Department Surgeon General's Office recognized in the first year of the US Civil War that record keeping for sick and wounded soldiers was "insufficient and defective," thus it announced on June 9, 1862 the intention to compile *Medical and Surgical History of the War of Rebellion, 1861–1865* (MSHWR) for publication.[7] However, it was not until November 4, 1863 that the War Department issued General Orders No. 355, directing "Medical Directors of Armies in the field [to] forward, direct to the Surgeon General at Washington, duplicates of their reports… after every engagement."[7, a]

By January 1864, the scope and focus of the data collected spread from the battlefield to include general hospitals used by the military. "Medical officers in charge of wards" were issued a "Register of Sick and Wounded" and a "Register of Surgical Operations" in which they kept "minutely and in detail, the particulars of all operations performed, or treated in [the] hospital."[7] These two registers later served as the foundation for the organizational structure of MSHWR. A month later, the military began explicitly requesting medical reports for "Sick and Wounded Rebel Prisoners of War" and "White and Colored Troops." [7, b]

In February 1865, the Surgeon General's Office requested that medical reports from "Medical Directors of Armies in the field or of detachment commands" be forwarded "within twenty days after every engagement." [7] Thus, the Surgeon General's Office did not formally seek timely medical reporting until two months remained in the war.

On June 8, 1868, the U.S. Congress commissioned Secretary of War Edwin M. Stanton to prepare for publication "five thousand copies of the First Part of the Medical and Surgical History of the Rebellion, [as] complied by the Surgeon General" of the U.S. Army Joseph K. Barnes.[7] The resulting tome (MSHWR) took almost two decades to fully publish (1870–1888), consisted of six volumes, and totaled approximately 3,000 pages. There are 718 pages of data tables at the front of MSHWR, with 112 separate tables by region and army group. Categories for year, month, mean strength (of military), cases, and deaths run along the x-axis header, while the y-axis left hand column lists five classes of diseases that are then divided into nine medical orders, and finally subdivided and enumerated into 150 "diseases" ranging from "serpent bite" and "gunshot wounds" to "dysentery" and "dropsy from heart disease." With multiple variables on both axes, the task of organizing and comprehending the data is complex. Furthermore, many of the "diseases" listed in the tables are in subsequent volumes given general descriptions, selective case study examples, accounts of treatments, and sometimes illustrative color plates or photographs to further aid in contextualizing their effects.

The MSHWR provides an extremely detailed examination of the medical condition and toll taken on soldiers during the US Civil War. Yet, this historical data have largely gone unexamined.[c] While the reliance on verifiable medical cases resulted in a relatively high degree of data integrity, it also almost assuredly had the unintended consequence of underreporting and undercounting the true number of medical maladies and injuries suffered by Civil War combatants.[8] As a result, one should view estimates derived from this source as highly conservative. The "true" numbers were almost undoubtedly worse. Unfortunately, a combination of time, incomplete records, and changes in medical diagnoses and definitions conspire to make obtaining exact figures impossible.[d] Another concern regarding the accuracy of the MSHWR is rooted in methodology. The revamping and continual readjustment of the system of recording medical data during the war undoubtedly resulted in some fluctuations and/or irregularities in the data reported. These statistical anomalies and limitations were acknowledged at the time.

RESULTS

Data were extracted from 110 tables representing segregated White and Black ("Colored") Union Forces (peak mean strength = 734,649 in 1864–1865) who served during the war. These data were collapsed by war theater (Atlantic, Central, Pacific). In 1861 through 1866 Whites only diagnosed diabetes rates ranged from 0% to .11%; in dividing the White rates into war theaters, we found rates of Whites in the Atlantic region ranged from .03% to .05%; in the Central region, from .03% to .08%, and, in the Pacific region, from 0% to .11%. For Blacks, no data were available from 1861 to 1862, as the Union medical department did not begin tracking African Americans until after the Emancipation Proclamation went into effect on January 1, 1863, and officially opened the Union military to African American soldiers. However, from 1863 through 1866, prevalence of diabetes in "Colored Troops" was similar to Whites, with ranges for Blacks from .02% to .07%; and two war theaters as: Atlantic: .02% to .07%; Central: .03% to .06%. None were reported for Pacific region (Table 1). All theaters combined, for White and Black troops separately, are summarized in Table 2 by total count and percent-

Table 1. Diabetes among Union forces by race and war theater during the US Civil War, 1861–1866

	1861–1862			1862–1863			1863–1864			1864–1865			1865–1866		
Region	Mean Strength	Cases *n* (%)	Deaths *n* (%)	Mean Strength	Cases *n* (%)	Deaths *n* (%)	Mean Strength	Cases *n* (%)	Deaths *n* (%)	Mean Strength	Cases *n* (%)	Deaths *n* (%)	Mean Strength	Cases *n* (%)	Deaths *n* (%)
White/Atlantic	176,650	85 (0.05)	1 (0.00)	313,841	164 (0.05)	8 (0.00)	249,424	70 (0.03)	2 (0.00)	287,572	81 (0.03)	2 (0.00)	37,883	11 (0.03)	0
White/Central	105,108	39 (0.04)	1 (0.00)	336,739	271 (0.08)	10 (0.00)	415,509	154 (0.04)	6 (0.00)	346,098	162 (0.05)	7 (0.00)	52,682	18 (0.03)	1 (0.00%)
White/Pacific	7,161	0	0	9,375	10 (0.11)	0	10,480	3 (0.03)	0	11,836	8 (0.07)	1 (0.008)	11,332	8 (0.07)	0
Total White	288,919	124 (0.04)	2 (0.00)	659,955	445 (0.07)	18 (0.00)	675,413	227 (0.03)	8 (0.00)	645,506	251 (0.04)	10 (0.00)	101,897	37 (0.04)	1 (0.00%)
Black/Atlantic							13,449	10 (0.07)	2 (0.01)	31,600	8 (0.03)	1 (0.00)	10,055	2 (0.02)	1 (0.01%)
Black/Central							31,725	19 (0.06)	2 (0.01)	57,543	23 (0.04)	2 (0.00)	46,562	12 (0.03)	4 (0.01%)
Total Black							45,174	29 (0.06)	4 (0.01)	89,143	31 (0.03)	3 (0.00)	56,617	14 (0.02)	5 (0.01%)

Table 2. Diabetes among White and Black Union Forces during the US Civil War, 1863–1866

	White			Black		
Year	Mean Strength	Cases *n* (%)	Deaths *n* (%)	Mean Strength	Cases	Deaths *n* (%)
1863	675,413	227 (0.03%)	8 (00.00%)	45,174	29 (0.06%)	4 (0.01%)
1864	645,506	251 (0.04%)	10 (0.00%)	89,143	31 (0.03%)	3 (0.00%)
1865	101,897	37 (0.04%)	1 (0.00%)	56,617	14 (0.02%)	5 (0.01%)

age for each variable with .03% for Whites and .06% for Blacks in 1863; .04% for Whites and .02% for Blacks in 1864; and .04% for Blacks and .01% for Blacks in 1865. Mortality was very minimal (approximately .01%) for both Blacks and Whites; suggesting that the number of cases did not differ by race.

DISCUSSION

The MSHWR is the earliest US data available on the diagnosis and prevalence of diabetes between races. According to the data extracted, during the time period of 1861 through 1866, no significant difference in prevalence of diabetes and mortality were seen between Blacks and Whites. This suggests that disparities were not prevalent at this time. However, classification of diabetes may have been problematic due to the poor understanding of the disease during the US Civil War and, as such, discrepancies in diagnosis and prevalence of diabetes may have existed during this time period but were underreported.

In comparison, the Civil War Union pension files collected on the Union veterans aged ≥65 years from 1890 to 1909 also found that Blacks did not differ significantly than Whites in diagnosis of diabetes and, in order to rule out whether discrimination existed in reporting diabetes for Blacks, the rates in which urinalysis was conducted were assessed and no racial differences were found.[9] Yet, the pension files showed that Blacks were 42% less likely to receive a diagnosis of diabetes at their first examination compared to their White counterparts, and those examined in the upper South were less likely to be diagnosed with diabetes compared to those examined outside the South.[9] This suggests that a greater difference between Whites and Blacks may have been present but, due to the intensity of discrimination that existed during this time, Blacks did not receive thorough examination and were consequently under-diagnosed with certain medical illness, including diabetes.

Further, data from 40,000 Union Army veterans were used to compare the treatment of Black veterans with the treatment of White veterans, and Blacks were shown to be hospitalized less than Whites for sickness and injury resulting in no documentation for disability assessment and examination post war.[10] Additionally, referral to a hospital was primarily required by a White officer and the data showed that, of those who died from wounds, 64% of Whites had been previously hospitalized compared to only 32% of Blacks. A disparity was also seen in the ability of Blacks to obtain pension support, which was affected by low literacy rates and poverty.[10] Finally, it was found that Blacks suffered higher mortality rates during the war than did Whites, with 18% of Blacks dying from disease compared to only 9% of Whites.[10]

Current data on incidence of diabetes in active duty US military personnel found that age and race were predictors of diabetes, with non-Hispanic Blacks and Asians having a two-fold increase of diagnosis compared to non-Hispanic Whites, which is consistent with the rates in the general population.[11] Overall, current studies support long-standing disparities between Blacks and Whites active duty and Veterans with diabetes.

This study of US Civil War medical data has several limitations worth men-

tioning. First, the records from the MSHWR were of active duty soldiers, which may have resulted in lower prevalence of diabetes due to healthy lifestyles. Secondly, the understanding of diabetes was poor during this time and as such the data gathered by the US Government during the US Civil War were collected by mid-19th century physicians who truly embodied the definition of "practicing" medicine. Additionally, the data extracted from MSHWR are now almost 150 years old and must be interpreted cautiously. Finally, we use "mean unit strength" as the denominator in calculating rates of diabetes and mortality, though this is an imperfect metric because casualties, other attrition, desertion, and replacement soldiers mean the number of unique troops serving in any year was undoubtedly higher than "mean unit strength." Unfortunately, precise numbers are impossible to obtain. Thus, the rates we present are probably higher than they should be. The total number of combatants who served on either side of the Civil War is unknown. However, generally accepted estimates place the number of soldiers and sailors that served during the war for the Union at approximately 2,100,000.[12, f]

In conclusion, the MSHWR provides some of the earliest records available that capture data on both Blacks and Whites during the early 1860s. These data suggest that no racial differences in diabetes prevalence and mortality existed between Blacks and Whites, at least among Union soldiers during this time period. This finding implies that disparities may have evolved over time and more recently. Going forward, identification of factors that led to evolution of disparities using historical data is important to better characterize the origin and predictors of disparities over time.

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AUTHOR CONTRIBUTIONS

Design and concept of study: Smith, Frueh, Campbell, Egede
Acquisition of data: Smith, Frueh
Data analysis and interpretation: Frueh, Egede
Manuscript draft: Smith, Frueh, Campbell, Egede
Statistical expertise: Smith, Frueh, Egede
Administrative: Frueh, Campbell, Egede
Supervision: Egede

APPENDIX A. FOOTNOTES

[a]A week later, the Surgeon General's Office requested "all obtainable statistics and data in connection with past and future operations" and drew "particular attention" to a list of medical topics of elevated importance, the first on the list being "morale and sanitary condition of the troops" (Barnes, 1870). While the Surgeon General did not provide the exact rationale for this, one can infer that the intention was to include parameters that at the time may not have been strictly considered of a "medical nature."

[b]While the apparent tardiness in regard to accurately cataloging enemy POW medical conditions may be attributed to a focus on one's own soldiers, the delay in tracking Black troops appears more anomalous given that the Emancipation Proclamation was two years old and the Bureau of Colored Troops was established 10 months prior to the request for medical reports on Black troops. Nevertheless, with the inclusion of these medical reports in addition to the slight modification of a few others, the Surgeon General's Office had in place a comprehensive system for tracking the medical condition of Civil War combatants by spring 1864.

[c]The *MSHWR* was mostly forgotten by the medical field, with the exception of a few medical libraries, and has proved intimidating to historians who lack the medical and statistical expertise to make sense of the complex and detailed data tables. As a result, the majority of references to the work were not found in medical publications, and citations and examples from non-medical works tended to mainly use large aggregate totals and/or basic comparative tables already provided by the text. In this study, we endeavored to move past broad statistical generalizations to gain a deeper understanding of the data in hopes of providing better context to contemporary medical and mental health professionals and historians.

[d]This was a fact not lost on the compilers of the *MSHWR* as they noted in its introduction, the publication "cannot be regarded as complete," and that while "most imperfect, they [the data presented] embrace so large a proportion of the troops concerned that they cannot fail to serve fairly as a reliable basis for deductions with regard to the health of the whole army" (Barnes, 1870).

[e]The mean strength during these two months was only 41,556 and they preceded any major combat engagements.

[f]Tabulating totals for the Confederacy is much more difficult, given the lack of records, yet most historians believe it safe to approximate the total strength of the Confederate military at 850,000 to 900,000 men.