

MULTIPLE SITES (IARC)

MFI93A01 Data File Set

Description

This analytical data file set consists of 14 files pertaining to the three U.S. nuclear sites included in an international combined study of cancer mortality among nuclear industry workers.

The objective of this International Agency for Research on Cancer (IARC) study was to conduct pooled analyses of nuclear industry workers by combining data from existing studies in the United States, United Kingdom, and Canada in a way that would minimize differences between these populations and their dosimetry. The motivation for conducting pooled analyses is threefold. First, estimates of carcinogenic risk per unit would be more precise with a larger worker population. Second, by applying comparable methodology and data protocol, a better understanding of differences and similarities among the existing studies could be achieved. Third, an international cooperative effort would encourage future participation of additional sites with suitable data.

The MFI93A01 data file set is comprised of 14 analytic files constructed using the IARC protocol. HFIARC_1 through HFIARC_4 contain Hanford Site data prepared by Pacific Northwest Laboratory. ORIARC_1 through ORIARC_5 contain Oak Ridge National Laboratory (ORNL) data prepared by Oak Ridge Associated Universities. RFIARC_1 through RFIARC_5 contain Rocky Flats Nuclear Weapons Plant (RFP) data prepared by Los Alamos National Laboratory.

The first file (HFIARC_1) contains demographic, work history, vital status and internal deposition data. There is one record for each of 44,106 workers. The second file (HFIARC_2) contains external exposure data. There are 342,645 records, one for each year of external exposure data for each of 36,927 monitored workers. The third file (HFIARC_3) contains additional internal exposure data. There are 324 records, one for each year of internal exposure data

for each of 125 workers. The fourth file (HFIARC_4) contains additional data related to internal exposures, off-site exposures and cause of death. There is one record for each of 44,106 workers.

The fifth file (ORIARC_1) contains demographic, work history, and vital status data. There is one record for each of 8,314 workers. The sixth file (ORIARC_2) contains additional vital status data. There are 1,525 records for 1,524 workers. The seventh file (ORIARC_3) contains external exposure data. There are 179,580 records, one for each year of external exposure data for each of 8,314 workers. The eighth file (ORIARC_4) contains internal exposure data. There is one record for each of 2,325 workers. The ninth file (ORIARC_5) contains additional exposure data. There are 11,848 records, one for each year of internal exposure data for each of 3,276 workers.

The tenth file (RFIARC_1) contains demographic, work history and vital status data. There is one record for each of 7,575 workers. The eleventh file (RFIARC_2) contains additional vital status data. There are 674 records for 671 workers. The twelfth file (RFIARC_3) contains external exposure data. There are 65,912 records, one for each year of external exposure data for each of 7,496 workers. The thirteenth file (RFIARC_4) contains internal exposure data. There is one record for each of 5,317 workers. The fourteenth file (RFIARC_5) contains off-site exposures. There is one record for each of five workers.

Workers at the Hanford Site were involved in a variety of activities that resulted in their exposure to radiation, including reactor operations, chemical separation of reactor fuel to obtain plutonium, treatment and storage of hazardous waste, and biological and engineering research.

MULTIPLE SITES

MFI93A01 Data File Set

Personal dosimeters (film or thermoluminescent) have been used at Hanford since 1944. Annual whole-body doses to penetrating external radiation are presented in units of millisieverts. Quality factors of 10 for fast neutrons, 3 for slow neutrons, and 1 for photons and electrons were used in the conversion of exposure to dose.

Bioassay programs to detect exposures to internally deposited radionuclides, primarily transuranics, at Hanford also were initiated in 1944. Internal exposure data were collected and evaluated for all individuals who worked in locations where there was a potential for intake of radioactive material.

ORNL began monitoring personnel for exposure to external penetrating radiation, primarily gamma rays, in 1943. Pocket chambers were used until June 1944, when film dosimeters (film badges) became the primary dosimeters. In 1975 film dosimeters were replaced with thermoluminescent dosimeters. From 1943 until the early 1950s, the usual practice was to provide personal dosimeters to only those workers entering designated areas where there was a potential for exposure. Subsequently, all workers at ORNL were monitored.

Based primarily on the potential for contamination from their work area, some workers were monitored for internal exposure to radionuclides beginning in 1951. Additional workers were

monitored to evaluate exposures incurred during incidents. Internal exposures were determined by examining results of urine and fecal bioassays and whole-body counting. Quantitative dose estimates from internally deposited radionuclides are not available because such estimates were not required. Also, all of the basic data needed to compute doses for the many radionuclides used at ORNL are not computerized. However, knowledgeable plant health physicists and dosimetrists state that the majority of internal monitoring results for this cohort suggest small internal doses, especially when compared with external doses.

RFP has been a weapons facility since 1952. Sources of occupational exposure include external radiation, both gamma and neutron, and potential for internal deposition of plutonium-239. Film dosimeters and thermoluminescent dosimeters were used to monitor for external radiation. Formal bioassay programs to monitor for internal radiation were begun in 1952. Results of both types of monitoring programs reflect technological improvements and changes in concepts and models during these years. ❖

MULTIPLE SITES

MFI93A01 Data File Set

Citations

IARC Study Group on Cancer Risk among Nuclear Industry Workers. 1994. Direct estimates of cancer mortality due to low doses of ionizing radiation: An international study. *The Lancet* 344:1039-1043.

Number of Analytic Files: 14		
File Name	Number of Variables	Type of Data
HFIARC_1	16	demographic; work history; vital status; internal deposition
HFIARC_2	9	external exposure
HFIARC_3	5	internal exposure
HFIARC_4	30	internal exposure; offsite exposure; cause of death
ORIARC_1	14	demographic; work history
ORIARC_2	6	vital status
ORIARC_3	6	external exposure
ORIARC_4	9	internal exposure
ORIARC_5	4	internal exposure
RFIARC_1	14	demographic; work history; vital status
RFIARC_2	5	vital status
RFIARC_3	6	external exposure
RFIARC_4	4	internal exposure
RFIARC_5	5	offsite exposure

Summary Death Tables

Cause of Death	No. of Deaths	
	Male	Female
Infectious & Parasitic Diseases	46	7
All Malignant Neoplasms	2,277	417
Lip, Oral Cavity & Pharynx	54	3
Digestive Organs & Peritoneum	615	86
Respiratory System	734	71
Bone & Connective Tissue	19	7
Skin	42	6
Breast	4	104
Genitourinary System	299	66
Brain/Central Nervous System (CNS)	76	10
Other & Unspecified Sites, Except Brain/CNS	186	24
Lymphatic/Hematopoietic	248	40
All Benign Neoplasms	9	3
All Neoplasms, Unspecified	16	2
Endocrine, Nutritional & Metabolic Diseases	174	32
Diseases of Blood & Blood-Forming Organs	14	5
Mental Disorders	56	10
Diseases of Nervous System & Sense Organs	90	21
Diseases of Circulatory System	5,118	471
Diseases of Respiratory System	665	90
Diseases of Digestive System	385	79
Diseases of Genitourinary System	107	11
Complications of Pregnancy & Childbirth	0	1
Diseases of Skin & Subcutaneous Tissue	4	3
Diseases of Musculoskeletal System & Connective Tissue	24	12
Congenital Anomalies	15	5
Symptoms & Ill-Defined Conditions	127	9
Accidents, Poisoning & Violence (External Causes)	1,006	131
Deaths, With ICD Code	10,133	1,309
Deaths, No ICD Code	312	49
Total Deaths, All Causes	10,445	1,358

MFI93A01

Variables for Analytic File HFIARC_1	
3 MB	
Name	Description
id	identification number
sex	sex of worker
dabirth	birth date
endstudy	study end date
dalvst	date of last vital status
dasem	date of start of employment
dalemp	date of last employment
yearpud	year of first plutonium deposition
yearpum	year of first plutonium monitoring
yearud	year of first uranium deposition
yearum	year of first uranium monitoring
typedep	type of internal deposition
yearothd	year of first other type deposition
ses	socioeconomic status
icd	underlying cause of death
icdrev	ICD revision number

Variables for Analytic File HFIARC_2	
21 MB	
Name	Description
id	identification number
sex	sex of worker
dabirth	birth date
year_	year dose was received
fac	facility where dose was received
dosex	x-rays and gamma rays
dosen	neutrons
dosetr	tritium
dosetot	total dose

Variables for Analytic File HFIARC_3	
8 KB	
Name	Description
id	identification number
sex	sex
dabirth	birth date
yearexpo	year of internal exposure
code1	code 1st list

Variables for Analytic File HFIARC_4	
6 MB	
Name	Description
id	identification number
sex	sex
dabirth	birth date
race	race
pu	amount of plutonium deposition
other_	amount of other type deposition
srflag	strontium flag
icd2	first associated cancer
icd3	second associated cancer
icd4	third associated cancer
icd5	fourth associated cancer
icd6	fifth associated cancer
seslast	last social class
sesgen	longest general social class
seslong	longest social class
length_	length of employment
yoffst1	year of off-site exposure 1
offsite1	amount of off-site exposure 1
yoffst2	year of off-site exposure 2
offsite2	amount of off-site exposure 2
yoffst3	year of off-site exposure 3
offsite3	amount of off-site exposure 3
yoffst4	year of off-site exposure 4

offsite4 amount of off-site exposure 4
yoffst5 year of off-site exposure 5
offsite5 amount of off-site exposure 5
yoffst6 year of off-site exposure 6
offsite6 amount of off-site exposure 6
neutron neutron estimate code
neutlike neutron likelihood code

Variables for Analytic File ORIARC_1	
500 KB	
Name	Description
filenum	file number
country	country
facility	within country facility number
id	identification number
dabirth	birth date
status	vital status
dalvst	date of last vital status
dasem	date of start of employment
dalemp	date of last employment
duremp	duration of employment
sex	sex
race	race
ses	socioeconomic status
industri	industrial/non-industrial

Variables for Analytic File ORIARC_2	
38 KB	
Name	Description
filenum	file number
globalid	global identification number
n	order of cause of death
icd3	first 3 digits of ICD code
icdl	last digit of ICD code
icdrev	ICD revision number

Variables for Analytic File ORIARC_3	
5 MB	
Name	Description
filenum	file number
globalid	global identification number
dosetype	type of radiation
year_	year dose was received
fac	facility where dose was received
dose	dose estimate (mSv)

MF193A01

Variables for Analytic File ORIARC_4	
Name	Description
	74 KB
filenum	file number
globalid	global identification number
yearpud	year of first plutonium deposition
yearpum	year of first plutonium monitoring
yearud	year of first uranium deposition
yearum	year of first uranium monitoring
typedep	type of internal deposition
yearothd	year of first other deposition
yearothm	year of first other monitoring

Variables for Analytic File ORIARC_5	
Name	Description
	261 KB
filenum	file number
globalid	global identification number
yearexpo code 1	year of internal exposure code 1st list

Variables for Analytic File RFIARC_1	
Name	Description
	470 KB
filenum	file number
country	country
facility	within country facility number
id	identification number
dabirth	birth date
status	vital status
dalvst	date of last vital status
dasem	date of start of employment
dalemp	date of last employment
duremp	duration of employment
sex	sex
race	race
ses	socioeconomic status
industri	industrial/non-industrial

Variables for Analytic File RFIARC_2	
Name	Description
	16 KB
filenum	file number
globalid	global identification number
n	order of cause of death
icd3	first 3 digits of ICD code
icdl	last digit of ICD code

Variables for Analytic File
RFIARC_3

2 MB

Name	Description
filenum	file number
globalid	global identification number
dosetype	type of radiation
year_	year dose was received
fac	facility where dose received
dose	dose estimate (mSv)

Variables for Analytic File
RFIARC_4

122 KB

Name	Description
filenum	file number
globalid	global identification number
yearpud	year of first plutonium deposition
yearpum	year of first plutonium monitoring

Variables for Analytic File
RFIARC_5

1 KB

Name	Description
filenum	file number
globalid	global identification number
n	index of doses
yeardose	year transfer dose registered
transdos	amount of transfer/off-site dose

MF193A01

MULTIPLE MYELOMA

MFMM98A1 Data File Set

Description

This analytic data file set consists of eight files generated for an epidemiological study of multiple myeloma among a cohort of 115,143 workers employed at the Hanford, Los Alamos National Laboratory, Oak Ridge National Laboratory, and Savannah River sites and hired before 1979.

This study was requested by the National Institute for Occupational Safety and Health (NIOSH) because of previous reports of associations of multiple myeloma with radiation exposures of workers at the Hanford site. The new study was intended to include more cases of disease, better evaluation of radiation doses, and measurement of other occupational exposures not available in the Hanford studies. The 98 multiple myeloma deaths and 391 age-matched controls were followed for vital status through 1990. Hanford workers were followed through only 1986. Information on prior work history, smoking, medical x-rays, and exposure to physical and chemical agents was derived from personnel, medical, industrial hygiene and health physics records.

The study compared exposure histories of cases and controls to investigate whether certain occupational exposures were relatively more common among cases. Potential exposures to a variety of chemical and physical agents that might be causes of multiple myeloma were investigated, including solvents, metals, welding fumes, asbestos, ionizing and non-ionizing radiation. With the exception of external penetrating radiation, for which most longer term workers had at least some badge data, information of exposures to specific chemical and physical agents was not sufficient to assign a quantitative exposure estimate or even to determine with a high degree of certainty whether or not a worker was exposed.

Total cumulative radiation doses were similar between cases and controls. However, doses received at ages 45 years and older were associated with an average 7% per 10 mSv (one rem) increased risk

of multiple myeloma, adjusted for age, race, sex, facility, period of hire, birth cohort, monitoring for internal radionuclide contamination, and external radiation received prior to age 45 years. The 95% confidence limit for this estimate was 1-13%. For exposure at ages 45 years and older, the odds ratio for workers with cumulative doses of 50 mSv (5 rem) or greater compared to workers with cumulative doses of less than 10 mSv was 4.34 (95% CI 1.46-12.90).

ANN_EXT includes annual external radiation dosimetry data from all study facilities standardized in a common format by year.

CCBASE is the basic case and control file which contains demographic data, employment dates, personnel and occupational health variables used in the analysis.

CHEM contains one record for each individual worker and constitutes a qualitative assessment of exposures to select chemical and physical hazards for the study population.

EMPDATES includes employment dates at each of the study sites.

INT_CNFS gives counts of internal monitoring records lagged 5, 10, 15, 20, and 25 years from the index date of the age at risk. Counts of Pu, SR, tritium, in vivo measurements, and nose counts are included.

MED_XRAY documents medical x-rays in occupational health department records at the four DOE sites.

OCC_HLTH contains one record for each individual worker of coded data abstracted from occupational health records at the four DOE sites.

PERS contains coded data abstracted from personnel records. ♦

MULTIPLE MYELOMA Summary Death Tables

MFMM98A1 Data File Set

Contact

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Number of Analytic Files: 8		
File Name	Number of Variables	Type of Data
ANN_EXT	9	annual external radiation doses
CCBASE	49	case control file
CHEM	31	chemical/physical hazards assessment file
EMPDATES	4	employment dates
INT_CNTR	37	counts of internal monitoring records
MED_XRAY	7	medical x-rays data
OCC_HLTH	12	occupational health record information
PERS	30	personnel records information

Cause of Death	No. of Deaths	
	Male	Female
Infectious & Parasitic Diseases	0	0
All Malignant Neoplasms	98	15
Lip, Oral Cavity & Pharynx	0	0
Digestive Organs & Peritoneum	9	1
Respiratory System	6	1
Bone & Connective Tissue	5	1
Skin	2	0
Breast	0	1
Genitourinary System	4	0
Brain/Central Nervous System (CNS)	0	1
Other & Unspecified Sites, Except Brain/CNS	1	0
Lymphatic/Hematopoietic	76	11
All Benign Neoplasms	0	0
All Neoplasms, Unspecified	0	0
Endocrine, Nutritional & Metabolic Diseases	1	2
Diseases of Blood & Blood-Forming Organs	0	0
Mental Disorders	1	1
Diseases of Nervous System & Sense Organs	22	4
Diseases of Circulatory System	51	1
Diseases of Respiratory System	10	2
Diseases of Digestive System	10	0
Diseases of Genitourinary System	2	1
Complications of Pregnancy & Childbirth	0	0
Diseases of Skin & Subcutaneous Tissue	0	0
Diseases of Musculoskeletal System & Connective Tissue	0	0
Congenital Anomalies	0	0
Symptoms & Ill-Defined Conditions	4	9
Accidents, Poisoning & Violence (External Causes)	4	0

Deaths, With ICD Code	175	31
Deaths, No ICD Code	2	0
Total Deaths, All Causes	177	31

Variables for Analytic File
ANN_EXT

170 KB

Name	Description
id	individual identifier
facility	DOE facility or site
neutron	annual neutron dose
pen_dose	annual penetrating dose
source	source of records
tritium	recorded tritium dose for year
wbd1	annual whole body dose
wbd2	annual whole body dose
year	year of annual dose

Variables for Analytic File
CCBASE

92 KB

Name	Description
ca81	first nonunderlying cancer
ca82	second nonunderlying cancer
cancerhx	history of cancer
case	case/control status
caseid	id of case in case-control set
caseset	identifier of the case control set
id	individual identifier
clas_chg	health classification changed
deny_job	ever denied job at a study facility
dlo	date of last observation
dob	date of birth
doefac	number of DOE facilities worked
educ_max	maximum education
endstudy	date of end of study
fac1	first non-study DOE facility
fac2	second non-study DOE facility
fac3	third non-study DOE facility
fac_ind	index facility
farm	ever lived/worked on farm
han	earliest hire date at Hanford
hfg_ind	index facility- hire date flag
hire	hire date at index facility

icda8	underlying cause of death
ind_age	index age
ind_date	index date
lanl	first hire date at LANL
military	ever military service
nir_exp	nonionizing radiation exposure
nuc_irad	nuclear ionizing radiation exposure
nummmfac	number DOE study facilities worked
occ_pnt	occupational exposure to paint
oh_rec	occupational health record available
ornl	first hire date at ORNL
oth_irad	nonnuclear ionizing radiation exp
pr_nfac1	first prior non-study nuclear facility
pr_nfac2	second prior non-study nuclear facil
pr_nucl	prior non-study nuclear facility
pr_rec	personnel record available
race	race
rad_rx	radiation treatment
sec_spec	special security clearance
sec_term	termination of security clearance
sex	gender of worker
sitein	earliest hire date
siteout	last term date
smoking	smoking history
srp	first hire date at SRS
vs	vital status

Variables for Analytic File
CHEM

21 KB

Name	Description
id	individual identifier
anymtl_c	any metal confidence
anymtl_j	any metal judgement
arom_c	aromatic hydrocarbons confidence
arom_j	aromatic hydrocarbons judgement
asb_c	asbestos confidence
asb_j	asbestos judgement
be_c	beryllium confidence
be_j	beryllium judgement
cd_c	cadmium confidence
cd_j	cadmium judgement
elf_c	ELF/EMF confidence
elf_j	ELF/EMF judgement
hal_c	halogenated hydrocarbons confidence
hal_j	halogenated hydrocarbons judgement
hg_c	mercury confidence
hg_j	mercury judgement
micro_c	microwave confidence
micro_j	microwave judgement
ni_c	nickel confidence
ni_j	nickel judgement
othmtl_c	other metals confidence
othmtl_j	other metals judgement
pb_c	lead confidence
pb_j	lead judgement
stat_c	static magnetic fields confidence

MFMM198A1

stat_j static magnetic fields judgement
ur_c uranium confidence
ur_j uranium judgement
weld_c welding fumes confidence
weld_j welding fumes judgement

Variables for Analytic File EMPDATES	
Name	Description
id	individual identifier
facility	DOE facility or site
strtdate	start date
type	type of employment status

Variables for Analytic File INT_CNTRS	
Name	Description
caseset	identifier of the case control set
id	individual identifier
nosec05	nose swipes- 5 year lag
nosec10	nose swipes- 10 year lag
nosec15	nose swipes - 15 year lag
nosec20	nose swipes - 20 year lag
nosec25	nose swipes - 25 year lag
oth05	other bioassays- 5 year lag
oth10	other bioassays- 10 year lag
oth15	other bioassays- 15 year lag
oth20	other bioassays- 20 year lag
oth25	other bioassays- 25 year lag
pu_c05	# of plutonium bioassays- 5 year lag
pu_c10	# of plutonium bioassays- 10 year lag
pu_c15	# of plutonium bioassays- 15 year lag
pu_c20	# of plutonium bioassays- 20 year lag
pu_c25	# of plutonium bioassays-25 year lag
sr_c05	# of strontium bioassays- 5 year lag
sr_c10	# of strontium bioassays- 10 year lag

sr_c15	# of strontium bioassays- 15 year lag
sr_c20	# of strontium bioassays- 20 year lag
sr_c25	# of strontium bioassays- 25 year lag
trit_05	tritium bioassays- 5 year lag
trit_10	tritium bioassays- 10 year lag
trit_15	tritium bioassays- 15 year lag
trit_20	tritium bioassays- 20 year lag
trit_25	tritium bioassays- 25 year lag
u_c05	# of uranium bioassays- 5 year lag
u_c10	# of uranium bioassays- 10 year lag
u_c15	# of uranium bioassays- 15 year lag
u_c20	# of uranium bioassays- 20 year lag
u_c25	# of uranium bioassays- 25 year lag
wb_c05	# of invivo counts- 5 year lag
wb_c10	# of invivo counts- 10 year lag
wb_c15	# of invivo counts- 15 year lag
wb_c20	# of invivo counts- 20 year lag
wb_c25	# of invivo counts- 25 year lag

Variables for Analytic File
MED_XRAY

206 KB

Name	Description
id	individual identifier
facility	DOE facility
xrdate	date of x-ray
xrreason	x-ray reason
xrtype	x-ray type
comments	notes about x-ray
xrrepeat	repeat x-ray

Variables for Analytic File
OCC_HLTH

20 KB

Name	Description
id	individual identifier
facility	DOE study facility
smoking	smoking history
yrsnosmk	years not smoking
clas_chg	health classification changed
deny_job	ever denied job at a study facility
cancerhx	history of cancer
icd9a	first cancer diagnosis
yr_dx1	date of first cancer diagnosis
icd9b	second cancer diagnosis
yr_dx2	date of second cancer diagnosis
rad_rx	radiation treatment

Variables for Analytic File
PERS

62 KB

Name	Description
cerid	individual identifier
facility	DOE study facility
birth_pl	place of birth
educ_max	maximum education
degree_1	first degree
degree_2	second degree
degree_3	third degree
sec_clr1	first security clearance code
sec_dt1	date of first security clearance
sec_clr2	second security clearance code
sec_dt2	date of second security clearance
sec_clr3	third security clearance code
sec_dt3	date of third security clearance
sec_spec	special security clearance
sec_term	termination of security clearance
military	military service
mil_bran	military branch
mil_in	military start date
mil_out	end of military service
mil_days	total days in military
farm	ever lived/worked on farm
pr_nucl	prior non-study nuclear facility
pr_nfac1	first prior non-study nuclear facility

pr_nfac2	second prior non-study nuclear facil
nuc_irad	ionizing radiation exposure
iradfac1	first nuclear ionizing radiation
iradfac2	second nuclear ionizing radiation
oth_irad	nonnuclear ionizing radiation exposure
occ_pnt	occupational exposure to paint
nir_exp	non-ionizing radiation exposure

MULTIPLE SITES

MFS93A01 Data File Set

Description

This analytic data file set supports a combined mortality study of employees at the Hanford, Fernald, and Oak Ridge sites. The results of this completed study have not been published. When information from a publication becomes available, the purpose and findings of this study will be added to the on-line CEDR description.

MFS93A01 consists of two files related to an analysis that uses this data and the data in HFS93A03. CEDR personnel originally received a single file and separated it into two files for logistical convenience.



Contact

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Number of Analytic Files: 2		
File Name	Number of Variables	Type of Data
MFS93_1	50	demographics; work history
MFS93_2	41	external radiation doses

MULTIPLE SITES

MFS93A01 Data File Set

Summary Death Tables

Cause of Death	No. of Deaths	
	Male	Female
Infectious & Parasitic Diseases	29	4
All Malignant Neoplasms	915	85
Lip, Oral Cavity & Pharynx	16	3
Digestive Organs & Peritoneum	225	17
Respiratory System	325	10
Bone & Connective Tissue	9	0
Skin	17	1
Breast	1	20
Genitourinary System	112	17
Brain/Central Nervous System (CNS)	35	2
Other & Unspecified Sites, Except Brain/CNS	67	2
Lymphatic/Hematopoietic	108	13
All Benign Neoplasms	2	0
All Neoplasms, Unspecified	3	0
Endocrine, Nutritional & Metabolic Diseases	42	2
Diseases of Blood & Blood-Forming Organs	8	0
Mental Disorders	16	1
Diseases of Nervous System & Sense Organs	22	2
Diseases of Circulatory System	1,884	62
Diseases of Respiratory System	210	12
Diseases of Digestive System	132	9
Diseases of Genitourinary System	37	5
Complications of Pregnancy & Childbirth	0	1
Diseases of Skin & Subcutaneous Tissue	2	1
Diseases of Musculoskeletal System & Connective Tissue	4	0
Congenital Anomalies	4	1
Symptoms & Ill-Defined Conditions	148	6
Accidents, Poisoning & Violence (External Causes)	471	33

Deaths, With ICD Code	3,929	224
Deaths, No ICD Code	662	49
Total Deaths, All Causes	4,591	273

Variables for Analytic File

MFS93_1

6 MB

Name	Description
------	-------------

id	identification number
plant	plant
sex	sex
race	race
birthyr	birth year relative to 1900
hireyr	hire year relative to 1900
termyr	termination year relative to 1900
deathyr	death year relative to 1900
icd8und	cause of death (underlying)
icd8con	cause of death (contributory)
paycod43	paycode by year, 1943-1982
⋮	
paycod82	

Variables for Analytic File

MFS93_2

17 MB

Name	Description
------	-------------

id	identification number
extdos43	external dose by year, 1943-1982
⋮	
extdos82	