Mortality and Economic Level in an Urban Area

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DURING the past century the association between mortality and economic status has been investigated repeatedly, and the same general conclusion has been reached—that the rate of mortality tends to vary inversely with the economic level of the community or population. Concomitantly, it has been believed and often demonstrated that morbidity also varies inversely with economic level. Within the past 5 years, however, at least three studies have been reported which suggest that the relationship no longer holds with respect to total illness. Graham, using occupation as the index of socioeconomic status, found no difference in the incidence of illness among six classes within Butler County, Pa., in 1954 (*1*). Laughton and associates made a similar observation among families of Windsor, Ont. Here families were classified into three groups according to the median rental of the census tract of residence, and illnesses were recorded for some 2-year period during the time between January 1948 and June 1953 (*2*). The third study compared families known to a public agency for reasons other than ill health with the remaining families of a community. Although members of the first group were of lower occupational status and educational attainment than members of the second group, they did not experience a greater incidence of illness in May 1952 or of hospitalization during the previous year (*3*).

In view of the reports that contradict the traditional inverse relationship with respect to illness, the study reported here and based on the examination of the 1940 and 1950 mortality among white residents of Pittsburgh, Pa., may be of some interest. This study contains no evidence that an inverse relationship no longer exists between economic level and mortality, but it does suggest a possible association of mortality with changes in the relative economic levels of residential areas.

Many of the published reports of the association between economic status and mortality have been based on the characteristics of the population in some geographic unit in which the decedent lived. Illustrative studies are those of Dorn (*4*), Altenderfer (*5*), and Lilienfeld (*6*). Dorn used counties as the basic geographic unit; Altenderfer used cities of at least 100,000; and Lilienfeld used census tracts. This study also employs the census tract as the basic unit.

Relative Economic Levels

The 1940 white population was subdivided into three economic groups, in the following manner. The census tracts, ranging in population from fewer than 100 to more than 10,000 white persons, were ranked in ascending order of the median value of owner-occupied units (*7*). The 55 tracts with the lowest values were preliminarily designated as of lowest economic status, the next 69 tracts as of medium status, and the remaining 70 tracts as of high economic status. Each group contained approximately one-third of the white population of Pittsburgh. Using the median monthly rental as the index of economic status, the procedure was repeated and the two results compared (table

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1). When home value and monthly rental indicated the same relative level (155 tracts with 81 percent of the population), the tract was assigned that position. When the two indices indicated different levels (39 tracts with 19 percent of the population), the tract was assigned the level indicated by the index based on the greater number of units. For example, if owner-occupied units outnumbered tenant-occupied units, the tract was assigned the level obtained when the median home value served as the index. When tenant-occupied units outnumbered owner-occupied units, the tract was classified according to the level indicated by the median monthly rental. The final classification was:

Economic status	*Census tracts*	*Population*
Low	59	197, 884
Middle	66	206, 530
High	69	204, 822

The subdivision of the 1950 population was carried out in a similar manner but with one additional index—median family income (*8*). The levels of 83 tracts with 48 percent of the population were determined by all three indices indicating the same level. For 104 tracts with another 48 percent of the population, 2 of the 3 indices indicated the same economic level, and the tracts were so assigned. The remaining seven tracts were designated as being of medium economic status. The final result was:

Economic status	*Census tracts*	*Population*
Low	70	199, 647
Middle	62	196, 396
High	62	197, 782

Table 2. Number of census tracts in Pittsburgh, Pa., by relative economic level, 1940 and 1950

1940	1950			Total
	Low	Middle	High	
Low	48	9	2	59
Middle	21	38	7	66
High	1	15	53	69
Total	70	62	62	194

All but 55 of the tracts had the same relative classification in 1950 as in 1940. For 52 of these that "changed," the 1950 classification was one step from the 1940 classification. Two tracts were classified in the lower third in 1940 and in the upper third in 1950. One tract "changed" from the upper third in 1940 to the lower third in 1950 (table 2).

In later comparisons, the one tract which in 1940 was in the upper third but declined to the lower third in 1950 was combined with the 21 tracts that were of the middle third in 1940 but of the lower third in 1950. The 1940 population of this tract was 860; the 1950 population, 850. Similarly, the 2 tracts, with a combined population of 2,554 in 1940 and 2,924 in 1950, which were in the lower third in 1940 but advanced to the upper third in 1950 were grouped with the 7 tracts which advanced from the middle third to the upper third from 1940 to 1950.

Change in Population

From 1940 to 1950, there was a considerable shift in the white population and also a net loss

Table 1. Economic status of white population of Pittsburgh, Pa., according to value of owner-occupied homes and median monthly rental value, 1940

Value of owner-occupied homes	Median monthly rental value						Total	
	Lower third		Middle third		Upper third		Number census tracts	Population
	Number census tracts	Population	Number census tracts	Population	Number census tracts	Population		
Lower third	40	151, 137	15	50, 959	----------	----------	55	202, 096
Middle third	15	47, 495	51	148, 309	3	7, 105	69	202, 909
Upper third	1	1, 147	5	9, 278	64	193, 806	70	204, 231

of 2½ percent. Not all areas, however, lost population. Losses occurred only in the aggregate areas which were of middle or low economic status in 1940 and remained at these levels in 1950. The population increased in each of the aggregate areas of high economic status in 1940 or 1950 (table 3).

A "cohort" comparison of the 1940 and 1950 population within each group showed that net out-migration, rather than death, was the major reason for the observed losses. Net in-migration was evident in the three groups that increased in population.

The census tracts which were of low economic status in both 1940 and 1950 illustrate net out-migration. In 1940, there were 11,779 children under 5 years of age in these tracts. In 1950, however, there were only 9,038 children between 10 and 15 years of age in these same tracts, a loss of 23.3 percent. This loss was more than 10 times that which would have occurred through death, and net out-migration is therefore indicated. Furthermore, every 5-year age cohort showed at least a 25 percent loss in population.

In the areas with larger populations in 1950 than in 1940, there were definite indications of net in-migration of young persons. For example, in the group that rose from the middle to the high level, there was net in-migration of males who were between 25 and 40 years of age in 1950 and of females between 20 and 35 years old. Areas of high economic status in both years gained in males between 10 and 40 years of age in 1950 and in females between 10 and 30 years old. Similar gains occurred in the group which fell from high to middle economic level.

Source of Mortality Data

Mortality data were obtained from the death certificates for white residents who died within

Table 3. Population of Pittsburgh, Pa., by change in relative economic level of census tracts between 1940 and 1950

1940 level	1950 level	Males			Females		
		1940	1950	Percent change	1940	1950	Percent change
Low	Low	84, 921	68, 882	−18. 9	80, 717	67, 549	−16. 3
	Middle	15, 524	14, 648	−5. 7	15, 028	14, 941	−. 6
Middle	Low	32, 955	30, 977	−6. 0	32, 632	32, 239	−1. 2
	Middle	61, 926	58, 896	−4. 9	64, 115	62, 365	−2. 7
	High	8, 775	9, 731	+10. 9	8, 681	9, 906	+14. 1
High	Middle	18, 641	21, 395	+14. 8	21, 484	24, 151	+12. 4
	High	76, 049	83, 432	+9. 7	87, 788	94, 713	+7. 9

Table 4. Deaths in 1957 among white residents of Pittsburgh, Pa., by place of occurrence and economic level in 1950

Place of death	Economic level of census tract, 1950					
	Low		Middle		High	
	Number	Percent	Number	Percent	Number	Percent
All places	2, 380	100. 0	2, 060	100. 0	2, 229	100. 0
Within the city	1, 950	81. 9	1, 716	83. 3	1, 904	85. 4
Outside the city	430	18. 1	344	16. 7	325	14. 6
Within the county	385	16. 2	291	14. 1	243	10. 9
In State and county institutions	333	14. 0	196	9. 5	125	5. 6
Other	52	2. 2	95	4. 6	118	5. 3
Other counties in Pennsylvania	30	1. 3	31	1. 5	37	1. 7
Other States	15	. 6	22	1. 1	45	2. 0

the city. These, then, did not represent all deaths among white residents, and it was necessary to assume that the degrees of incompleteness were the same for all economic groups. Data for more recent years on all resident deaths suggest that this may not have been an unreasonable assumption.

With the 1950 classification of census tracts being used, complete mortality data for 1957 showed that deaths outside the city accounted for 18 percent of the deaths among persons of the low economic level, 17 percent of the middle group, and 15 percent of the high group. One of the reasons for this slight inverse relationship is that the county and State institutions which provide care to the indigent of the city are located outside the city limits. And while the more well-to-do may seek care in nursing homes in the suburbs or in other States, this is counterbalanced by the less well-to-do using the public institutions (table 4).

There is, therefore, the possibility that in this report mortality among the lower economic groups was underestimated by a greater amount than mortality among the population of higher economic status, thus diminishing any inverse relationship between mortality and economic levels that might exist.

Classification of the causes of death in both years was carried out under the principles of the sixth revision of the International Statistical Classification of Diseases, Injuries, and Causes of Death.

Mortality Ratios

The mortality experience of each subgroup was summarized in two "expected numbers," one for males and one for females. The 1940 expected numbers were computed in three stages, one for all persons under 40 years of age, one for the native-born, and one for foreign-born persons 40 years old and over. The area's specific death rates for the age groups under 10, 10–29, and 30–39 years were applied to the city's population, giving an expected number of deaths for persons under 40 years of age. The second and third expected values were obtained by applying the age-specific death rates for the age groups 40–49, 50–59, 60–69, and 70 and over to both foreign-born and native-born populations. Finally, the three expected values were summed, with the total becoming the expected number for the subgroup.

Table 5. Standardized mortality ratios among white residents of Pittsburgh, Pa., by economic level, 1940 and 1950

Sex and age (years)	Economic level						Total deaths in city	
	1940			1950				
	Low	Middle	High	Low	Middle	High	1940	1950
Males								
All ages	**1. 11**	**0. 97**	**0. 93**	**1. 13**	**0. 99**	**0. 88**	**3, 447**	**3, 103**
Under 10	1. 14	. 98	. 84	1. 19	1. 05	. 73	287	230
10–29	1. 13	. 86	1. 02	. 95	1. 16	. 90	169	61
30–39	1. 43	. 88	. 73	1. 48	. 83	. 64	154	84
40–49	1. 17	1. 14	. 67	1. 31	. 85	. 85	337	272
50–59	1. 23	. 89	. 93	1. 23	1. 04	. 75	652	534
60–69	1. 08	. 97	. 98	1. 08	. 98	. 92	843	872
70 and over	. 99	. 98	1. 03	1. 04	. 98	. 97	1, 005	1, 050
Females								
All ages	**1. 14**	**1. 00**	**. 93**	**1. 06**	**1. 05**	**. 91**	**2, 853**	**2, 528**
Under 10	. 91	1. 03	1. 07	1. 01	. 85	1. 16	183	159
10–29	1. 07	1. 14	. 80	1. 00	1. 12	. 87	122	58
30–39	1. 13	1. 02	. 88	1. 27	. 96	. 77	139	88
40–49	1. 27	1. 01	. 81	1. 18	1. 21	. 68	246	160
50–59	1. 65	. 92	. 79	1. 23	. 99	. 84	384	331
60–69	1. 20	. 99	. 93	1. 13	1. 03	. 87	662	566
70 and over	1. 03	1. 00	1. 00	. 97	1. 09	. 95	1, 117	1, 166

The distinction between foreign-born and native-born in the handling of the 1940 data was made for three reasons. First, the age-specific rates for the foreign-born were higher than those for the native-born; second, the foreign-born constituted one-third of the population 40 years of age or older; and third, the foreign-born were not equally distributed among the three economic levels.

The 1950 data did not permit the separation of foreign- and native-born since the age distribution of the two groups was not published by census tracts. (In 1950, less than 15 percent of those 40 years old or older were foreign-born.) Therefore, the 1950 expected numbers for a subgroup were obtained by applying the age-sex specific rates to the city's population, without consideration of country of birth.

Once an expected number of deaths for a subgroup was obtained, it was related to the observed number of deaths in the city as a whole. The resulting ratios are the bases of many of the comparisons presented. Other comparisons are presented in terms of the ratios obtained from relating the age-specific rate for a subgroup to the corresponding age-specific rate for the city.

Mortality and Economic Level

In both 1940 and 1950, an inverse relationship between economic level and mortality was found (table 5). In general, the highest mortality occurred among persons within the areas designated as being of low economic level, and the most favorable experience was found among the residents of the areas of high economic

Table 6. Mortality ratios among white residents of Pittsburgh, Pa., by cause of death and economic level, 1940 and 1950

Cause of death	Economic level						Total deaths in city	
	1940			1950				
	Low	Middle	High	Low	Middle	High	1940	1950
Males								
All causes	**1. 11**	**0. 97**	**0. 93**	**1. 13**	**0. 99**	**0. 88**	**3, 447**	**3, 103**
Tuberculosis	1. 65	. 77	. 51	1. 70	. 98	. 30	121	71
Other infective and parasitic diseases	. 99	1. 10	. 90	1. 04	1. 14	. 82	40	19
Malignant neoplasms	1. 05	. 99	. 99	1. 02	. 92	1. 05	383	426
Diabetes	1. 28	1. 04	. 73	1. 10	. 89	1. 02	69	47
Diseases of the nervous system and sense organs	. 99	. 94	1. 06	1. 01	. 91	1. 07	.344	321
Diseases of the circulatory system	. 95	1. 00	1. 05	1. 05	1. 04	. 92	1, 321	1, 372
Diseases of the respiratory system	1. 23	1. 13	. 68	1. 67	1. 02	. 25	261	94
Diseases of the digestive system	1. 38	. 75	. 94	1. 28	. 82	. 86	200	135
Diseases of the genitourinary system	1. 10	1. 00	. 85	. 92	1. 04	1. 06	111	74
Accidents	1. 46	. 92	. 71	1. 29	1. 00	. 71	236	141
Suicide	1. 25	. 95	. 81	. 91	. 69	1. 39	51	45
Homicide	1. 12	1. 10	. 92	. 71	1. 57	. 74	11	8
All other	1. 25	. 89	. 88	1. 41	. 98	. 58	299	350
Females								
All causes	**1. 14**	**1. 00**	**0. 93**	**1. 06**	**1. 05**	**0. 91**	**2, 853**	**2, 528**
Tuberculosis	1. 25	. 89	. 94	1. 56	. 85	. 65	68	36
Other infective and parasitic diseases	1. 84	. 97	. 56	. 90	. 65	1. 44	18	14
Malignant neoplasms	. 94	1. 00	1. 06	. 90	1. 09	1. 00	383	437
Diabetes	1. 56	1. 00	. 68	. 92	1. 13	. 97	94	83
Diseases of the nervous system and sense organs	1. 10	1. 05	. 91	1. 14	. 92	. 96	363	396
Diseases of the circulatory system	1. 08	1. 00	. 96	1. 07	1. 08	. 88	1, 158	1, 068
Diseases of the respiratory system	1. 12	1. 06	. 90	1. 39	1. 07	. 63	232	52
Diseases of the digestive system	1. 33	. 97	. 84	1. 23	1. 18	. 64	131	103
Diseases of the genitourinary system	1. 48	1. 23	. 47	1. 40	. 99	. 65	84	41
Accidents	1. 42	. 88	. 80	1. 07	1. 21	. 76	88	64
Suicide	. 51	. 77	1. 32	1. 16	1. 34	. 52	12	16
Homicide	1. 20	1. 03	. 77	2. 64	. 60	. 00	3	5
All other	1. 25	. 83	. 99	. 98	1. 00	1. 03	219	213

status. Exceptions to the inverse relationship were found in several of the age groups, the most noticeable, in both 1940 and 1950, being that of childhood mortality among females. The highest mortality among females under 10 years of age occurred in the areas of high economic status.

Causes of death which followed the pattern of the overall ratios in both 1940 and 1950 were tuberculosis (male), diseases of the respiratory system (male and female), diseases of the digestive and genitourinary systems (female), and accidents among males (table 6). The frequency of these causes of death have at one time or the other been found to be related to economic status.

When the populations of the two extreme economic levels were compared, that is, the low with the high, there was no question that the former demonstrated the greater mortality. With but two exceptions, females under 10 years of age in both 1940 and 1950 and males 70 years old and older in 1940, all age-specific death rates were higher in the low economic group. In 1950, the greatest relative differential was observed for males in the age group 30–39. The death rate in the low economic group was 2.8 per 1,000 and exceeded that in the high group by 135 percent. The next highest relative differential was among females 40–49 years of age, with women of the low economic group experiencing a rate of 4.6 per 1,000, 75 percent above the high group. Practically all age-adjusted rates by cause of death were also higher among the populations of the poorer tracts. The few exceptions included cancer among females, the ratios being 0.94 to 1.06 in 1940 and 0.90 to 1.00 in 1950. Among males, the exceptions were diseases of the nervous system and sense organs in both years, diseases of the circulatory system in 1940, and cancer and diseases of the genitourinary system in 1950.

Mortality and Change in Economic Level

Additional information on the relationship between economic level and mortality was suggested when each of the three groups of the

Table 7. 1940 mortality ratios among white residents of Pittsburgh, Pa., by age and change in relative economic level

Sex and age (years)	1940 level							Total deaths in city
	Low		Middle			High		
	1950 level		1950 level			1950 level		
	Low	Middle	Low	Middle	High	Middle	High	
Males								
All ages	**1.16**	**0.86**	**1.06**	**0.95**	**0.87**	**1.12**	**0.89**	**3,447**
Under 10	1.27	.59	1.04	1.01	.45	1.12	.78	287
10–29	1.08	1.37	.87	.85	.88	1.80	.82	169
30–39	1.59	.61	1.30	.75	.22	1.18	.62	154
40–49	1.22	.86	1.27	1.11	.88	.74	.66	337
50–59	1.28	.91	.90	.84	1.33	1.15	.87	652
60–69	1.11	.86	.99	.96	1.02	1.16	.94	843
70 and over	1.01	.86	1.14	.98	.67	1.07	1.02	1,005
Females								
All ages	**1.15**	**1.09**	**.89**	**1.08**	**.80**	**1.18**	**.86**	**2,853**
Under 10	.94	.76	.70	1.19	1.10	2.20	.81	183
10–29	1.11	.90	1.02	1.26	.64	1.09	.73	122
30–39	1.20	.78	.88	1.23	.00	.76	.91	139
40–49	1.28	1.21	.90	1.04	1.12	1.47	.63	246
50–59	1.44	1.15	.80	1.01	.61	.92	.75	384
60–69	1.21	1.12	.90	1.07	.82	1.14	.87	662
70 and over	1.01	1.14	.92	1.05	.85	1.11	.97	1,117

1940 population was subdivided by considering simultaneously both the 1940 and 1950 relative levels of each census tract.

The population of the low economic group in 1940 was divided into two components: (*a*) those persons who lived in tracts whose 1950 classification was also low and (*b*) those persons in tracts which were of higher level in 1950. Similarly, the population in the middle level group was considered in three parts: (*a*) persons in the areas with a low classification in 1950, (*b*) persons in areas of middle level in 1950, and (*c*) persons in areas with a high 1950 classification. Finally, the population living in areas of high economic level in 1940 was divided between those who lived in sections that were of high economic level in the 1950 classification and those who lived in sections that were at a lower level in 1950. These seven groups have already been indicated in tables 2 and 3, and table 7 summarizes the 1940 mortality experience of the populations in the seven areas.

The most favorable experience in 1940 occurred in the areas which were to rise in relative economic level or to remain at the high level. The least favorable experience occurred in the areas which were to fall in relative economic level or to remain at the low level.

The experience of the men who lived in areas which were to advance economically in relative terms was particularly favorable, equaling that for men in the sections which ranked high in economic level in both 1940 and 1950. Much of this favorable experience was related to the

Table 8. 1940 mortality ratios among white residents of Pittsburgh, Pa., by cause of death and change in relative economic level

Cause of death	1940 level							Total deaths in city
	Low		Middle			High		
	1950 level		1950 level			1950 level		
	Low	Middle	Low	Middle	High	Middle	High	
Males								
All causes	**1. 16**	**0. 86**	**1. 06**	**0. 95**	**0. 87**	**1. 12**	**0. 89**	**3, 447**
Tuberculosis	1. 70	1. 43	1. 10	. 67	. 40	. 96	. 41	121
Other infective and parasitic diseases	1. 18	. 00	1. 43	. 72	3. 52	. 80	. 93	40
Malignant neoplasms	1. 06	1. 01	. 87	1. 04	1. 29	1. 05	. 98	383
Diabetes	1. 31	1. 07	1. 01	. 95	2. 87	1. 35	. 59	69
Diseases of the nervous system and sense organs	1. 09	. 44	. 97	. 92	1. 18	1. 25	1. 00	344
Diseases of the circulatory system	. 96	. 85	1. 04	1. 02	. 83	1. 16	1. 03	1, 321
Diseases of the respiratory system	1. 33	. 70	1. 54	. 98	. 80	. 93	. 61	261
Diseases of the digestive system	1. 44	1. 05	. 75	. 82	. 25	1. 08	. 89	200
Diseases of the genitourinary system	1. 06	1. 34	. 80	1. 15	. 71	1. 05	. 78	111
Accidents	1. 51	1. 09	1. 41	. 73	. 35	1. 15	. 60	236
Suicide	1. 40	. 37	1. 36	. 70	. 92	1. 58	. 58	51
Homicide	1. 33	. 00	. 00	1. 84	. 00	1. 19	. 91	11
All other	1. 35	. 79	1. 02	. 86	. 55	1. 00	. 86	299
Females								
All causes	**1. 15**	**1. 09**	**0. 89**	**1. 08**	**0. 80**	**1. 18**	**0. 86**	**2, 853**
Tuberculosis	1. 00	2. 62	1. 32	. 72	. 72	. 99	. 94	68
Other infective and parasitic diseases	1. 90	1. 42	. 43	1. 28	. 00	2. 13	. 21	18
Malignant neoplasms	. 93	. 98	. 83	1. 13	. 47	1. 24	1. 01	383
Diabetes	1. 53	1. 78	1. 02	1. 01	. 83	. 80	. 65	94
Diseases of the nervous system and sense organs	1. 12	1. 02	. 88	1. 11	1. 28	1. 00	. 88	363
Diseases of the circulatory system	1. 09	1. 08	. 89	1. 09	. 71	1. 16	. 91	1, 158
Diseases of the respiratory system	1. 22	. 53	. 86	1. 14	. 50	1. 40	. 77	232
Diseases of the digestive system	1. 28	1. 78	1. 07	. 98	. 42	1. 17	. 76	131
Diseases of the genitourinary system	1. 56	. 92	. 89	1. 37	2. 25	. 64	. 44	84
Accidents	1. 49	1. 04	. 75	. 87	1. 65	. 96	. 74	88
Suicide	. 36	1. 43	. 94	. 78	. 00	1. 87	1. 17	12
Homicide	1. 43	. 00	. 00	1. 57	. 00	. 00	. 97	3
All other	1. 30	1. 00	. 73	. 96	. 16	1. 63	. 84	219

fact that the lowest rates for diseases of the circulatory system were observed in these areas (ratios=0.85 and 0.83).

In the areas which were to decline from the middle level in 1940 to the low level in 1950, several causes of death among men were of interest in that they are ones usually associated with lower economic levels. First of all, the ratio for mortality from diseases of the respiratory system was the highest of all groups, even exceeding that among men of the areas that would remain in the low level in 1950 (table 8). The ratios for accidental death and suicide were also high.

With one exception, the data for females followed the pattern of males, that is, the most favorable experience was found among the residents of areas which were to advance to or remain in the upper level in 1950. The exception was among women in the areas classified in the middle level in 1940 and in the low level in 1950. While the men of these areas exhibited a mortality which was 6 percent higher than that for all men in the city, the women experienced a mortality which was 11 percent lower than that for all women. Their advantage involved all age groups except the 10–29-year group and all causes of death except tuberculosis, diabetes, and diseases of the digestive system.

In order that the 1950 mortality could be viewed in terms of the past relative economic level of areas as well as the current relative economic level, the 1950 population was subdivided by considering both the 1940 and 1950 relative levels of each census tract. In other words, subgroups of the population and their mortality experiences were analyzed with respect to the current relative level of census tracts (1950) and the past relative level of the tracts (1940). Table 9, based on the 1950 mortality, shows ratios for each of the subgroups and again demonstrates a negative association between economic level and mortality. When compared with table 7, it also suggests that the relative level of the past is of less importance than the relative level of the future with respect to current mortality. For example, within each major group the ratios for the two or three components are more alike in table 9 than in table 7.

Table 9. 1950 mortality ratios among white residents of Pittsburgh, Pa., by age and change in relative economic level

Sex and age (years)	1940 level							Total deaths in city
	Low		Middle			High		
	1950 level		1950 level			1950 level		
	Low	Middle	Low	Middle	High	Middle	High	
Males								
All ages	**1.12**	**1.14**	**0.91**	**0.98**	**1.03**	**0.98**	**0.88**	**3,103**
Under 10	1.21	1.13	.85	1.21	.71	1.22	.66	230
10–29	.76	1.34	.55	1.17	1.51	.45	.95	61
30–39	1.48	1.46	1.12	.77	.80	.99	.60	84
40–49	1.33	1.26	.78	.98	.54	.53	.88	272
50–59	1.28	1.12	1.33	.88	1.30	.96	.73	534
60–69	1.09	1.08	.81	1.01	1.01	.69	.94	872
70 and over	1.00	1.13	.83	.97	1.08	1.00	.97	1,050
Females								
All ages	**1.04**	**1.11**	**1.05**	**1.06**	**1.02**	**.97**	**.91**	**2,528**
Under 10	.88	1.30	1.32	.83	.52	.17	1.30	159
10–29	1.07	.87	1.30	1.10	1.03	1.06	.85	58
30–39	1.51	.75	.22	1.29	.59	.32	.82	88
40–49	1.25	1.05	1.37	1.22	1.11	.37	.71	160
50–59	1.17	1.36	.96	1.12	.66	.92	.83	331
60–69	1.11	1.15	1.15	.96	1.15	1.25	.84	566
70 and over	.93	1.05	1.00	1.07	1.15	1.09	.94	1,166

Table 10 is also based on the 1950 mortality and gives added evidence that tuberculosis and diseases of the respiratory system were still good indicators of economic level in spite of their relative unimportance numerically in the total mortality picture.

Decrease in Mortality from 1940 to 1950

Between 1940 and 1950, all areas experienced a decrease in mortality rates. The decrease, however, was not at a uniform rate. In table 11, equal ratios for the years 1940 and 1950 mean a relative decrease in mortality equal to that seen in the city as a whole. Since a 1950 ratio smaller than its corresponding 1940 ratio means a decrease exceeding that observed in the entire city, the greatest proportional decreases occurred in the two areas of highest mortality in 1940. These were (*a*) the areas which were of low economic level in both 1940 and 1950 and (*b*) the areas which were in the high level in 1940 but in the middle level in 1950. One of the smallest proportional decreases occurred in the census tracts classified at the middle level in 1940 and at the low level in 1950.

Summary and Discussion

1. On the basis of data on median home value, monthly rental, and family income by census tract, the 1940 and 1950 white populations of Pittsburgh, Pa., were divided into three economic groups referred to as the lower

Table 10. 1950 mortality ratios among white residents of Pittsburgh, Pa., by cause of death and change in relative economic level

Cause of death	1940 level							Total deaths in city
	Low		Middle			High		
	1950 level		1950 level			1950 level		
	Low	Middle	Low	Middle	High	Middle	High	
Males								
All causes	1. 12	1. 14	0. 91	0. 98	1. 03	0. 98	0. 88	3, 103
Tuberculosis	1. 58	1. 96	. 95	1. 16	. 55	. 36	. 27	71
Other infective and parasitic diseases	1. 28	. 50	1. 24	1. 29	. 63	. 00	. 90	19
Malignant neoplasms	1. 09	. 78	. 88	. 94	. 91	1. 34	1. 03	426
Diabetes	1. 15	. 97	1. 52	. 88	. 57	. 00	1. 12	47
Diseases of the nervous system and sense organs	1. 01	1. 01	1. 18	. 85	. 97	. 91	1. 09	321
Diseases of the circulatory system	1. 05	1. 05	. 83	1. 00	1. 24	. 96	. 92	1, 372
Diseases of the respiratory system	1. 73	1. 52	2. 56	. 90	. 41	. 34	. 24	92
Diseases of the digestive system	1. 53	. 73	1. 16	. 72	. 88	. 28	. 92	135
Diseases of the genitourinary system	1. 06	. 60	. 23	1. 17	1. 08	. 55	1. 10	74
Accidents	1. 07	1. 77	. 55	1. 28	. 56	1. 10	. 66	141
Suicide	. 66	1. 43	. 60	. 67	. 89	. 72	1. 46	45
Homicide	1. 00	. 00	2. 65	1. 90	. 00	. 00	. 80	8
All other	1. 21	1. 84	. 56	1. 07	1. 00	. 58	. 57	350
Females								
All causes	1. 04	1. 11	1. 05	1. 06	1. 02	. 97	. 91	2, 528
Tuberculosis	1. 53	1. 64	. 92	. 97	. 35	. 94	. 64	36
Other infective and parasitic diseases	. 65	1. 42	1. 74	. 69	. 86	. 00	1. 59	14
Malignant neoplasms	. 88	. 94	1. 03	1. 00	1. 29	. 69	1. 03	437
Diabetes	. 87	1. 03	1. 26	1. 15	1. 00	2. 05	. 91	83
Diseases of the nervous system and sense organs	1. 06	1. 29	. 66	1. 03	. 77	1. 02	. 96	396
Diseases of the circulatory system	1. 09	1. 03	1. 15	1. 09	1. 02	1. 21	. 86	1, 068
Diseases of the respiratory system	1. 27	1. 65	1. 82	. 77	1. 56	. 76	. 63	52
Diseases of the digestive system	1. 11	1. 53	1. 61	1. 21	. 89	. 42	. 66	103
Diseases of the genitourinary system	1. 61	. 95	. 59	1. 10	. 85	. 00	. 70	41
Accidents	. 66	1. 93	1. 01	1. 10	1. 75	. 53	. 78	64
Suicide	1. 73	. 00	1. 22	1. 56	. 79	1. 96	. 35	16
Homicide	2. 86	2. 10	. 00	. 00	2. 28	. 00	. 00	5
All other	. 95	1. 01	1. 11	1. 00	. 83	. 49	1. 13	213

Table 11. Mortality ratios among white residents of Pittsburgh, Pa., by change in relative economic level, 1940 and 1950

1940 level	1950 level	Males		Females	
		1940	1950	1940	1950
Low	Low	1. 16	1. 12	1. 15	1. 04
	Middle	. 86	. 91	1. 09	1. 05
Middle	Low	1. 06	1. 14	. 89	1. 11
	Middle	. 95	. 98	1. 08	1. 06
	High	. 87	. 98	. 80	. 97
High	Middle	1. 12	1. 03	1. 18	1. 02
	High	. 89	. 88	. 86	. 91

one-third, the middle one-third, and the upper one-third, and the census tracts in which these groups lived were classified into low, middle, and high economic levels.

2. Mortality data for the 2 years were analyzed. In both instances a negative association between economic level and mortality was shown.

3. In both years, the frequency of deaths from certain causes appeared to be closely related to economic level. The causes were tuberculosis, diseases of the respiratory system, and accidents among men, and deaths from diseases of the respiratory, digestive, and genitourinary systems among women.

4. The relative differentials between the low and high groups were just as great in 1950 as in 1940 for the age groups covering the years 30 through 69.

5. In general, the census tracts which improved in relative economic level from 1940 to 1950 had a lower mortality in 1940 than those tracts whose relative economic levels remained unchanged or decreased from 1940 to 1950. This suggests an association between the 1940 mortality and the "future" relative economic level (1950) of the census tracts.

6. The 1950 mortality data were analyzed in terms of the current (1950) and past (1940) relative economic levels of the census tracts, and no association was found between the 1950 mortality and the past relative economic levels of the census tracts.

These findings point up the fact that currently in a large modern city, the well-established phenomenon of differences in mortality among economic classes still is in evidence. Both in 1940 and 1950, mortality was highest in the census tracts with the poorer populations and lowest in the census tracts characterized by populations with higher incomes. Practically all causes of death contributed to the economic differential mortality in these 2 years and, as expected, the inverse relationship between economic level and frequency of death from tuberculosis, respiratory disease, diseases of the digestive system, and accidents was particularly noteworthy.

A new feature of the relationship between economic level of the population and mortality was revealed by the finding that in 1940 those census tracts which were to rise in relative economic level between 1940 and 1950 had a lower mortality than the census tracts of the same or higher economic level whose relative economic level was not to improve between 1940 and 1950. It would seem, then, that a favorable mortality experience preceded or went hand in hand with an improvement in the relative economic level of census tracts. In order to understand the real meaning of this concomitance and the manner in which it occurred, one needs more detailed knowledge of the factors which brought about changes in the relative economic level of the census tracts and of the changes in other characteristics which accompanied the change in economic level.

In general, economic improvement or deterioration in urban areas is reflected in improvement or deterioration of the physical environment and in shifts of population groups. Either of these factors alone or jointly could have affected the mortality of 1940. The point to emphasize, however, is that even before the improvement in the economic level of an area was demonstrated, the area experienced low mortality. Another point which emerges from this study is that the systematic analysis of vital and health statistics in a community still offers many opportunities to explore the meaning of certain factors related to ill health.

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Address inquiries to the publisher or sponsoring agency.

Safe Medicine Cabinet

The lives of many children could have been saved in 1958 by a simple household cabinet, properly used.

The National Clearinghouse for Poison Control Centers reports that during 1958 there were 1,429 deaths from accidental ingestion of poisons. More than 400 of these were in children. In 80 percent of all poisoning cases occurring in the home, according to the National Clearinghouse, the items ingested were readily accessible.

In 1958, 14,069 cases of ingestion of hazardous substances were reported to the National Clearinghouse for Poison Control Centers, established in Washington in 1957 by the Public Health Service. Of these 14,069 cases, 90 percent were in children under 5 years of age. Actually, it is estimated that 500,000 cases of household poisoning occur annually.

Most frequent causes of child poisoning are the common aspirin—baby and regular—and kerosene. One or the other from year to year heads the list of fatalities from accidental poisonings. Drugs, led by aspirin, caused 35 percent of the fatalities in children under 5 years in 1958.

Other common causes of accidental poisonings are barbiturates, bleach, turpentine, rodenticides, potassium permanganate, pine oil disinfectants, sanitizing agents, cleaning agents, furniture polish and floor wax, and insecticides such as roach paste.

Since most childhood poisonings are a result of the failure to keep dangerous chemicals out of reach of toddlers, there have been many efforts to develop a storage chest that a child will not be able to open, but that can be opened easily by an average person old enough to know a safe item from a dangerous one. Dr. A. L. Chapman, chief, Division of Special Health Services, Public Health Service demonstrated such a prototype medicine cabinet before the Plumbing Fixture Manufacturers Association at their meeting in Washington this year.

The cabinet, which Dr. Chapman was instrumental in developing, has an ingenious locking device, difficult for a child to open, but easy for an adult.

As shown in the illustration, the cabinet has five buttons, three of which are intended simply to confuse the child. Only the second and fourth, from top or bottom, pressed simultaneously, will open the cabinet. No other combination of buttons will work—and the second and fourth are placed too far apart for a child's hand to reach both at once.

Dr. Chapman claims that since the bathroom cabinet is usually cluttered with shaving equipment, cosmetics, and medicine, in most cases medicine is the first item to be moved elsewhere. He says that a desirable medicine cabinet "should be attractive, large, accessible—one which would invite its use." He conceives that such a cabinet might be placed in the kitchen rather than the bathroom, as he believes that much home medication takes place there.

As a result of the meeting of Public Health Service personnel with the Plumbing Fixture Manufacturers Association, a Medicine Cabinet Manufacturers Council was established and an Executive Committee appointed. This committee is negotiating to develop a set of standards for manufacturing such a cabinet.