Life Experience of Cancer Patients in Tennessee Tumor Clinics

By SARA LOU HATCHER, M.A.

A STUDY of patients admitted to cancer clinics in Tennessee was begun by the Tennessee Department of Public Health in 1947. The purpose was to study the life experience of these patients according to type, site, and extent of the malignant neoplasms and other variables such as sex and age.

For the collection of data, the clinics complete a summary record for every patient admitted for the first time with a malignant neoplasm and send the record to the Tennessee Department of Public Health. The upper half of the record has identifying data, classification of the findings by type, site, and extent, and a summary of the treatment. The lower half provides space for recording the status of the patient at yearly intervals after diagnosis. For information regarding status of patients (living or dead), the clinic is queried at yearly intervals after diagnosis. If the clinic is unable to give the status of the patient, a query is sent to the health department in the county where the patient is a resident. Also, data regarding cause of death are obtained from death certificates and are entered at the bottom of the record.

Followup data are available for 5 years for patients admitted to the participating clinics in 1947, 1948, and 1949. The factors considered in this discussion are the site and extent of the malignant neoplasms and the race of the patient. It is realized that other factors, such as age and sex, may influence the probability of death from cancer, and plans are in progress to include these in a more extensive report.

There were 2,476 patients with malignant neoplasms admitted to the clinics during the 3 years 1947, 1948, and 1949. Of these, 1,645 (approximately two-thirds) were white, and 831 (one-third) were Negro patients. The distribution of the patients according to the site of the cancer is shown in table 1 and figure 1. Cancer of the skin and female genital organs accounted for more admissions than any other site, with approximately one-fourth of all admissions for each. Other sites in order of frequency were breast, buccal cavity and digestive organs, male genital organs, and respiratory system. Cancer of all sites for which less than 75 persons were admitted were included in the "other" group. This group includes cancers of the urinary system, brain, bone, lymphatic system, and so forth.

The percentages by site vary according to race (table 1, fig. 2). The two most common cancer sites for the white patients were the skin and female genital organs. For the Negroes they were the female genital organs and breast. Nearly two-fifths (38.2 percent) of the white admissions were for cancer of the skin while only 2.9 percent of the Negro patients admitted had skin cancer. About 41 percent of the Negroes had cancer of the female genital organs compared with 17.4 percent of the white patients.

Miss Hatcher, a senior statistician in the Tennessee Department of Public Health, presented this paper at the meeting of the Southern Branch of the American Public Health Association in Tulsa, Okla., in April 1956.

Table 1. Number and percentage of patients with malignant neoplasms, according to site, by race, Tennessee tumor clinics, 1947–49

Site	Total		White		Negro	
	Number	Percent	Number	Percent	Number	Percent
Total	2, 476	99. 9	1, 645	100. 1	831	100. 1
Buccal cavity	199	8. 0	159	9. 7	40	4. 8
Digestive organs	199	8. 0	117	7. 1	82	9. 9
Respiratory system	82	3. 3	67	4. 1	15	1. 8
Breast	309	12. 5	151	9. 2	158	19. 0
Female genital organs	624	25. 2	287	17. 4	337	40. 6
Male genital organs	103	4. 2	54	3. 3	49	5. 9
Skin	652	26. 3	628	38. 2	24	2. 9
Other	308	12. 4	182	11. 1	126	15. 2

Percentage distributions by site for a broader group of patients are available for two other southern areas for recent years, Atlanta, Ga., 1947 (*1*), and Birmingham, Ala., 1948 (*2*). The Atlanta and Birmingham studies include cancer patients seen, diagnosed, treated, or under observation by hospitals, clinics, and physicians while the Tennessee cases are made up entirely of clinic patients. Although not strictly comparable, the data for the three studies are offered in table 2 and figure 3.

As would be expected, the percentage distributions by site seem about the same for the Atlanta and Birmingham areas, but they differ from those for Tennessee. A larger proportion of the patients admitted to the Tennessee clinics had cancer of the buccal cavity, breast, and female genital organs. The percentage with cancer of the digestive organs was about one-half that of the Atlanta and Birmingham areas. The percentages were approximately the same for the respiratory system, male genital organs, and skin. One-fourth of the cancers in each of these three areas were of the skin.

In general, it seems that the clinic patients in Tennessee sought medical aid more often for

Figure 1. Percentage of cancer cases admitted to tumor clinics, by site, Tennessee, 1947–49.

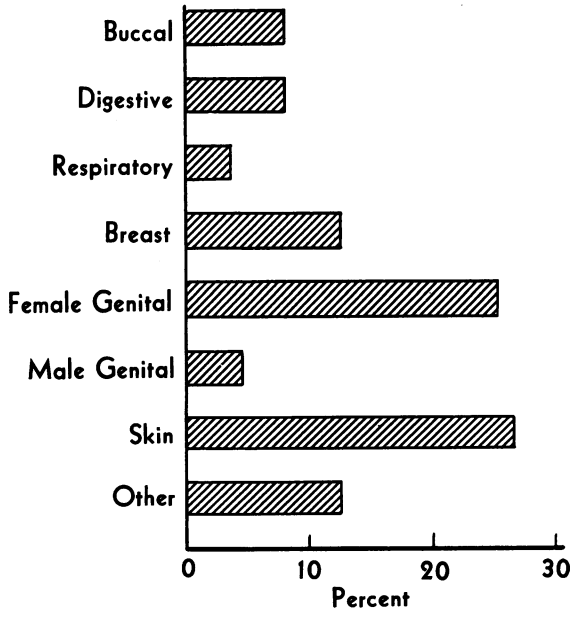
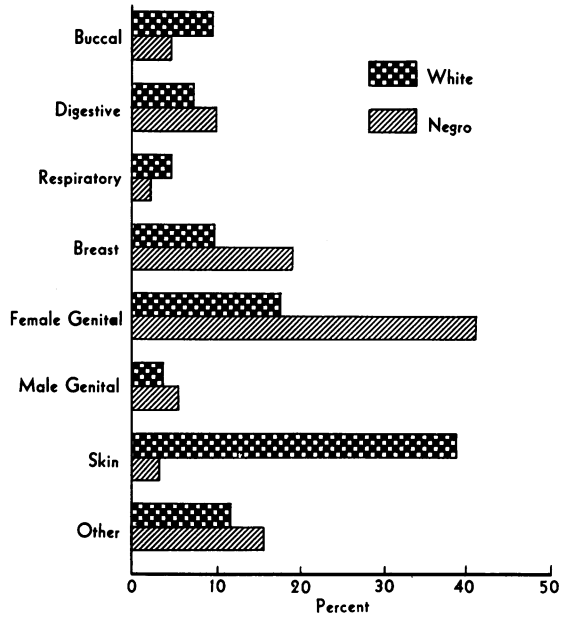


Figure 2. Percentage of cancer cases admitted to tumor clinics, by site and race, Tennessee, 1947–49.



cancer of the so-called accessible sites while the broader groups of patients in Atlanta and Birmingham were seen for the inaccessible sites as well.

Extent of Lesions

It is of interest to know the percentage distribution of the patients admitted to the Tennessee clinics according to the extent of their lesions (table 3 and fig. 4). Of the 2,476 patients, 600 (24.2 percent) were stated to have localized lesions; 719 (29.0 percent) were stated to have regional involvement; and 435 (17.6 percent) were thought to have remote metastasis at the time of admission. The extent was not classified for 722 (29.2 percent) of the lesions. The following discussion of extent relates to the 1,754 patients for whom extent was stated.

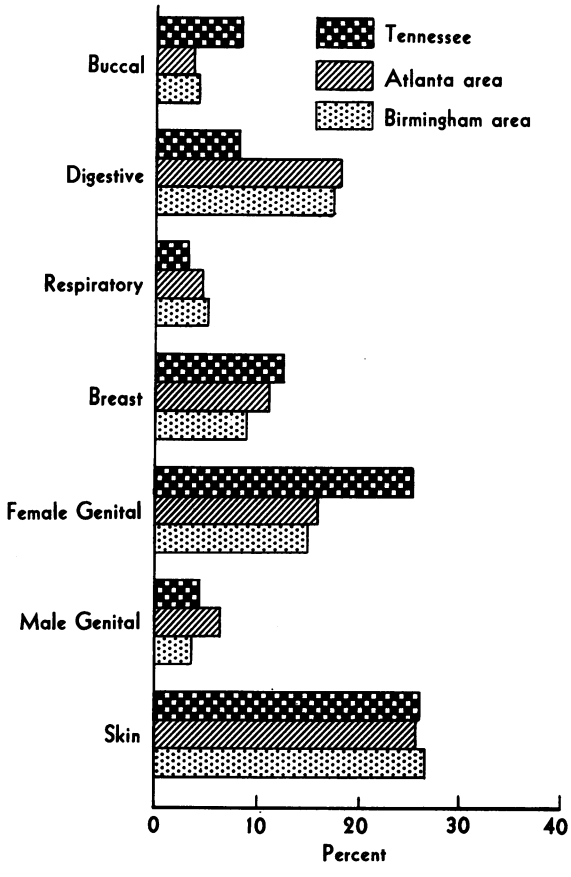
As would be expected, cancer of the inaccessible sites was generally discovered late. Remote metastasis was more often present on admission for cancer of the digestive and respiratory systems than for any other site. The percentage of breast cancer with remote metastasis was relatively small, but more than 60 percent in both races had regional involvement. The distribution of cancer of the breast according to extent was the same for both white and Negro patients. This was also true for cancer of the female genital organs. For malignant neoplasms of the buccal cavity, digestive organs, respiratory system, and male genital organs, the percentage with remote metastasis was somewhat greater for Negro than for white patients.

Table 2. Percentage of patients with malignant neoplasms, by site, participating clinics in Tennessee, 1947–49, Atlanta, Ga., area, 1947, and Birmingham, Ala., area, 1948

Site	Tennessee	Atlanta [1]	Birmingham [2]
Total	99. 9	100. 0	99. 9
Buccal cavity	8. 0	3. 7	4. 1
Digestive organs	8. 0	17. 8	17. 7
Respiratory system	3. 3	4. 7	5. 2
Breast	12. 5	10. 3	9. 0
Female genital organs	25. 2	16. 3	15. 5
Male genital organs	4. 2	5. 9	3. 8
Skin	26. 3	26. 0	26. 7
Other	12. 4	15. 3	17. 9

[1] SOURCE: Reference 1.
[2] SOURCE: Reference 2.

Figure 3. Percentage of cancer cases, by site, Tennessee tumor clinics, 1947–49, Atlanta, Ga., 1947, and Birmingham, Ala., 1948.



In only a small proportion was there remote metastasis of the skin lesions on admission. However, the proportion of Negroes with regional involvement was much larger than for white patients. More than three-fourths (78.8 percent) of the malignant neoplasms of the skin in white patients were localized compared with 40 percent in Negroes.

Since such a large percentage of the white patients had skin cancer and most of these lesions were localized, the data excluding skin sites are given in table 3 and figure 5. When skin cancer is excluded, the percentages of the lesions in each extent group are practically the same for the white and Negro patients. These percentages are as follows: Approximately 20 percent for each race were localized;

nearly 50 percent had regional involvement; and in approximately 30 percent remote metastasis was present.

Probability of Death

The preceding discussion has dealt with the characteristics of the cases admitted. The remainder of this paper will be concerned with the probability of survival or death of these patients according to site and extent of the malignant neoplasms at the time of admission and the race of the patient.

The rates for probability of death have been obtained by the adaptation of life table methods used for tuberculosis patients (*3*) and recommended by Berkson (*4*) for survival and death rates of cancer patients. By this method each person whose status is known is considered as being at risk of death for the year of observa-

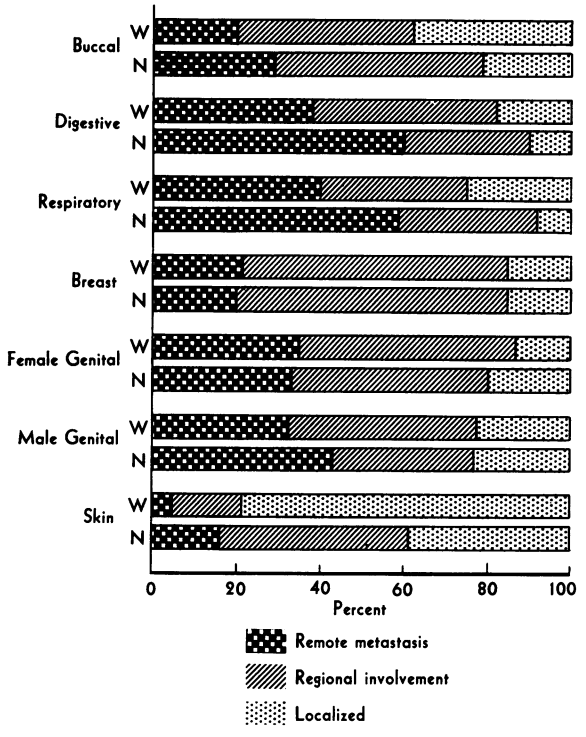
Table 3. Number and percentage of white and Negro patients with malignant neoplasms, according to site, by known extent, Tennessee tumor clinics, 1947–49

Site	Total		Localized		Regional involvement		Remote metastasis	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
White								
Total	1, 133	99. 9	476	42. 0	422	37. 2	235	20. 7
Buccal cavity	115	100. 0	43	37. 4	49	42. 6	23	20. 0
Digestive organs	88	100. 0	17	19. 3	38	43. 2	33	37. 5
Respiratory system	55	100. 0	14	25. 5	19	34. 5	22	40. 0
Breast	126	100. 0	20	15. 9	80	63. 5	26	20. 6
Female genital organs	221	100. 0	30	13. 6	115	52. 0	76	34. 4
Male genital organs	47	100. 0	11	23. 4	21	44. 7	15	31. 9
Skin	396	100. 0	312	78. 8	70	17. 7	14	3. 5
Other	85	100. 0	29	34. 1	30	35. 3	26	30. 6
Excluding skin	737	100. 1	164	22. 3	352	47. 8	221	30. 0
Negro								
Total	621	100. 0	124	20. 0	297	47. 8	200	32. 2
Buccal cavity	28	100. 0	6	21. 4	14	50. 0	8	28. 6
Digestive organs	62	100. 0	6	9. 7	19	30. 6	37	59. 7
Respiratory system	12	99. 9	1	8. 3	4	33. 3	7	58. 3
Breast	142	100. 0	22	15. 5	93	65. 5	27	19. 0
Female genital organs	250	100. 0	51	20. 4	118	47. 2	81	32. 4
Male genital organs	38	100. 0	9	23. 7	13	34. 2	16	42. 1
Skin	20	100. 0	8	40. 0	9	45. 0	3	15. 0
Other	69	99. 9	21	30. 4	27	39. 1	21	30. 4
Excluding skin	601	100. 0	116	19. 3	288	47. 9	197	32. 8

Table 4. Percentage of patients with malignant neoplasms dying during first 5 years of observation, by site, Tennessee tumor clinics

Site	First year	First 2 years	First 3 years	First 4 years	First 5 years
Total	33. 4	45. 9	53. 8	58. 7	62. 4
Buccal cavity	36. 5	51. 5	57. 4	61. 9	65. 4
Digestive organs	64. 5	74. 7	79. 3	83. 9	85. 9
Respiratory system	65. 4	73. 1	75. 7	79. 5	80. 9
Breast	29. 2	45. 2	55. 4	62. 9	66. 5
Female genital organs	36. 0	51. 4	59. 7	63. 2	66. 5
Male genital organs	31. 4	45. 3	55. 5	63. 3	69. 5
Skin	10. 8	19. 9	26. 4	31. 6	36. 6
Other	49. 8	62. 4	72. 7	77. 3	80. 1

Figure 4. Percentage of cancer cases admitted to tumor clinics, according to site, by race and extent, Tennessee, 1947–49.



tion. Each of the persons with unknown status is counted as being exposed to one-half year of experience since it is probable that some have died and others have survived. The status of 92.2 percent of 2,476 patients admitted to the clinics was known at the end of 5 years. Thus, 7.8 percent of the patients were lost because of unknown status.

Nearly two-thirds (62.4 percent) of all patients admitted were dead by the end of 5 years of observation. The percentages vary according to the site of the malignant neoplasm (table (4 and fig. 6).

The highest mortality followed cancer of the digestive organs, with 85.9 percent of the patients dead within the first 5 years. For the respiratory system, 80.9 percent of the patients died during the 5 years. Next in order were cancer of the male genital organs (69.5 percent dead), breast and female genital organs, with 66.5 percent of patients with cancer of each site dying, and cancer of the buccal cavity, for which the mortality was 65.4 percent. The probability of dying with cancer of the skin during the 5 years was only 36.6 percent.

How is the mortality for these sites distributed over the 5 years? Approximately two-thirds of those with cancer of the digestive organs or respiratory system died during the first year of observation. It may be remembered that a relatively large percentage of the patients with cancer of these two sites had remote metastasis on admission. As will be shown later, most of the patients with such extensive involvement died during the first year. For patients with cancer of the digestive organs and respiratory system, the percentage dying the first year was as high as the percentage at the end of 5 years for patients with cancer of the buccal cavity, breast, female genital organs, and male genital organs. The increase in mor-

Figure 5. Percentage of cancer cases (excluding skin) admitted to tumor clinics, by extent of lesion and race, Tennessee, 1947–49.

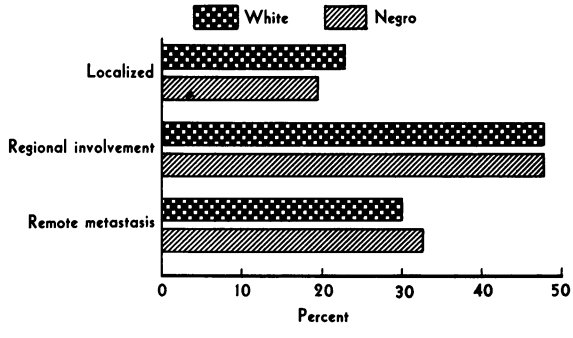


Figure 6. Mortality of cancer patients admitted to tumor clinics, by site and years of observation, Tennessee, 1947–49.

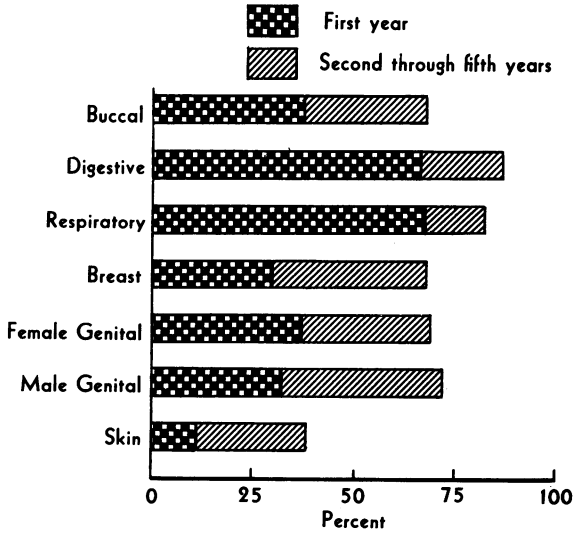
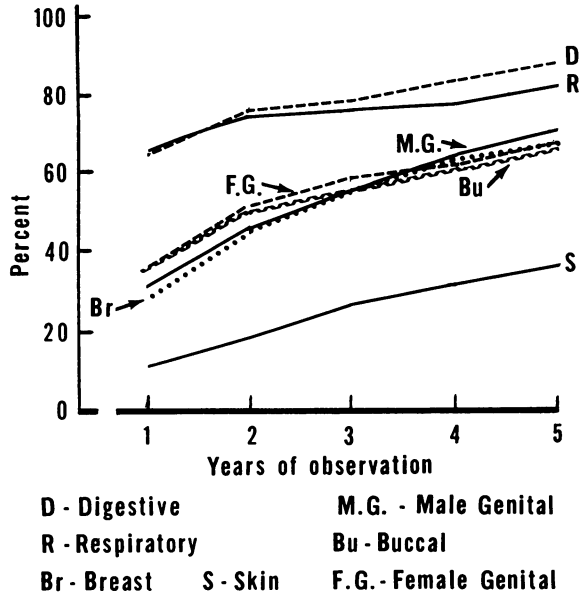


Figure 7. Mortality of cancer patients admitted to tumor clinics, by site, during 5 years of observation, Tennessee, 1947–49.



tality for sites other than digestive and respiratory systems was more gradual (table 4, fig. 7). When the cumulative percentages by years are shown graphically the lines for buccal cavity, breast, female genital organs, and male genital organs almost coincide. Approximately one-third of those with cancer of either of these four sites died during the first year of observation with the remainder of the deaths occurring durthe next 4 years. The mortality of those with malignant skin neoplasms was much lower, with 10.8 percent dead within the first year and increasing until 36.6 percent had died by the end of the 5 years of observation. Figure 7 points out that mortality was highest for the inaccessible sites, next highest for the partially accessible sites, and lowest for the accessible site of skin.

How does extent of the lesion affect these rates? This can be seen for white and Negro patients in table 5 and figure 8. If remote metastasis was present at the time of clinic admission, the mortality was the same for the two groups; approximately three-fourths of all were dead at the end of the first year and by the end of 5 years more than 90 percent were dead. When there was regional involvement, approximately 30 percent of the white patients and 40 percent of the Negroes were dead by the end of the first year. Two-thirds (66.3 percent) of the white patients and three-fourths (76.2

Figure 8. Mortality of cancer patients (excluding skin) admitted to tumor clinics by extent of lesion and race, during 5 years of observation, Tennessee, 1947–49.

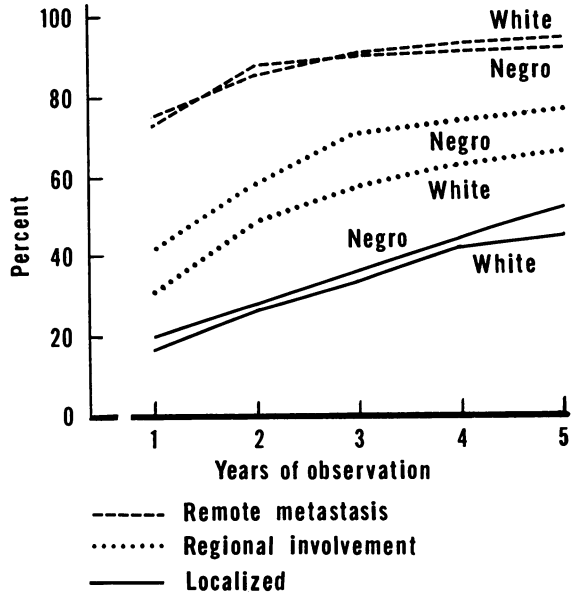


Table 5. Percentage of patients with malignant neoplasms of sites excluding skin dying during first 5 years of observation, by known extent and race, Tennessee tumor clinics

Period of observation	Localized		Regional involvement		Remote metastasis	
	White	Negro	White	Negro	White	Negro
First year	16. 0	20. 0	31. 1	40. 8	75. 7	74. 2
First 2 years	26. 5	27. 9	47. 9	58. 5	86. 2	87. 7
First 3 years	33. 4	36. 0	57. 6	68. 9	90. 8	90. 0
First 4 years	41. 2	43. 6	62. 6	74. 1	94. 1	91. 8
First 5 years	45. 1	51. 1	66. 3	76. 2	94. 6	92. 4

percent) of the Negro patients were dead within 5 years after admission. As would be expected, mortality for those with localized lesions was lower for both the white and Negro patients.

What were the causes of death for those patients who died? The deaths were studied according to the cause of death as given on the death certificate. There were 1,497 deaths among the 2,476 patients admitted. The cause of death was definitely stated as cancer for nearly three-fourths (72.5 percent) of the deaths for both the white and Negro patients. It would be of interest to study these cancer deaths to see how many were caused by the same type of cancer that was diagnosed on admission and how many were due to another type. Perhaps this can be done in subsequent studies.

Summary

Followup data are available for 5 years for patients admitted to the participating cancer clinics in Tennessee in 1947, 1948, and 1949.

Of the 2,476 admissions to the clinics during these 3 years, approximately one-fourth were for cancer of the female genital organs and one-fourth for skin cancer. Of the white patients, 38.2 percent had skin cancer while only 2.9 percent of the Negro patients had skin cancer.

Thirty-three percent of the patients died during the first year; 46 percent were dead by the end of the second year; 54 percent, by the end of the third year; 59 percent, by the end of the fourth year; and 62 percent were dead by the end of the first 5 years of observation. The sites with the highest mortality were the digestive organs and the respiratory system. The percentage dying with cancer of these sites during the first year was as high as the percentage at the end of 5 years for patients with cancer of the buccal cavity, breast, female genital organs, and male genital organs.

More than 90 percent of both white and Negro patients with remote metastasis at time of admission to the clinic died within the first 5 years. Two-thirds of the white patients and three-fourths of the Negro patients with regional involvement on admission were dead within 5 years. Mortality among those with localized lesions was lower for both white and Negro patients.

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Detailed data on the survival status of the clinic patients and the method used in calculating the probability of their survival or death can be obtained in mimeograph form from the author.

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Cardiovascular Disease Abstracts

A new publication devoted to abstracts in the cardiovascular disease field is being issued in 1957 by the Excerpta Medica Foundation with the support of the National Heart Institute, Public Health Service. The first volume, containing approximately 800 pages, will cover the world's medical literature.

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