The Use of Historical Vital Statistics when Analyzing African-Descended Population Heterogeneity

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This paper explores population substructure through an analysis of 726 individual death certificates representing African-American and West-Indian immigrant populations who died from tubercular infection in Manhattan, New York City, NY, 1890–1930. From the death certificate data, four classes of tubercular infection were derived: pulmonary, chronic pulmonary, acute/miliary tuberculosis and tubercular meningitis. Individuals were classified according to color and place of birth. Using these data, the correlation among color, region of birth and the type of tubercular infection causing death was examined. Through a Chi-squared analysis, the data demonstrated that: 1) color did not significantly influence the type of tuberculosis an individual died from, and 2) region of birth influenced the type of tuberculosis an individual died from. The results of this analysis lead to the conclusion that historical vital records, specifically death certificate data, are useful when exploring historical population substructure.

Key words: Africans ■ tuberculosis

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INTRODUCTION

Tuberculosis (TB) is a nondiscriminatory infectious disease primarily caused by *Mycobacterium tuberculosis*. As an illness of the respiratory system, an infected person can spread the bacteria into the air when coughing or sneezing. About 1.6 million people die from TB annually, and the World Health Organization[1] identifies TB as a global emergency. In 2005, southeast Asia accounted for 34% of the global incidence cases. The estimated incidence in sub-Saharan Africa is twice the rate of southeast Asia, with approximately 350 cases per 100,000 individuals. The number of new cases continues to rise each year.[1] While many may be exposed to *M. tuberculosis*, of those exposed, <50% develop tubercular disease. This reflects both the variation in the virulence of the tubercle bacillus[2-3] and an individual's immune response.[3-9] An analysis of the dialogue surrounding historical and current TB incidence, prevalence, morbidity and mortality reveals that race is often defined as a risk factor influencing the host immune response. African and African-descended populations are often highlighted as having an innate susceptibility to tubercular infection.[4]

Through an analysis of 726 individual death certificates representing African-American and African-descended immigrants who died from tubercular infection in Manhattan, New York City, NY, 1890–1930, this paper provides an analysis of microethnic substructure within the macroracial category black. It is hypothesized that regionally specific historical explorations of demography and epidemiology can provide preliminary insight into population substructure. It is anticipated that this analysis will add another voice to the danger of using gross racial categories when delineating population parameters.

RACE AND TUBERCULOSIS AMONG AFRICAN-DESCENDED POPULATIONS: A BRIEF REVIEW

During the late 19th/early 20th century, epidemiological data emphasized that the morbidity and mortality rate from TB was higher among African-descended populations in comparison to whites.[10,11] In 1920, the mortality rate from TB was 2.7 times greater among African-descended populations than among whites. In North Carolina, the death rate was 2.3 times greater among African-descended populations as compared to whites. In Philadelphia, between 1910–1920, the proportion of African-descended populations who contracted the disease was 4–6 times greater than that of whites.[12] Due to the constant contact between these two ethnological groups, the high rate of TB among African-descended populations was an important issue for all public health professionals.

While the majority of scientists concurred that TB was a *Mycobacterium* infection, researchers described

African-descended populations as more susceptible to the tubercle bacillus and developing tubercular infection. Often, susceptibility was described to result from an inferior biology and culture. For example, Frederick Hoffman alleged that African-descended populations possessed an inferior constitution and thus had a low resistance to mycobacterium infections. This low resistance resulted in the population having very little resistance in the struggle for life.[13] Other health scientists described the adult population as childlike and possessing little ability to care for themselves. The homes they lived in were portrayed as dirty and the food they consumed as unhealthy and contaminated. These conditions allowed for the spread of disease and infection.[14] Some researchers believed that the high rate of TB among African-descended populations resulted from an innate inability to provide for themselves as free persons. Thus, the only form of prevention was to return them to a state of slavery.[14]

Some researchers argued that it was not inherent racial characteristics that resulted in high morbidity and mortality from TB, but an oppressed social, political and economic status.[15-17] These researchers emphasized that after emancipation African-descended population began moving into urban centers for greater economic advancement. For example, during the late 19th/early 20th century, the New York City African-descended population experienced phenomenal growth; more than doubling between 1900–1920 and then redoubling in the single decade of the 1920s.[18] A large proportion of this population increase may be attributed to the thousands of African-descended populations leaving the south between 1915–1950 to escape sharecropping, worsening economic conditions and the lynch mob. New opportunities in the north could be offered as a result of better wages and homes and increased political and civil rights. In addition to southern African-descended populations, a proportion of the population also migrated from the West-Indian islands. According to Irma Watkins Owens, between 1900–1930 approximately 40,000 West-Indian immigrants arrived in New York City.[19]

African-descended individuals (immigrant and native), European immigrants and other disenfranchised native populations living in urban regions were all documented to share a high TB morbidity and mortality rate as a result of overcrowded living conditions, malnutrition and physical stresses. These conditions made individuals more susceptible to TB. Under other circumstances, some African-descended groups remained in rural areas of the south. In the rural regions of the south, healthcare and medical facilities often did not have adequate equipment or sufficient staff to cater to the needs of the population. Many emphasized the need for more African-descended physicians, nurses and hospital facilities to tend to the concerns of the community.[20]

While research no longer includes an element of the inferiority of African-descended peoples, there continues to be a tendency to assume an innate susceptibility of African-descended population to TB. In their 1981 publication *Another Dimension to the Black Diaspora: Diet, Disease and Racism*, Kenneth Kiple and Virginia King described how the susceptibility of African-descended populations to tubercular infection resulted from the lack of exposure to the tubercle bacillus in African ancestral environments.[21] In the 1990s, William W. Stead found that among 25,000 tuberculin-negative nursing home residents in the United States, in comparison to white residents, blacks were twice as likely to become infected.[22]

A REANALYSIS TUBERCULOSIS DEATHS THROUGH ARCHIVAL VITAL STATISTICS DATA

This study provides an analysis of the death certificates of 726 American born and immigrant African-descendant individuals. These individuals died from TB in the borough of Manhattan between 1890–1930. Through this analysis, this essay illustrates how historical and archival records can prove useful to contemporary researchers by providing critical data surrounding the biological and cultural constitution of past populations. When using these historical and archival sources, researchers are, in a sense, conducting a local population level genealogy of a predefined geographical region. According to Swedlund and Herring, vital data are one of the three main classes of records used when reconstructing population parameters. Vital records reflect the standing population through sampling its vital events as they occur. They depict birth, marriage and death patterns in any given year.[23]

Vital records collected in New York City reflect three social phenomena characterizing the late 19th/early 20th century: industrialization, migration and rapid population increase in industrial regions. These three social phenomena resulted in an increase in the number of cases and deaths from infectious, contagious and communicable diseases. As a result of this increase in disease, there was: 1) a growing concern over the prevention and elimination of disease; and 2) a development in the methodology used to track demographic and epidemiological patterns to identify at-risk populations so that public health policy could target those in need.[24-28] Frederick L. Hoffman stated that vital statistics prove essential for public health and medical purposes and assist in the furtherance of efforts to prevent disease and to prolong human life.[29]

During the late 19th/early 20th century, there were a number of registration districts that reported vital statistics directly to the United States. New York City was (and currently is) comprised of five counties or boroughs, including Kings (Brooklyn), Queens, Staten Island (Richmond), Manhattan and the Bronx. As a result of its

population size, New York City was a separate registration district from New York State and reported all health statistics directly to federal authorities. Because during the mid-19th century New York City required the death certificate mandatory when obtaining a burial or removal permit,[30] it is assumed that of all vital statistics data collected (birth, marriage and death), an analysis of data derived from the death certificate would provide a representative cross section of the African-descended population dying from TB in New York City, 1890–1930.

MATERIALS

The author collected these death certificate data between October 1998 and July 1999 from microfilmed copies of the original forms that are located in the Municipal Archives, Tweed Courthouse, New York City. The high mortality and the large size of the New York City (all five boroughs) population made it impossible to collect data on all individuals dying from TB between 1890–1930. As a result, collections were limited to individuals dying from tubercular disease in New York County (Manhattan borough). Manhattan includes the island that borders the lower Hudson River as well as several other smaller islands and a small portion of the mainland.

There were five criteria for inclusion in the sample population: 1) the primary or secondary cause of death was listed as TB; 2) the death occurred in New York County (Manhattan), NYC; 3) the individual died in the months of January, April, July and October; 4) the individual died in the years 1890, 1895, 1900, 1905, 1910, 1915, 1920, 1925, 1930; 5) the individual was identified as African descended. Data from the death certificates were entered into Microsoft® Access.™ The months of January, April, July and October were selected because these months are spaced by three months and represent the four seasons of winter, spring, summer and fall.

For this study, the 726 individuals were divided into two separate color categories—black and colored. On the official certificates of death, individuals whose race/color was described as colored, light brown, brown or dark brown were included in the colored as opposed to black population. During the late 19th/early 20th century, skin color was identified as an important distinguishing variable among African Americans. For example in his 1906 publication *The Health and Physique of the Negro American*, W.E.B. DuBois refuted the idea of homogeneity and subclassified the African-descended population into 48 categories that described variation in complexion, hair color, height, build, eye color and character. These 48 categories were then collapsed into four larger categories, including Negro, Mulatto, Quadroon and Octoroon. DuBois also indicated that the degree of mixture assisted in determining status within the African-descended community.[15] For this study, it is hypothesized that color was a mark of admixture and could have resulted in microethnic substructure. This substructure could possibly contribute to the creation of subpopulations possessing varying levels of susceptibilities and resistance to TB.

The individual death certificates also included information on place of birth. There were a total of 53 places of birth recorded on the individual death certificates, indicating further microethnic substructure beneath the racial level. These regions of birth were divided into five categories, including northeastern United States, southeastern United States, United States, West Indies and other. Data on international origins of late-19th/early-20th-century African-descended populations are of special interest since there are no historical data available for New York City showing the distribution of this foreign-born group.[18] Individuals included in the category United States were generally provided this designation at the time of death. This unspecified and overgeneralized designation represents the native–foreign dichotomy resulting from the high rate of immigration and often the misguided supposition that immigrants were inferior to native born Americans.[31,32]

Types of TB were separated into four categories, including pulmonary, chronic pulmonary, tubercular

Table 1. Frequency and percent of type of tubercular infection by color, 1890–1930

Color	Pulmonary	Chronic Pulmonary	Tubercular Meningitis	Acute and Miliary	Total % Total Color
Black					
n	261	88	27	18	394
percent black	66.2%	22.3%	6.9%	4.5%	54.26%
percent tb	52.2%	67%	50%	45%	
Colored					
n	239	44	27	22	332
percent colored	66.3%	13%	8%	12.7%	45.73%
percent tb	47.7%	33%	50%	55%	
Total	500	132	54	40	726
Percent total tb	68.9%	18%	7.4%	5.5%	100%

meningitis, and acute and miliary. The categories pulmonary TB, chronic pulmonary and tubercular meningitis were derived directly from the death certificates. Acute and miliary included those certificates that listed these TB classifications as well as all disseminated forms. It is hypothesized that there may be a relationship between color, region of birth and type of tubercular infection. Frequency tables were generated and Chi-squared tests were run to test for independence between variables. A phi statistic was also run to determine the strength of the relationships.

RESULTS

Table 1 presents frequency distributions for the percent of black and colored individuals and reveals that pulmonary TB was the most common form of TB causing death among both black and colored individuals. Pulmonary TB was followed by chronic pulmonary, acute and miliary TB, and tubercular meningitis. The data also illustrate that both black and colored individuals had a very similar number and percentage of deaths from pulmonary TB. Blacks and colored individuals had an identical number of deaths from tubercular meningitis. Interestingly, a disparity existed between the number of deaths from chronic TB, with blacks suffering from a total of 88 deaths (67%) and colored individuals experiencing a total of 44 deaths (33%).

Table 2 and Figure 1 present the frequency and percentage of tubercular infection by region of birth and illustrate that pulmonary TB was the primary type of TB, with a total of 500 deaths (68.9%). Pulmonary TB was followed by chronic pulmonary (n=132, 18.1%), tubercular meningitis (n=54, 7.4%), and acute and military (n=40, 5.5%). Figure 1 spatially depicts this frequency distribution.

Chi-squared analyses were run to test for independence between: 1) color and type of TB, and 2) region of birth and type of TB. The results from these Chi-squared analyses are provided in Table 3. Race was independent from the type of tubercular infection (Chi-square=10.98, p=0.01). In comparison to race, region of birth was not independent from type of tubercular infection (Chi square=98.6, p=0.01). The Chi square revealed that even when omitting the category United States, region of birth remained significant (Chi square=48.7, p=0.01). Another Chi square was run, eliminating the categories of United States and other from region of birth. This analysis also revealed a significant relationship between region of birth and type of tubercular infection (Chi square=49.53, p=0.01).

The phi statistic supported the Chi-squared results. There was little to no association between color and type of

Table 2. Frequency of type of tubercular infection by region of birth, 1890–1930

Region of Birth	Pulmonary	Chronic Pulmonary	Tubercular Meningitis	Acute and Miliary	Total (N) % Total Region
Northeastern United States					
n	163	32	42	19	
% NE	63.4%	12.5%	16.4%	7.4%	256
% Type of TB	32.6%	24.2%	77.7%	47.5%	35.26%
Southeastern United States					
n	110	5	1	4	
% SE	91.7%	4.16%	.83%	3.3%	120
% Type of TB	22%	3.8%	1.85%	10%	16.5%
United States					
n	143	71	8	8	
% US	62.2%	30%	3.5%	3.5%	230
% Type of TB	28.6%	53.8%	14.81%	20%	31.68%
West Indies					
n	63	18	2	7	
% WI	70%	20%	2.2%	7.7%	90
% Type of TB	12.6%	13.6%	3.7%	17.5%	12.39%
Other					
n	21	6	1	2	
% other	70%	20%	3.3%	6.7%	30
% Type of TB	4.2%	4.5%	1.85%	5%	4.1%
Total n	500	132	54	40	726
Total % type of TB	68.9%	18.1%	7.4%	5.5%	100%

tubercular infection (0.049). However, between birthplace and type of tubercular infection, there was a weak positive association (0.301). Even when omitting the region of birth United States (0.332) and United States and other (0.325), a weak positive association remained (Table 3).

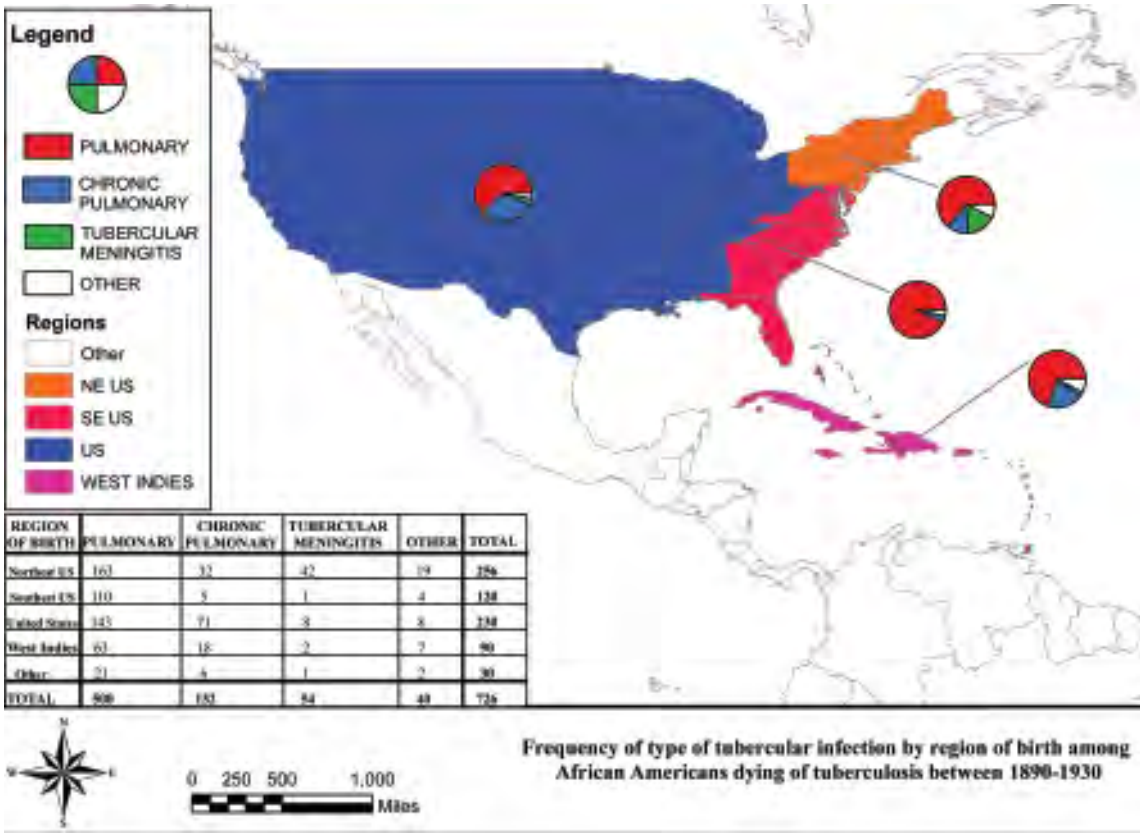
DISCUSSION

According to Ronald Taylor,[33] researchers tend to neglect studying within-group variation of African-descended populations. Taylor believes this to result from the tendency to envision the population racially as opposed to ethnically, and emphasize the conditions of racial oppression and exploitation as the exclusive source of their sociocultural characteristics. In turn, this emphasis obscures the important role of migration, urbanization and intragroup conflict in promoting a distinctive identity.

Interestingly, in comparison to birthplace, color did not have a significant influence on the type of tubercular infection an individual died from. However, this result is based on the assumption that the variation observed in the color category provided on the death certificate accurately represented the individual's ethnic identity. The actual identity of the deceased individuals can never be known. Furthermore, it was assumed that the category "colored" denoted racially admixed individuals, and "black" denoted individuals with a lesser degree of admixture. It is difficult to definitely establish if the racial classification of the African-descended population was in fact this ridged, as there was no standard used during the late 19th/early 20th century. Thus, the color category provided on the death certificate may have varied depending on which doctor or undertaker was completing the death certificate.

This study revealed that between 1890–1930 the New York City African-descendant population experienced phenomenal growth as a result of migration. These

Figure 1. Type of tubercular infection by region of birth among African Americans dying from tuberculosis between 1890–1930



REGION OF BIRTH	PULMONARY	CHRONIC PULMONARY	TUBERCULAR MENINGITIS	OTHER	TOTAL
Northeast US	163	32	42	19	256
Southeast US	110	5	1	4	120
United States	143	71	8	8	230
West Indies	63	18	2	7	90
Other	21	6	1	2	30
TOTAL	500	132	54	40	726

Table 3. Chi-square results

Variables Analyzed	χ^2	Critical Value	p
Color and type of tubercular infection	10.98	18.475	NS
Region of birth and type of TB infection	98.6	36.191	0.01
Region of birth and type of TB infection (category U.S. omitted)	48.7	30.578	0.01
Region of birth and type of TB infection (categories U.S. and other omitted)	49.53	24.725	0.01

data support previous research indicating that African-descendant populations migrated to New York City,[18,34] with the majority of people originating in the southeastern United States and the West Indies. While the bulk of international immigration came from the West Indies, immigrants classified in a homogenous racial category also had origins in South America, Latin America, Australia, the Pacific Islands, Africa and Europe. The national origins of decedents illustrate that between 1890–1905, individuals born in Virginia were the third highest-ranking migratory population after individuals born in New York City and the United States. There were also a number of individuals migrating from South Carolina, North Carolina, Maryland and Georgia.

These trends are consistent with previous demographic research. In 1900, Virginia was highlighted as contributing to nearly half of the native African-descended populations born outside of New York State (44,471).[18,34] After migration from Virginia diminished, other African-descended populations began to migrate from farther south—South Carolina (33,765), North Carolina (26,120) Georgia (19,546) etc.[18,34] However, the birthplace data from the death certificates indicate that African descendants were also migrating from the northeastern, midwestern and western United States. For example, among descendants there were two individuals from Rhode Island, two from Pennsylvania, two from New Hampshire, three from Connecticut and one from Michigan.

A relationship between regional birthplace and type of tubercular infection suggests that where a migrant was born or lived prior to settlement in New York City may have contributed to the type of tubercular infection that ultimately resulted in their death. While the sample population is small and a number of confounding variables may ultimately have influenced the Chi-squared analysis, these data provide suggestive evidence of the significance of studies of heterogeneity within the African-descended populations. It also suggests that to understand this diversity during the late 19th/early 20th century, researchers must not only consider the West Indies and southeastern United States as a source variation but incorporate data from all regions of the world.

While in the past very little emphasis has been placed on the heterogeneity of the African-descended population, some studies are beginning to prove critical when working to eliminate health disparities. This study illustrated that the African-descended population in New York City was not static, but rather fluid, as a result of multiple migrations. Current research on contemporary populations demonstrates that regional birthplace is an important variable when tracking health patterns within macroracial groups. For example, in their investigation of risk for cardiovascular disease in New York City, Fang et al. found that within the African-descended population, southern-born African Americans had a significantly higher risk of cardiovascular disease than individuals born in the northeast or Caribbean.[35] Read and Emerson[36] illustrate that grouping together foreign- and native-born African-descended populations conceals important health differentials. Future studies must investigate if this within-group heterogeneity also influences susceptibilities and resistances to infectious disease including TB.

It is possible that variation in disease resistance and susceptibility could be attributed to both intrinsic and extrinsic factors. Intrinsic factors would include biological/genetic characteristics that cause an individual to be susceptible or resistant to TB. Extrinsic factors would result from environments that decrease resistance and increase susceptibility. Studies investigating TB among African and African-descended populations generally describe these populations as being more intrinsically susceptible to develop tubercular disease.[21,22] However, as evidenced by this research, it is probably not safe to assume that all individuals comprising the traditionally defined racial group "black, of African descent" are intrinsically identical.

A first step in understanding the possible patterns of underlying intrinsic variability would be through an analysis of the origins of regional founding populations. This type of investigation should begin with a comprehensive understanding of migration patterns of Africans during the Transatlantic Middle Passage. Through this type of analysis we could determine what African ethnic groups comprise founding populations in specific geographical regions. Researchers investigating the Middle Passage document that the trade of Africans was not random, as certain African ethnic groups were preferred in certain regions of the western hemisphere.[37,38] Once arriving in the United States, Africans interacted and procreated with different European and Native-American populations. Was the level of interaction between different social-political racial groups identical in Charles-

Table 4. Phi statistic results

Variables Analyzed	Phi Statistic	Approximate Significance
Color and type of tubercular infection	0.049	0.615
Region of birth and type of TB infection	0.382	0.000
Region of birth and type of TB infection (category U.S. omitted	0.332	0.92
Region of birth and type of TB infection (categories U.S. and other omitted)	0.325	0.188

ton, New Orleans, Houston, Chicago, Brazil, London, Georgetown, Guiana or Puerto Rico? The answer to this question is an emphatic "no." Miscegenation laws varied from state to state in the United States and from country to country. Research documenting how population mixtures varied regionally is essential when attempting to understand human diversity. The population in New York City is even more complex, as individuals from all over the United States and world have migrated to this small region. While the Chi-squared analysis presented above did not find a significant relationship between individuals identified as black and colored, the phenomenon of racial mixing does document how the investigation of African diasporic health must go beyond the African continent and be transcontinental.

In addition to the relationship between decedents and regional founding populations, immunity and resistance to the *Mycobacterium* TB result from the interaction between genes, the sociocultural environment and the natural environment. Thus, exposures during the life cycle may have contributed to an individual dying from a certain type of tubercular infection. For example, host nutrition is a significant variable when mounting an immunological response to *Mycobacterium* infections. However, expressed phenotypes having nutritional origins may result from nutrition throughout the life cycle and/or nutrition at the time an individual was exposed to the *tubercle bacillus*. One possible line of future research could attempt to identify how: 1) components of the diet during the late 19th/early 20th century regionally varied; and 2) the diet varied among people residing in New York City. Current research illustrates that diet among African-American, African-Caribbean, African-Europeans and African populations varies by geographical origins and that this regional variation can impact health status.[35,36,39] It can also be hypothesized that within these geographical regions, further variation may also exist according to socioeconomic status, gender and any other existing ethnic distinctions. The results of this research suggest that this regional information is critical when determining disease risk.

Heterogeneity within a traditionally defined racial group is a concept that can be extended to non-African-descended populations. In a similar study, Leslie and Bitenas[40] illustrated that in late-19th/early-20th century Manhattan, region of birth was a significant variable influencing the type of tubercular infection European Americans and European immigrants died from. Unfortunately, when defining the white population in the United States, similar to African-descended populations, this substructure is often overlooked.

THE USE AND LIMITS OF ARCHIVAL DATA FOR THE STUDY OF HISTORICAL HETEROGENEITY PATTERNS

The above analysis reveals how archival vital statistics data can reveal heterogeneity within racial groups. However, it is important to understand the context in which these data were collected. This exercise can allow for an evaluation of the uses and limitations of the data. Since the information on the death certificate was later compiled and reported for the purposes of monitoring mortality, there was a systematic approach when collecting these data. For example, M.O. Heckard, the registrar of vital statistics in Chicago during the early 20th century, described two parties who were primarily responsible for the collection of death certificate data—the undertaker and physician. The undertaker report included important demographic information while the physician's report certified the cause of death.[41] According to late-19th/early-20th-century public health researcher John S. Billings, the physician who was in charge of collecting cause-of-death data in New York City was either employed for that particular purpose and paid by the state, or was the physician in charge of the deceased person immediately previous to death. Billings described New York City as having a very efficient system of registering deaths that was competent and well executed.[24]

While Billings characterized New York City as a model for other registration districts when collecting and compiling death data, retrospective analyses of these documents must be approached cautiously. As historical documents, death certificate data are reflective of the time period they were collected. As a result of: 1) the changing constitution of the American population in general and the New York City population in particular; and 2) the development of the field of public health, the variables cause of death and race were fluid and varied over time and geographical space.

One disease of special interest to late-19th/early-20th-century health scientists was TB. Since TB was endemic in New York City during the late 19th/early 20th century, the correct classification of this disease was paramount among New York City health and vital statisticians. According to Louis Dublin, health statistician for the Metropolitan Life Insurance Company, while TB was easier to diagnosis than other maladies of the time,[42] the potential for bias must be noted in this retrospective analysis.

An analysis of the dialogue among late-19th/early-20th-century health science researchers reveals concern surrounding the development of a uniform system of classifying cause-of-death data. This concern resulted in the American Public Health Association's recommendation in 1898 that the International List of Causes of Death (ICD) be implemented and revised every 10 years. While these researchers worked to establish a uniform and systematic way to classify disease, it is unknown whether or not physicians filling out death certificates actually utilized the ICD or if it was primarily used by those health scientists compiling the data from the death certificates into statistical reports.[43] According to Dublin,

in New York City causes of death that present little difficulty are immediately classified according to the ICD.[10] Similar dialogue surrounding the ICD during the period provides suggestive evidence that it may have been primarily used by those health scientists when compiling death certificate data.[41] The ICD served (and continues to serve) to provide some uniformity across the registration districts when creating statistical reports.

While 19th- and 20th-century researchers worked to establish a uniform system of cause of death, in their analysis of 19th-century literal causes of death, Anderson and Leonard[44] state that there is no natural or universal classification of disease, and describe how social biases can and often influence diagnosis during an illness and at the time of death. They illustrate that lower-class persons were generally perceived as suffering from a higher morbidity and mortality from TB, and were possibly inaccurately overdiagnosed. They noted that being a young male adult through the working ages substantially increased the likelihood that the death was classified as TB.[44] Since during the late 19th/early 20th century it was uncommon for autopsies to be conducted at the time of death, it is possible that, depending on the physician, the type of tubercular infection diagnosed throughout the illness and at the time of death would vary.

CONCLUSION

The study of African-descendant population heterogeneity illustrates the problematic assumption of single homogenous racial categories when describing population parameters. The pattern of TB mortality and the microethnic groups identified in this study are regionally specific to New York City, 1890–1930. It is a dangerous supposition that these microethnic groups can be utilized in another region of the world. However, these microethnic group designations may be applicable to current New York City populations, as the knowledge of this demographic history may prove essential when attempting to model biological and cultural variability in relation to disease (TB) risk.

It is also important to emphasize that researchers must be cautious in approaches discussing regional human variability and corresponding disease vulnerabilities and susceptibilities. As illustrated by historical racial science, predispositions or resistance to disease was often used to characterize a population as inferior or superior.[12] This scientific practice resulted from an oversimplification of the scientific facts. The facts showed that: 1) it was difficult to classify individuals into mutually exclusive racial groups, 2) there were multiple variables involved when identifying vulnerabilities and susceptibilities to disease, and 3) humans are plastic and adapt to environments throughout the life cycle.[45] However, because of a priori conclusions surrounding the inferiority and superiority of racial groups, the facts were distorted and simplified to conform to hierarchical discussions. Thus, when approaching the study of current populations, it is important to identify how these scientific miscalculations occurred. Equipped with this historical framework, we can build models leading to effective and efficient preventions and interventions to diseases like TB. We can use these historical data to not only model how an approach investigating microethnic substructure is more precise but to also prevent misguided interpretations of data.

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