Dataset Integrity Check for the Nonalcoholic Steatohepatitis (NASH) Nonalcoholic fatty liver disease (NAFLD) Adult Data Files

Prepared by Michael Spriggs
IMS Inc.
3901 Calverton Blvd, Suite 200 Calverton MD 20705
April 8, 2014

Table of Contents

1 Standard Disclaimer

The intent of this DSIC is to provide confidence that the data distributed by the NIDDK repository is a true copy of the study data. Our intent is not to assess the integrity of the statistical analyses reported by study investigators. As with all statistical analyses of complex datasets, complete replication of a set of statistical results should not be expected in secondary analysis. This occurs for a number of reasons including differences in the handling of missing data, restrictions on cases included in samples for a particular analysis, software coding used to define complex variables, etc. Experience suggests that most discrepancies can ordinarily be resolved by consultation with the study data coordinating center (DCC), however this process is labor-intensive for both DCC and Repository staff. It is thus not our policy to resolve every discrepancy that is observed in an integrity check. Specifically, we do not attempt to resolve minor or inconsequential discrepancies with published results or discrepancies that involve complex analyses, unless NIDDK Repository staff suspect that the observed discrepancy suggests that the dataset may have been corrupted in storage, transmission, or processing by repository staff. We do, however, document in footnotes to the integrity check those instances in which our secondary analyses produced results that were not fully consistent with those reported in the target publication.

2 Study Background

Nonalcoholic fatty liver disease (NAFLD) affects 10%-30% of the general U.S. population and can progress to significant fibrosis and cirrhosis. The Nonalcoholic Steatohepatitis Clinical Research Network (NASH CRN) was initiated by the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) in 2002 to conduct multicenter, collaborative studies on the etiology, contributing factors, natural history, complications, and treatment of NASH.

The aim of this study is to determine the associations of readily available demographic, clinical, and laboratory variables with the diagnosis of NASH and its key histological features, and determine the ability of these variables to predict the severity of nonalcoholic fatty liver disease (NAFLD).

Note that this data package only contains the analysis datasets that were used for the Arun et al [1] publication.

3 Archived Datasets

All SAS data files, as provided by the Data Coordinating Center (DCC), are located in the NASH “Data” folder in the data package. For this replication, variables were taken from the “table1”, “table 2”, and “table 3”, datasets. These datasets were analysis datasets created by the DCC .

4 Statistical Methods

Analyses were performed to duplicate results for the data published by Arun et al [1] in the New England Journal of Medicine in May 2010.

To verify the integrity of the three datasets, descriptive statistics of baseline characteristics were computed, by treatment group (Table B, table D, table F).

5 Results

Table 1 in the publication [1], Characteristics of Adult Patients with NAFLD Enrolled in the NASH CRN Studies. Table A lists the variables that were used in the replication and Table B compares the results calculated from the archived data file to the results published in Table 1. The results of the replication are similar to the published results.

Table 2 in the publication [1: Characteristics of Adult Patients with NAFLD with Contemporaneous Biopsies and Clinical Factors by Presence of Definite NASH. Table C lists the variables that were used in the replication and Table D compares the results calculated from the archived data file to the results published in Table 2. The results of the replication are similar to the published results.

Table 3 in the publication [1] Characteristics of Adult Patients with NAFLD with Contemporaneous Biopsies and Clinical Factors by Fibrosis Stage. Table E lists the variables that were used in the replication and Table F compares the results calculated from the archived data file to the results published in Table 3. The results of the replication are similar to the published results.

6 Conclusions

The NIDDK repository is confident that the NASH data files to be distributed are a copy of the manuscript data.

7 References

1. Neuschwander-Tetri, B. A., Clark, J. M., Bass, N. M., Van Natta, M. L., Unalp-Arida, A., Tonascia, J., Zein, C. O., Brunt, E. M., Kleiner, D. E., McCullough, A. J., Sanyal, A. J., Diehl, A. M., Lavine, J. E., Chalasani, N., Kowdley, K. V. and NASH Clinical Research Network (2010), Clinical, laboratory and histological associations in adults with nonalcoholic fatty liver disease. Hepatology, 52: 913–924. doi: 10.1002/hep.23784

Table A: Variables used to replicate Table 1: Characteristics of Adult Patients with NAFLD Enrolled in the NASH CRN Studies

Table Variable	Variables Used in Replication from the "Table 1" Dataset
Proximity of Liver Biopsy to Enrollment	PROXIMIT
Acanthosis nigricans	ACANTH
Acanthosis nigricans severity score	ACANTHN
Age - yrs	AGE
Albumin - g/dL	ALB
Alkaline phosphatase - U/L	ALKA
Isolated Alkaline phosphatase	ALKAISO
AST - U/L	ALT
Abnormal AST	ALTULN1
AMA	AMA
ANA	ANA
ANA and ASMA	ANAASMA
Cirrhosis	ANYCIRRH
ASMA	ASMA
AST - U/L	AST
Abnormal AST	ASTULN1
Bilirubin, direct - mg/dL	BILID
Bilirubin, total - mg/dL	BILIT
Body Mass Index - kg/m2	BMI
Total cholesterol - mg/dL	CHOL
Definite NASH	DEFNASH
Type 2 diabetes	DIAB2
Ferritin ng/mL	FERR
GGT - U/L	GGT
Globulin - g/dL	GLOB
Glucose mg/dL	GLUC
HbA1c - %	HBA1C
HDL cholesterol - mg/dL	HDL
Hematocrit - %	HEMA
Hispanic ethnicity	HISPANIC
HOMA-IR - mg/dL/uU/mL/405	HOMA
Hypertension	HTN
Any inflammation	IBALL
Fibrosis score	IFIBRO

Table Variable	Variables Used in Replication from the "Table 1" Dataset
Steatosis>=34%	IGRADE
Lobular inflammation>=grade 2	IINFLAM
NAS>=5	INAS
International normalized ratio	INR
Insulin uU/mL	INSU
Portal inflammation>mild	IPORTAL
LDL cholesterol - mg/dL	LDL
Biopsy length	LENG10
Male gender	MALE
Mallory bodies	MALLORY
Metabolic syndrome	META
Platelets - 1000/mm3	PLAT
AST/ALT ratio	RATIO
Triglyercides - mg/dL	TRI
Waist circumference - cm	WAIST
White blood cell - 1000/mm3	WBC
White race	WHITE
Waist to hip ratio	WTHIP

Table B: Comparison of values computed in integrity check to reference article Table 1 values

Characteristic	<=6 Months (n=698) [Manuscript]	<=6 Months (n=698) [DSIC]	<=6 Months (n=698) [Diff]	>6 Months (n=403) [Manuscript]	>6 Months (n=403) [DSIC]	>6 Months (n=403) [Diff]
Male (%)	39	39	0	34	34	0
Age, years (median +- SD)	49	49	0	52	52	0
White (%)	81	81	0	85	85	0
Hispanic (%)	14	14	0	7	7	0
Hypertension (%)	44	44	0	56	56	0
Type 2 diabetes (%)	22	22	0	42	42	0
Metabolic syndrome† (%)	62	62	0	59	59	0
Acanthosis nigricans Positive (%)	13	13	0	9	9	0
Acanthosis nigricans Severity score (mean +- SD)	0.31	0.31	0	0.18	0.18	0
Body mass index (kg/m2)	34	34	0	33	33	0
Waist circumference (cm)	108	108	0	106	106	0
Waist-to-hip ratio	0.93	0.93	0	0.93	0.93	0
AST (U/L)	45	45	0	37	37	0
Abnormal AST** (%)	48	48	0	35	35	0
ALT (U/L)	65	65	0	44	44	0
Abnormal ALT** (%)	65	65	0	41	41	0
AST/ALT	0.72	0.72	0	0.84	0.84	0
Alkaline phosphatase (U/L)	80	80	0	85	85	0
Isolated abnormal alkaline phosphatase§ (%)	3	3	0	6	6	0
GGT (U/L)	49	49	0	46	46	0
Globulin (g/dL)	3	3	0	3	3	0
Albumin (g/dL)	4.2	4.2	0	4.3	4.3	0
Bilirubin, total (mg/dL)	0.7	0.7	0	0.7	0.7	0

Characteristic	<=6 Months (n=698) [Manuscript]	<=6 Months (n=698) [DSIC]	<=6 Months (n=698) [Diff]	>6 Months (n=403) [Manuscript]	>6 Months (n=403) [DSIC]	>6 Months (n=403) [Diff]
Bilirubin, direct (mg/dL)	0.1	0.1	0	0.1	0.1	0
International normalized ratio (mean +- SD)	1.02	1.02	0	1.04	1.04	0
Hematocrit (%)	42	43	-1	41	41	0
White blood cells (1000/mm3)	6.7	7	0	6.3	6	0
Platelet count (1000/mm3)	244	245	-1	225	225	0
Total cholesterol (mg/dL)	195	195	0	188	189	-1
HDL cholesterol (mg/dL)	42	42	0	45	45	0
LDL cholesterol (mg/dL)	119	119	0	111	111	0
Triglycerides (mg/dL)	152	152	0	141	141	0
HbA1c (%)	5.7	5.7	0	5.8	5.8	0
Fasting serum glucose (mg/dL)	96	96	0	99	99	0
Fasting serum insulin (lU/mL)	19	19	0	17	17	0
HOMA-IR (mg/dL lU/mL/405)	4.4	4.4	0	4.4	4.4	0
ANA (% positive)	24	24	0	21	21	0
ASMA (% positive)	10	10	0	15	15	0
ANA þ ASMA (% both positive)	3	3	0	5	5	0
AMA (% positive)	6	6	0	1	1	0
Ferritin (ng/mL)	155	155	0	127	127	0
Steatosis (% >= 34%)	59	59	0	47	47	0
Lobular inflammation (% >= grade 2)	48	48	0	44	44	0
Portal inflammation (% > mild)	20	20	0	30	30	0
Ballooning (% any)	67	67	0	64	64	0
NAFLD Activity Score (% >=5)	49	49	0	44	44	0

Characteristic	<=6 Months (n=698) [Manuscript]	<=6 Months (n=698) [DSIC]	<=6 Months (n=698) [Diff]	>6 Months (n=403) [Manuscript]	>6 Months (n=403) [DSIC]	>6 Months (n=403) [Diff]
Presence of NASH (% definite)	58	58	0	55	55	0
Fibrosis score§§ (mean +- SD)	1.5	1.1	0	1.9	1.4	0
Mallory bodies (% present)	28	28	0	33	33	0
Biopsy length (% < 10 mm)	13	13	0	14	14	0

Characteristic	No Liver Biopsy (n=165) [Manuscript]	No Liver Biopsy (n=165) [DSIC]	No Liver Biopsy (n=165) [Diff]	Total (n=1266) [Manuscript]	Total (n=1266) [DSIC]	Total (n=1266) [Diff]
Male (%)	33	33	0	36	36	0
Age, years (median +- SD)	52	52	0	50 +- 12	50 ± 12	0, 0
White (%)	79	79	0	82	82	0
Hispanic (%)	14	14	0	12	12	0
Hypertension (%)	52	52	0	49	49	0
Type 2 diabetes (%)	40	40	0	31	31	0
Metabolic syndrome† (%)	57	57	0	61	61	0
Acanthosis nigricans Positive (%)	13	13	0	12	12	0
Acanthosis nigricans Severity score (mean +- SD)	0.28	0.28	0	0.26 +- 0.81	0.26 ± 0.81	0, 0
Body mass index (kg/m2)	33	33	0	33 +- 6	33 ± 7	0, -1
Waist circumference (cm)	106	106	0	108 +- 15	108 ± 14	0, 1
Waist-to-hip ratio	0.92	0.92	0	0.93 +- 0.08	0.93 ± 0.08	0, 0
AST (U/L)	36	36	0	41 +- 22	41 ± 33	0, -11
Abnormal AST** (%)	27	27	0	41	41	0
ALT (U/L)	45	45	0	56 +- 36	56 ± 49	0, -13
Abnormal ALT** (%)	42	42	0	55	55	0
AST/ALT	0.79	0.79	0	0.76 +- 0.30	0.76 ± 0.40	0, -0.1
Alkaline phosphatase (U/L)	82	82	0	82 +- 30	82 ± 38	0, -8
Isolated abnormal alkaline phosphatase§ (%)	2	2	0	4	4	0
GGT (U/L)	45	45	0	47 +- 40	47 ± 86	0, -46
Globulin (g/dL)	3	3	0	3.0 +- 0.5	3.0 ± 0.6	0, -0.1
Albumin (g/dL)	4.2	4.2	0	4.2 +- 0.4	4.2 ± 0.5	0, -0.1
Bilirubin, total (mg/dL)	0.7	0.7	0	0.7 +- 0.3	0.7 ± 0.5	0, -0.2

Characteristic	No Liver Biopsy (n=165) [Manuscript]	No Liver Biopsy (n=165) [DSIC]	No Liver Biopsy (n=165) [Diff]	Total (n=1266) [Manuscript]	Total (n=1266) [DSIC]	Total (n=1266) [Diff]
Bilirubin, direct (mg/dL)	0.1	0.1	0	0.1 +- 0.07	0.1 ± 0.1	0, -0.03
International normalized ratio (mean +- SD)	1.04	1.04	0	1.03 +- 0.18	1.03 ± 0.18	0, 0
Hematocrit (%)	41	41	0	42 +- 4	42 ± 4	0, 0
White blood cells (1000/mm3)	6.5	6.5	0	6.5 +- 1.8	6.5 ± 2.7	0, -0.9
Platelet count (1000/mm3)	236	236	0	237 +- 70	237 ± 77	0, -7
Total cholesterol (mg/dL)	184	184	0	192 +- 41	192 ± 43	0, -2
HDL cholesterol (mg/dL)	43	43	0	43 +- 12	43 ± 13	0, -1
LDL cholesterol (mg/dL)	110	110	0	117 +- 36	117 ± 37	0, -1
Triglycerides (mg/dL)	134	134	0	144 +- 78	144 ± 119	0, -41
HbA1c (%)	5.8	5.8	0	5.7 +- 0.7	5.7 ± 1.2	0, -0.5

Table C: Variables used to replicate Table 2: Characteristics of Adult Patients with NAFLD with Contemporaneous Biopsies and Clinical Factors by Presence of Definite NASH

Table Variable	Variables Used in Replication from the "Table 2" Dataset
Acanthosis nigricans	ACANTH
Acanthosis nigricans severity score	ACANTHN
Age - yrs	AGE
Albumin - g/dL	ALB
Alkaline phosphatase - U/L	ALKA
Isolated Alkaline phosphatase	ALKAISO
AST - U/L	ALT
Abnormal AST	ALTULN1
AMA	AMA
ANA	ANA
ANA and ASMA	ANAASMA
Cirrhosis	ANYCIRRH
ASMA	ASMA
AST - U/L	AST
Abnormal AST	ASTULN1
Bilirubin, direct - mg/dL	BILID
Bilirubin, total - mg/dL	BILIT
Body Mass Index - kg/m2	BMI
Total cholesterol - mg/dL	CHOL
Definite NASH	DEFNASH
Type 2 diabetes	DIAB2
Ferritin ng/mL	FERR
GGT - U/L	GGT
Globulin - g/dL	GLOB
Glucose mg/dL	GLUC
HbA1c - %	HBA1C
HDL cholesterol - mg/dL	HDL
Hematocrit - %	HEMA
Hispanic ethnicity	HISPANIC
HOMA-IR - mg/dL/uU/mL/405	HOMA
Hypertension	HTN
Any inflammation	IBALL
Fibrosis score	IFIBRO
Steatosis>=34%	IGRADE

Table Variable	Variables Used in Replication from the "Table 2" Dataset
Lobular inflammation>=grade 2	IINFLAM
NAS>=5	INAS
International normalized ratio	INR
Insulin uU/mL	INSU
Portal inflammation>mild	IPORTAL
LDL cholesterol - mg/dL	LDL
Biopsy length	LENG10
Male gender	MALE
Mallory bodies	MALLORY
Metabolic syndrome	META
Platelets - 1000/mm3	PLAT
AST/ALT ratio	RATIO
Triglyercides - mg/dL	TRI
Waist circumference - cm	WAIST
White blood cell - 1000/mm3	WBC
White race	WHITE
Waist to hip ratio	WTHIP

Table D: Comparison of values computed in integrity check to reference article Table 2 values

Characteristic	No (n=291) [Manuscript]	No (n=291) [DSIC]	No (n=291) [Diff]	Yes (n=404) [Manuscript]	Yes (n=404) [DSIC]	Yes (n=404) [Diff]
Male (%)	45	44	1	34	32	2
Age, years (median)	48	49	-1	49	52	-3
White (%)	82	82	0	80	83	-3
Hispanic (%)	13	11	2	15	12	3
Hypertension (%)	40	43	-3	47	52	-5
Type 2 diabetes (%)	17	22	-5	26	35	-9
Metabolic syndrome† (%)	56	55	1	66	66	0
Acanthosis nigricans Positive (%)	13	12	1	14	12	2
Acanthosis nigricans Severity score (mean)	0.26	0.25	0.01	0.34	0.26	0.08
Body mass index (kg/m2)	33	33	0	34	34	0
Waist circumference (cm)	108	108	0	109	108	1
Waist-to-hip ratio	0.93	0.93	0	0.94	0.93	0.01
AST (U/L)	37	37	0	55	48	7
ALT (U/L)	56	53	3	74	61	13
AST/ALT	0.68	0.72	-0.04	0.74	0.79	-0.05
Alkaline phosphatase (U/L)	78	79	-1	83	84	-1
Isolated abnormal alkaline phosphatase§ (%)	5	6	-1	2	3	-1

Characteristic	No (n=291) [Manuscript]	No (n=291) [DSIC]	No (n=291) [Diff]	Yes (n=404) [Manuscript]	Yes (n=404) [DSIC]	Yes (n=404) [Diff]
GGT (U/L)	40	41	-1	56	54	2
Globulin (g/dL)	2.9	2.9	0	3	3	0
Albumin (g/dL)	4.2	4.2	0	4.2	4.2	0
Bilirubin, total (mg/dL)	0.7	0.7	0	0.6	0.6	0
Bilirubin, direct (mg/dL)	0.1	0.1	0	0.1	0.1	0
International normalized ratio (mean)	1.01	1.01	0	1.03	1.04	-0.01
Hematocrit (%)	42	42	0	43	42	1
White blood cells (1000/mm3)	6.7	6.5	0.2	6.8	6.6	0.2
Platelet count (1000/mm3)	249	246	3	239	231	8
Total cholesterol (mg/dL)	194	193	1	196	192	4
HDL cholesterol (mg/dL)	43	43	0	41	42	-1
LDL cholesterol (mg/dL)	120	119	1	119	115	4
Triglycerides (mg/dL)	137	138	-1	159	153	6
HbA1c (%)	5.6	5.6	0	5.7	5.8	-0.1
Fasting serum glucose (mg/dL)	94	95	-1	97	99	-2
Fasting serum insulin (lU/mL)	16	16	0	20	20	0
HOMA-IR (mg/dL lU/mL/405)	3.8	3.8	0	5	5.1	-0.1

Characteristic	No (n=291) [Manuscript]	No (n=291) [DSIC]	No (n=291) [Diff]	Yes (n=404) [Manuscript]	Yes (n=404) [DSIC]	Yes (n=404) [Diff]
ANA (% positive)	26	23	3	23	23	0
ASMA (% positive)	14	15	-1	7	9	-2
ANA þ ASMA (% both positive)	5	5	0	1	2	-1
AMA (% positive)	4	3	1	8	6	2
Ferritin (ng/mL)	129	129	0	174	155	19
Steatosis (% >= 34%)	50	44	6	66	62	4
Lobular inflammation (% >= grade 2)	30	29	1	62	61	1
Portal inflammation (% > mild)	13	16	-3	25	29	-4
Ballooning (% any)	22	22	0	100	100	0
NAFLD Activity Score (% >=5)	16	14	2	73	72	1
Fibrosis score§§ (mean)	0.9	1	-0.1	2	2.1	-0.1
Mallory bodies (% present)	2	3	-1	46	50	-4
Biopsy length (% < 10 mm)	19	18	1	9	10	-1

Table E: Variables used to replicate Table 3: Characteristics of Adult Patients with NAFLD with Contemporaneous Biopsies and Clinical Factors by Fibrosis Stage

Table Variable	Variables Used in Replication from the "Table 3" Dataset
Acanthosis nigricans	ACANTH
Acanthosis nigricans severity score	ACANTHN
Age - yrs	AGE
Albumin - g/dL	ALB
Alkaline phosphatase - U/L	ALKA
Isolated Alkaline phosphatase	ALKAISO
AST - U/L	ALT
Abnormal AST	ALTULN1
AMA	AMA
ANA	ANA
ANA and ASMA	ANAASMA
Cirrhosis	ANYCIRRH
ASMA	ASMA
AST - U/L	AST
Abnormal AST	ASTULN1
Bilirubin, direct - mg/dL	BILID
Bilirubin, total - mg/dL	BILIT
Body Mass Index - kg/m2	BMI
Total cholesterol - mg/dL	CHOL
Definite NASH	DEFNASH
Type 2 diabetes	DIAB2
Ferritin ng/mL	FERR
GGT - U/L	GGT
Globulin - g/dL	GLOB
Glucose mg/dL	GLUC
HbA1c - %	HBA1C
HDL cholesterol - mg/dL	HDL
Hematocrit - %	HEMA
Hispanic ethnicity	HISPANIC
HOMA-IR - mg/dL/uU/mL/405	HOMA
Hypertension	HTN
Any inflammation	IBALL
Fibrosis score	IFIBRO
Steatosis>=34%	IGRADE

Table Variable	Variables Used in Replication from the "Table 3" Dataset
Lobular inflammation>=grade 2	IINFLAM
NAS>=5	INAS
International normalized ratio	INR
Insulin uU/mL	INSU
Portal inflammation>mild	IPORTAL
LDL cholesterol - mg/dL	LDL
Biopsy length	LENG10
Male gender	MALE
Mallory bodies	MALLORY
Metabolic syndrome	META
Platelets - 1000/mm3	PLAT
AST/ALT ratio	RATIO
Triglyercides - mg/dL	TRI
Waist circumference - cm	WAIST
White blood cell - 1000/mm3	WBC
White race	WHITE
Waist to hip ratio	WTHIP

Table F: Comparison of values computed in integrity check to reference article Table 3 values

Characteristic	None (n=183) [Manuscript]	None (n=183) [DSIC]	None (n=183) [Diff]	Mild/Moderate (n=338) [Manuscript]	Mild/ Moderate (n=338) [DSIC]	Mild/ Moderate (n=338) [Diff]
Male (%)	41	41	0	41	39	2
Age, years (median)	45	46	-1	48	49	-1
White (%)	81	80	1	80	82	-2
Hispanic (%)	19	15	4	14	12	2
Hypertension (%)	34	37	-3	44	48	-4
Type 2 diabetes (%)	11	14	-3	21	27	-6
Metabolic syndrome† (%)	60	58	2	64	63	1
Acanthosis nigricans Positive (%)	13	12	1	15	13	2
Acanthosis nigricans Severity score (mean)	0.29	0.28	0.01	0.36	0.3	0.06
Body mass index (kg/m2)	33	33	0	33	33	0
Waist circumference (cm)	106	105	1	109	108	1
Waist-to-hip ratio	0.93	0.93	0	0.94	0.94	0

Characteristic	None (n=183) [Manuscript]	None (n=183) [DSIC]	None (n=183) [Diff]	Mild/Moderate (n=338) [Manuscript]	Mild/ Moderate (n=338) [DSIC]	Mild/ Moderate (n=338) [Diff]
AST (U/L)	35	35	0	50	43	7
ALT (U/L)	56	56	0	70	64	6
AST/ALT	0.65	0.67	-0.02	0.7	0.71	-0.01
Alkaline phosphatase (U/L)	77	78	-1	79	80	-1
Isolated abnormal alkaline phosphatase§ (%)	3	4	-1	4	4	0
GGT (U/L)	38	40	-2	46	45	1
Globulin (g/dL)	2.8	2.9	-0.1	3	2.9	0.1
Albumin (g/dL)	4.2	4.3	-0.1	4.3	4.3	0
Bilirubin, total (mg/dL)	0.7	0.7	0	0.7	0.7	0
Bilirubin, direct (mg/dL)	0.1	0.1	0	0.1	0.1	0
International normalized ratio (mean)	0.99	0.99	0	1.01	1.01	0
Hematocrit (%)	42	42	0	43	43	0
White blood cells (1000/mm3)	6.7	6.7	0	6.9	6.9	0

Characteristic	None (n=183) [Manuscript]	None (n=183) [DSIC]	None (n=183) [Diff]	Mild/Moderate (n=338) [Manuscript]	Mild/ Moderate (n=338) [DSIC]	Mild/ Moderate (n=338) [Diff]
Platelet count (1000/mm3)	254	254	0	254	253	1
Total cholesterol (mg/dL)	197	197	0	196	195	1
HDL cholesterol (mg/dL)	42	43	-1	41	43	-2
LDL cholesterol (mg/dL)	122	121	1	122	120	2
Triglycerides (mg/dL)	149	151	-2	160	157	3
HbA1c (%)	5.6	5.6	0	5.7	5.7	0
Fasting serum glucose (mg/dL)	93	94	-1	96	96	0
Fasting serum insulin (lU/mL)	16	14	2	19	17	2
HOMA-IR (mg/dL lU/mL/405)	3.5	3.4	0.1	4.6	4.4	0.2
ANA (% positive)	21	21	0	26	23	3
ASMA (% positive)	12	14	-2	7	8	-1
ANA þ ASMA (% both positive)	5	6	-1	1	1	0
AMA (% positive)	4	3	1	8	5	3

Characteristic	None (n=183) [Manuscript]	None (n=183) [DSIC]	None (n=183) [Diff]	Mild/Moderate (n=338) [Manuscript]	Mild/ Moderate (n=338) [DSIC]	Mild/ Moderate (n=338) [Diff]
Ferritin (ng/mL)	119	122	-3	172	163	9
Steatosis (% >= 34%)	50	50	0	68	65	3
Lobular inflammation (% >= grade 2)	26	25	1	60	58	2
Portal inflammation (% > mild)	6	5	1	15	16	-1
Ballooning (% any)	34	34	0	75	71	4
NAFLD Activity Score (% >=5)	21	21	0	59	56	3
Presence of NASH (% definite)	15	15	0	70	66	4
Mallory bodies (% present)	1	1	0	27	26	1
Biopsy length (% < 10 mm)	20	18	2	12	13	-1

Characteristic	Bridging (n=118) [Manuscript]	Bridging (n=118) [DSIC]	Bridging (n=118) [Diff]	Cirrhotic (n=54) [Manuscript]	Cirrhotic (n=54) [DSIC]	Cirrhotic (n=54) [Diff]
Male (%)	28	31	-3	39	28	11
Age, years (median)	54	55	-1	57	56	1
White (%)	77	81	-4	89	89	0
Hispanic (%)	10	8	2	4	4	0
Hypertension (%)	51	58	-7	59	58	1
Type 2 diabetes (%)	29	42	-13	50	56	-6
Metabolic syndrome† (%)	64	62	2	52	60	-8
Acanthosis nigricans Positive (%)	11	10	1	11	11	0
Acanthosis nigricans Severity score (mean)	0.25	0.19	0.06	0.15	0.2	-0.05
Body mass index (kg/m2)	35	34	1	35	35	0
Waist circumference (cm)	111	109	2	115	110	5
Waist-to-hip ratio	0.93	0.93	0	0.94	0.93	0.01
AST (U/L)	59	48	11	52	46	6
ALT (U/L)	78	61	17	46	39	7
AST/ALT	0.83	0.85	-0.02	1.16	1.15	0.01
Alkaline phosphatase (U/L)	89	87	2	100	100	0

Characteristic	Bridging (n=118) [Manuscript]	Bridging (n=118) [DSIC]	Bridging (n=118) [Diff]	Cirrhotic (n=54) [Manuscript]	Cirrhotic (n=54) [DSIC]	Cirrhotic (n=54) [Diff]
Isolated abnormal alkaline phosphatase§ (%)	2	4	-2	6	9	-3
GGT (U/L)	67	64	3	78	66	12
Globulin (g/dL)	3.1	3.1	0	3.4	3.3	0.1
Albumin (g/dL)	4.2	4.2	0	4	4	0
Bilirubin, total (mg/dL)	0.6	0.6	0	0.8	0.9	-0.1
Bilirubin, direct (mg/dL)	0.1	0.1	0	0.2	0.2	0
International normalized ratio (mean)	1.03	1.04	-0.01	1.16	1.15	0.01
Hematocrit (%)	42	41	1	41	40	1
White blood cells (1000/mm3)	6.4	6.2	0.2	6	5.8	0.2
Platelet count (1000/mm3)	228	210	18	148	147	1
Total cholesterol (mg/dL)	198	191	7	170	172	-2
HDL cholesterol (mg/dL)	42	42	0	42	44	-2
LDL cholesterol (mg/dL)	119	111	8	97	101	-4
Triglycerides (mg/dL)	147	145	2	124	124	0
HbA1c (%)	5.8	5.9	-0.1	5.9	6	-0.1

Characteristic	Bridging (n=118) [Manuscript]	Bridging (n=118) [DSIC]	Bridging (n=118) [Diff]	Cirrhotic (n=54) [Manuscript]	Cirrhotic (n=54) [DSIC]	Cirrhotic (n=54) [Diff]
Fasting serum glucose (mg/dL)	98	100	-2	98	104	-6
Fasting serum insulin (lU/mL)	22	21	1	24	22	2
HOMA-IR (mg/dL lU/mL/405)	5.9	5.7	0.2	5.9	5.9	0
ANA (% positive)	20	22	-2	33	27	6
ASMA (% positive)	12	16	-4	15	17	-2
ANA þ ASMA (% both positive)	4	5	-1	4	5	-1
AMA (% positive)	8	5	3	2	3	-1
Ferritin (ng/mL)	185	160	25	159	118	41
Steatosis (% >= 34%)	58	52	6	31	27	4
Lobular inflammation (% >= grade 2)	60	59	1	22	30	-8
Portal inflammation (% > mild)	41	40	1	54	65	-11
Ballooning (% any)	91	89	2	80	81	-1
NAFLD Activity Score (% >=5)	69	65	4	33	36	-3
Presence of NASH (% definite)	88	84	4	61	65	-4

Characteristic	Bridging (n=118) [Manuscript]	Bridging (n=118) [DSIC]	Bridging (n=118) [Diff]	Cirrhotic (n=54) [Manuscript]	Cirrhotic (n=54) [DSIC]	Cirrhotic (n=54) [Diff]
Mallory bodies (% present)	60	63	-3	54	52	2
Biopsy length (% < 10 mm)	5	9	-4	13	14	-1

```
title1 "%sysfunc(getoption(sysin))";
title2 " ";

options nofmterr;

*** Reading in the analysis datasets used for the DSIC;
libname inlib5 xport "/prj/niddk/ims_analysis/NASH/private_orig_data/NASHCRN_Data_Sharing_AdultNAFLDDatabase_Hepatology_2010/Datasets/table1.xpt";
proc copy in =inlib5  out= work;
libname inlib6 xport "/prj/niddk/ims_analysis/NASH/private_orig_data/NASHCRN_Data_Sharing_AdultNAFLDDatabase_Hepatology_2010/Datasets/table2.xpt";
proc copy in =inlib6  out= work;
libname inlib7 xport "/prj/niddk/ims_analysis/NASH/private_orig_data/NASHCRN_Data_Sharing_AdultNAFLDDatabase_Hepatology_2010/Datasets/table3.xpt";
proc copy in =inlib7  out= work;

*** Reading in the Paper output used for the DSIC;
filename manu1 "/prj/niddk/ims_analysis/NASH/private_created_data/NASH_HEPA_V1/Table1.xls";
proc import out=manu1 DATAFILE=manu1 DBMS=xls REPLACE;
  getnames=YES;
filename manu2 "/prj/niddk/ims_analysis/NASH/private_created_data/NASH_HEPA_V1/Table2.xls";
proc import out=manu2 DATAFILE=manu2 DBMS=xls REPLACE;
  getnames=YES;
filename manu3 "/prj/niddk/ims_analysis/NASH/private_created_data/NASH_HEPA_V1/Table3.xls";
proc import out=manu3 DATAFILE=manu3 DBMS=xls REPLACE;
  getnames=YES;

*** Macro Table 1 ***;
%macro freqdata_1all(order=, invar=);
  %freqdata1a(order=&order, invar=&invar);
  %freqdata1b(order=&order, invar=&invar);
%mend freqdata_1all;

%macro freqdata1a(order=, invar=);
proc freq data=table1 compress noprint;
        tables &invar/out=data1;
        format _all_;
        run;

data data1(keep=PROXIMIT LEVEL name CHARALL ORDERER PCT_DISP);
  set data1(rename=(&invar=LEVEL));
  length name $100 CHARALL $100 PROXIMIT $9;
  name=upcase("&invar");
  PCT_DISP=round(PERCENT);
  CHARALL=compress(put(PCT_DISP,8.));
  ORDERER=&order;
  PROXIMIT="COHORT";

data accumfreq1;
  set accumfreq1 data1;
%mend freqdata1a;

%macro freqdata1b(order=, invar=);
proc freq data=table1 compress noprint;
        tables PROXIMIT*&invar/out=data1 outpct;
        format _all_;
        run;

data data1(keep=PROXIMIT LEVEL name CHARALL ORDERER PCT_DISP);
```

```
  set data1(rename=(&invar=LEVEL));
  length CHARALL name $100;
  name=upcase("&invar");
  PCT_DISP=round(PCT_ROW);
  CHARALL=compress(put(PCT_DISP,8.));
  ORDERER=&order;

data accumfreq2;
  set accumfreq2 data1;
%mend freqdata1b;

%macro meandata1(order=, invar=, roundvar=, digit=);
proc means data=table1 mean stddev noprint;
        var &invar;
        class PROXIMIT;
        output out=data1 mean=mean stddev=stddev;
        run;

data data1(drop=_TYPE_ _FREQ_);
  set data1;
  length name CHARALL $100;
  name=upcase("&invar");
  mean=round(mean,&roundvar);
  stddev=round(stddev,&roundvar);
  CHARALL=compress(put(mean,8.&digit))||" ± "||compress(put(stddev,8.&digit));
  if PROXIMIT=' ' then PROXIMIT='COHORT';
  ORDERER=&order;

data accummeans2;
  set accummeans2 data1;

%mend meandata1;
%macro mediandata1(order=, invar=, roundvar=, digit=);
proc means data=table1 median stddev noprint;
        var &invar;
        class PROXIMIT;
        output out=data1 median=median stddev=stddev;
        run;

data data1(drop=_TYPE_ _FREQ_);
  set data1;
  length name CHARALL $100 PROXIMIT $9;
  name=upcase("&invar");
  median=round(median,&roundvar);
  stddev=round(stddev,&roundvar);
  CHARALL=compress(put(median,8.&digit))||" ± "||compress(put(stddev,8.&digit));
  if PROXIMIT=' ' then PROXIMIT='COHORT';
  ORDERER=&order;

data accummedians2;
  set accummedians2 data1;

%mend mediandata1;

%macro inert1(orderer=);
  orderer=&orderer;
```

```
  PROXIMIT='COHORT';
  output;
  PROXIMIT='<= 6 mos';
  output;
  PROXIMIT='> 6 mos';
  output;
  PROXIMIT='no biopsy';
  output;
%mend inert1;



data accumfreq1 accumfreq2 accummeans2 accummedians2;
  set _null_;

proc freq data=table1;
  tables PROXIMIT/missing list;
  title3 'PROXIMIT n counts';

%freqdata_1all(order=1, invar=MALE);
%freqdata_1all(order=3, invar=WHITE);
%freqdata_1all(order=4, invar=HISPANIC);
%freqdata_1all(order=5, invar=HTN);
%freqdata_1all(order=6, invar=DIAB2);
%freqdata_1all(order=7, invar=META);
%freqdata_1all(order=8, invar=ACANTH);
%freqdata_1all(order=14, invar=ASTULN1);
%freqdata_1all(order=16, invar=ALTULN1);
%freqdata_1all(order=19, invar=ALKAISO);
%freqdata_1all(order=37, invar=ANA);
%freqdata_1all(order=38, invar=ASMA);
%freqdata_1all(order=39, invar=ANAASMA);
%freqdata_1all(order=40, invar=AMA);
%freqdata_1all(order=42, invar=IGRADE);
%freqdata_1all(order=43, invar=IINFLAM);
%freqdata_1all(order=44, invar=IPORTAL);
%freqdata_1all(order=45, invar=IBALL);
%freqdata_1all(order=46, invar=INAS);
%freqdata_1all(order=47, invar=DEFNASH);
%freqdata_1all(order=49, invar=MALLORY);
%freqdata_1all(order=50, invar=LENG10);
%mediandata1(order=2, invar=AGE, roundvar=1, digit=0);
%meandata1(  order=9, invar=ACANTHN, roundvar=.01, digit=2);
%mediandata1(order=10, invar=BMI, roundvar=1, digit=0);
%mediandata1(order=11, invar=WAIST, roundvar=1, digit=0);
%mediandata1(order=12, invar=WTHIP, roundvar=.01, digit=2);
%mediandata1(order=13, invar=AST, roundvar=1, digit=0);
%mediandata1(order=15, invar=ALT, roundvar=1, digit=0);
%mediandata1(order=17, invar=RATIO, roundvar=.01, digit=2);
%mediandata1(order=18, invar=ALKA, roundvar=1, digit=0);
%mediandata1(order=20, invar=GGT, roundvar=1, digit=0);
%mediandata1(order=21, invar=GLOB, roundvar=.1, digit=1);
%mediandata1(order=22, invar=ALB, roundvar=.1, digit=1);
%mediandata1(order=23, invar=BILIT, roundvar=.1, digit=1);
%mediandata1(order=24, invar=BILID, roundvar=.1, digit=1);
%meandata1(  order=25, invar=INR, roundvar=.01, digit=2);
```

```
%mediandata1(order=26, invar=HEMA , roundvar=1, digit=0);
%mediandata1(order=27, invar=WBC  , roundvar=.1, digit=1);
%mediandata1(order=28, invar=PLAT , roundvar=1, digit=0);
%mediandata1(order=29, invar=CHOL , roundvar=1, digit=0);
%mediandata1(order=30, invar=HDL  , roundvar=1, digit=0);
%mediandata1(order=31, invar=LDL  , roundvar=1, digit=0);
%mediandata1(order=32, invar=TRI  , roundvar=1, digit=0);
%mediandata1(order=33, invar=HBA1C, roundvar=.1, digit=1);
%mediandata1(order=34, invar=GLUC  , roundvar=1, digit=0);
%mediandata1(order=35, invar=INSU  , roundvar=1, digit=0);
%mediandata1(order=36, invar=HOMA, roundvar=.1, digit=1);
%mediandata1(order=41, invar=FERR, roundvar=1, digit=0);
%meandata1(order=48, invar=NFIBRO, roundvar=.1, digit=1);

data accumfreq1;
  set accumfreq1;
  if LEVEL=1 then output;

data accumfreq2;
  set accumfreq2;
  if LEVEL=1 then output;

data accuminert1;
  retain orderer;
  length PROXIMIT $9;
  %inert1(orderer=1  );
  %inert1(orderer=2  );
  %inert1(orderer=3  );
  %inert1(orderer=4  );
  %inert1(orderer=5  );
  %inert1(orderer=6  );
  %inert1(orderer=7  );
  %inert1(orderer=8  );
  %inert1(orderer=9  );
  %inert1(orderer=10 );
  %inert1(orderer=11 );
  %inert1(orderer=12 );
  %inert1(orderer=13 );
  %inert1(orderer=14 );
  %inert1(orderer=15 );
  %inert1(orderer=16 );
  %inert1(orderer=17 );
  %inert1(orderer=18 );
  %inert1(orderer=19 );
  %inert1(orderer=20 );
  %inert1(orderer=21 );
  %inert1(orderer=22 );
  %inert1(orderer=23 );
  %inert1(orderer=24 );
  %inert1(orderer=25 );
  %inert1(orderer=26 );
  %inert1(orderer=27 );
  %inert1(orderer=28 );
  %inert1(orderer=29 );
  %inert1(orderer=30 );
  %inert1(orderer=31 );
```

```
  %inert1(orderer=32 );
  %inert1(orderer=33 );
  %inert1(orderer=34 );
  %inert1(orderer=35 );
  %inert1(orderer=36 );
  %inert1(orderer=37 );
  %inert1(orderer=38 );
  %inert1(orderer=39 );
  %inert1(orderer=40 );
  %inert1(orderer=41 );
  %inert1(orderer=42 );
  %inert1(orderer=43 );
  %inert1(orderer=44 );
  %inert1(orderer=45 );
  %inert1(orderer=46 );
  %inert1(orderer=47 );
  %inert1(orderer=48 );
  %inert1(orderer=49 );
  %inert1(orderer=50 );



data accumtab1;
  set accumfreq1 accumfreq2 accummeans2 accummedians2;
  if indexc(CHARALL,' ') ne 0 and PROXIMIT ne "COHORT" then CHARALL=substr(CHARALL,1,indexc(CHARALL,' '));


proc sort data=accumtab1;
  by PROXIMIT orderer;

proc sort data=accuminert1;
  by PROXIMIT orderer;

data accumtab1;
  merge accumtab1 accuminert1;
  by PROXIMIT orderer;

proc sort data=accumtab1;
  by orderer;

data accumtabmanu1(keep=orderer less6mos_dsic more6mos_dsic COHORT_dsic COHORT_SD_dsic no_biopsy_dsic);
  set accumtab1;
  by orderer;
  retain less6mos_dsic more6mos_dsic COHORT_dsic COHORT_SD_dsic no_biopsy_dsic;
  if first.orderer then do;
    less6mos_dsic=.;
    more6mos_dsic=.;
    COHORT_dsic=.;
    COHORT_SD_dsic=.;
    no_biopsy_dsic=.;
  end;
  if PROXIMIT="<= 6 mos" then less6mos_dsic=max(PCT_DISP,MEAN,MEDIAN);
  else if PROXIMIT="> 6 mos" then more6mos_dsic=max(PCT_DISP,MEAN,MEDIAN);
  else if PROXIMIT="COHORT" then do;
    COHORT_dsic=max(PCT_DISP,MEAN,MEDIAN);
    COHORT_SD_dsic=stddev;
```

```
  end;
  else if PROXIMIT="no biopsy" then no_biopsy_dsic=max(PCT_DISP,MEAN,MEDIAN);
  else abort;
  if last.orderer then output;

data mergetable1;
  merge manu1 accumtabmanu1;
  by orderer;
  length COHORT_CHAR COHORT_dsic_CHAR COHORT_diff_CHAR $20;
  less6mos_diff=less6mos-less6mos_dsic;
  more6mos_diff=more6mos-more6mos_dsic;
  no_biopsy_diff=no_biopsy-no_biopsy_dsic;
  COHORT_diff=cohort-cohort_dsic;
  COHORT_SD_diff=COHORT_SD-COHORT_sd_dsic;

  if COHORT_SD=. then COHORT_CHAR=strip(put(Cohort,best6.));
  else if COHORT_SD ne . then COHORT_CHAR=strip(put(Cohort,best6.))||", "||strip(put(Cohort_SD,best6.));
  if COHORT_SD_dsic=. then COHORT_dsic_CHAR=strip(put(Cohort_dsic,best6.));
  else if COHORT_SD_dsic ne . then COHORT_dsic_CHAR=strip(put(Cohort_dsic,best6.))||", "||strip(put(Cohort_SD_dsic,best6.));
  if COHORT_SD_diff=. then COHORT_diff_CHAR=strip(put(Cohort_diff,best6.));
  else if COHORT_SD_diff ne . then COHORT_diff_CHAR=strip(put(Cohort_diff,best6.))||", "||strip(put(Cohort_SD_diff,best6.));

data mergetable1;
  set mergetable1(drop=COHORT COHORT_SD COHORT_dsic COHORT_SD_DSIC cohort_diff cohort_sd_diff);

proc print data=mergetable1 noobs;
  var less6mos less6mos_dsic less6mos_diff more6mos more6mos_dsic more6mos_diff no_biopsy no_biopsy_dsic no_biopsy_diff cohort_char cohort_dsic_char
cohort_diff_char;
  format less6mos_dsic more6mos_dsic no_biopsy_dsic best6.;
  title3 'table1';

*** Macro Table 2 ***;

%macro freqdata2(order=, invar=);
proc freq data=table1 compress noprint;
        tables DEFNASH*&invar/out=data1 outpct;
        format _all_;
        run;

data data1(keep=DEFNASH LEVEL name CHARALL ORDERER PCT_DISP);
  set data1(rename=(&invar=LEVEL));
  length CHARALL name $100;
  name=upcase("&invar");
  PCT_DISP=round(PCT_ROW);
  CHARALL=compress(put(PCT_DISP,8.));
  ORDERER=&order;

data accumfreq2;
  set accumfreq2 data1;
%mend freqdata2;

%macro meandata2(order=, invar=, roundvar=, digit=);
proc means data=table1 mean stddev noprint;
        var &invar;
        class DEFNASH;
        output out=data1 mean=mean stddev=stddev;
```

```
        run;

data data1(drop=_TYPE_ stddev _FREQ_);
  set data1;
  length name CHARALL $100;
  name=upcase("&invar");
  mean=round(mean,&roundvar);
  stddev=round(stddev,&roundvar);
  CHARALL=compress(put(mean,8.&digit));
  if DEFNASH=. then delete;
  ORDERER=&order;

data accummeans2;
  set accummeans2 data1;

%mend meandata2;

%macro mediandata2(order=, invar=, roundvar=, digit=);
proc means data=table1 median stddev noprint;
        var &invar;
        class DEFNASH;
        output out=data1 median=median stddev=stddev;
        run;

data data1(drop=_TYPE_ stddev _FREQ_);
  set data1;
  length name CHARALL $100;
  name=upcase("&invar");
  median=round(median,&roundvar);
  stddev=round(stddev,&roundvar);
  CHARALL=compress(put(median,8.&digit));
  if DEFNASH=. then delete;
  ORDERER=&order;

data accummedians2;
  set accummedians2 data1;

%mend mediandata2;

%macro inert2(orderer=);
  orderer=&orderer;
  DEFNASH=0;
  output;
  DEFNASH=1;
  output;
%mend inert2;

data accumfreq1 accumfreq2 accummeans2 accummedians2;
  set _null_;

%freqdata2(order=1, invar=MALE);
%freqdata2(order=3, invar=WHITE);
%freqdata2(order=4, invar=HISPANIC);
%freqdata2(order=5, invar=HTN);
%freqdata2(order=6, invar=DIAB2);
%freqdata2(order=7, invar=META);
```

```
%freqdata2(order=8, invar=ACANTH);
%freqdata2(order=14, invar=ASTULN1);
%freqdata2(order=16, invar=ALTULN1);
%freqdata2(order=19, invar=ALKAISO);
%freqdata2(order=37, invar=ANA);
%freqdata2(order=38, invar=ASMA);
%freqdata2(order=39, invar=ANAASMA);
%freqdata2(order=40, invar=AMA);
%freqdata2(order=42, invar=IGRADE);
%freqdata2(order=43, invar=IINFLAM);
%freqdata2(order=44, invar=IPORTAL);
%freqdata2(order=45, invar=IBALL);
%freqdata2(order=46, invar=INAS);
%freqdata2(order=48, invar=MALLORY);
%freqdata2(order=49, invar=LENG10);
%mediandata2(order=2, invar=AGE, roundvar=1, digit=0);
%meandata2(  order=9, invar=ACANTHN, roundvar=.01, digit=2);
%mediandata2(order=10, invar=BMI, roundvar=1, digit=0);
%mediandata2(order=11, invar=WAIST, roundvar=1, digit=0);
%mediandata2(order=12, invar=WTHIP, roundvar=.01, digit=2);
%mediandata2(order=13, invar=AST, roundvar=1, digit=0);
%mediandata2(order=15, invar=ALT, roundvar=1, digit=0);
%mediandata2(order=17, invar=RATIO, roundvar=.01, digit=2);
%mediandata2(order=18, invar=ALKA, roundvar=1, digit=0);
%mediandata2(order=20, invar=GGT, roundvar=1, digit=0);
%mediandata2(order=21, invar=GLOB, roundvar=.1, digit=1);
%mediandata2(order=22, invar=ALB, roundvar=.1, digit=1);
%mediandata2(order=23, invar=BILIT, roundvar=.1, digit=1);
%mediandata2(order=24, invar=BILID, roundvar=.1, digit=1);
%meandata2(  order=25, invar=INR, roundvar=.01, digit=2);
%mediandata2(order=26, invar=HEMA , roundvar=1, digit=0);
%mediandata2(order=27, invar=WBC  , roundvar=.1, digit=1);
%mediandata2(order=28, invar=PLAT , roundvar=1, digit=0);
%mediandata2(order=29, invar=CHOL , roundvar=1, digit=0);
%mediandata2(order=30, invar=HDL  , roundvar=1, digit=0);
%mediandata2(order=31, invar=LDL  , roundvar=1, digit=0);
%mediandata2(order=32, invar=TRI  , roundvar=1, digit=0);
%mediandata2(order=33, invar=HBA1C, roundvar=.1, digit=1);
%mediandata2(order=34, invar=GLUC  , roundvar=1, digit=0);
%mediandata2(order=35, invar=INSU  , roundvar=1, digit=0);
%mediandata2(order=36, invar=HOMA, roundvar=.1, digit=1);
%mediandata2(order=41, invar=FERR, roundvar=1, digit=0);
%meandata2(order=47, invar=NFIBRO, roundvar=.1, digit=1);

data accumfreq2;
  set accumfreq2;
  if LEVEL=1 then output;

data accuminert1;
  retain orderer;
  %inert2(orderer=1  );
  %inert2(orderer=2  );
  %inert2(orderer=3  );
  %inert2(orderer=4  );
  %inert2(orderer=5  );
  %inert2(orderer=6  );
```

```
  %inert2(orderer=7  );
  %inert2(orderer=8  );
  %inert2(orderer=9  );
  %inert2(orderer=10 );
  %inert2(orderer=11 );
  %inert2(orderer=12 );
  %inert2(orderer=13 );
  %inert2(orderer=14 );
  %inert2(orderer=15 );
  %inert2(orderer=16 );
  %inert2(orderer=17 );
  %inert2(orderer=18 );
  %inert2(orderer=19 );
  %inert2(orderer=20 );
  %inert2(orderer=21 );
  %inert2(orderer=22 );
  %inert2(orderer=23 );
  %inert2(orderer=24 );
  %inert2(orderer=25 );
  %inert2(orderer=26 );
  %inert2(orderer=27 );
  %inert2(orderer=28 );
  %inert2(orderer=29 );
  %inert2(orderer=30 );
  %inert2(orderer=31 );
  %inert2(orderer=32 );
  %inert2(orderer=33 );
  %inert2(orderer=34 );
  %inert2(orderer=35 );
  %inert2(orderer=36 );
  %inert2(orderer=37 );
  %inert2(orderer=38 );
  %inert2(orderer=39 );
  %inert2(orderer=40 );
  %inert2(orderer=41 );
  %inert2(orderer=42 );
  %inert2(orderer=43 );
  %inert2(orderer=44 );
  %inert2(orderer=45 );
  %inert2(orderer=46 );
  %inert2(orderer=47 );
  %inert2(orderer=48 );
  %inert2(orderer=49 );

data accumtab2;
  set accumfreq2 accummeans2 accummedians2;
  if DEFNASH=. then delete;

proc sort data=accumtab2;
  by DEFNASH orderer;

proc sort data=accuminert1;
  by DEFNASH orderer;

data accumtab2;
  merge accumtab2 accuminert1;
```

```
  by DEFNASH orderer;
  if orderer in(14 16) then delete;

proc sort data=accumtab2;
  by orderer;

data accumtabmanu2(keep=orderer nash_no_dsic nash_yes_dsic);
  set accumtab2;
  by orderer;
  retain nash_no_dsic nash_yes_dsic;
  if first.orderer then do;
    nash_no_dsic=.;
    nash_yes_dsic=.;
  end;
  if DEFNASH=0 then nash_no_dsic=max(PCT_DISP,MEAN,MEDIAN);
  else if DEFNASH=1 then nash_yes_dsic=max(PCT_DISP,MEAN,MEDIAN);
  else abort;
  if last.orderer then output;

data mergetable2;
  merge manu2 accumtabmanu2;
  by orderer;
  length nash_no_diff nash_yes_diff 8.;
  nash_no_diff=nash_no-nash_no_dsic;
  nash_yes_diff=nash_yes-nash_yes_dsic;

proc freq data=table2;
  tables DEFNASH/missing list;
  title3 'Table 2 N population';

proc print data=mergetable2 noobs;
  var orderer nash_no nash_no_dsic nash_no_diff nash_yes nash_yes_dsic nash_yes_diff;
  format nash_no nash_no_dsic nash_no_diff nash_yes nash_yes_dsic nash_yes_diff best6.;
  title3 'table2';

*** Macro Table 3 ***;

%macro freqdata3(order=, invar=);
proc freq data=table1 compress noprint;
       tables IFIBRO*&invar/out=data1 outpct;
       format _all_;
       run;

data data1(keep=IFIBRO LEVEL name CHARALL ORDERER PCT_DISP);
  set data1(rename=(&invar=LEVEL));
  length CHARALL name $100;
  name=upcase("&invar");
  PCT_DISP=round(PCT_ROW);
  CHARALL=compress(put(PCT_DISP,8.));
  ORDERER=&order;

data accumfreq2;
  set accumfreq2 data1;
%mend freqdata3;

%macro meandata3(order=, invar=, roundvar=, digit=);
```

```
proc means data=table1 mean stddev noprint;
        var &invar;
        class IFIBRO;
        output out=data1 mean=mean stddev=stddev;
        run;

data data1(drop=_TYPE_ stddev _FREQ_);
  set data1;
  length name CHARALL $100;
  name=upcase("&invar");
  mean=round(mean,&roundvar);
  stddev=round(stddev,&roundvar);
  CHARALL=compress(put(mean,8.&digit));
  if IFIBRO=. then delete;
  ORDERER=&order;

data accummeans2;
  set accummeans2 data1;

%mend meandata3;

%macro mediandata3(order=, invar=, roundvar=, digit=);
proc means data=table1 median stddev noprint;
        var &invar;
        class IFIBRO;
        output out=data1 median=median stddev=stddev;
        run;

data data1(drop=_TYPE_ stddev _FREQ_);
  set data1;
  length name CHARALL $100;
  name=upcase("&invar");
  median=round(median,&roundvar);
  stddev=round(stddev,&roundvar);
  CHARALL=compress(put(median,8.&digit));
  if IFIBRO=. then delete;
  ORDERER=&order;

data accummedians2;
  set accummedians2 data1;

%mend mediandata3;

%macro inert3(orderer=);
  orderer=&orderer;
  IFIBRO=0;
  output;
  IFIBRO=1;
  output;
  IFIBRO=2;
  output;
  IFIBRO=3;
  output;
%mend inert3;

proc freq data=table3;
```

```
  tables ifibro/missing list;
  title3 'Table 3 N counts';

data accumfreq1 accumfreq2 accummeans2 accummedians2;
  set _null_;

%freqdata3(order=1, invar=MALE);
%freqdata3(order=3, invar=WHITE);
%freqdata3(order=4, invar=HISPANIC);
%freqdata3(order=5, invar=HTN);
%freqdata3(order=6, invar=DIAB2);
%freqdata3(order=7, invar=META);
%freqdata3(order=8, invar=ACANTH);
%freqdata3(order=14, invar=ASTULN1);
%freqdata3(order=16, invar=ALTULN1);
%freqdata3(order=19, invar=ALKAISO);
%freqdata3(order=37, invar=ANA);
%freqdata3(order=38, invar=ASMA);
%freqdata3(order=39, invar=ANAASMA);
%freqdata3(order=40, invar=AMA);
%freqdata3(order=42, invar=IGRADE);
%freqdata3(order=43, invar=IINFLAM);
%freqdata3(order=44, invar=IPORTAL);
%freqdata3(order=45, invar=IBALL);
%freqdata3(order=46, invar=INAS);
%freqdata3(order=47, invar=DEFNASH);
%freqdata3(order=48, invar=MALLORY);
%freqdata3(order=49, invar=LENG10);
%mediandata3(order=2, invar=AGE, roundvar=1, digit=0);
%meandata3(  order=9, invar=ACANTHN, roundvar=.01, digit=2);
%mediandata3(order=10, invar=BMI, roundvar=1, digit=0);
%mediandata3(order=11, invar=WAIST, roundvar=1, digit=0);
%mediandata3(order=12, invar=WTHIP, roundvar=.01, digit=2);
%mediandata3(order=13, invar=AST, roundvar=1, digit=0);
%mediandata3(order=15, invar=ALT, roundvar=1, digit=0);
%mediandata3(order=17, invar=RATIO, roundvar=.01, digit=2);
%mediandata3(order=18, invar=ALKA, roundvar=1, digit=0);
%mediandata3(order=20, invar=GGT, roundvar=1, digit=0);
%mediandata3(order=21, invar=GLOB, roundvar=.1, digit=1);
%mediandata3(order=22, invar=ALB, roundvar=.1, digit=1);
%mediandata3(order=23, invar=BILIT, roundvar=.1, digit=1);
%mediandata3(order=24, invar=BILID, roundvar=.1, digit=1);
%meandata3(  order=25, invar=INR, roundvar=.01, digit=2);
%mediandata3(order=26, invar=HEMA , roundvar=1, digit=0);
%mediandata3(order=27, invar=WBC  , roundvar=.1, digit=1);
%mediandata3(order=28, invar=PLAT , roundvar=1, digit=0);
%mediandata3(order=29, invar=CHOL , roundvar=1, digit=0);
%mediandata3(order=30, invar=HDL  , roundvar=1, digit=0);
%mediandata3(order=31, invar=LDL  , roundvar=1, digit=0);
%mediandata3(order=32, invar=TRI  , roundvar=1, digit=0);
%mediandata3(order=33, invar=HBA1C, roundvar=.1, digit=1);
%mediandata3(order=34, invar=GLUC  , roundvar=1, digit=0);
%mediandata3(order=35, invar=INSU  , roundvar=1, digit=0);
%mediandata3(order=36, invar=HOMA, roundvar=.1, digit=1);
%mediandata3(order=41, invar=FERR, roundvar=1, digit=0);
```

```
data accuminert1;
  retain orderer;
  %inert3(orderer=1  );
  %inert3(orderer=2  );
  %inert3(orderer=3  );
  %inert3(orderer=4  );
  %inert3(orderer=5  );
  %inert3(orderer=6  );
  %inert3(orderer=7  );
  %inert3(orderer=8  );
  %inert3(orderer=9  );
  %inert3(orderer=10 );
  %inert3(orderer=11 );
  %inert3(orderer=12 );
  %inert3(orderer=13 );
  %inert3(orderer=14 );
  %inert3(orderer=15 );
  %inert3(orderer=16 );
  %inert3(orderer=17 );
  %inert3(orderer=18 );
  %inert3(orderer=19 );
  %inert3(orderer=20 );
  %inert3(orderer=21 );
  %inert3(orderer=22 );
  %inert3(orderer=23 );
  %inert3(orderer=24 );
  %inert3(orderer=25 );
  %inert3(orderer=26 );
  %inert3(orderer=27 );
  %inert3(orderer=28 );
  %inert3(orderer=29 );
  %inert3(orderer=30 );
  %inert3(orderer=31 );
  %inert3(orderer=32 );
  %inert3(orderer=33 );
  %inert3(orderer=34 );
  %inert3(orderer=35 );
  %inert3(orderer=36 );
  %inert3(orderer=37 );
  %inert3(orderer=38 );
  %inert3(orderer=39 );
  %inert3(orderer=40 );
  %inert3(orderer=41 );
  %inert3(orderer=42 );
  %inert3(orderer=43 );
  %inert3(orderer=44 );
  %inert3(orderer=45 );
  %inert3(orderer=46 );
  %inert3(orderer=47 );
  %inert3(orderer=48 );
  %inert3(orderer=49 );

data accumtab3;
  set accumfreq2 accummeans2 accummedians2;
  if IFIBRO=. then delete;
```

```
proc sort data=accumtab3;
  by IFIBRO orderer;

proc sort data=accuminert1;
  by IFIBRO orderer;

data accumtab3;
  merge accumtab3 accuminert1;
  by IFIBRO orderer;
  if orderer in(14 16) then delete;

proc sort data=accumtab3;
  by orderer;

data accumtabmanu3(keep=orderer fib_none_dsic fib_mod_dsic fib_bridge_dsic fib_cir_dsic);
  set accumtab3;
  by orderer;
  retain fib_none_dsic fib_mod_dsic fib_bridge_dsic fib_cir_dsic;
  if first.orderer then do;
    fib_none_dsic=.;
    fib_mod_dsic=.;
    fib_bridge_dsic=.;
    fib_cir_dsic=.;
  end;
  if IFIBRO=0 then fib_none_dsic=max(PCT_DISP,MEAN,MEDIAN);
  else if IFIBRO=1 then fib_mod_dsic=max(PCT_DISP,MEAN,MEDIAN);
  else if IFIBRO=2 then fib_bridge_dsic=max(PCT_DISP,MEAN,MEDIAN);
  else if IFIBRO=3 then fib_cir_dsic=max(PCT_DISP,MEAN,MEDIAN);
  else abort;
  if last.orderer then output;

data mergetable3;
  merge manu3 accumtabmanu3;
  by orderer;
  length fib_none_diff fib_mod_diff fib_bridge_diff fib_cir_diff 8.;
  fib_none_diff=fib_none-fib_none_dsic;
  fib_mod_diff=fib_mod-fib_mod_dsic;
  fib_bridge_diff=fib_bridge-fib_bridge_dsic;
  fib_cir_diff=fib_cir-fib_cir_dsic;

proc print data=mergetable3 noobs;
  var orderer fib_none fib_none_dsic fib_none_diff
              fib_mod fib_mod_dsic fib_mod_diff
              fib_bridge fib_bridge_dsic fib_bridge_diff
              fib_cir fib_cir_dsic fib_cir_diff;
  format fib_none fib_none_dsic fib_none_diff
              fib_mod fib_mod_dsic fib_mod_diff
              fib_bridge fib_bridge_dsic fib_bridge_diff
              fib_cir fib_cir_dsic fib_cir_diff best6.;
  title3 'table 3';
```