Errors in Clinical Statements of Causes of Death

Second Report *

KURT POHLEN, PH.D., AND HAVEN EMERSON, M.D., F.A.P.H.A.

Consultant in Statistics, W. K. Kellogg Foundation, Battle Creek, Mich.†; and Professor of Public Health Emeritus in Residence, DeLamar Institute of Public Health, College of Physicians and Surgeons, Columbia University, New York, N. Y.

THIS is the second paper of a series on "Errors in Clinical Statements of Causes of Death." In using the word "error," we do not necessarily mean real or serious diagnostic mistakes such as occur when, for instance, the clinician diagnoses an ulcer of the duodenum which proves at autopsy to be a carcinoma of the stomach, or when the pathologist finds that the aneurysm of the aorta is not due to syphilis, but to arteriosclerotic degeneration.

Besides such incorrect statements we often find others which are only incomplete diagnoses; for instance, if "pneumonia" is stated instead of the precise diagnosis, lobar pneumonia or bronchopneumonia. In this group of partly correct statements belong cases in which the clinician has given only the site or pathologic condition, or both, secondary to the primary disease. This is especially true with metastasis of malignant tumors, and purulent infections.

Both such groups of diagnostic errors, the incorrect and partly correct statements, are of a *clinical nature.* Comparing the clinical diagnosis with the autopsy findings, we are in most cases in position to decide whether the clinical diagnosis was correct, partly correct, incomplete or incorrect. But dealing with the statistics of causes of death, we frequently find differences between clinical and pathologic causes of death as they are to be tabulated according to the *International List of Causes of Death.*

For instance: A case in which the clinician has given the cause of death as "hypertensive arteriosclerotic heart disease" and the pathologist reports: "nephrosclerosis with hypertension and myocardial failure," we decide that the clinical diagnosis is correct because the same condition was meant in both diagnostic statements. The classification of these two statements according to the *International List of Causes of Death,* however, would place the clinical diagnosis under No. 93d (hypertensive heart disease when no involvement of the kidneys is mentioned) and the pathologist's statement under 131a, because the arteriosclerotic kidney is mentioned. Thus, we find the same clinical condition may be tabulated under two

* Based upon 25,066 clinical and post-mortem statements on causes of death. The Tables 1–5 contain only an abstract of 19 diseases, the complete tables refer to every disease listed in the *International List of Causes of Death* with numerous additional subdivisions. The first report appeared in *A.J.P.H.*, 32, 3:251 (Mar.), 1942. The final report, to be finished in 1943, will be based on 40,000 autopsy protocols and clinical histories from 30 different hospitals.

† Recently of the Bureau of Vital Statistics, New York City Health Department.

different rubrics or numbers of the *International List*. In another illustration, we find the opposite situation: when the clinician, without having made an operation or biopsy, diagnoses a carcinoma of the gallbladder and the pathologist finds a sarcoma of the liver with obstruction of the biliary passages, we have a clinical error of site and kind of disease. Tabulation of either statements would, however, be under the name number, 46f (cancer of the liver and biliary passages).

The first example is complicated by the lack of uniformity in clinical diagnoses and terms of the *International* classification and brings both statements "arteriosclerotic heart disease" and "hypertensive cardio-vascular disease" under the same number, 93d (chronic myocarditis without mention of rheumatism), but the clinician means, in most cases, renal involvement when he states the condition to be that of hypertension. Of a similar nature are all cases where the clinician states: "chronic rheumatic cardio-valvular disease" without mentioning especially that the mitral valve is also affected. These cases must be registered under No. 92c (chronic myocarditis, specified as rheumatic). The pathologist gives accurately the same diagnosis, but mentions in his report aortic stenosis and insufficiency, mitral stenosis and insufficiency and many secondary conditions caused by this "chronic rheumatic cardio-valvular disease." The result in tabulation is to list that case under 92b (chronic diseases of the mitral valve). We find later that the bulk of changes in clinical and pathologic assignments to numbers of the *International List* for cardio-valvular and cardio-vascular diseases are due to such lack of uniformity of diagnostic statements.

We have to mention the only further important source of changes in the statistical tabulation caused by different assignment according to primary and contributory causes of death. We have in this group two possibilities:

(a) cases in which both diseases, which occurred simultaneously, have been diagnosed by either clinical or post-mortem examination, but where the clinician was of other opinion than the pathologist, as to which disease shall be mentioned as primary and which as contributory.

(b) cases in which the disease, mentioned solely by the clinician, was verified by the pathologist, who, however, found an additional or other condition of primary importance. We have, for instance, several cases of benign hypertrophy of the prostate (No. 137a), in which the clinician found beside the benign hypertrophy a carcinoma of the prostate and mentions the malignant tumor in first place as primary cause of death, and reports both conditions as the final causes of death.

It is sometimes extremely difficult to decide whether or not the clinician made a mistake, especially in cases belonging to group (a), and more so when the pathologist says afterward that the clinical opinion is correct also.

The comparison of Errors in Clinical Statements, as they appear in the statistics of causes of death, must therefore consider both types of diagnostic changes of:

(I) clinical nature
(II) statistical tabulation

Such a twofold and combined consideration of incorrect, incomplete, partly correct, and correct clinical statements is the subject of this second contribution.

Our first objective is to determine the accuracy of clinical statements with regard to the clinical nature of the diagnosis. Every complete diagnosis consists, or should consist of three statements:

(1) the cause of the disease
(2) the organ which is affected
(3) the manifestation and pathologic changes caused by the disease

Illustration: "ruptured appendicitis" is complete; it gives the organ (appendix), the cause (infection), and the pathologic condition (rupture). "Arte-

riosclerotic cardio-vascular disease" is incomplete; it gives the organ (cardio-vascular system in its entirety), the cause (arteriosclerotic degeneration), but it fails to give the important manifestation which may be that of a coronary sclerosis, nephrosclerosis, cerebral hemorrhage, etc.

In the first report we did not attempt to evaluate the clinical statements regarding the manifestation of diseases, because of the difficulties due to lack of uniformity in diagnostic definitions, especially as far as the pathologic verification of clinical statements is concerned. We have, for instance, to remember that some manifestations of disease, removed by operations, cannot be seen at autopsy. Second: In this paper we intend to compare the results of the statistics of causes of death with clinical considerations which must be based upon the statistical classification of diseases in which only occasional manifestations are mentioned (such as cholecystitis: with and without mention of cholelithiasis, the arteriosclerotic cardio-vascular and the rheumatic cario-valvular diseases, and the manifestations of tertiary syphilis, etc.)

We have, however, distinguished in each case, between the *site* of disease and the *cause* of disease, and coded each clinical statement according to the degree of its correctness or incorrectness, topographically and etiologically.

The following code was used for diagnostic changes which are numbered from O to Y in twelve different items with corresponding meanings for the topo-

CODES FOR DIAGNOSTIC CHANGES

		Code	*Topographic*	*Etiologic*
			Correct site is stated	Correct cause is stated
Correct		0	(the statement is considered correct also in cases where the body as a whole is affected, or the correct site was not found in either diagnosis)	(the statement is considered correct also in cases where in neither diagnosis a specific cause but only a pathologic condition has been given)
Incomplete		1	Only correct organ system or body system was mentioned	Only correct etiologic or pathologic group was mentioned
Partly Correct	*Specified Diagnosis*	2	Secondary area involved in extension of disease has been mistaken for primary site	Secondary pathologic condition in extension of disease has been mistaken for primary cause
		3	Secondary site (metastasis or other secondary lesion) has been mistaken for primary site	Secondary pathologic condition subsequent to primary disease has been mistaken for cause of primary disease
		4	Site of contributory disease, which is independent of primary disease, has been mistaken for site of primary disease	Specified cause of contributory disease, which is independent from primary disease, has been mistaken for cause of primary disease
	Unspecified Diagnosis	5	Organ system or body region of secondary site, which is different from organ system or body region of primary site, has been mistaken for primary site.	Etiologic or pathologic group of secondary disease, subsequent to primary disease and different from etiologic or pathologic group of primary disease, has been mistaken for cause of primary disease
		6	Organ system or body region of contributory disease, different from organ system or body region of primary disease, has been mistaken for site of primary disease	Etiologic or pathologic group of contributory disease has been mistaken for etiologic or pathologic group of primary disease
Incorrect		7	Incorrect specified site, belonging to the same organ system of correct site and in close topographic relation	Incorrect specified cause or pathologic condition, belonging to the same etiologic group and in close etiologic relation
		8	Other specified incorrect sites	Other specified incorrect causes or pathologic conditions
		9	Incorrect unspecified site, belonging to another organ system or body region	Incorrect unspecified cause, belonging to another etiologic or pathologic group
No diagnosis		X	———	Only a symptom or manifestation, not indicating a definite disease (cause) is mentioned
		Y	No site of primary disease is given	No cause, pathologic condition or symptom is given

TABLE 4

Accuracy of Clinical Statements Regarding the Site of Disease

No. of International List (Rev. 1939)	Causes of Death	Total Deaths	The Clinical Statement Regarding the Site of Disease Is									
			Correct		Incomplete	Partly Correct Referring to				Incorrect		No Site Is Given
						Secondary Site		Contributory Disease				
			No.	Per cent		Precise	Indistinct	No.	Per cent	No.	Per cent	
1	2	3	4	5	6	7	8	9	10	11	12	13
8	Scarlet fever	73	65	89	..	..	..	4	5	4	5	..
13b	Tuberculosis of the respiratory system	1,764	1,696	96	9	8	..	27	2	24	1	..
35	Measles	66	65	98	..	..	..	..	..	1	2	..
44b	Lymphogranulomatosis	108	95	88	1	5	..	1	1	6	6	..
46b	Cancer of the stomach	555	481	87	2	10	..	5	1	57	10	..
46f	Cancer of the liver or biliary passages	139	93	67	1	30	..	1	1	14	10	..
48a	Cancer of the cervix	138	132	96	..	4	..	..	..	2	1	..
61	Diabetes mellitus	352	287	79	..	2	..	60	17	2	1	1
74a	Leukemias	285	269	94	1	1	..	3	1	11	4	..
92b	Chronic diseases of the mitral valve	273	242	89	3	..	..	17	6	11	4	..
92c	Chronic rheumatic endocarditis	309	279	90	8	..	..	13	4	9	3	..
93d	Chronic myocarditis, not rheumatic	1,046	574	55	61	137	29	170	16	75	7	..
108	Lobar pneumonia	789	639	81	6	2	..	43	5	99	13	..
117a	Ulcer of the stomach	175	127	73	8	3	..	8	5	29	17	..
121	Appendicitis	421	396	94	2	3	..	4	1	16	4	..
122a	Hernia	161	156	97	..	..	..	2	1	3	2	..
124b	Cirrhosis of the liver, unspecified	196	164	84	1	9	..	11	6	11	6	..
131a	Arteriosclerotic kidney	591	518	88	5	26	2	30	5	10	2	..
159	Premature birth	876	748	85	3	1	..	115	13	9	1	..
	Total	25,066	19,265	77	743	1,412	106	1,371	5	1,547	6	622

TABLE 5

Accuracy of Clinical Statements Regarding the Cause of Disease

No. of International List (Rev. 1939)	Cause of Death	Total Deaths	The Clinical Statement Regarding the Cause of Disease Is: Correct No.	Correct Per cent	Incomplete	Partly Correct Referring to Secondary Condition: Precise	Secondary Condition: Indistinct	Partly Correct Referring to Contributory Disease No.	Contributory Disease Per cent	Incorrect No.	Incorrect Per cent	Insufficient: Symptom Only	Insufficient: No Cause Is Given
1	2	3	4	5	6	7	8	9	10	11	12	13	14
8	Scarlet fever	73	61	84	..	..	..	4	5	8	11	..	..
13b	Tuberculosis of the respiratory system	1,764	1,653	94	2	...	..	24	1	84	5	1	..
35	Measles	66	65	98	..	..	..	..	..	1	2	..	..
44b	Lymphogranulomatosis	108	81	75	1	..	..	1	1	25	23	..	..
46b	Cancer of the stomach	555	479	86	14	..	..	1	1	61	11	..	..
46f	Cancer of the liver or biliary passages	139	117	84	12	..	..	..	..	10	7	..	..
48a	Cancer of the cervix	138	136	99	..	..	..	..	..	2	1	..	..
61	Diabetes mellitus	352	286	81	1	2	..	60	17	2	1	1	..
74a	Leukemias	285	252	88	9	1	..	3	1	20	7	..	..
92b	Chronic diseases of the mitral valve	273	232	85	7	1	..	16	5	17	6	..	..
92c	Chronic rheumatic endocarditis	309	266	86	5	..	..	15	5	23	7	..	..
93d	Chronic myocarditis, not rheumatic	1,046	719	69	33	5	..	171	16	109	10	9	..
108	Lobar pneumonia	789	652	83	16	1	..	28	4	92	12	..	..
117a	Ulcer of the stomach	175	144	82	3	1	..	8	5	18	10	1	..
121	Appendicitis	421	401	95	..	..	..	3	1	17	4	..	..
122a	Hernia	161	156	97	..	..	..	1	1	4	2	..	..
124b	Cirrhosis of the liver, unspecified	196	138	70	2	2	..	16	8	37	19	1	..
131a	Arteriosclerotic kidney	591	525	89	5	1	..	32	5	26	4	2	..
159	Premature birth	376	748	85	2	..	..	115	13	11	1	..	..
	Total	25,066	19,146	76	1,007	255	17	1,241	5	2,437	10	535	428

graphic and etiologic part of the diagnosis.

0—means a correct diagnosis, where the pathologic statement is the same as the clinical statement.

1—means incomplete statements, such as pneumonia instead of lobar or bronchopneumonia, or urinary infection, etc.

2—indicates the secondary area (or pathologic condition, etiologically) involved in extension of the disease. These are cases in which the form of the lesion (manifestation) plays its part, and to which a complicating extension of the process, *e.g.*, a carcinoma of the prostate, involving ureters and bladder belongs.

3 and 4—distinguish the secondary and contributory diseases, the former caused by the primary disease and the latter independent of it.

5 and 6—are similar to 3 and 4, respectively; in 5 and 6 the site or cause is not given in precise but rather in unspecified terms, for instance, tumor of the urinary system.

The other items are self-explanatory.

A code number 00 means that the clinical diagnosis was correct, topographically and etiologically; 10 means: incomplete topographic and correct etiologic statement (e.g., the beforementioned example of pneumonia); 01 means: correct topographic, incomplete etiologic statement (e.g., tumor of prostate instead of carcinoma or benign hypertrophy of the prostate); 24 means: secondary site and contributory disease (e.g., a case of carcinoma of the stomach with metastasis in the liver diagnosed as liver cirrhosis when the liver cirrhosis was really present), but a case of carcinoma of the stomach without metastasis in the liver, diagnosed as liver cirrhosis, when cirrhosis of the liver was present, would be coded as 44; 88 means: a disease incorrectly diagnosed both topographically and etiologically.

This large number of different code numbers is summarized in our report according to the group mentioned in the first column: *correct, incomplete, partly correct, incorrect,* and *no diagnosis.*

We may refer first to *Tables 4 and 5* * dealing with 19 diseases of interest, according to frequency, statistical consideration and for other reasons. The tables are based upon slightly more than 25,000 cases; the final report will deal with more than 40,000 cases. Our preliminary study includes each disease mentioned in the *International List of Causes of Death.* Since these 5 tables and additional figures referring to a former similar study made upon material from Magdeburg contain 115 pages, we have summarized our results in the material presented here.

Table 4 refers to the accuracy of topographic statements, disregarding the etiologic statements, and *Table 5* to the accuracy of etiologic statements, disregarding the topographic part of the diagnosis. We find 6 per cent of cases with incorrect site of disease, and 10 per cent with incorrect cause of disease. The frequency varies among the diseases considerably, as we see in column 12.

Column 10 indicates the percentage of contributory sites, or causes, taken as primary causes, and column 5 gives the results of the positive part of our study, the correct sites and causes, which are, about equally, slightly more than four-fifths of all cases.

Table 3 combines the accuracy of statements regarding the clinical nature and the comparison of statistical tabulation for the same diseases. We have, at first, divided all cases whether or not the clinical diagnosis was correct, incomplete, partly correct, and incorrect (including with the latter group the cases with no diagnosis given). Under incorrect are included all cases in which either part of the diagnosis was incorrect; i.e., that incorrect site but correct cause, or vice versa, renders the whole

* The tables are numbered according to the sequence of the complete tables contained in Vol. 2, Nos. 4 and 5, of "*Health and Statistics,*" published by Kurt Pohlen. A limited number of copies of these tables are available to those interested.

diagnosis incorrect. Similarly, we defined as partly correct all cases in which at least one part of the diagnosis was partly correct, the other part may be better (incomplete or correct) but not incorrect, and so forth.

Then we distinguished in every group of "correct, incomplete, partly correct, or incorrect" diagnosis the individual cases, whether or not the respective number of the *International List* was the same, if tabulation was made on the clinical diagnosis as it would have been had the pathologist's statement been used as basis of tabulation.

In column 6, for instance, 190 cases of chronic rheumatic endocarditis (No. 92c) are mentioned, where the clinical statement "rheumatic chronic cardiovalvular disease" was considered correct, but where the additional findings at autopsy revealed the mitral involvement and called for a different classification under 92b. The same is true with the disease No. 93d, chronic myocarditis, not rheumatic, where beside 278 correct cases there were 265 others, mostly "hypertensive cardio-vascular diseases" for which their international classification was changed due to insufficient definition of the disease.

Table 3 is based upon the clinical diagnosis; all diseases being first sorted according to the *International List* numbers of the clinical statement. Then they were grouped according to the code as correct, incomplete, . . . etc., diagnoses.

We can carry out the same operation in sorting all cases under the *International List* number according to the pathologist's statements and consider how many of them were previously (at clinical examination) correctly, incompletely, etc., diagnosed.

This is done in *Table 2,* which is arranged in the same manner as Table 3. We see here again two diseases with large frequencies in column 6, but now No. 92b, chronic diseases of the mitral valve, and 131a, arteriosclerotic kidney, to which the corresponding cases of chronic rheumatic endocarditis, and chronic myocarditis, beforementioned, were transferred. It is not a mere coincidence that we find in column 6 of *Table 3* (under disease No. 92c), and in column 6 of *Table 2* (under disease No. 92b), exactly the same number of cases.

The final figures for vital statistics, summarizing the experience of *Tables 2 and 3,* are given in *Table 1,* which refers to the classification according to the *International List of Causes of Death* only. Let us take, for illustration, No. 46b, cancer of the stomach. The clinical examination resulted in 555 cases classified under this rubric, of which 456 (col. 6) were verified by autopsy, which means that the pathological classification was the same for them. In 99 cases, however, their allocation in the *International List* was changed, 24 times due to incomplete or partly correct statements and 75 times due to real diagnostic errors.

In addition to the 456 cases of clinically diagnosed and pathologically verified cancer of the stomach, there are 168 cases in which the gastric malignancy was discovered at autopsy only; 90 times among them due to incomplete and partly correct statements, and 78 times due to an incorrect diagnosis. This gives a total of 624 cases, which is 12 per cent higher than the figures compiled according to the clinical examination.

The rate 12 per cent is listed in column 12 as coefficient of correction, which indicates the percentage to which the figures based on clinical statements must be increased or decreased when corrected by the figures based on the pathologist's statements.

In columns 10 and 11, are listed two types of indices of error. If we take again the example of carcinoma of the stomach, we find that this disease (or a disease which has the same *International*

TABLE 3

Accordance of Clinical Statements on Causes of Death With Autopsy Findings—Based Upon the Clinical Diagnosis

No. of International List (Rev. 1939)	Causes of Death	Total Deaths	Total Correct in Per cent of Col. 3	The Autopsy Findings Reveal, That the Clinical Statement, as Mentioned in Col. 2, Is: Correct — The No. of the International List of Causes of Death, Referring to the Autopsy Diagnosis, Is Same as or Different from the No. Mentioned in Col. 1		Incomplete		Partly Correct		Incorrect	
				Same	Different	Same	Different	Same	Different	Same	Different
1	2	3	4	5	6	7	8	9	10	11	12
8	Scarlet fever	73	84	61	..	..	..	..	8	..	4
13b	Tuberculosis of the respiratory system	1,764	93	1,630	13	..	2	..	32	..	87
35	Measles	66	99	65	..	..	..	..	..	..	1
44b	Lymphogranulomatosis	108	75	81	..	..	2	..	3	..	22
46b	Cancer of the stomach	555	80	442	..	7	3	7	21	..	75
46f	Cancer of the liver or biliary passages	139	63	88	..	2	..	8	25	2	14
48a	Cancer of the cervix	138	95	131	..	..	..	..	5	..	2
61	Diabetes mellitus	352	81	284	2	..	1	..	62	..	3
74a	Leukemias	285	88	251	1	4	4	2	11	..	12
92b	Chronic diseases of the mitral valve	273	83	219	7	3	6	2	25	1	10
92c	Chronic rheumatic endocarditis	309	85	73	190	..	7	1	22	..	16
93d	Chronic myocarditis, not rheumatic	1,046	52	278	265	3	45	3	309	1	142
108	Lobar pneumonia	789	75	587	3	1	11	..	117	..	70
117a	Ulcer of the stomach	175	65	114	..	1	10	..	29	1	20
121	Appendicitis	421	94	396	..	..	1	..	6	..	18
122a	Hernia	161	97	156	..	..	..	1	1	..	3
124b	Cirrhosis of the liver, unspecified	196	70	137	1	1	1	..	21	..	35
131a	Arteriosclerotic kidney	591	85	499	2	2	..	11	49	..	28
159	Premature birth	876	85	744	3	..	2	..	115	..	12
	Total	25,066	67	16,782	836	161	747	163	2,940	46	3,391

number) was mentioned in 723 cases:

456 times in both the clinical and pathological statement,
99 (24 plus 75) times in the clinical statement only, which was not verified by autopsy, and in
168 (90 plus 78) times in the pathologic statements and not previously mentioned as any kind of gastric malignancy in the clinical record.

Among the 723 cases, in which some kind of gastric malignancy was mentioned, we find 456 correct and 267 (99 plus 168) erroneous statements. These 267 erroneous statements are 37 per cent of the total of 723 and this can be considered as the Index of Error.

Based upon our studies on the difference between incomplete, partly correct, and incorrect diagnoses, we may divide the Index of Error into

(a) the error of clinical diagnosis (col. 10) which includes both types of incorrect diagnoses (75 clinical statements not verified post-mortem and 78 post-mortem statements not observed clinically), and expresses the sum as a percentage of the total of all examinations in which cancer of the stomach is mentioned.

(b) the inadequacy of statistical tabulation (col. 11) which combines in the same manner the changes in the *International* classification due to incomplete and partly correct statements.

The variation of the Indices of Error is seen in *Table 1.* We observe the large difference between the infectious diseases (scarlet fever, tuberculosis of the respiratory system, and measles) and the organic heart diseases (endocarditis and myocarditis), but we see also the large factor of partly correct diagnoses among the latter.

These facts cannot be discussed in detail here. We mention briefly, however, the two other groups, representing the data from *Tables 4 and 5* and indicating the accuracy of etiologic and topographic statements, separated from each other.

Statistical studies like these about which we are reporting cannot be easily compared with other similar studies. This is due to several causes:

(1) Our present material is derived from outstanding hospitals. We might expect to find here relatively low "Indices of Error," but we have seen that the statements of the best clinicians by reason of their exactness and completeness of diagnostic statements differ often in some details from the findings of expert pathologists. The better the pathologic examination, the higher the per cent of error.

(2) A nomenclature of diseases which goes into many details makes more changes in the statistical classification possible than a nomenclature which is less detailed. For instance: the previous *International List* (1929) mentioned chronic nephritis only. Today (1938 list), we have a division into arteriosclerotic kidney and other chronic nephritis. Numerous cases of chronic glomerulonephritis which proved to be arteriosclerotic kidney are, in the present study, considered to be incorrect diagnoses; they did not indicate a change in the statistical tabulation before the last revision of the *International List* took place in 1938.

CONCLUSION

We recognize that we all are inaccurate, partly because we do not have the means to establish and express the truth completely. There are inaccuracies in vital statistics, but we do not think that vital statistics are therefore worthless or should be discarded or unused. On the contrary, by identifying the location and degree of errors, we are in the position to offer valuable aid to the clinician and the pathologist in diagnosis, and we increase the information which statistics can offer by making manifest those errors which so often are used to discredit vital statistics. In this way, the former cause of unreliability becomes a source of genuine information.

The statistics which we have presented herewith and those presented last year would be incomplete if we should not have tabulated the direction of diagnostic changes. Now we know how often a diagnosis has been incorrect, but

TABLE 1

Summary of Clinical-pathologic Statistics of Statements on Causes of Death, U. S. Hospitals, 1930–1939

No. of International List (Rev. 1939)	Causes of Death	No. of Deaths According to the Clinical Diagnosis	Correction of Diagnoses *					No. of Deaths According to the Pathologic Diagnosis	Indices of Error Regarding		Coefficient of Correction
			The Clinical Diagnosis as Mentioned in Col. 2			The Diagnosis of Col. 2 Was Found Only by Autopsy Due to			Error of Clinical Diagnosis	Inadequacy of Statistical Tabulation	
			Was Not Verified by Autopsy		Was Verified by Autopsy						
			Incomplete and Partly Correct Statement	Incorrect Statement		Incomplete and Partly Correct Statement	Incorrect Statement		Col.: 5+8 / 3+9−6 ×100	Col.: 4+7 / 3+9−6 ×100	Col.: 9−3 / 3 ×100
1	2	3	4	5	6	7	8	9	10	11	12
8	Scarlet fever	73	8	4	61	..	..	61	5	11	−16
13b	Tuberculosis of the respiratory system	1,764	47	87	1,630	85	86	1,801	9	7	+2
35	Measles	66	..	1	65	3	..	68	1	4	+3
44b	Lymphogranulomatosis	108	5	22	81	9	18	108	31	10	0
46b	Cancer of the stomach	555	24	75	456	90	78	624	21	16	+12
46f	Cancer of the liver or biliary passages	139	25	14	100	72	76	248	31	34	+79
48a	Cancer of the cervix	138	5	2	131	10	7	148	6	10	+7
61	Diabetes mellitus	352	65	3	284	10	9	303	3	20	−14
74a	Leukemias	285	16	12	257	12	18	287	10	9	+1
92b	Chronic diseases of the mitral valve	273	38	10	225	247	60	532	11	68	−64
92c	Chronic rheumatic endocarditis	309	219	16	74	15	21	110	25	44	+33
93d	Chronic myocarditis, not rheumatic	1,046	619	142	285	86	49	420	16	60	−60
108	Lobar pneumonia	789	131	70	588	162	64	814	13	29	+3
117a	Ulcer of the stomach	175	39	20	116	18	43	177	28	24	+1
121	Appendicitis	421	7	18	396	39	28	463	9	9	+10
122a	Hernia	161	1	3	157	1	12	170	9	1	+6
124b	Cirrhosis of the liver, unspecified	196	23	35	138	31	70	239	35	18	+22
131a	Arteriosclerotic kidney	591	51	28	512	697	196	1,405	15	49	+138
159	Premature birth	876	120	12	744	6	8	758	2	14	−13
	Total	25,066	4,523	3,391	17,152	4,523	3,391	25,066	29	20	0

* Regarding the No. of the *International List of Causes of Death*

TABLE 2

Accordance of Clinical Statements on Causes of Death With Autopsy Findings—Based Upon the Post-mortem Diagnosis

No. of International List (Rev. 1939)	Causes of Death	Total Deaths	Total Correct in Per cent of Col. 3	The Previous Clinical Statement, Regarding the Autopsy Cases, as Mentioned in Col. 2, Is: Correct — The No. of the International List of Causes of Death, Referring to the Previous Clinical Diagnosis, Is Same as or Different from the No. Mentioned in Col. 1		Incomplete		Partly Correct		Incorrect	
				Same	Different	Same	Different	Same	Different	Same	Different
1	2	3	4	5	6	7	8	9	10	11	12
8	Scarlet fever	61	100	61	..	..	..	..	..	..	..
13b	Tuberculosis of the respiratory system	1,801	91	1,630	10	..	4	..	71	..	86
35	Measles	68	96	65	..	..	..	..	3	..	..
44b	Lymphogranulomatosis	108	75	81	..	..	1	..	8	..	18
46b	Cancer of the stomach	624	69	442	1	7	24	6	65	1	78
46f	Cancer of the liver or biliary passages	248	36	88	1	2	10	8	61	2	76
48a	Cancer of the cervix	148	89	131	1	..	2	..	7	..	7
61	Diabetes mellitus	303	94	284	1	..	..	..	9	..	9
74a	Leukemias	287	88	251	1	4	..	2	11	..	18
92b	Chronic diseases of the mitral valve	532	77	219	190	3	14	2	43	1	60
92c	Chronic rheumatic endocarditis	110	72	73	6	..	4	1	5	..	21
93d	Chronic myocarditis, not rheumatic	420	75	278	39	3	5	3	42	1	49
108	Lobar pneumonia	814	72	587	2	1	35	..	125	..	64
117a	Ulcer of the stomach	177	64	114	..	1	3	1	15	..	43
121	Appendicitis	463	86	396	3	..	1	..	35	..	28
122a	Hernia	170	90	156	..	..	..	1	1	..	12
124b	Cirrhosis of the liver, unspecified	239	58	137	2	1	1	..	28	..	70
131a	Arteriosclerotic kidney	1,405	36	499	299	2	55	11	343	..	196
159	Premature birth	758	98	744	1	..	..	..	5	..	8
	Total	25,066	70	16,782	824	161	756	163	2,911	46	3,423

we do not know yet which new diagnosis took the place of the one first given. We are, therefore, preparing tables that show each individual change of diagnosis and all combinations of diagnoses with each other.

We are preparing to make the same (or similar) tables as for the clinical and pathologic cause of death, for the comparison between the diagnosis at admission to hospital and at autopsy. Furthermore, we are sorting our records according to cases with operation, biopsy, electrocardiogram, etc.

Finally, we are preparing tables giving the combination between primary and secondary conditions, on one hand, and the various contributory diseases on the other hand (each separated from the other). These tables based upon autopsy findings, will then include the various secondary conditions and manifestations in order to give a complete picture of the cause of death.