

5

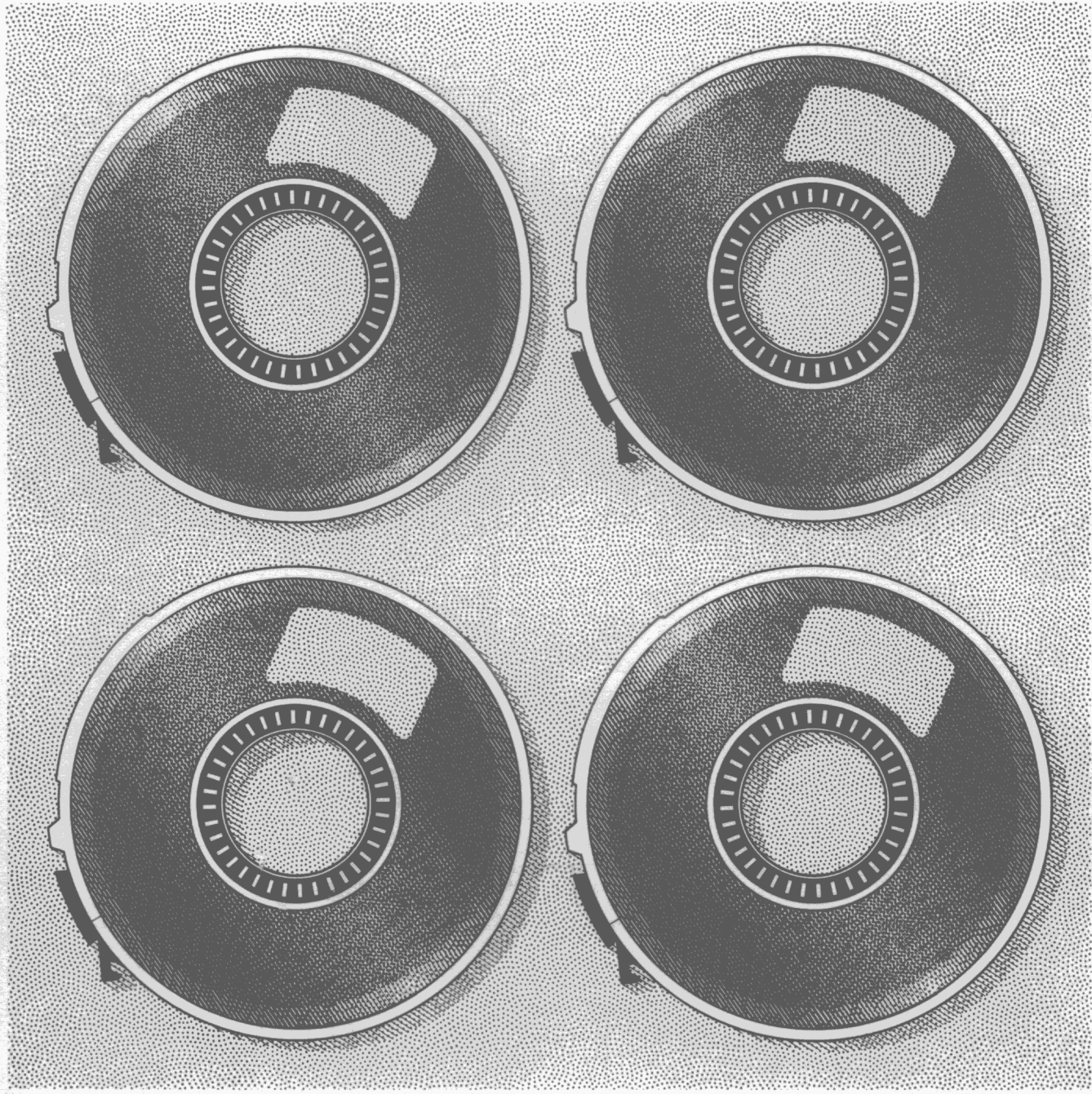
Public Use Data Tape Documentation



Osteoarthritis and
Rheumatoid Arthritis
I Tape Number 1005

National Health Examination Survey, 1959-62

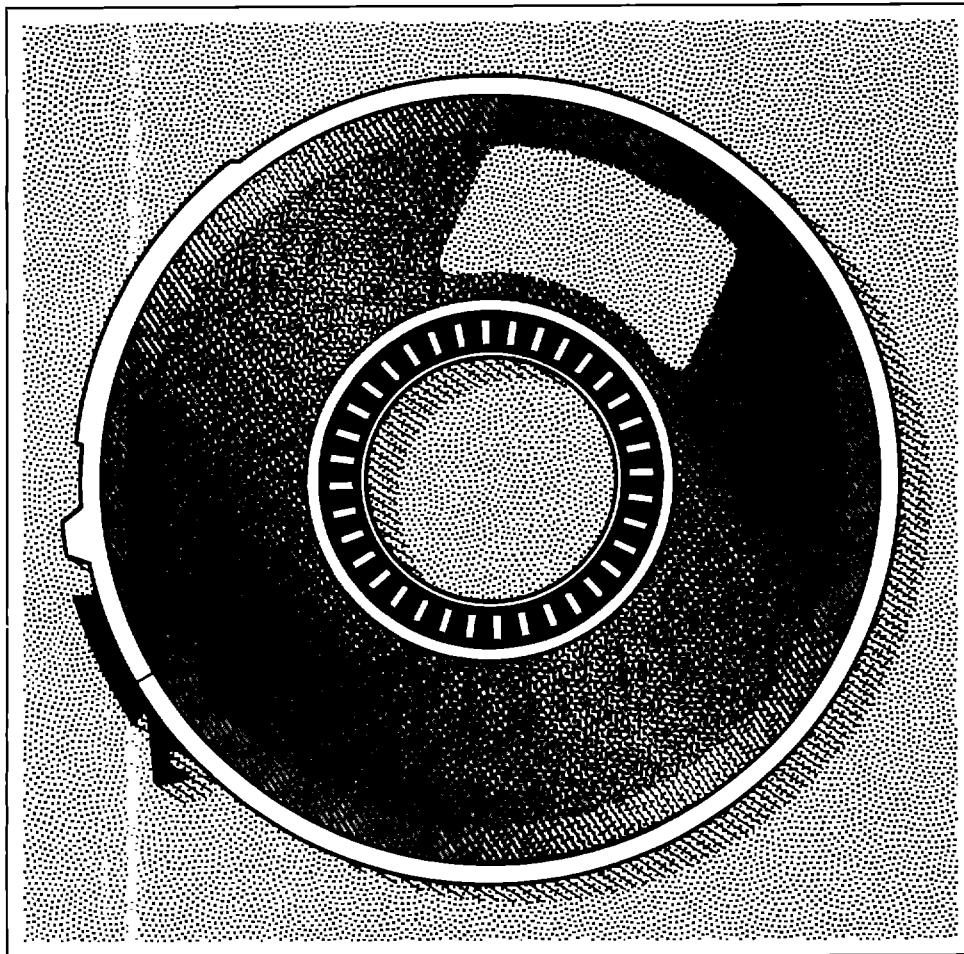
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES • Public Health Service • Office of Health Research, Statistics, and Technology • National Center for Health Statistics



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Rheumatoid Arthritis
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U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Office of Health Research, Statistics, and Technology
National Center for Health Statistics

Hyattsville, Maryland
May 1981

FILE CHARACTERISTICS

TITLE: User Data Set #5 - Osteoarthritis & Rheumatoid Arthritis
CONTENT: Osteoarthritis & Rheumatoid Arthritis Data by File Sequence Number
CASE COUNT: 6672
RECORD COUNT: 6672
RECORDING MODE: FB
RECORD LENGTH: 52 Characters
RECS/BLOCK: 1 record
DENSITY: 1600-BPI
CHANNEL: 9-trk
LOCATION: North Carolina DP Facility
CREATED BY: DHES/NCHS/HRA
DATA SET NAME: HE005002.OAANDRA
REEL NUMBER(S): 002426
COMMENTS: Copy of tape with same Dsname HE005002.OAANDRA on Reel #006310

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- II. Detailed Description of Data Items
- III. Appendix A: Explanation of X-ray Coding techniques
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FILE DESCRIPTION AND CODES

INTRODUCTION

The overall plan of the Health Examination Survey (HES) was to conduct successive, separate cycles of examinations in specific segments of the national population. The data in this report refers to the survey for cycle 1.

The first cycle of the HES was the examination of a sample of adults. It was directed toward the collection of statistics on the medically defined prevalence of certain chronic diseases and of a particular set of dental findings and physical and physiological measurements. The probability sample consisted of 7,710 of all non-institutional civilian adults in the age range 18-79 years in the United States. Altogether, 6,672 persons were examined during the period from October 1959 to December 1962.

The tape contains data from the cycle 1 survey relating to the Osteoarthritis/Rheumatoid Arthritis findings for each examined person. There are 6,672 records of 52 characters each. The first 43 characters are coded numeric and represent 33 separate data items. The remaining 9 characters positions are filled with blanks.

ITEM	TYPE POSITION		NUMBER OF POSITIONS	ITEM DESCRIPTION & CODES	CONTROL COUNTS	SOURCE	SRT TAPE POSITION
	FROM	TO					
1	1	5	5	FILL SEQUENCE 450001-56672			1-5
2	6	11	5	FINAL ESTIMATION WEIGHT		HES-207 Item 10	26-31
3	12		1	RACE RECODE 1 = White 2 = Negro 3 = Other	5719 827 126	HES-205	34
4	13	14	2	AGE/SEX RECODE code 01 - Males 18-24 02 - Males 25-34 03 - Males 35-44 04 - Males 45-54 05 - Males 55-64 06 - Males 65-74 07 - Males 75-79 08 - Females 18-24 09 - Females 25-34 10 - Females 35-44 11 - Females 45-54 12 - Females 55-64 13 - Females 65-74 14 - Females 75-79	411 675 703 547 418 265 72 534 746 784 705 443 299 70		
5	15		1	OA HANDS FINAL READING code 1 - None 2 - Doubtful 3 - Minimal 4 - Moderate 5 - Severe 9 - No X-ray	2316 2363 1335 345 54 259	Hands Feet X-rays	821
6	16		1	OA FEET-FINAL READING code 1 - None 2 - Doubtful 3 - Minimal 4 - Moderate 5 - Severe 9 - No X-ray	2968 2280 1052 105 8 259	Hands Feet X-rays	822

ITEM	TAPE POSITION		NUMBER OF POSITIONS	ITEM DESCRIPTION & CODES	CONTROL COUNTS	SOURCE	SRT TAPE POSITION
	FROM	TO					
7	17		1	OA HANDS & FEET - FINAL READING code 1 - None 2 - Doubtful 3 - Minimal 4 - Moderate 5 - Severe 9 - No X-ray	1585 2630 1741 397 59 259	Hands & Feet X-rays	823
8	18		1	RA HANDS-FINAL READING code 1 - None 2 - Doubtful 3 - Minimal 4 - Moderate 5 - Severe 9 - No X-ray	6349 34 15 9 6 259	Hands & Feet X-rays	824
9	19		1	RA FEET-FINAL READING code 1 - None 2 - Doubtful 3 - Minimal 4 - Moderate 5 - Severe 9 - No X-ray	6379 12 11 8 3 259	Hands & Feet X-rays	825
10	20		1	RA HANDS & FEET FINAL READING code 1 - None 2 - Doubtful 3 - Minimal 4 - Moderate 5 - Severe 9 - No X-ray	6334 38 22 12 7 259	Hands & Feet X-rays	826
11	21		1	OSTEO-ARTHRITIS DIAGNOSIS X-RAY code 1 - None 2 - Mild Upper (hands) 3 - Mild Lower (feet) 4 - Mild Both (Hands & Feet) 5 - Moderate or Severe Upper 6 - Moderate or Severe Lower 7 - Moderate or Severe Lower, Mild Upper 8 - Moderate or Severe Upper, Mild Lower 9 - Moderate or Severe Both	4216 862 451 428 170 12 45 173 56	Hands & Feet X-rays	827

ITEM	TAP POSITION		NUMBER OF POSITIONS	ITEM DESCRIPTION & CODES	CONTROL COUNTS	SOURCE	SER TAPE POSITION
	FROM	TO					
12	22		1	X-RAY READING ESTIMATED 1 - Not Estimated X-ray reading 2 - No X-ray Not Estimated 3 - Estimated For Feet Only All 3 Readers 4 - Estimated for Feet 1st Reader Only (See Note)	6409 259 3 1	Hands & Feet X-rays	228
13	23		1	LIMITATION OF ACTIVITY 1 - Unable to carry on major activity 2 - Limited in amount of major activity 3 - Not limited in major activity, but otherwise limited 4 - Not limited 5 - Unknown	156 681 275 2771 2789 259	From Household Question- naire HES 1	1119
14	24		1	O.A. HANDS OR FEET-CONDENSED X-RAY READING BY SEVERITY 1 - None 2 - Mild 3 - Moderate or Severe 9 - No X-ray	4216 1741 456 259	Hands & Feet X-rays	1120
15	25		1	O.A. DIAGNOSIS CONDENSED BY LOCATION 1 - None (X-ray) 2 - Upper (Hands) 3 - Lower (Feet) 4 - Both (Hands & Feet) 9 - No X-Ray	4216 1032 463 702 259	Hands & Feet X-rays	1121
16	26		1	MORNING STIFFNESS 1 - Yes, every few days, quite a bit 2 - Yes, every few days, just a little 3 - Yes, less often, quite a bit 4 - Yes, less often, just a little 5 - No, & Questionable	462 302 122 983 4803	HES-204 Q. 27	1122
17	27		1	SWOLLEN JOINTS 1 - Yes, every few days, quite a bit 2 - Yes, every few days, just a little 3 - Yes, less often, quite a bit 4 - Yes, less often, just a little 5 - No, & Questionable	207 116 98 333 5918	HES-204 Q. 28	1123

ITEM	I/M L POSITION		NUMBER OF POSITIONS	ITEM DESCRIPTION & CODES	CONTROL COUNTS	SOURCE	SRT TAPE POSITION
	FROM	TO					
18	28		1	IRITIS-RECODE 1 - In one or both eyes 2 - In neither eye or unknown	6 6666	HES-205 17	1124
19	29		1	R & A TENDERNESS 1 - Yes 2 - No or not indicated	912 5750	HES-205 51-63	1126
20	30		1	A & R SUBCUTANEOUS NODULES 1 - Yes 2 - No or not indicated	8 6664	HES-205 51-63	1127
21	31		1	A & R SWELLING IN OTHER JOINTS 1 - One joint 2 - Two or more joints 3 - Same joint right or left side 4 - No swelling or none indicated	112 24 127 6409	HES-205 51-63	1128
22	32		1	A & R PAIN ON MOTION EXCEPT DISTAL-INTERPHALANGEAL & SPIRE 1 - Yes 2 - No or not indicated	185 6487	HES-205 51-63	1129
23	33		1	A & R EXAMINING PHYSICIANS IMPRESSIONS 1 - Classical Arthritis 2 - Definite Arthritis 3 - Rheumatic complaints 4 - Questionable 5 - No Arthritis indicated	602 642 564 552 4312	HES-205	1130
24	34		1	BENTONITE FLOCCULATION (DILUTION) 1 - 0 or Negative 2 - More than 1:16 3 - 1:16 4 - 1:32 5 - 1:64 6 - 1:128 7 - 1:256 8 - 1:512 9 - Less than 1:512 A Diagnosis for R.A. The higher the dilution the rare likely R.A.	6396 2 67 79 49 28 20 16 15	HES-208 Item 6	1131

ITEM	TAPE POSITION		NUMBER OF POSITIONS	ITEM DESCRIPTION & CODES	CONTROL COUNTS	SOURCE	SRT TAPE POSITION
	FROM	TO					
25	35		1	ESTIMATED BFT RESULTS 1 - Not estimated 2 - Estimated	6483 189	HES-208 Item 6	1132
26	36		1	R.A. DIAGNOSIS 1 - Classical R.A. 2 - Definite R.A. 3 - Probable R.A. 4 - Possible R.A. 5 - Not R.A.	8 51 145 740 5723	HES-205	1135
27	37		1	JOINT PAINS? 1 - Yes, every few day, quite a bit 2 - Yes, every few day, just a little 3 - Yes, less often, quite a bit 4 - Yes, less often, just a little 5 - No and Questionable	517 215 276 975 4689	HES-204 Q. 29	1136
28	38		1	JOINT TENDERNESS? 1 - Yes, every few days, quite a bit 2 - Yes, every few days, just a little 3 - Yes, less often, quite a bit 4 - Yes, less often, just a little 5 - No and Questionable	221 84 73 329 5965	HES-204 Q. 30	1137
29	39		1	THINK YOU HAVE ARTHRITIS OR RHEUMATISM-DID YOUR DOCTOR CONFIRM IT? 1 - Yes, told so by MD 2 - No, Not told by MD 3 - Yes, unknown reply 4 - No & Questionable	1130 837 32 4637	HES-204 Q. 61	1138

ITEM	TAPE POSITION FROM / TO	NUMBER OF POSITIONS	ITEM DESCRIPTION & CODES	CONTROL COUNTS	SOURCE	SRT TAPE POSITION
30	40	1	ARTHRITIS OR RHEUMATISM-DURATION 1 - 1 Year 2 - 1-5 Years 3 - Over 5 Years 4 - Other 5 - No Arthritis or Rheumatism	319 704 960 39 4652	HES-204 Q. 61	1139
31	41	1	ARTHRITIS & RHEUMATISM - HAVE YOU HAD IT IN THE PAST YEAR? 1 - Yes 2 - No 3 - Questionable 4 - Other 5 - No Arthritis or Rheumatism	1662 312 18 28 4652	HES-204 Q. 61	1140
32	42	1	ARTHRITIS OR RHEUMATISM - DO YOU TAKE MEDICINE FOR IT? 1 - Yes 2 - No 3 - Questionable 4 - Other 5 - No Arthritis Indicated	611 1360 15 34 4652	HES-204 Q. 61	1141
33	43	1	GOUT - RECODE 1 - Yes 2 - No or Questionable	66 6506	HES-204 Q. 64	1145

Detailed Description of Data Items

DETAIL NOTE #1

FILE SEQUENCE NUMBER

This five digit code represents two identifying numbers. The first is the number 'five' which is given to every record. This number identifies the tape as being an Osteoarthritis & Rheumatoid Arthritis tape. The last four digits sequentially number all of the records (from 0001 to 6672) on the tape.

DETAIL NOTE #2

FINAL ESTIMATE WEIGHT

This data item is the final weighting factor that will adjust the sampled person to the PSU selective technique and to the post-stratification by age & sex for the final national estimates. In addition, this number was adjusted so that the biasing effect of non-response would be minimized.

DETAIL NOTE #5, #6, #7,
#8, #9, #10

O.A.	Hands	- Final Reading
O.A.	Feet	- Final Reading
O.A.	Hands & Feet	- Final Reading
R.A.	Hands	- Final Reading
R.A.	Feet	- Final Reading
R.A.	Hands & Feet	- Final Reading

These data items refer to diagnosis of O.A. & R.A. according to x-rays taken. Appendix A tells how x-rays were interpreted and how a final reading was derived from three individual readings. Note that the original codes were: 0-4,BL; and the corresponding codes presently used for the O.A. & R.A. tape are 1-5,9.

When osteoarthritis & rheumatoid arthritis existed in the same individual, the grade given for Osteoarthritis was based only on those joints not affected by rheumatoid arthritis, since the former changes were considered secondary to the destructive changes of rheumatoid arthritis.

DETAIL NOTE #11

OSTEO-ARTHRITIS DIAGNOSIS (X-ray)

This item gives a further breakdown of codes for item #7 on the Osteoarthritis & Rheumatoid Arthritis tape. The original x-rays were used as the source for the coding of this item.

DETAIL NOTE #12

X-RAY READING ESTIMATED

This item indicates that values for x-ray readings were estimated when certain x-rays were not available for some reason or another. "Not Estimated" indicates that the x-rays were taken. "Estimated for feet only all 3 readers" indicates that the original x-rays of the feet were not available for reading so an estimate had to be made as to the score for that examinee. "Estimated for feet - 1st reader only" indicated that one of the copies of the feet x-rays for an examinee were not available. The rating for that examinee was estimated.

DETAIL NOTE #13

LIMITATION OF ACTIVITY

This item was taken on the HES Household Survey. The question of limitation of activity pertained to everyone who was limited (eg: invalids, amputies, disabled persons, arthritic persons, etc.). This means that the item does not refer exclusively to arthritic persons.

DETAIL NOTE #14

OA HANDS OR FEET CONDENSED
X-RAY READING BY SEVERITY

This item is a condensed version of O.A. & R.A. Tape item #11 based on severity (none, mild, moderate or severe).

DETAIL NOTE #15

O.A. HANDS OR FEET CONDENSED
X-RAY READING BY LOCATION

This item is a condensed version of O.A. & R.A. tape item #11 based on location (hands, feet, or hands & feet).

DETAIL NOTE #24

BENTONITE FLOCCULATION

In the test bentonite, a naturally occurring clay in powder form was suspended in distilled water. Particles of optimum size for the test were obtained by differential centrifugation. The particles were coated with gamma globulin and dyed methylene blue.

Rheumatoid factor, if present in an examinee's serum, flocculated coated particles. Findings were considered positive when at least 50 percent (50%) of the bentonite particles were clumped into compact masses by a serum diluted 1:32 or more.

DETAIL NOTE #25

ESTIMATED BFT RESULTS

At the time BFT results were coded some data was not available. These instances results were estimated.

When no information was available, it was assumed that the distribution of characteristics and BFT results would parallel those for person of the same age, sex, and race.

Appendix A

Explanation of X-ray Coding Techniques

RATING METHODS AND READER AGREEMENT ON X-RAY DIAGNOSIS

With the decision to base the diagnosis of osteoarthritis solely on X-ray evidence, the need to ensure maximum uniformity in the grading for all 6,413 sets of films from the Survey examination was critical. The ratings, as previously indicated, were done independently by members of a team of three skilled specialists in arthritic diseases to minimize the possi-

bility of underreporting of degenerative changes. Disagreements obtained were later resolved by consultation.

For rating purposes, the X-rays of the hands and feet contained no identification other than the Survey number and the date to obviate possible bias from a knowledge of age and sex.

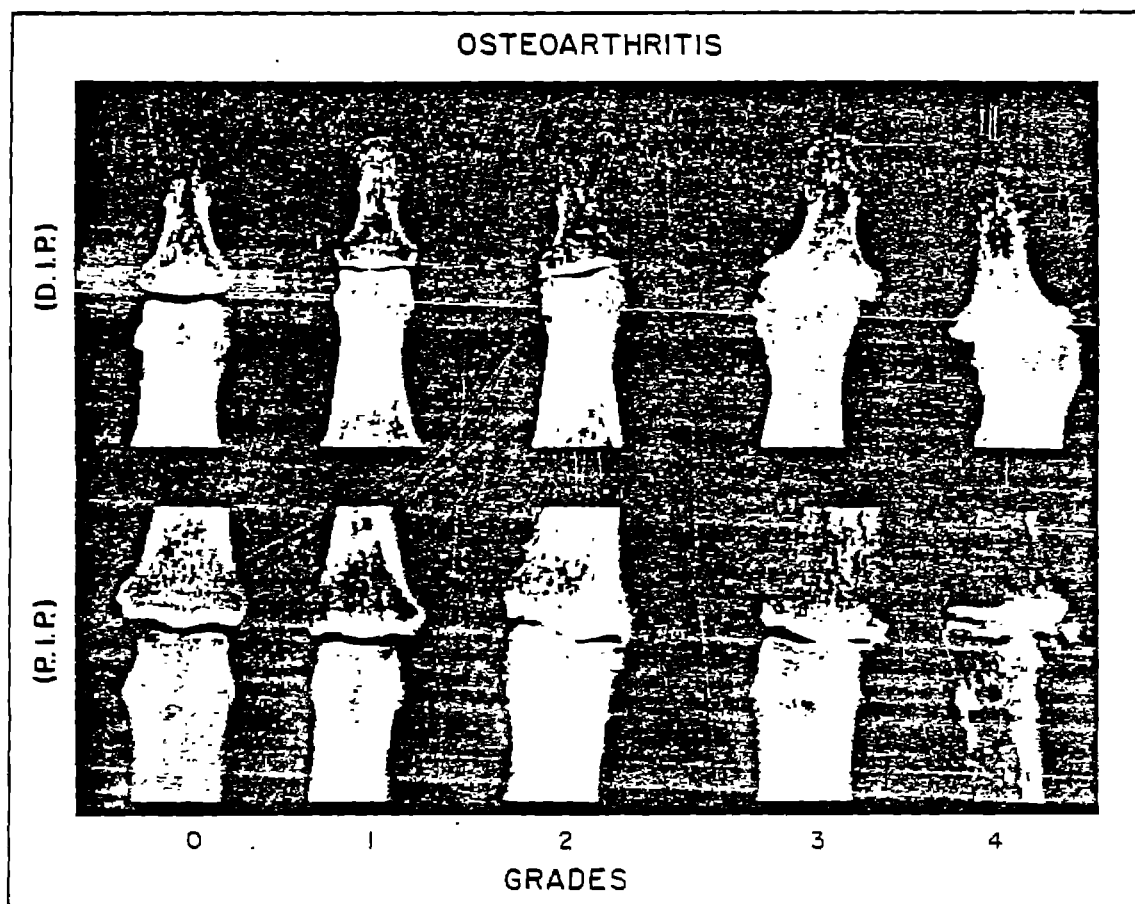


Figure 1. Grading of osteoarthritis in distal-interphalangeal (D.I.P.) and proximal-interphalangeal (P.I.P.) joints of the hands. Radiograph series from the Clinical Center, National Institutes of Health used in the Health Examination Survey, Cycle 1.

Radiographs of the hands and feet of each examinee were treated as a unit and filed in the same envelope. The envelopes from two stands were placed in random order and the films examined independently by the three specialists from the National Institute of Arthritis and Metabolic Diseases.

The rating, as previously indicated, was done in accordance with the method and published photographs of Kellgren and Lawrence⁵ and the films from the Clinical Center, National Institutes of Health shown in figures I and II. The degree was classed into the five grades: 0-none; 1-doubtful; 2-minimal; 3-moderate; and 4-severe.

The readers rated independently of each other, examining either the film of the hands or feet first and, where necessary, referring back to the film which had first been read before entering the final grades. After the final grades were determined by the reader, the films were returned to their envelopes and no further revision in rating was permitted.

When the radiographic changes observed in any single joint of the hands (or feet) exceeded the grade of any other joint on the same film by two grade points or more, the grades were recorded in the form of a fraction with the grade of the more severely affected joint as the denominator and the maximum grade of the others as the numerator. The grade of such isolated joints was not used in determining the severity of osteoarthritis as reported herein. Furthermore, as previously indicated, when osteoarthritis and rheumatoid arthritis evidence coexisted on the same film the grading given for osteoarthritis was based only on those joints not affected by rheumatoid arthritis, since these changes were considered secondary to the destructive changes of rheumatoid arthritis.

Other than the above exceptions, the grade given for the hands or for the feet was the grade of the most severely affected joint of that extremity. When the grades given by the three observers for a single film were within one point of each other, the majority ruled.

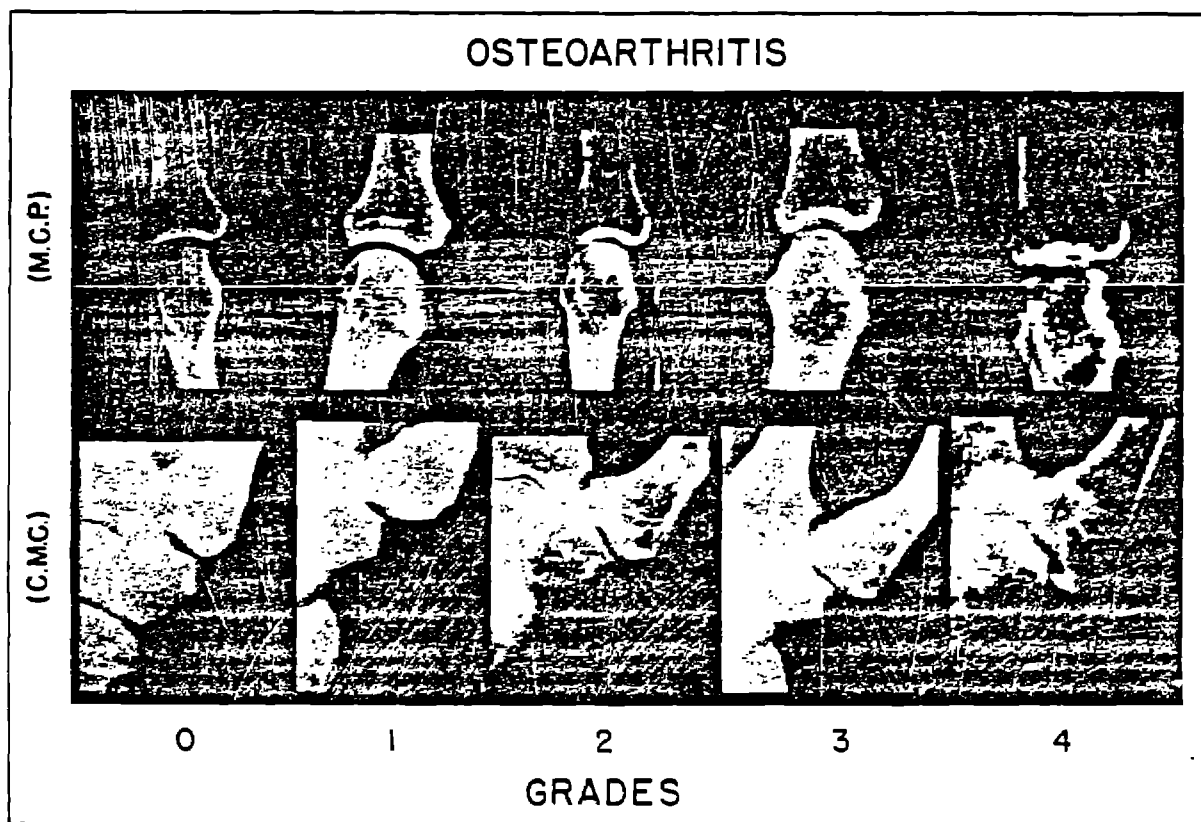


Figure II. Gradings of osteoarthritis in metacarpophalangeal (M.C.P.) and carpometacarpal (C.M.C.) joints of the hands. Radiograph series from the Clinical Center, National Institutes of Health used in the Health Examination Survey, Cycle I.

When the grades differed by two or more points, the three observers reread the film together. They first regraded the film independently without consultation and if this second grading was within one point, the majority ruled. If, however, the grading still differed by two or more points, the difference was discussed and a final grade determined.

The higher of the two ratings—for hands or feet—was considered to be the degree of severity of osteoarthritis in the examinee for the purpose of the Survey diagnosis.

As shown in table I, the level of agreement among the three readers was significantly better on the X-rays of the hands than those of the feet. While all three readers had about the same level of agreement on the X-rays of the hand—correlations ranging from +0.75 to +0.77 for pairs of readers—one of the readers

(RLB) agreed more closely with another reader (TAB) ($r = +0.64$) than with the third reader (JJB) ($r = +0.59$). The level of agreement for films of the hands was of approximately the same order of magnitude as that cited by Kellgren and Lawrence⁵ (+0.78) for replicate readings by two observers in a series of 85 films in which the first carpometacarpal joints were rated.

The level of intraobserver correlations shown in table II for one stand of examinees was of essentially the same order of magnitude as the interobserver correlations obtained in the Survey. It also did not differ significantly from the intraobserver correlations obtained on replicate readings for the metacarpophalangeal and first carpometacarpal joints of +0.88 and +0.81, respectively, in the study cited by Kellgren and Lawrence.⁵

Table I. Interobserver correlations on osteoarthritis gradings among pairs of readers of the 6,413 X-ray films for hands and feet: Cycle I of the Health Examination Survey, 1960-62

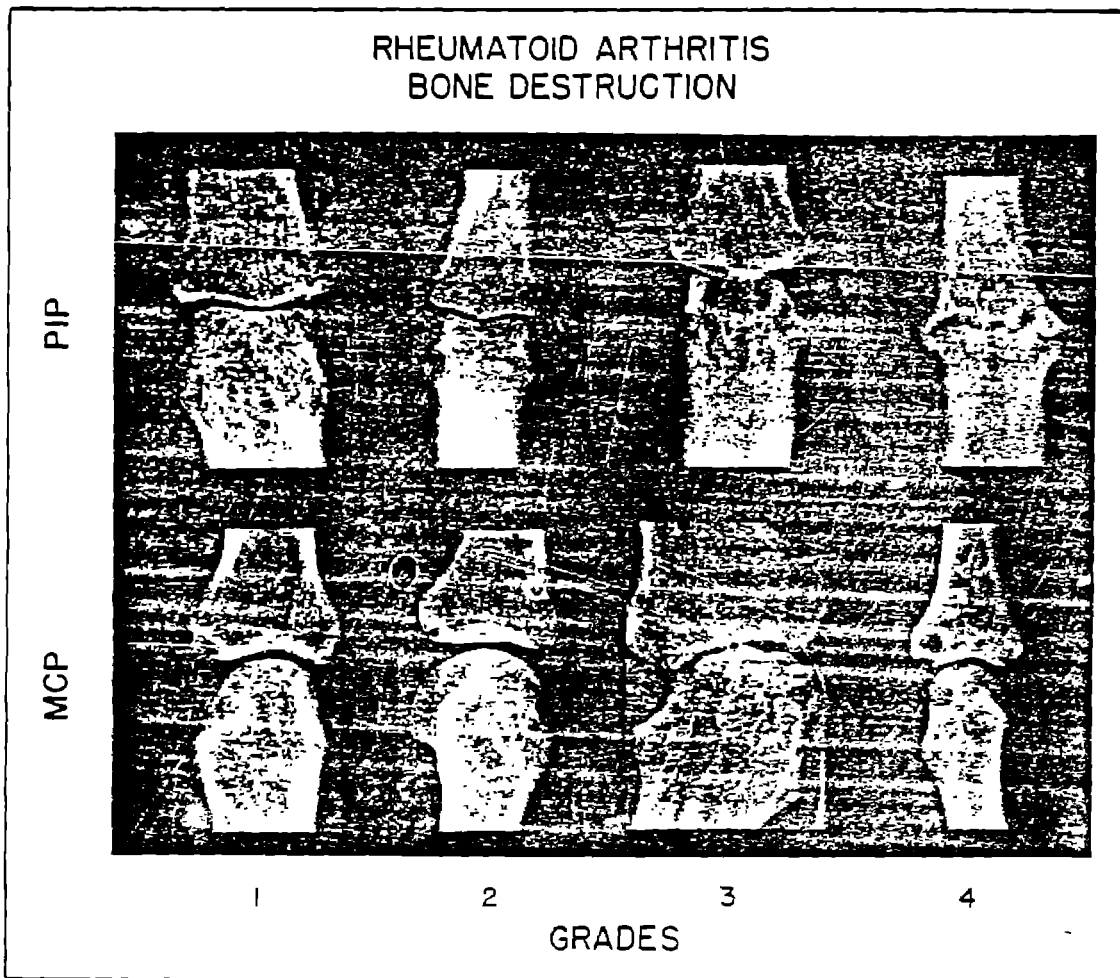
Reader	Correlations for films of	
	Hands	Feet
JJB and TAB-----	+0.76	+0.61
TAB and RLB-----	+0.77	+0.64
JJB and RLB-----	+0.75	+0.59
JJB and final reading----	+0.81	+0.73
TAB and final reading----	+0.82	+0.78
RLB and final reading----	+0.78	+0.75

Table II. Inter- and intra-observer correlations on osteoarthritis gradings among pairs of readers for one stand (150 sets of film): Cycle I of the Health Examination Survey, 1960-62

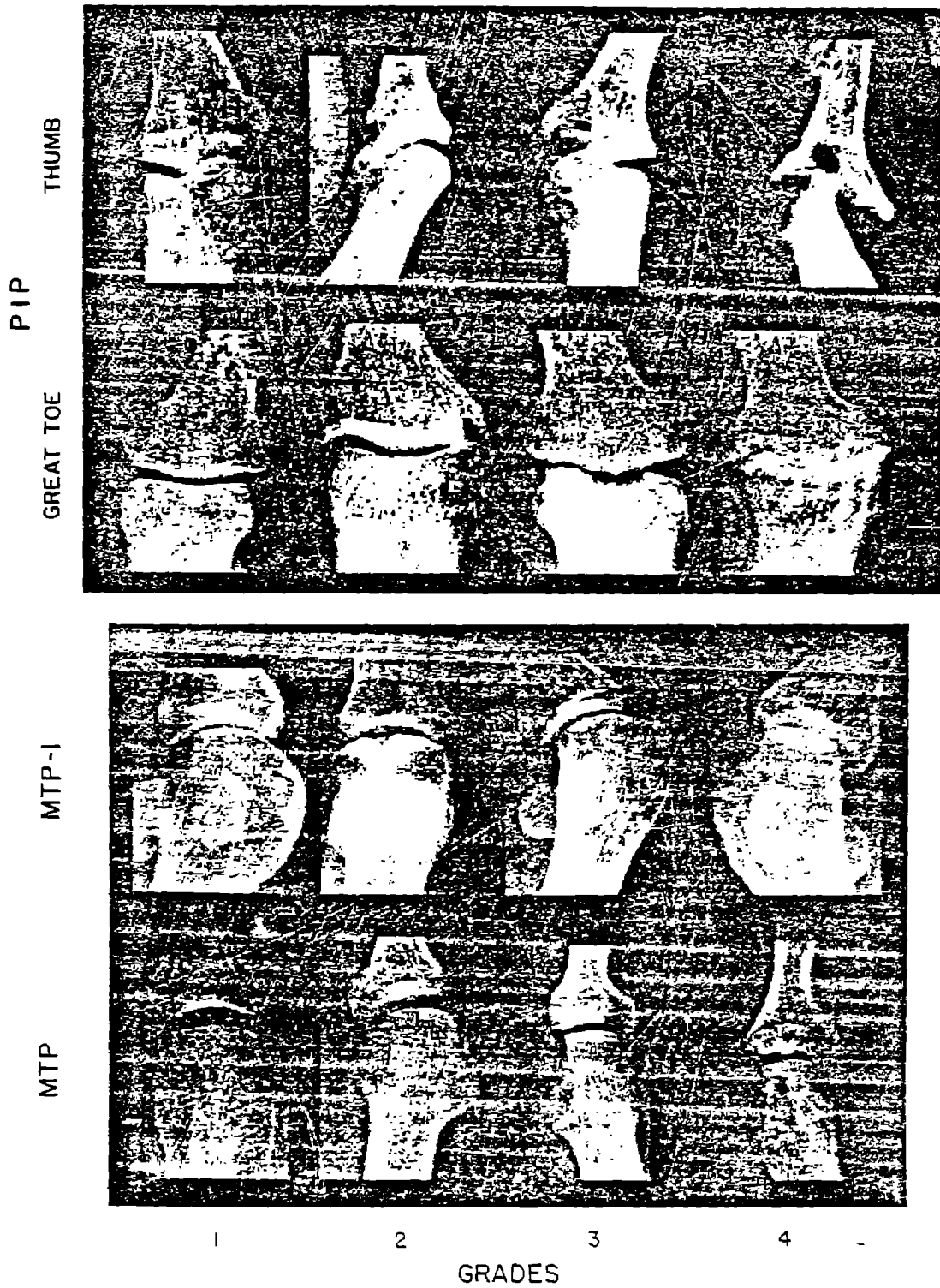
Reader	Correlations for films of	
	Hands	Feet
JJB and TAB-----	+0.69	+0.68
TAB and RLB-----	+0.81	+0.71
JJB and RLB-----	+0.40	+0.62
JJB (1st and 2d reading)--	+0.86	+0.67
TAB (1st and 2d reading)--	+0.77	+0.77
RBL (1st and 2d reading)--	+0.81	+0.77

REFERENCE X-RAY PLATES

The following X-rays show gradings of rheumatoid arthritis bone destruction in the metacarpophalangeal (MCP), proximal interphalangeal (PIP), and metatarsophalangeal (MTP) joints of the hands and feet. The radiograph series is from the Clinical Center, National Institutes of Health.



RHEUMATOID ARTHRITIS BONE DESTRUCTION



THUMB

PIP

GREAT TOE

MTP-I

MTP

1

2

3

4

GRADES

Appendix B
Glossary of Selected Terms

GLOSSARY

The following terms were referred to in the detailed descriptions of the Osteoarthritis & Rheumatoid Arthritis data items.

DISTAL INTERPHALANGEAL: Distal - remote, farthest from the center, origin, or head.

Interphalangeal - situated in a 'joint' between two phalanges (phalanges pertaining to any bone in the finger or toe).

GOUT: a condition characterized by perversion of the purine metabolism, by excess of uric acid in the blood, by attacks of acute arthritis and by forming chalky deposits in the cartilages of joints, which deposits, however, consists mostly of urates.

IRITIS: inflammation of the iris. The condition is marked by pain, congestion in the ciliary region, photophobia, contraction of the pupil, and discoloration of the iris. One of the causes of iritis is rheumatism, Gouty or uratic iritis is painful iritis occurring in gouty patients.

OSTEOARTHRITIS: chronic multiple degenerative joint disease.

RHEUMATOID ARTHRITIS: a chronic disease of the joints, usually poly-articular, marked by inflammatory changes in the synovial membranes and articular structures and by atrophy and rarefaction of the bones. In late stages, deformity and ankylosis develops.

RHEUMATISM: a disease marked by inflammation of the connective tissue structures of the body, especially the muscles and joints, by pain in these parts, by vegetation on the valves of the heart, and by the presence of Aschoff bodies in the myocardium and skin.

SUBCUTANEOUS NODULES: subcutaneous - occurring beneath the skin.

Nodules - a small boss or node which is solid and can be detected by touch.

Aschoff bodies - submiliary collections of cells and leukocytis in the interstitial tissues of the heart in rheumatic myocarditis.