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# A study of the incidence of cancer in a large general hospital during 1899-1923, inclusive

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BOSTON UNIVERSITY

GRADUATE SCHOOL

Thesis

A STUDY OF THE INCIDENCE OF CANCER IN A LARGE GENERAL  
HOSPITAL DURING THE YEARS 1899-1923, INCLUSIVE

Submitted by

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In partial fulfilment of requirements for  
the degree of Master of Arts

1925

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## 1. Introduction.

It is generally recognized that one of the greatest problems confronting the medical profession is that of malignant disease. Of all the phases of this many-sided problem, the question as to whether cancer is becoming increasingly prevalent is one of the most important from its practical implications and one of the most interesting from a purely theoretical viewpoint.

The magnitude of the cancer problem is shown by the fact that the number of deaths from cancer in 1922<sup>1</sup> in the United States Registration Area, which then included 38 states, containing 85% of the total population of the country, was 80,938 and that the number of cancer deaths in the entire United States in 1923<sup>2</sup> was estimated at 100,000.

The present study was undertaken with a view to determining whether an increase in cancer incidence could be demonstrated from a survey of the tissue specimens submitted to the pathological laboratory of a large general hospital during a period of 25 years.

## 2. Survey of Literature.

Before proceeding to a consideration of the hospital data, it may be of advantage to review the present status of the question of cancer incidence, the term "cancer" throughout this paper being meant to include not only carcinoma but

all other forms of malignant disease as well.

The statistician Hoffman<sup>3</sup>, who has made perhaps the most extensive study of the subject, believes that "The mortality from cancer is increasing at a more or less alarming rate throughout the civilized world" and that "this increase implies most serious consequences to the populations concerned."

Ewing<sup>4</sup> states that "The weight of evidence today points conclusively to the opinion that cancer is steadily increasing and that this increase is liable to become more pronounced. Surgeons are practically unanimous in the belief that cancer has been steadily gaining in frequency during the past quarter century."

The handbook for physicians<sup>5</sup> distributed by the American Society for the Control of Cancer, written by Greenough, Ewing and Wainwright, unequivocally concludes that "From whatever point of view considered there is no question but that the disease is increasing. This increase is not apparent or attributable to improved methods of certification and classification but is a real increase due to conditions which are as yet imperfectly understood."

Barker<sup>6</sup> and Tuffier<sup>7</sup> simply repeat Hoffman's arguments and adduce no new ones. The unquestioned progressive rise in the official cancer mortality rates constitutes the strongest point in the case of those who believe that the disease is gaining in prevalence.

Table 1-Cancer Death Rates  
U. S. Registration Area<sup>8</sup>

<u>Year</u>	<u>No. of Deaths</u>	<u>Rate per 100,000</u>
1900	19,381	62.9
1905	24,330	71.4
1910	41,039	76.2
1915	54,584	81.4
1920	72,931	83.4
1922	80,938	86.8

The number of deaths in the United States Registration Area is seen to have increased over 400% in but 22 years and the rate, which, being adjusted to the increase in population is of course more significant, has mounted over 38% in the same period.

Examination of the official Massachusetts and Boston statistics yields even more startling results.

Table 2-Cancer Death Rates  
Commonwealth of Mass.<sup>9</sup>

<u>Year</u>	<u>No. of Deaths</u>	<u>Rate per 100,000</u>
1900	1,998	71.0
1905	2,501	83.0
1910	3,028	89.9
1915	3,708	100.4
1920	4,494	116.7
1922	4,650	118.1

The rate of increase in Massachusetts from 1900 to 1922 as shown by these figures was 66%.

Table 3-Cancer Death Rates  
City of Boston<sup>10</sup>

<u>Year</u>	<u>No. of Deaths</u>	<u>Rate per 100,000</u>
1900	452	80.6
1905	628	105.0
1910	693	107.2
1915	855	119.1
1920	968	129.8
1922	1,123	146.9

Here the rate, which in 1900 was 80.6, rose in 1922 to 149.6, an increase of 82%.

Crude mortality statistics, however, imposing as they undoubtedly are, by no means constitute a reliable guide to the actual prevalence or morbidity of cancer. "There is ever present in vital statistics, and from the beginning always has been," says Pearl,<sup>11</sup> "an attempt to make the incidence of mortality a measure or index of the incidence of morbidity. Mortality is not and never can be a good index of morbidity, generally speaking."

The reasons for this sweeping statement are several. In the first place crude mortality rates take no account of the very important fact that the proportion of the population at the older age groups is increasing year by year, thereby providing an annually augmented increment of persons of cancer age. Fisk<sup>12</sup> states that in 1900 the average expectation of life was 49 years whereas in 1922 it was 58 years. The average life span therefore was lengthened nine years during this period. Strong<sup>13</sup> notes that "The effect of age distribution is so great that it is safe to say that any considerable increase in the proportion of the population at the older ages would cause a noticeable increase in the cancer death rate."

In the second place, crude rates do not consider social, marital and economic status or race and sex distribution. These omissions, however, are conceded to have but little bearing on the cancer problem.

Two other factors are of importance in this connection. One is the constant improvement in medical diagnosis and the other is the increasing accuracy in methods of certification and classification of causes of death. Working to-

gether, they have resulted in placing in the cancer column many deaths formerly attributed to other causes. Willcox<sup>14</sup> emphasizes this point: "The assignment of deaths to cancer which under earlier conditions would have been assigned to unknown or ill-defined causes has played an important part in exaggerating the increase in reported cancer mortality."

The decrease in the percentage of deaths ascribed to senility and old age is so striking that the figures are here reproduced:

Table 4-Senility Death Rates  
U. S. Registration Area<sup>15</sup>

<u>Year.</u>	<u>Rate per 100,000.</u>
1900	44.0
1905	36.4
1910	25.3
1915	18.4
1920	14.2
1922	13.2

The decrease in rate from 1900 to 1922 amounts to 70%.

Wells<sup>16</sup> cites such diseases as "indigestion", "intestinal obstruction", "anemia", "septicemia", "peritonitis" and "abscess" as having in previous years been charged with deaths actually caused by various forms of cancer.

To some extent the cancer death rate of large cities is swelled by an influx of non-residents who come for cancer treatment. The deaths within the city of such persons adds appreciably to the local mortality. This is occurring in Baltimore according to Howard<sup>17</sup> and doubtless holds true in Boston.

Newsholme<sup>18</sup> in analyzing the reasons for the rise in the mortality rate from cancer summarizes them as follows:



"1. Improved diagnosis. 2. Improved certification.  
 3. Increase in average age of the population. 4. Assign-  
 ment of fewer deaths to old age and ill-defined causes.  
 5. Steadily increasing proportion of hospital facilities in  
 large communities, leading to the discovery of a large number  
 of cases."

Eggers<sup>19</sup> studied the mortality rates of a group of  
 constitutional diseases, such as gout, diabetes, asthma and  
 cardiorenal disease. Over a period of years the rate of in-  
 crease of the constitutional diseases was found to resemble  
 closely that of cancer. From this circumstance he deduces  
 that neither cancer nor the constitutional disease group is  
 really increasing, but he gives no reasons why both could not  
 very well be gaining simultaneously.

The course of mortality from appendicitis in the  
 United States Registration Area for the first 22 years of the  
 present century illustrates with what caution mortality statis-  
 tics should be accepted.

Table 5-Appendicitis Death Rates  
 U. S. Registration Area<sup>20</sup>

<u>Year</u>	<u>Rate per 100,000</u>
1900	8.8
1905	10.2
1910	11.4
1915	12.3
1920	13.4
1922	14.2

The 1922 rate is 61% above that of 1900. The gain  
 in the cancer rate during the same period was 38%. One would  
 indeed be rash to conclude from the above figures that appendi-  
 citis is really increasing at such an alarming pace. What

they chiefly signify is that the diagnosis of appendicitis is now made much more commonly than was the case a quarter-century ago. Very likely the real death rate has if anything diminished, owing to the improvement in surgical technic and the now more or less generally accepted practice of early operation.

Wood<sup>21</sup> observes that wherever the registration of deaths is accurate, no important increase in the mortality rate can be demonstrated. Switzerland is a case in point. The Swiss have kept their vital statistics on a high plane of efficiency for a great many years, and although the cancer rate of Switzerland is one of the highest-if not the highest- on record, Aebly<sup>22</sup> has recently been able to demonstrate that in the period from 1896 to 1920 there has been no marked increase in the cancer mortality rate in Switzerland.

Wolff<sup>23</sup> as well as Willcox and Newsholme believes the increase in cancer prevalence has not been proved and is apparent rather than real. Dublin<sup>24</sup> of the Metropolitan Life Insurance Company, which has been collecting precise data on cancer deaths among its policy-holders since 1911, sees no clearly defined tendency to increase or decrease in the ages between 30 and 65 but finds a small increase in the ages above 65.

The San Francisco Cancer Survey<sup>25</sup> collected the data relating to admissions of cancer patients in twelve American hospitals for the years 1911-1916, inclusive, and 1917-1922, inclusive. There were 9,421 cancer patients admitted to the hospitals in the first period and 11,372 in the second, an ad-

vance of 1,951 patients or 31%. But since these figures are not adjusted for the normal increase in hospital population during the corresponding years, i. e., not compared with the increase in total cases shown by the respective hospitals, they possess little or no value.

Howard<sup>26</sup> in a careful analysis of the statistics of the City of Baltimore lays stress upon the advances in medical practice and statistical classification and the deaths in Baltimore of non-residents who go there for treatment as accounting in large part for the advance in the recorded rate and concludes that there is little reason to believe that cancer is actually increasing.

Wells<sup>27</sup> reviewing a series of 3,700 autopsies found 545 cases of malignancy, 400 of which had been correctly diagnosed during life. The 145 cases of cancer which his necropsies added constituted a correction of 36%. This unfavorable clinical showing prompts him to the assertion that statistics based upon clinical diagnoses are unreliable, and he makes a strong plea for more post-mortem examinations in order to establish the true incidence of cancer.

Wood<sup>28</sup> also insists that "while it may be that cancer is increasing, it is impossible to prove that increase until in every death from cancer the tumor is examined by a competent pathologist."

Whipple<sup>29</sup> and Willcox<sup>30</sup> would go further and establish by law the registration of all forms of sickness in order to build a reliable system of morbidity statistics. Morbidity statistics, as Trask<sup>31</sup> succinctly puts it, "include all cases of the disease; mortality statistics only the fatal ones."

The so-called communicable diseases-typhoid fever, tuberculosis, smallpox, measles, mumps, scarlet fever, diphtheria, etc., are the only ones for which morbidity statistics now exist. To extend the sphere of reportable diseases to include all sicknesses may be highly desirable but is as yet hardly within the bounds of realization. For light on the problem of cancer prevalence we must therefore turn to the findings of the pathological laboratory.

### 3. Original Data.

The Massachusetts Homeopathic Hospital is a large institution of 560 beds with a diversified and practically unchanging type of clientele. This hospital possesses the further advantage of comparative uniformity of tissue diagnosis, the present Pathologist having been in active personal charge of the laboratory for the past 25 years.

Since 1915 all tissue specimens taken from patients have been submitted to the Pathologist for gross and microscopic diagnosis. Previous to 1915 submission of specimens was optional. If there was the least suspicion of malignancy the specimen was certain to be sent to the laboratory but if it was frankly benign, it was in many cases not submitted.

As noted above, the major advantage of statistics based upon pathological specimens is that the diagnosis is made on straight scientific lines and the uncertainties of clinical diagnosis are eliminated.

The present data were carefully compiled from the records of the diagnoses of the tissues from twenty selected organs:

Scalp and Face	Jejunum, ileum and colon
Eye	Rectum
Nose and Antrum	Kidney
Lips	Bladder
Mouth	Prostate
Jaw	Thyroid
Tongue	Ovary
Stomach	Uterus
Duodenum	Cervix
Gall-Bladder	Vagina

Watters<sup>32</sup> has published a similar study with respect to the mammary gland.

In order to study the comparative incidence of the carcinomatous lesions, the time covered by the Survey, 1899-1923, inclusive, has been divided into five five-year periods. Since we are interested primarily in whether a given tissue is benign or malignant and not in determining how many benign or malignant pathological lesions it may exhibit, a double benign lesion such as fibromyoma and endometritis was entered in the benign column but once, and a mixed specimen, such as carcinoma and fibroid of the uterus was always entered in the malignant column only. There were a few specimens labelled "doubtful." These were classified as malignant.

Table 1-Specimens from Scalp and Face  
(excluding eye and lip)

<u>DIAGNOSIS</u>	<u>TOTAL</u>	<u>1899-03</u>	<u>1904-08</u>	<u>1909-13</u>	<u>1914-18</u>	<u>1919-23</u>
Carcinoma	73	6	15	26	18	8
Adenocarcinoma	4	2	-	1	1	-
Basal-cell carc.	3	-	-	-	-	3
Squamous cell carc.	46	13	3	12	12	6
Sarcoma	3	-	-	2	-	1
Alveolar Sarcoma	1	1	-	-	-	-
Melanotic Sarcoma	3	-	-	2	-	1
Round cell Sarcoma	3	-	2	1	-	-
TOTAL MALIGNANT	136	22	20	44	31	19
Negative	62	10	11	14	16	11
Angioma	4	-	1	1	1	1
Chondroma	1	-	-	1	-	-
Cylindroma	1	-	-	1	-	-
Dermoid cyst	1	-	1	-	-	-
Fibroma	1	-	1	-	-	-
Fibrous tissue	5	-	2	-	1	2
Granulation tissue	2	1	-	1	-	-
Inflammatory tissue	9	-	-	4	3	2
Keratosis	1	-	1	-	-	-
Lipoma	6	1	-	1	4	-
Lupus	1	-	-	1	-	-
Papilloma	12	2	-	1	4	5
Sebaceous cyst	9	1	-	2	2	4
TOTAL BENIGN	115	15	17	27	31	25
GRAND TOTAL	251	37	37	71	62	44

Table 2-Specimens from Eye

<u>DIAGNOSIS</u>	<u>TOTAL</u>	<u>1899-03</u>	<u>1904-08</u>	<u>1909-13</u>	<u>1914-18</u>	<u>1919-23</u>
Carcinoma	5	-	4	1	-	-
Glioma	2	-	-	-	2	-
Sarcoma	3	-	-	-	3	-
Fibrosarcoma	1	-	-	1	-	-
Giant-cell sarcoma	1	-	1	-	-	-
Melanotic sarcoma	4	-	1	-	2	-
Round cell sarcoma	3	1	2	-	-	1
TOTAL MALIGNANT	19	1	8	2	7	1
TOTAL BENIGN	39	3	4	9	13	10
GRAND TOTAL	58	4	12	11	20	11

Table 3-Nose and Antrum

<u>DIAGNOSIS</u>	<u>TOTAL</u>	<u>1899-03</u>	<u>1904-08</u>	<u>1909-13</u>	<u>1914-18</u>	<u>1919-23</u>
Carcinoma	17	3	2	6	4	2
Adenocarcinoma	1	-	-	1	-	-
Squamous cell carc.	4	-	1	2	-	1
Sarcoma	5	1	1	-	2	1
Alveolar Sarcoma	4	2	2	-	-	-
Angiosarcoma	2	-	1	-	-	1
Mixed-cell sarc.	1	-	1	-	-	-
Round-cell sarc.	1	-	-	1	-	-
Spindle-cell sarc.	1	-	-	-	-	1
TOTAL MALIGNANT	36	6	8	10	6	6
TOTAL BENIGN	59	5	26	16	6	6
GRAND TOTAL	95	11	34	26	12	12

Table 4-Lip

<u>DIAGNOSIS</u>	<u>TOTAL</u>	<u>1899-03</u>	<u>1904-08</u>	<u>1909-13</u>	<u>1914-18</u>	<u>1919-23</u>
Carcinoma	44	1	15	8	17	3
Squamous cell carc.	36	6	10	6	10	4
TOTAL MALIGNANT	80	7	25	14	27	7
TOTAL BENIGN	26	5	2	9	7	3
GRAND TOTAL	106	12	27	23	34	10

Table 5-Mouth

<u>DIAGNOSIS</u>	<u>TOTAL</u>	<u>1899-03</u>	<u>1904-08</u>	<u>1909-13</u>	<u>1914-18</u>	<u>1919-23</u>
Carcinoma	11	-	2	5	3	1
Adenocarcinoma	1	-	-	-	1	-
Squamous-cell carc.	5	1	1	-	2	1
Colloid carcinoma	1	-	-	1	-	-
Fibrochondrosarcoma	1	-	1	-	-	-
Giant-cell sarcoma	1	-	-	-	1	-
Lymphosarcoma	1	1	-	-	-	-
TOTAL MALIGNANT	21	2	4	6	7	2
TOTAL BENIGN	24	3	4	6	8	3
GRAND TOTAL	45	5	8	12	15	5

Table 6-Jaw

<u>DIAGNOSIS</u>	<u>TOTAL</u>	<u>1899-03</u>	<u>1904-08</u>	<u>1909-13</u>	<u>1914-18</u>	<u>1919-23</u>
Carcinoma	14	1	1	3	6	3
Squamous-cell carc.	14	6	2	2	3	1
Chondrosarcoma	1	-	-	-	1	-
Fibrosarcoma	1	1	-	-	-	-
Giant-cell sarcoma	7	1	2	2	-	2
Endothelioma	1	-	-	-	-	-
TOTAL MALIGNANT	38	10	5	7	10	6
TOTAL BENIGN	24	1	5	6	5	7
GRAND TOTAL	62	11	10	13	15	13



Table 7-Tongue

<u>DIAGNOSIS</u>	<u>TOTAL</u>	<u>1899-03</u>	<u>1904-08</u>	<u>1909-13</u>	<u>1914-18</u>	<u>1919-23</u>
Carcinoma	18	-	5	4	5	4
Squamous-cell carc.	14	3	1	1	6	3
Endothelioma	1	1	-	-	-	-
TOTAL MALIGNANT	33	4	6	5	11	7
Negative	5	-	-	1	3	1
Angioma	4	1	1	-	2	-
Hyperkeratosis	1	1	-	-	-	-
Inflammatory tissue	4	1	2	-	1	-
Mucoid tissue	1	-	1	-	-	-
Papilloma	10	1	4	-	4	1
Retention cyst	1	-	-	-	1	-
TOTAL BENIGN	27	4	8	2	11	2
GRAND TOTAL	50	8	14	7	22	9

Table 8-Stomach

<u>DIAGNOSIS</u>	<u>TOTAL</u>	<u>1899-03</u>	<u>1904-08</u>	<u>1909-13</u>	<u>1914-18</u>	<u>1919-23</u>
Carcinoma	20	2	3	4	7	4
Adenocarcinoma	6	-	-	3	2	1
Colloid carcinoma	1	-	-	-	-	1
TOTAL MALIGNANT	27	2	3	7	9	6
Negative	9	2	3	1	3	-
Adipose tissue	1	-	-	-	1	-
Glandular hypertrophy	1	-	-	-	-	1
Lymphadenitis	1	-	-	1	-	-
Papillary adenoma	1	-	-	-	-	1
Polypus	1	1	-	-	-	-
Tuberculosis	1	-	-	1	-	-
Ulcer	96	-	9	9	32	46
TOTAL BENIGN	111	3	12	12	36	48
GRAND TOTAL	138	5	15	19	45	54

Table 9-Duodenum

<u>DIAGNOSIS</u>	<u>TOTAL</u>	<u>1899-03</u>	<u>1904-08</u>	<u>1909-13</u>	<u>1914-18</u>	<u>1919-23</u>
Adenocarcinoma	1	-	-	-	-	1
TOTAL MALIGNANT	1	-	-	-	-	1
Diverticulum	1	-	-	-	-	1
Ulcer	13	-	-	-	1	12
TOTAL BENIGN	14	-	-	-	1	13
GRAND TOTAL	15	-	-	-	1	14

Table 10-Gall Bladder

<u>DIAGNOSIS</u>	<u>TOTAL</u>	<u>1899-03</u>	<u>1904-08</u>	<u>1909-13</u>	<u>1914-18</u>	<u>1919-23</u>
Carcinoma	8	1	-	3	2	2
Adenocarcinoma	2	1	-	-	-	1
TOTAL MALIGNANT	10	2	-	3	2	3
TOTAL BENIGN	487	1	20	40	101	325
GRAND TOTAL	497	3	20	43	103	328

Table 11-Jejunum, Ileum and Colon

<u>DIAGNOSIS</u>	<u>TOTAL</u>	<u>1899-03</u>	<u>1904-08</u>	<u>1909-13</u>	<u>1914-18</u>	<u>1919-23</u>
Carcinoma	20	-	2	5	6	7
Adeno-carcinoma	43	4	5	7	12	15
Colloid carcinoma	4	-	3	-	1	-
Round-cell sarcoma	1	-	-	-	1	-
TOTAL MALIGNANT	68	4	10	12	20	22
Negative	6	-	2	2	-	2
Adipose tissue	2	-	-	-	-	2
Cicatrical stenosis	1	-	-	-	1	-
Diverticulitis	5	-	-	1	2	2
Fibromuscular tissue	5	-	-	3	2	-
Gangrene	4	1	-	-	1	2
Inflammatory tissue	13	1	-	4	2	6
Lipoma	1	-	1	-	-	-
Meckel's diverticulum	1	-	-	-	-	1
Tuberculosis	2	-	-	-	1	1
Volvulus	1	-	-	-	1	-
TOTAL BENIGN	41	2	3	10	10	16
GRAND TOTAL	109	6	13	22	30	38

Table 12-Rectum

<u>DIAGNOSIS</u>	<u>TOTAL</u>	<u>1899-03</u>	<u>1904-08</u>	<u>1909-13</u>	<u>1914-18</u>	<u>1919-23</u>
Carcinoma	22	1	1	5	12	3
Adenocarcinoma	53	4	13	14	10	12
Colloid carcinoma	1	-	-	-	-	1
Squamous cell carc.	2	-	-	-	-	2
TOTAL MALIGNANT	78	5	14	19	22	18
TOTAL BENIGN	104	12	14	14	23	41
GRAND TOTAL	182	17	28	33	45	59

Table 13-Kidney

<u>DIAGNOSIS</u>	<u>TOTAL</u>	<u>1899-03</u>	<u>1904-08</u>	<u>1909-13</u>	<u>1914-18</u>	<u>1919-23</u>
Hypernephroma	13	1	2	3	5	2
Sarcoma	6	3	-	1	1	1
TOTAL MALIGNANT	19	4	2	4	6	3
TOTAL BENIGN	113	10	14	23	34	32
GRAND TOTAL	132	14	16	27	40	35

Table 14-Bladder

<u>DIAGNOSIS</u>	<u>TOTAL</u>	<u>1899-03</u>	<u>1904-08</u>	<u>1909-13</u>	<u>1914-18</u>	<u>1919-23</u>
Carcinoma	33	-	9	6	8	10
Colloid carcinoma	1	1	-	-	-	-
Papillary carcinoma	17	-	1	1	5	10
TOTAL MALIGNANT	51	1	10	7	13	20
TOTAL BENIGN	29	-	5	3	7	14
GRAND TOTAL	80	1	15	10	20	34

Table 15-Prostate

<u>DIAGNOSIS</u>	<u>TOTAL</u>	<u>1899-03</u>	<u>1904-08</u>	<u>1909-13</u>	<u>1914-18</u>	<u>1919-23</u>
Carcinoma	48	2	7	12	14	13
Adenocarcinoma	12	-	3	6	3	-
Squamous cell carc.	2	-	1	1	-	-
TOTAL MALIGNANT	62	2	11	19	17	13
TOTAL BENIGN	261	11	30	51	82	87
GRAND TOTAL	323	13	41	70	99	100

Table 16-Thyroid

<u>DIAGNOSIS</u>	<u>TOTAL</u>	<u>1899-03</u>	<u>1904-08</u>	<u>1909-13</u>	<u>1914-18</u>	<u>1919-23</u>
Carcinoma	4	-	-	2	1	1
Adenocarcinoma	4	-	2	2	-	-
Sarcoma	2	1	-	1	-	-
TOTAL MALIGNANT	10	1	2	5	1	1
TOTAL BENIGN	130	4	7	37	45	37
GRAND TOTAL	140	5	9	42	46	38

Table 17-Ovary

<u>DIAGNOSIS</u>	<u>TOTAL</u>	<u>1899-03</u>	<u>1904-08</u>	<u>1909-13</u>	<u>1914-18</u>	<u>1919-23</u>
Carcinoma	19	5	2	5	2	5
Adenocarcinoma	15	3	6	6	-	-
Colloid carcinoma	2	-	1	1	-	-
Fibrocystadeno - carc	1	-	-	1	-	-
Papillary adeno-carc	27	-	4	5	9	9
Papillary cyst adeno carc	29	1	1	9	6	12
Sarcoma	3	1	-	1	1	-
Angiosarcoma	1	1	-	-	-	-
Fibrosarcoma	1	-	-	1	-	-
Mixed cell sarcoma	1	-	-	1	-	-
Myxosarcoma	1	1	-	-	-	-
Round cell sarcoma	4	2	2	-	-	-
TOTAL MALIGNANT	104	14	16	30	18	26
TOTAL BENIGN	1752	216	187	428	371	550
GRAND TOTAL	1856	230	203	458	389	576

Table 18-Uterus

<u>DIAGNOSIS</u>	<u>TOTAL</u>	<u>1899-03</u>	<u>1904-08</u>	<u>1909-13</u>	<u>1914-18</u>	<u>1919-23</u>
Carcinoma	188	28	19	54	48	39
Adenocarcinoma	80	22	20	18	11	9
Papillary cysto- carcinoma	2	-	2	-	-	-
Squamous cell carc.	7	7	-	-	-	-
Sarcoma	9	4	3	2	-	-
Fibrosarcoma	5	2	1	-	2	-
Hydatid mole	4	-	1	2	1	-
Myoblastoma	2	-	-	-	-	2
TOTAL MALIGNANT	297	63	46	76	62	50
TOTAL BENIGN	2345	339	426	521	568	491
GRAND TOTAL	2642	402	472	597	630	541

Table 19-Cervix

<u>DIAGNOSIS</u>	<u>TOTAL</u>	<u>1899-03</u>	<u>1904-08</u>	<u>1909-13</u>	<u>1914-18</u>	<u>1919-23</u>
Carcinoma	136	20	33	18	31	34
Adenocarcinoma	6	2	2	-	1	1
Squamous cell carc.	5	2	2	-	-	1
Sarcoma	1	-	-	-	-	-
TOTAL MALIGNANT	148	24	38	18	32	36
TOTAL BENIGN	378	41	53	58	73	153
GRAND TOTAL	526	65	91	76	105	189

Table 20-Vagina

<u>DIAGNOSIS</u>	<u>TOTAL</u>	<u>1899-03</u>	<u>1904-08</u>	<u>1909-13</u>	<u>1914-18</u>	<u>1919-23</u>
Carcinoma	34	3	6	6	13	6
Adenocarcinoma	1	-	-	1	-	-
Cystadenocarcinoma	1	-	-	1	-	-
Squamous cell carc.	20	5	5	5	2	3
Round cell sarcoma	2	2	-	-	-	-
TOTAL MALIGNANT	58	10	11	13	15	9
TOTAL BENIGN	84	12	3	15	8	46
GRAND TOTAL	142	22	14	28	23	55

Unfortunately, we cannot compare the benign with the malignant cases of the corresponding five-year periods because, as previously noted, during the first 16 years (1899-1914) within the scope of this survey all benign tissues were not submitted for examination. But in a comparison with the growth of the hospital population, however, and more particularly with the growth of the surgical portion of the hospital population, we possess a most reliable index of relative cancer morbidity.

The following table illustrates the increase in both surgical and total cases during each five-year period.

Table 21-Growth of Massachusetts Homeopathic Hospital Population.

	<u>1899-03</u>	<u>1904-08</u>	<u>1909-13</u>	<u>1914-18</u>	<u>1919-23</u>
Total cases	11,957	20,175	26,281	38,118	44,036
Total surgical cases	9,452	13,550	16,697	19,817	22,749

It is at once apparent that in 1919-1923 there was 3.7 times as many total cases and 2.4 times as many surgical cases as in 1899-1903.

Table 22, by utilizing the ratio of malignant to total surgical cases in each quinquennium, provides a common basis for the measure of cancer incidence. Since all cancer cases are placed on the surgical service, the number of surgical patients constitutes a more accurate guide than the total of all patients. Of the 20 organs on which data were secured 8 were excluded from this table as having an insufficient number of specimens to render the results of value.

Table 22—PERCENTAGES OF TOTAL SURGICAL CASES DUE TO CANCER

<u>Period</u>	<u>Surgical Patients</u>	<u>SCALP and FACE</u>		<u>LIP</u>		<u>TONGUE</u>		<u>STOMACH</u>	
		Can- cer	Per cent	Can- cer	Per cent	Can- cer	Per cent	Can- cer	Per cent
1899-03	9,452	22	.23	7	.07	4	.04	2	.02
1904-08	13,550	20	.15	25	.18	6	.04	3	.02
1909-13	16,697	44	.26	14	.08	5	.03	7	.04
1914-18	19,817	31	.16	27	.14	11	.05	9	.04
1919-23	22,749	19	.08	7	.03	7	.03	6	.02

<u>Period</u>	<u>Surgical Patients</u>	<u>JEJUNUM, ILEUM &amp; COLON</u>		<u>RECTUM</u>		<u>BLADDER</u>		<u>PROSTATE</u>	
		Can- cer	Per cent	Can- cer	Per cent	Can- cer	Per cent	Can- cer	Per cent
1899-03	9,452	4	.04	5	.05	1	.01	2	.02
1904-08	13,550	10	.07	14	.10	10	.07	11	.08
1909-13	16,697	12	.07	19	.11	7	.04	19	.11
1914-18	19,817	20	.10	22	.11	13	.06	17	.08
1919-23	22,749	22	.10	18	.08	20	.09	13	.06

<u>Period</u>	<u>Surgical Patients</u>	<u>OVARY</u>		<u>UTERUS</u>		<u>CERVIX</u>		<u>VAGINA</u>	
		Can- cer	Per cent	Can- cer	Per cent	Can- cer	Per cent	Can- cer	Per cent
1899-03	9,452	14	.15	63	.67	24	.25	10	.11
1904-08	13,550	16	.12	46	.34	38	.28	11	.08
1909-13	16,697	30	.17	76	.45	18	.11	13	.08
1914-18	19,817	18	.09	62	.31	32	.16	15	.07
1919-23	22,749	26	.11	50	.22	36	.16	9	.04

Examination of Table 22 reveals a striking decrease in the relative malignancy rates of the uterus, cervix and vagina. Moreover, in the case of the uterus and vagina, the number of cancer specimens during the first quinquennium actually exceeded that in the last, in spite of the fact that the total surgical cases more than doubled within the same time. It is hardly safe, however, to conclude from the reduction in relative percentages that cancer of these organs is decreasing, for we must remember that in the past 25 years "a considerable increase in the sphere of surgical operations has occurred, thereby decreasing the ratio to any one form of lesion." 33

Ovarian malignancy is shown to have been at its height during the third period, 1909-1913, but taken in its entirety, has become slightly less prevalent.

The figures for the small and large intestine, rectum, bladder and prostate exhibit an unmistakable gain, both as regards actual specimens and comparative rates. How much of this is due to increased skill in surgical diagnosis and readier submission to surgical procedures it is impossible to determine.

The percentages for the face and lips show a downward tendency, which is unquestionably due to the use of Radium in carcinoma of these regions, while those for the tongue and stomach exhibit a most remarkable uniformity.

While it is always unsafe to generalize from the study of a limited field, the conclusion seems to be warranted that with the exception of four organs; intestine, rectum, bladder and prostate, there has been no demonstrable increase



in cancer incidence in the Massachusetts Homeopathic Hospital during the years 1899-1923.

#### 4. Summary.

The purpose of the present study was to determine whether cancer is increasing in frequency in the clientele of the Massachusetts Homeopathic Hospital.

Consultation of the literature revealed that authorities are by no means agreed that cancer is increasing. Some paint an alarming picture of the situation while others upon analysis of the statistics find the increase to be more apparent than real.

Tables of recent cancer mortality for the United States, State of Massachusetts and City of Boston are presented and their limitations fully discussed. At the same time the superiority of morbidity statistics and, in lieu of these, of pathological statistics is set forth.

In a series of tabulations the benign and malignant specimens received at the Pathological Laboratory of the Massachusetts Homeopathic Hospital from 1899 to 1923, inclusive, are enumerated, together with figures giving the concomitant growth of the hospital population.

Finally ratios are drawn for each five-year period between the number of cancer specimens on the one hand and the total surgical cases on the other. These show that in the Massachusetts Homeopathic Hospital during the 25 year period covered by this survey, cancer of the intestine, rectum, bladder and prostate has apparently become more frequent, but

that cancer of all other organs has certainly not increased.

I wish to express my appreciation to Doctor William H. Watters for his invaluable assistance and advice.

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