A Consideration of Mortality in Three Subcultures

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THE IMPETUS for this particular consideration of differential mortality is the marked paucity of data relating to health characteristics of one of the major ethnic minorities in the United States—Mexican-Americans (Chicanos). Very little is known concerning incidence and prevalence of disease conditions in this population, a surprising circumstance in view of the fact that persons of Mexican-American descent comprise the second largest minority in the country and the largest minority group in the southwest (*1*).

Paucity of Information about Chicanos

The following are probably the most important reasons for the lack of health information concerning this population.

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1. Many areas in the United States have few or no persons of Mexican-American descent. More than four-fifths of this population live in five States: Texas, Colorado, New Mexico, Arizona, and California.

2. Even in the southwest, where Chicanos constitute a significant portion of the population, vital and health statistics typically are not recorded using Mexican-American, Latin, or Spanish descent as a racial or ethnic classification. Members of this ethnic group are considered white for statistical purposes by most agencies, including the National Center for Health Statistics and the Bureau of the Census.

3. Before 1950 even basic population data upon which to base vital rates were lacking or at best, unreliable. In 1950 data relating to persons of Mexican-American descent were obtained by the Census Bureau by identifying white persons of Spanish surname on the census schedules. These data were published for the five States mentioned previously. The Census Bureau used this same procedure during the 1960 census to identify persons with Spanish surnames (*2, 3*). Obviously this procedure is costly, time-consuming, and not often

attempted. The National Center for Health Statistics does not publish data in this form.

4. For the past several decades ethnic studies in this country have been limited almost exclusively to the Negro-American or black subculture, to the neglect of other disadvantaged minority groups such as the American Indian or the Mexican-American subcultures. Consequently, a great deal more is known about the morbidity and mortality patterns for black Americans as well as for white or Anglo-Americans.

Mortality of White and Nonwhite Persons

Data have been collected, analyzed, and published comparing the mortality and morbidity experiences of white and nonwhite persons in the United States for many years. The National Center for Health Statistics routinely publishes all vital statistics in this form. (Nonwhite is broken down further for such groups as Negro, Indian, Chinese, Japanese, or other). In most areas of the United States nonwhite usually is synonymous with black.

Mortality data for these two major groups indicate that nonwhite mortality is greater than white mortality for total mortality, diabetes mellitus, major cardiovascular and renal diseases, vascular lesions affecting the central nervous system, chronic and unspecified nephritis and other renal sclerosis, and homicide. In 1950, for example, the reported age-adjusted death rate for white persons was 800 per 100,000, compared with 1,230 for nonwhite persons. In 1960 the difference was slightly smaller, but the death rate for white persons was still markedly lower than for nonwhite persons (730 compared with 1,040) (*4, 5*).

Kroeber, as part of an attempt to determine if observed differentials between white and nonwhite persons were genetic in origin, compiled a list of what he considered to be race-related diseases. However, he cautioned against overly relying on a unitary explanation involving genetics (*6*). Other authors have concurred. Petersen, for example, points out that available data are strongly suggestive of pronounced genetic influences in some diseases, but we simply do not know how important they are relative to social and environmental factors (*7*).

In discussing the interaction of race and mortality, Mechanic concludes ". . . These differences reflect a wide variety of factors: nutrition and exposure to disease, access to preventive medicine and medical care, protective health behavior, sanitary practices, and attitudes and ways of life. Above and beyond these factors, the data reflect further differences in mortality (especially between whites and nonwhites) which appear to be related to a deprived way of life, apathy and neglect, and a disorganized cultural pattern" (*8*).

Literature on Chicanos

The fact that Mexican-Americans or Chicanos differ markedly from other subcultures, such as Anglo or black Americans, in language, cultural heritage, and life-style has been documented to some extent (*9–13*). The implications of such cultural differences for health in this group have been less clearly articulated. Several studies have examined the attitudes, knowledge, values, and behavior of the Chicanos relating to health in general (*14–17*), but empirical studies of incidence and prevalence of disease conditions in this population have been few in number and limited in scope (*18*).

The most basic data, and the crudest indicators, about the general level of health in a population are mortality data. This is true of infant and childhood mortality in particular, but is also true for the population generally. There is probably no more fundamental source of data related to the health status of a population than mortality statistics. Death, compared with other health outcomes, is easily defined and readily observable. Unfortunately, death as an event is often the end product of a chain of events involving the long-term interaction of such factors as disease processes, use of health services, and knowledge, attitudes, and behavior of the person affected. For example, outcomes of illness are in many instances a product of the interaction of disease conditions and lack of health care.

A number of morbid conditions (such as diabetes) ordinarily are not fatal if medically treated, but they may become fatal if treatment is not instituted. On the other hand, a sizable proportion of illnesses of an acute, self-limiting type (the common cold) have little direct effect on longevity and mortality, regardless of medical treatment.

Thus, mortality may provide some indication of health status, but is inextricably related to health care as well as to the social and economic characteristics of the people affected. As such, the use of mortality as a measure of health status, or of health outcomes, presents a number of conceptual and methodological problems (*19*). Nevertheless,

in the absence of other information, mortality data may indicate possible differences in health conditions among a population's various subgroups.

Although mortality data are the most basic of health indicators, virtually nothing is known about overall mortality patterns and even less is known about specific disease mortality among Chicanos. Occasional studies have used available data to examine particular problems, such as the high rate of tuberculosis mortality in this population (*20*) and excess lung cancer mortality among Latin females (*21*). To our knowledge, however, only three published papers are concerned with overall mortality patterns for this subculture.

Two short papers were published by Ellis almost a decade ago examining mortality differentials between Chicanos (white persons with Spanish surnames) and Anglos (other white persons) in 1950. One paper examined data for San Antonio (*22*) and the other, for Houston (*23*). Ellis reported that the overall age-adjusted mortality rate for Chicanos in San Antonio was 989, compared with 742 for Anglos. Among Chicanos, the rate for males was 1,063 and the rate for females was 909. In Houston, Ellis reported rates of 924 per 100,000 for Chicanos and 764 for Anglos. The rate for Chicano males was 958 and for females, 904. Ellis did not include black people in his study, nor did he examine ethnic differences in mortality over time.

In a report published in 1968, Moustafa and Weiss analyzed vital statistics data from San Antonio for the period around 1960 (*24*). They compared mortality of blacks, Anglos, and Chicanos for all causes and for the 10 leading causes. Neonatal and infant death rates of Chicanos were intermediate to those of Anglos and blacks. Chicano death rates from heart disease, vascular lesions, and cancer were lower than those of Anglos and black persons. Unfortunately, Moustafa and Weiss did not age-adjust their data, an important procedure because the Chicano population typically is much younger than the others. Furthermore, males and females were not compared.

These few studies constitute what is known statistically about overall Chicano mortality patterns. No published studies have examined mortality differences of males and females among Chicanos, blacks, and Anglos, either for total deaths or by particular causes of deaths. Nor have differences between these ethnic groups over time been examined.

The purpose of this study was to examine differences in mortality among these three major ethnic subcultures in a large metropolitan area. Our objective was to ascertain what differences there may be between males and females of these three ethnic groups and how these differences change over time, if in fact they do change.

Procedures

Houston, Tex., mortality data for the period 1940–67 were assembled by the staff of the Houston Department of Public Health and the department of epidemiology, M. D. Anderson Hospital and Tumor Institute, University of Texas. These data presented an opportunity to examine the mortality of the Chicano population in a major metropolitan area over time.

1. Using the Census Bureau's procedure and the Immigration and Naturalization Service's publication on Spanish names (*25*), some 200,000 death records were screened, and all those of persons with a Spanish surname were coded as such. (Other techniques could be used to identify persons of Spanish or Mexican heritage, but for demographic research there seems little point in doing so until the Bureau of the Census changes its procedure for identifying this population by delineating Spanish surnames. A classification of vital events or other data which did not use the Spanish surname as the criterion would not yield data comparable to census population data and hence, data on the numerator and denominator would refer to different population bases.)

2. Population data were obtained from Bureau of the Census Reports for 1950 and 1960 (*26–29*).

3. Using the U.S. population in 1950 as the standard million, age-adjusted death rates were computed for Houston in 1950 and 1960 using the direct method. Using deaths for the years 1949–51 and 1959–61, 3-year average rates were constructed for both decades for each sex in the three ethnic groups: Anglo males and females, black males and females, and Chicano males and females.

4. For comparing the death rates of blacks and Chicanos with that of Anglos, standard mortality ratios were also computed in the following manner. In each 10-year age class, the age-specific death rate for Anglos (total males and females) was multiplied by the number of people in the corresponding age group for blacks and Chicanos. This product was the number of deaths in the black and Chicano groups that would be expected

to occur if their age-specific rates were the same as those of Anglos. Expected deaths were summed over all ages, and the total was compared with the total observed deaths. The standard mortality ratio was derived by dividing the number of observed deaths of blacks or Chicanos by the number of expected deaths of blacks or Chicanos (*30*).

Examination of mortality in urban areas is often difficult because boundary changes are frequent. Houston is no exception; the boundaries changed considerably between 1950 and 1960. This problem was resolved by creating a "death registration area" for a 131-tract area in the Houston Standard Metropolitan Statistical Area (SMSA) in 1960 for which mortality data were also available in 1950. The area was larger than the city of Houston in 1960 but smaller than the SMSA, which consisted of Harris County.

Analysis of the data in this paper entails comparisons of (*a*) the ethnic and sex differences in mortality in 1950 and again in 1960 and (*b*) changes in mortality patterns of each sex by ethnic group between 1950 and 1960.

Findings

Table 1 shows the population, rate of growth, and distribution by sex and ethnicity for Houston in 1950 and 1960. As can be seen, the area experienced substantial population growth between 1950 and 1960. Although Chicanos made up the smallest proportion of the population in both 1950 and 1960, their rate of increase for both sexes exceeded that of both Anglos and blacks. The Chicano population was large enough to generate sufficient numbers of deaths at the beginning of each decade (263 deaths in 1950 and 352 in 1960) to allow descriptive analysis of total mortality experience.

Table 2. Mortality from all causes, by sex and ethnicity, Houston, Tex., 1950 and 1960

Sex and ethnic group	1950 [1]		1960 [1]	
	Age-adjusted rate per 100,000 [2]	Ratio of male to female	Age-adjusted rate per 100,000 [2]	Ratio of male to female
Anglos:				
Males.....	990	1.58	951	1.75
Females...	625		543	
Blacks:				
Males.....	1,291	1.20	1,223	1.33
Females...	1,077		921	
Chicanos:				
Males.....	1,395	1.08	979	1.21
Females...	1,296		806	

[1] 3-year average deaths for 1949–51 and 1959–61.
[2] Age-adjusted rates computed by the direct method, using the total U.S. population in 1950 as the standard.

Chicano males in 1950 had an excess of 400 deaths per 100,000 population when compared to Anglos (table 2). In 1960 the situation was quite different. Anglo males still had the lowest rate, but Chicano males had a rate only slightly higher. Black males, on the other hand, had a substantially higher mortality rate.

Anglo females in 1950 also had the lowest rate, considerably lower than for black females who had the second lowest rate. Like Chicano males, Chicano females had a markedly higher rate than either their black or Anglo counterparts. In fact, the Chicano female rate in 1950 was double that for Anglo females, being almost the same magnitude as for Chicano males. In 1960 Anglo females still had the lowest death rate, still markedly lower than either blacks or Chicanos. However, by 1960 the Chicano female death rate had dropped from last to second, about 100 per 100,000 lower than for blacks. Like the males, the mortality rate for Chicano females declined drastically from 1950 to

Table 1. Population size, growth, and distribution, by sex and ethnicity, Houston, Tex., 1950 and 1960

Sex and ethnic group	1950 population	Percent	1960 population	Percent	Percent change
All males.....	343,594	100.0	516,351	100.0	50.3
Anglo.....	258,597	75.3	366,896	71.1	41.9
Black.....	69,043	20.1	115,395	22.3	67.1
Chicano.....	15,954	4.6	34,060	6.6	113.5
All females.....	354,288	100.0	541,579	100.0	52.9
Anglo.....	263,898	74.5	383,885	70.9	45.5
Black.....	74,680	21.1	123,905	22.3	65.9
Chicano.....	15,710	4.4	33,789	6.8	115.1

SOURCE: References 26–29.

1960. Anglo and black female mortality rates also declined, but not nearly so much.

The ratio of male to female mortality among the three ethnic groups in both 1950 and 1960 is quite different, although the male rate is higher in each ethnic group for both periods (table 2). Also, in the decade from 1950 to 1960 the ratio of male to female mortality increased in all three ethnic groups. However, the Chicano sex ratio is lower than that for either blacks or Anglos, and this pattern holds for both periods. Anglos, as other studies have reported, have the largest ratio of male to female mortality.

The age-adjusted rates in table 2 are based on the age distribution of the total U.S. population in 1950. In an effort to make the data more comparable temporally and geographically, the standard mortality ratio (SMR) was used. The SMR's in table 3 give the force of mortality for each sex of the two minority groups in 1950 and 1960, provided the Anglo rates for the same sex and year had prevailed.

In 1950 black males had an observed mortality rate 1.56 times greater than would be expected if black males had the same schedule of death rates as Anglo males; for Chicano males the observed rate was 1.66 times greater than the expected rate. Among females the differences were much more dramatic. Chicano females had an observed mortality rate 2.43 times greater than would have been expected if the rates for Anglo females had prevailed among Chicano females. The differences were almost as striking for black females—observed mortality was 2.07 times greater than expected.

By contrast, in 1960, observed mortality among Chicano females was 1.67 times greater than expected mortality using the 1960 rates for Anglo females. Similarly, for black females the ratio of observed to expected deaths was 1.87. Although the changes were not as pronounced, a similar pattern exists for males in 1960. The ratio of observed to expected deaths among Chicano males was 1.12; among black males observed deaths were 1.43 times greater than expected deaths.

In an attempt to examine changes occurring in mortality during 1950–60, SMR's for all three ethnic groups in 1960 were calculated using the 1950 Anglo rates (table 4). The results indicate that Chicano males in 1960 had essentially the same force of mortality as their Anglo counterparts a decade earlier. The trend does not hold for females, with Chicano females still having a more pronounced force of mortality than Anglo females. The SMR was 1.01 for Chicano males and

Table 4. Expected and observed deaths and standard mortality ratios, by sex and ethnicity, 1960, using 1950 Anglo mortality rates [1]

Sex and ethnic group	Number of deaths		Standard mortality ratio
	Observed	Expected [2]	
Males:			
Anglo	2,743	2,923	0.94
Black	1,075	813	1.32
Chicano	192	190	1.01
Females:			
Anglo	1,326	2,232	.59
Black	879	559	1.57
Chicano	160	118	1.36

[1] Mortality for Anglo, black, and Chicano males are based on 1949–51 average Anglo male rates. Similarly, mortality for Anglo, black, and Chicano females are based on 1949–51 average Anglo female rates.

[2] Expected number of deaths, given that population's age structure, if the Anglo age-specific rates had occurred in that population.

Table 3. Expected and observed deaths and standard mortality ratio, by sex and ethnicity [1]

Sex and ethnic group	1950			1960		
	Number of deaths		Standard mortality ratio	Number of deaths		Standard mortality ratio
	Observed	Expected [2]		Observed	Expected [2]	
Males:						
Black	708	455	1.56	1,075	753	1.43
Chicano	144	87	1.66	192	172	1.12
Females:						
Black	609	294	2.07	879	470	1.87
Chicano	119	49	2.43	160	96	1.67

[1] Death rates for males are based on the 1949–51 and 1959–61 Anglo male rates, respectively. Similarly, the female rates are based on the 1949–51 and 1959–61 average Anglo female rates.

[2] Expected number of deaths, given that population's age structure, if the Anglo age-specific rates had occurred in that population.

1.36 for females. By contrast, employing Anglo rates for 1950, the ratio of observed to expected deaths for black males was 1.32; for black females the SMR was 1.57. An interesting comparison is Anglo mortality in 1960, based on the Anglo death rate schedule in 1950. The SMR for Anglo males was 0.94, indicating very little decline. On the other hand, the SMR for Anglo females was 0.59, which represents a substantial decline.

Discussion

Although these findings are based on mortality data for a single metropolitan area, the results appear congruent with other such studies. That is, distinct differences in the mortality in the three ethnic groups are manifested statistically. Specifically, the males and females of both minority groups experienced a greater force of mortality in both 1950 and 1960 than their Anglo counterparts. The findings for blacks substantiate other mortality studies of this group; black females have markedly higher rates than Anglo females and the same differential applies to males, although the difference is not so pronounced.

As pointed out earlier, there have been virtually no comparative mortality studies which focus on Chicanos. Nonetheless, the Anglo-Chicano mortality differences observed in 1950 by Ellis for Houston and San Antonio generally are substantiated by both the 1950 and 1960 data examined here. The same patterns were observed by Moustafa and Weiss for San Antonio in 1960.

The observed patterns seem clear. However, a number of substantive questions arise for which the data examined provide no ready answer. For example, are these patterns of Chicano mortality representative of urban Chicano populations in the United States? Does Chicano mortality in rural areas differ from that in urban areas and, if so, how and to what extent? An extremely interesting sociological question is to what extent will increasing cultural amalgamation erode Anglo-Chicano mortality differentials? Finally, and perhaps most important, if the observed mortality patterns are typical, what might possibly account for these ethnic differentials?

The answer to the first question would seem to be a tentative yes, in view of the data reported for San Antonio. A more definitive answer awaits analysis of data from other urban centers with large Chicano populations, such as those in El Paso, Albuquerque, Phoenix, and Los Angeles. An answer to the second question may be forthcoming soon. Since 1959 all births and deaths in Texas have been routinely coded for Spanish surnames. None of these data have ever been systematically analyzed nor published. The University of Texas School of Public Health is currently negotiating to obtain these data. Once acquired, these data will permit rural-urban comparisons of fertility and mortality for Anglos, blacks, and Chicanos.

The question of the effect of cultural amalgamation is beyond the scope of these data. However, it is interesting to note that both ethnic minorities approximate the Anglo rates to a much greater extent in 1960 than in 1950, an outcome which conceivably could be attributable to increasing sociocultural similarities among the groups. However, this narrowing of differences in mortality ratios may be the result of increasing accuracy of the census.

A study comparing the mortality experience of foreign born Mexican-Americans with first and second generation members of this ethnic group would provide more direct examination of this issue. Work by Krueger and Moriyama, as well as others, would seem to indicate marked differences in such groups, particularly for some causes of death (*31*). Additional data pertaining to acculturation would be marriage data for the two periods. An increased rate over time of exogamous marriages between the ethnic groups would be one indicator of decreasing cultural differences.

Given the fact that ethnic status in American society is the product of the interaction of sociocultural, biological, and economic factors, the observance of mortality differentials among these three ethnic subcultures almost certainly implies differences in these factors. However, in the absence of data on these factors, their possible influences can only be inferred. We simply do not have the data at this time to ascertain the contributions of the physical environment, and of genetic, immunologic, economic, dietary, social, and psychological factors which might account for the differences between Chicanos, blacks, and Anglos. And, not just for mortality, but for ill health in general. However, in view of the observed inverse relationship between socioeconomic status and mortality, and between socioeconomic status and minority group status, it is highly probable that most (if not all) of the observed ethnic mortality differentials are attributable to socioeconomic differentials (*32*).

The preceding comments, of course, are relevant only if the mortality differentials are accurate. However, there is evidence which suggests that the differences could be at least partly artifactual. First, when different sources of data provide the numerator and denominator, as in this study, comparability of the information is always subject to question. In addition, the data used in this paper are limited by the procedure used to identify persons of Mexican-American origin—the use of Spanish surnames. In particular there is the problem of misclassification because of intermarriage of women with Spanish surnames and men with other surnames, as well as the problem of Anglization of Spanish surnames by changes in spelling. These events are known to occur, but the frequency of their occurrence is unknown. To the extent that these errors are more prevalent in one source of data than the other, additional bias is introduced.

Possibly more serious methodological problems are posed by the probability that undercounts in the census and underregistration of vital events are likely to be most pronounced among minority groups. For example, in 1960 for some age groups the estimates of census undercount for blacks are more than 20 percent (*33*). The undercounts of Anglos are much less. Although no comparable estimates are available for 1960 on underregistration of births and deaths, data for 1940 and 1950 indicate black people were relatively more underreported. If failure to be counted in the census and in the vital registration system is largely a function of membership in disadvantaged minority groups (which appears to be the case), then the underreporting for Chicanos may be at least as great as for blacks. Almost certainly it is substantially greater than for Anglos.

The exact implications of this double source of error from the census and vital registration procedures are unclear, although Demeny and Gingrich argue that the overall effect from 1900 to 1940 was to underestimate white-nonwhite differentials (*34*). What the results are for 1960, in view of the improvements in vital registration and continued, marked census undercounts, is not certain. Zelnik concludes that even after adjustment for major sources of error, the age patterns of mortality for black persons still differ markedly from those of the Anglos (*35*). Siegel estimates that 9.5 percent of the total nonwhite population was not counted in the 1960 census. If corrections for underenumeration are made, the 1960 nonwhite death rate is reduced from 9.6 to 8.8 per 1,000 population. The effect of more accurate census enumeration on the death rate for those age groups with particularly high rates of underenumeration seems evident (*36*).

The substantive and the methodological issues outlined in this paper pose significant problems in demographic and epidemiologic research among minority populations. Much of the difficulty stems from the fact that the principal sources of data, the census and vital registration system, basically are not statistical information systems. In this regard, Linder's proposed Vital Event Numeration Unitary System (VENUS) might provide a useful alternative (*37*). As outlined, it could provide task-specific health and demographic data for defined target groups, on a continuous sample basis, in which data for the numerator and the denominator would both come from a single source. Thus, the approach proposed by Linder would eliminate or greatly ameliorate many problems generated by the traditional approach of combining data from the census and vital statistics.

Until something similar to Linder's VENUS proposal is operational, however, we must continue to rely on traditional sources of health statistics to identify and analyze the health problems of ethnic minorities. In this regard, at least two sources of data relevant to the health status of Chicanos have not been exploited. These are the vital statistics data on births and deaths and data from the National Health Survey compiled by the National Center for Health Statistics. These two data-acquisition programs are ongoing and could provide useful information on the health of Mexican-Americans, just as they have done traditionally for Anglos, blacks and, more recently, for American Indians (*38*). At this time these two sources could generate health data for Chicanos through the mechanism currently used by the Bureau of the Census to identify members of this ethnic group, use of Spanish surnames. If this procedure were instituted, data on fertility, mortality, health interviews, and health examinations could be made available for the three major culturally disadvantaged populations in America—blacks, Chicanos, and Indians (as well as other groups).

Conclusion

In this paper we have examined mortality rates of Chicanos to determine if they differ from those of blacks and Anglos. The data indicate that for

the population and time periods examined, the mortality rates of Chicanos differ. Therefore, it would seem that social scientists, demographers, and health researchers should direct more attention to the demographic and health characteristics of this population than they have in the past. Before such studies can be accomplished, however, reliable data on population and health will need to be made available.

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Very little is known concerning the morbidity and mortality of Mexican-Americans, a surprising circumstance in view of the fact that they comprise the second largest minority in the country and the largest minority group in the southwest. No studies have been published which examine the mortality differentials for the three major ethnic groups in the U.S.: Anglos, blacks, and Chicanos. Using the Spanish surname criterion to identify Chicanos, mortality differetials for these three groups in a major southwestern city are examined for 1950 and 1960.

For 1950, the age-adjusted rates per 100,000 population were as follows: Anglo males (990) and females (625); black males (1,291) and females (1,077); Chicano males (1,395) and females (1,296). For 1960, the age-adjusted death rates were: Anglo males (951) and females (543); black males (1,223) and females (921); Chicano males (979) and females (806). For both time periods, the sex differential was least pronounced for Chicanos and most pronounced for Anglos.

Standard mortality ratios indicate that in 1950 black males had an observed mortality rate 1.56 times greater and Chicano males had an observed rate 1.66 times greater than Anglo males. In 1950 black females had an observed rate 2.07 times greater and Chicanos a rate 2.43 times greater than Anglo females. By comparison, black males had an observed rate 1.43 times greater and Chicanos a rate 1.12 times greater than Anglos in 1960. For females, blacks had a rate 1.87 and Chicanos had a rate 1.67 times greater than Anglos.

The data indicate that, for the population and time periods examined, the three groups have different mortality experiences. Therefore, it would seem that more attention should be directed to the demographic and health characteristics of the Chicano group. Before this can be done, however, problems of census enumeration and vital event underregistration in minority groups will have to be resolved. A partial solution might be provided by Linder's proposed Vital Event Numeration Unitary System.