

SUPPLEMENTAL MATERIAL

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Supplemental Table 1. Outcome ascertainment in HealthLNK and MESA

Outcome	MESA	HealthLNK	
		Sensitive Criteria	Specific Criteria
Myocardial Infarction	- Based on combination of symptoms, ECG abnormalities, and cardiac biomarkers and classified into definite or probable	- ICD-9 codes 410.X, 410.XX in any position for inpatient or outpatient encounter OR - Troponin > upper limit of normal	- ICD-9 codes 410.X, 410.XX in any position for inpatient encounter with or without - Troponin 2X > upper limit of normal or both
Stroke	- Rapid onset of focal neurologic event lasting 24 hours or until death AND - Not secondary to brain trauma, tumor, infection, or other nonvascular cause AND - Clinically relevant lesion on brain imaging	- ICD-9 codes 433.X1, 434.X1, 436, 362.3, 430.X, 431, 432 in any position for inpatient or outpatient encounter	- ICD-9 codes 433.X1, 434.X1, 436, 362.3, 430.X, 431, 432 in any position for inpatient encounter
Heart Failure	- Symptoms (dyspnea, edema) - Definite heart failure required at least one of the following: 1) Pulmonary edema or congestion on chest x-ray 2) Dilated left ventricle and/or left ventricular systolic dysfunction 3) Diastolic dysfunction with elevated filling pressures - Probable heart failure required either physician diagnosis or patient receiving treatment for heart failure	- ICD-9 codes 402.01, 402.11, 402.91, 404.01, 404.03, 404.11, 404.13, 404.91, 404.93, 428.XX in any position for inpatient encounter or two outpatient encounters OR - Intravenous diuretic OR - BNP > 100 pg/mL, pro-BNP > 2000 pg/mL	- ICD-9 codes 402.01, 402.11, 402.91, 404.01, 404.03, 404.11, 404.13, 404.91, 404.93, 428.XX in primary position for inpatient encounter with or without - Intravenous diuretic/ BNP > 100 pg/mL, pro-BNP > 2000 pg/mL

Supplemental Table 2. Summary of data types and data completeness in HealthLNK for sample of 802 participants.

HealthLNK Data Types	Number of participants, n (%)
Demographics	771 (96.1)
Diagnostic codes from encounters	696 (86.8)
Diagnostic codes from procedures	591 (73.7)
Medication data	576 (71.8)
Vital signs data	588 (73.3)
Laboratory data	584 (72.8)
All six data types	443 (55.2)

Supplemental Table 3. Comparison of gender in HealthLNK and MESA

		HealthLNK				
		Female	Male	Other	Missing	Total
MESA	Female	408	4	5	21	438
	Male	1	343	6	14	364
	Total	409	347	11	35	802

Supplemental Table 4. Comparison of race/ethnicity in HealthLNK and MESA

		HealthLNK						
		White	Asian	Black	Hispanic	Other	Missing	Total
MESA	White	344	1	2	1	12	79	439
	Asian	2	70	0	0	33	29	134
	Black	1	1	177	1	14	35	229
	Total	347	72	179	2	59	143	802

Supplemental Table 5. Performance of HTN algorithm in HealthLNK with ICD-9 codes alone using MESA as the criterion standard

HealthLNK	MESA		
	HTN (n=340)	No HTN (n=293)	Total (n=633)
HTN	242	79	321
No HTN	98	214	312

HealthLNK

Sensitivity: 71.2% (242/340)

Specificity: 73.0% (214/293)

Positive Predictive Value: 75.4% (242/321)

Negative Predictive Value: 68.6% (214/312)

Supplemental Table 6. Performance of HTN algorithm with ICD-9 codes and clinical data in HealthLNK using MESA as the criterion standard

HealthLNK	MESA		
	HTN (n=340)	No HTN (n=293)	Total (n=633)
HTN	280	119	399
No HTN	60	174	234

HealthLNK

Sensitivity: 82.4% (280/340)

Specificity: 59.4% (174/293)

Positive Predictive Value: 70.2% (280/399)

Negative Predictive Value: 74.4% (174/234)

Supplemental Table 7. Performance of obesity algorithm using ICD-9 codes alone in HealthLNK using MESA as the criterion standard

HealthLNK	MESA		
	Obesity (n=152)	No Obesity (n=481)	Total (n=633)
Obesity	47	12	59
No Obesity	105	469	574

HealthLNK

Sensitivity: 30.9% (47/152)

Specificity: 97.5% (469/481)

Positive Predictive Value: 79.7% (47/59)

Negative Predictive Value: 81.7% (469/574)

Supplemental Table 8. Performance of obesity algorithm with ICD-9 codes and clinical data in HealthLNK using MESA as the criterion standard

HealthLNK	MESA		
	Obesity (n=152)	No Obesity (n=481)	Total (n=633)
Obesity	111	49	160
No Obesity	41	432	473

HealthLNK

Sensitivity: 73.0% (111/152)

Specificity: 89.8% (432/481)

Positive Predictive Value: 69.4% (111/160)

Negative Predictive Value: 91.3% (432/473)

Supplemental Table 9. Performance of diabetes algorithm with ICD-codes only in HealthLNK using MESA as criterion standard

HealthLNK	MESA		
	Diabetes (n=89)	No Diabetes (n=541)	Total (n=630 ^a)
Diabetes	69	24	93
No Diabetes	20	517	537

HealthLNK

Sensitivity: 77.5% (69/89)

Specificity: 95.6% (517/541)

Positive Predictive Value: 74.2% (69/93)

Negative Predictive Value: 96.3% (517/537)

Supplemental Table 10. Performance of diabetes algorithm with ICD-9 codes and clinical data in HealthLNK using MESA as criterion standard

HealthLNK	MESA		
	Diabetes (n=89)	No Diabetes (n=541)	Total (n=630 [*])
Diabetes	71	36	107
No Diabetes	18	505	523

HealthLNK

Sensitivity: 79.8% (71/89)

Specificity: 93.3% (505/541)

Positive Predictive Value: 66.4% (71/107)

Negative Predictive Value: 96.6% (505/523)

* Three participants from the sample of 633 due to missing diabetes status in MESA
Supplemental Table III. HealthLNK data types for 71 individuals with diabetes identified in HealthLNK and MESA

Supplemental Table 11. HealthLNK data types for the 280 individuals with hypertension identified in HealthLNK and MESA

ICD-9	Medication	Elevated Blood Pressure Measurement	Frequency (%) n=280
Yes	Yes	Yes	107 (38.2%)
Yes	Yes	--	62 (22.1%)
Yes	--	Yes	27 (9.6%)
Yes	--	--	46 (16.4%)
--	Yes	Yes	10 (3.6%)
--	Yes	--	18 (6.4%)
--	--	Yes	10 (3.6%)

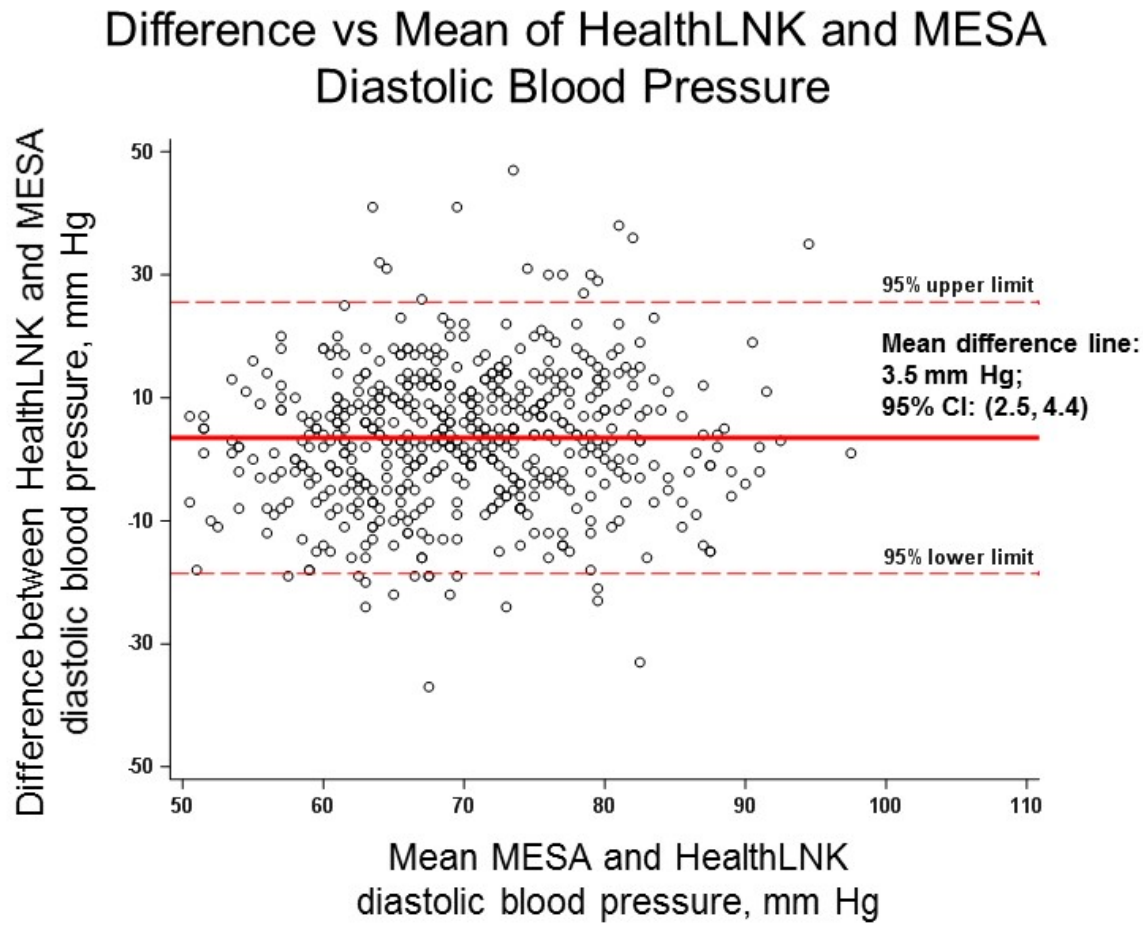
Supplemental Table 12. HealthLNK data types for the 111 individuals with obesity identified in HealthLNK and MESA

ICD-9	Body Mass Index Measurement	Frequency (%) n=111
Yes	Yes	43 (38.7%)
Yes	--	4 (3.6%)
--	Yes	64 (57.7%)

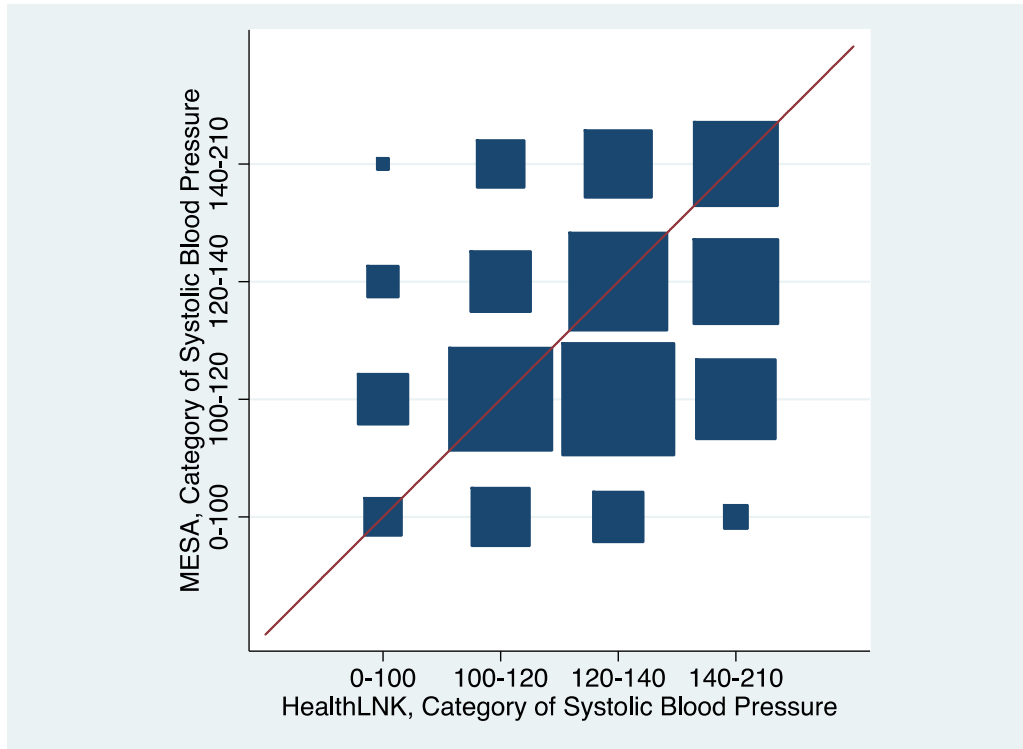
Supplemental Table 13. HealthLNK data types for the 71 individuals with diabetes identified in HealthLNK and MESA

ICD-9	Medication	Elevated Hemoglobin A1C	Frequency (%) n=71
Yes	Yes	Yes	2 (2.8%)
Yes	Yes	--	47 (66.2%)
Yes	--	Yes	0 (0%)
Yes	--	--	20 (28.2%)
--	Yes	Yes	0 (0%)
--	Yes	--	2 (2.8%)
--	--	Yes	0 (0%)

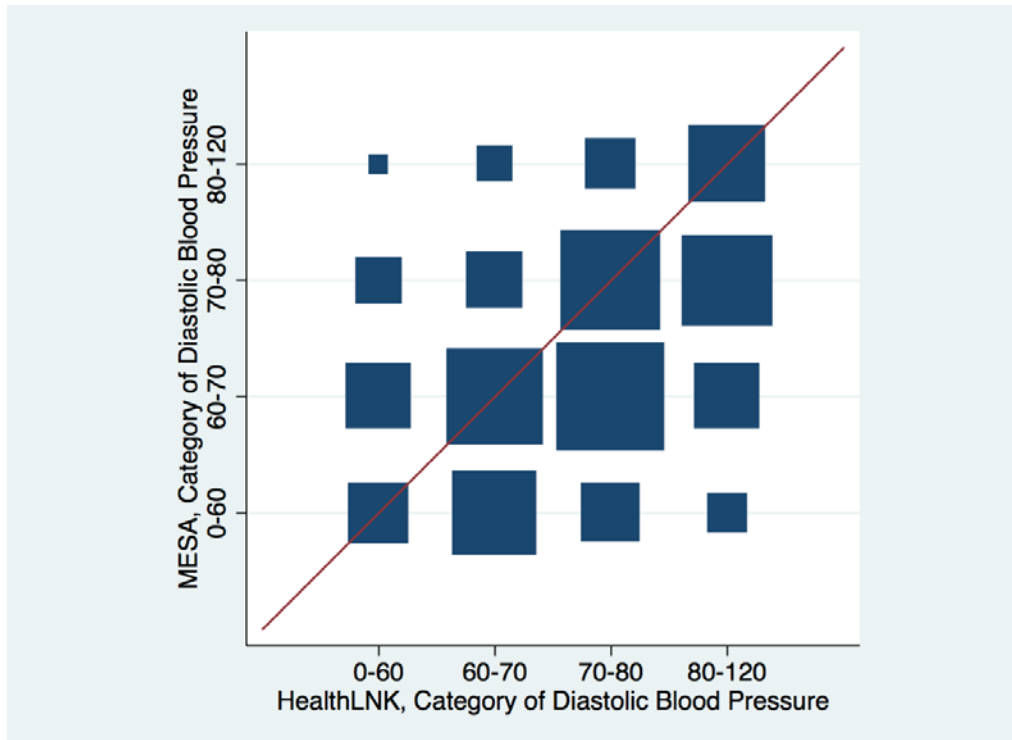
Supplemental Figure 1. Bland-Altman plots for MESA and HealthLNK diastolic blood pressure



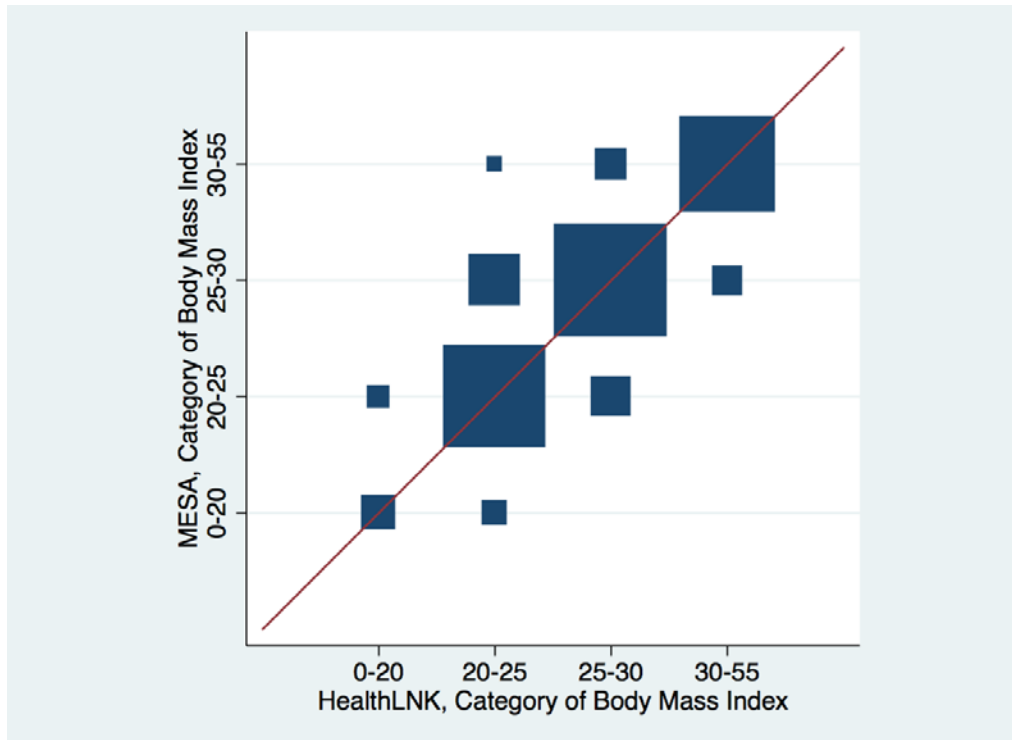
Supplemental Figure 2. Fluctuation diagram for systolic blood pressure



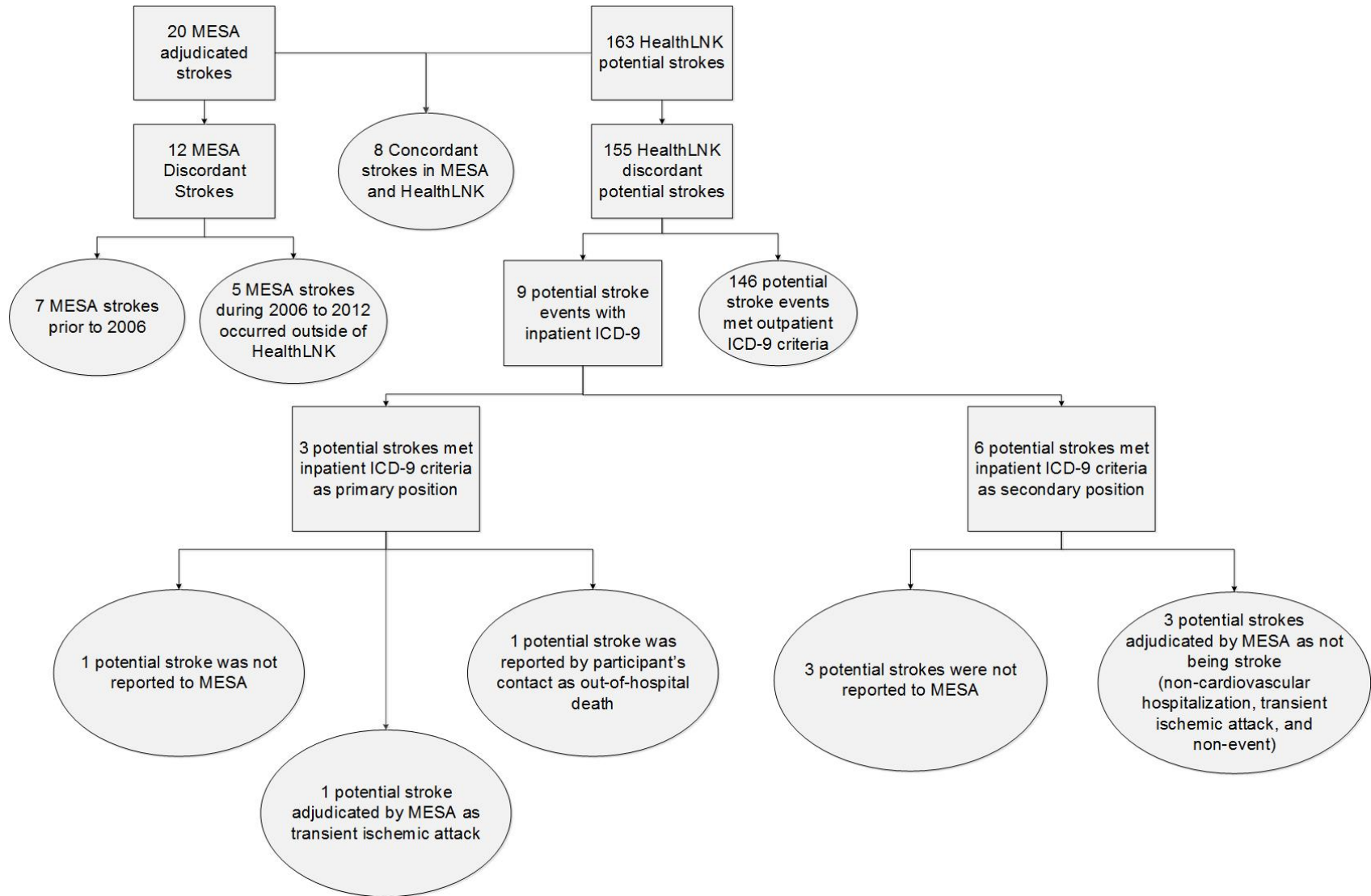
Supplemental Figure 3. Fluctuation diagram for diastolic blood pressure



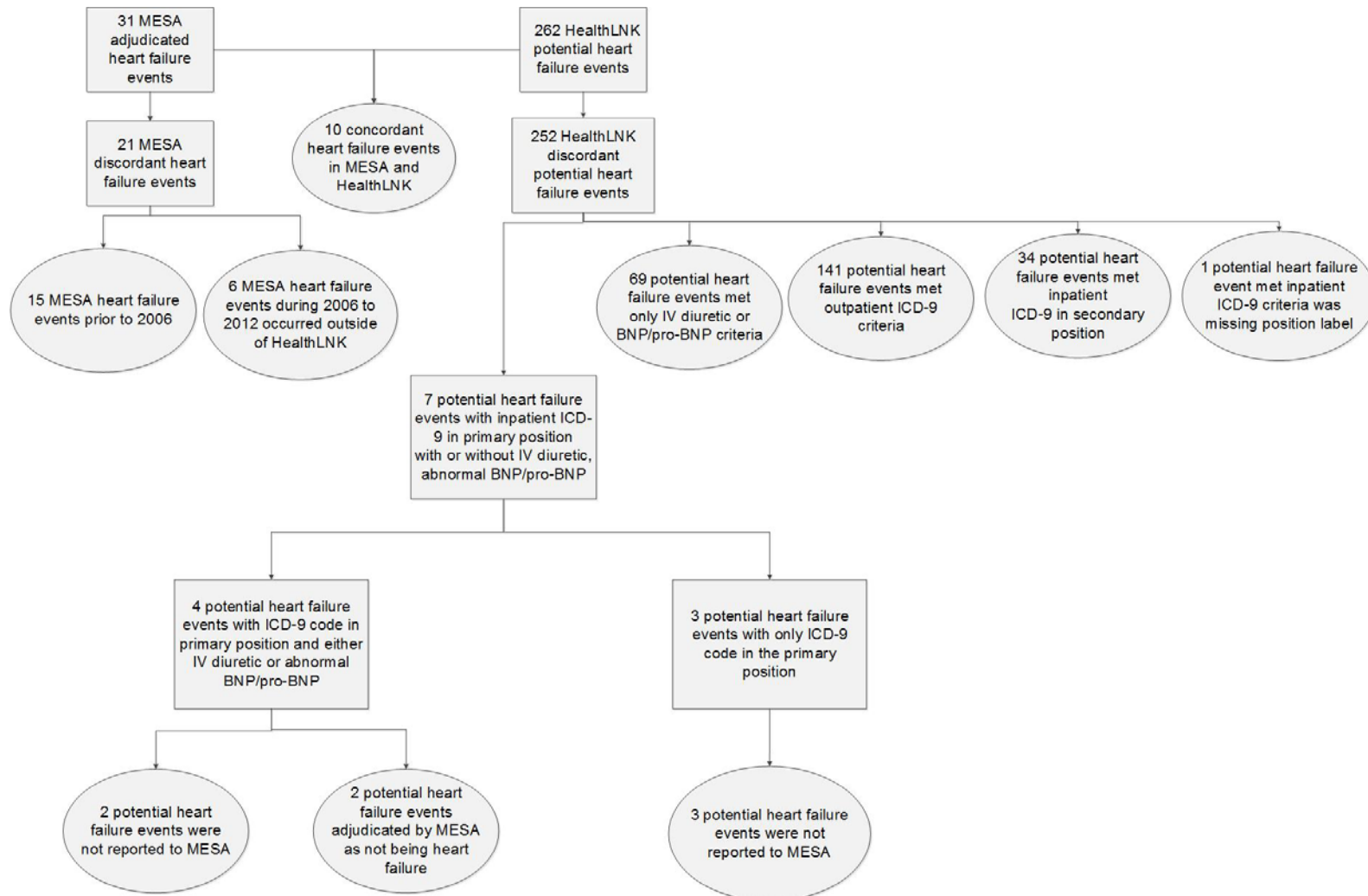
Supplemental Figure 4. Fluctuation diagram for body mass index



Supplemental Figure 5. Diagram of concordant and discordant strokes in MESA and potential strokes in HealthLNK

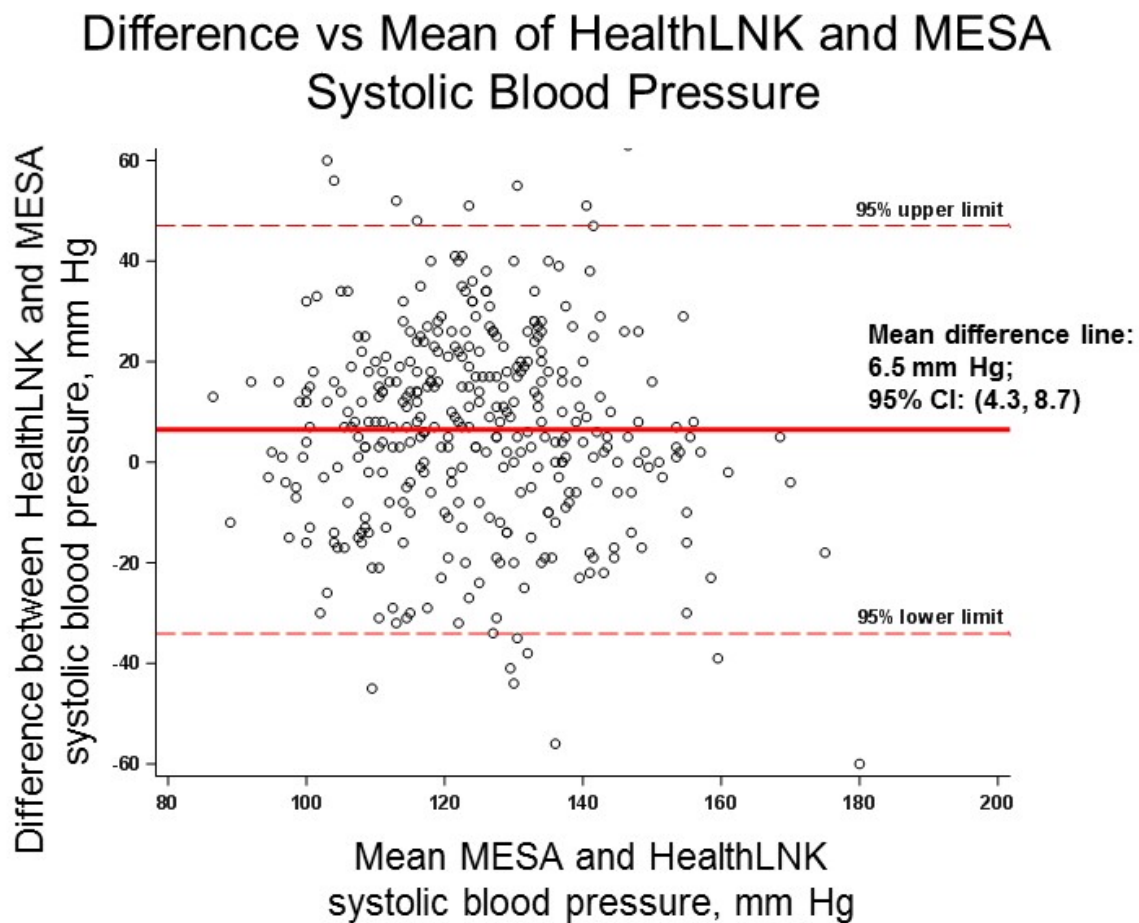


Supplemental Figure 6. Diagram of concordant and discordant heart failure events in MESA and potential heart failure events in HealthLNK. BNP = Brain Natriuretic Peptide

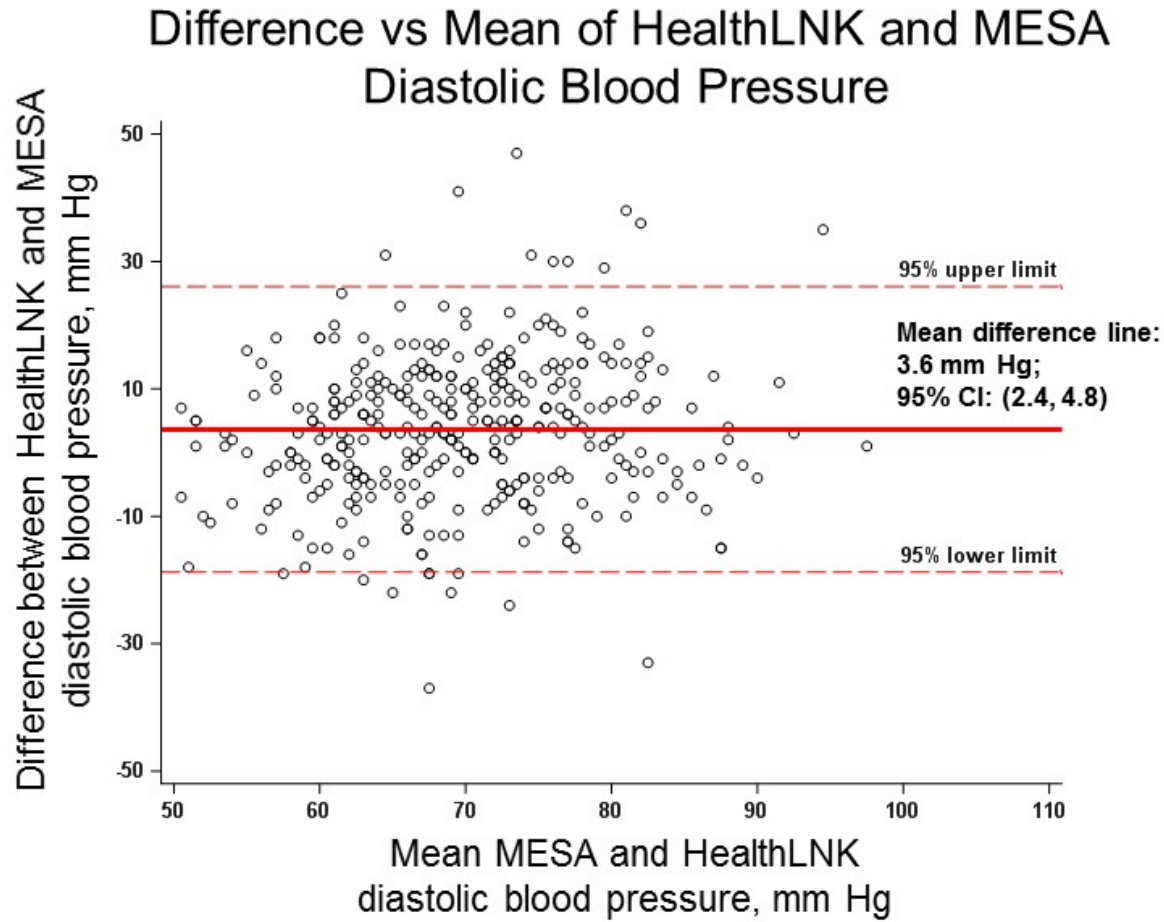


Supplemental Figure 7. Sensitivity analysis for blood pressure measurements

A. Systolic blood pressure measurement within one year of MESA examination date (n=352)

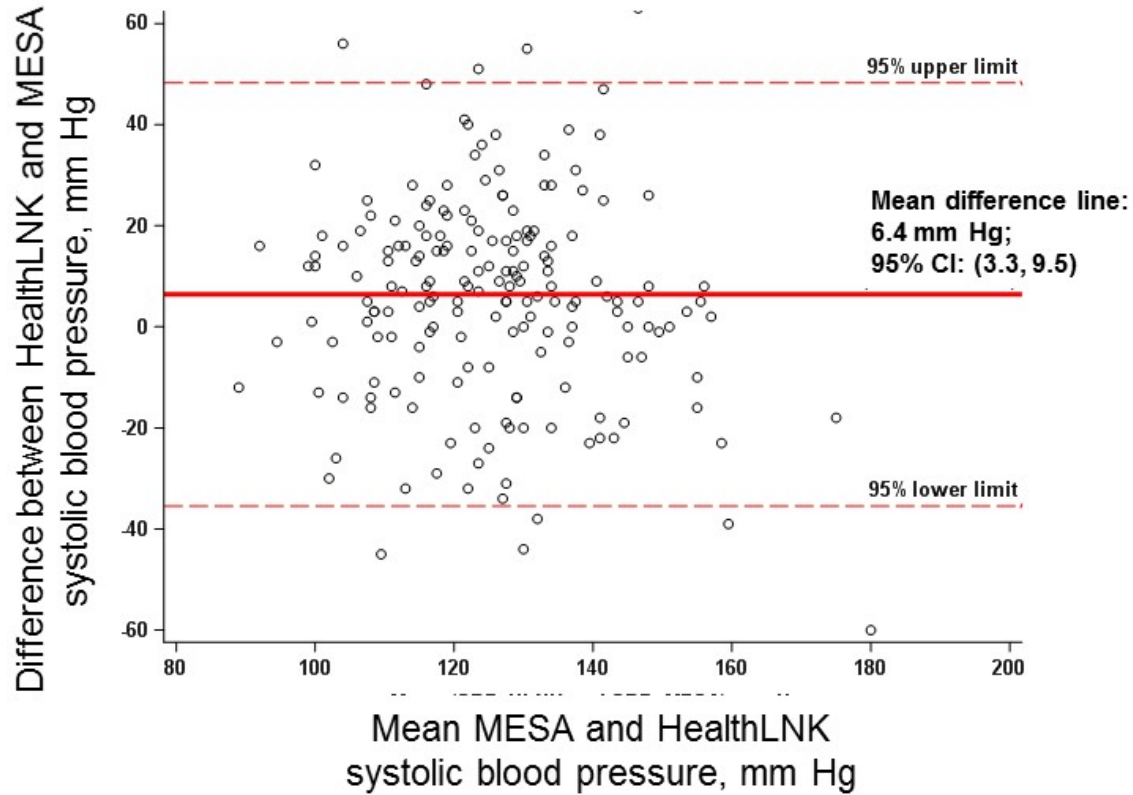


B. Diastolic blood pressure measurement within one year of MESA examination date (n=185)

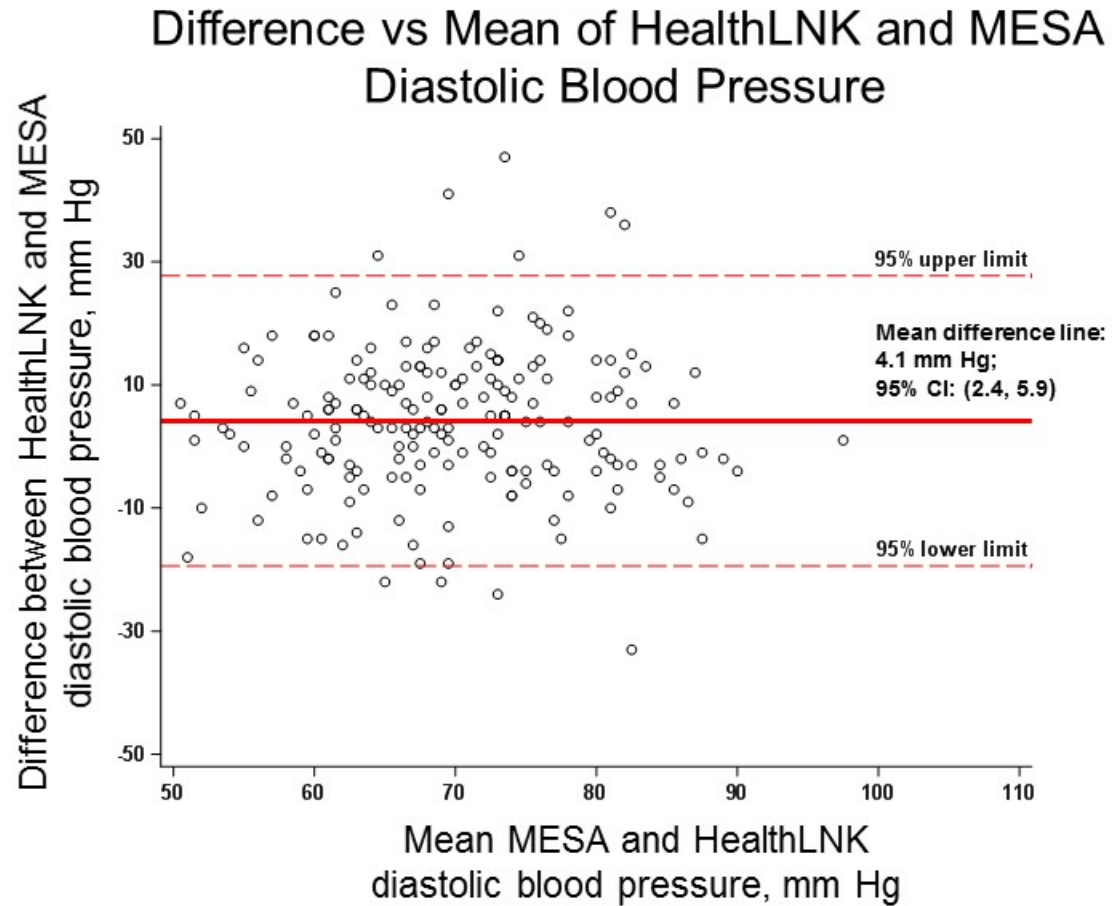


C. Systolic blood pressure measurement within three months of MESA examination date (n=352)

Difference vs Mean of HealthLNK and MESA Systolic Blood Pressure

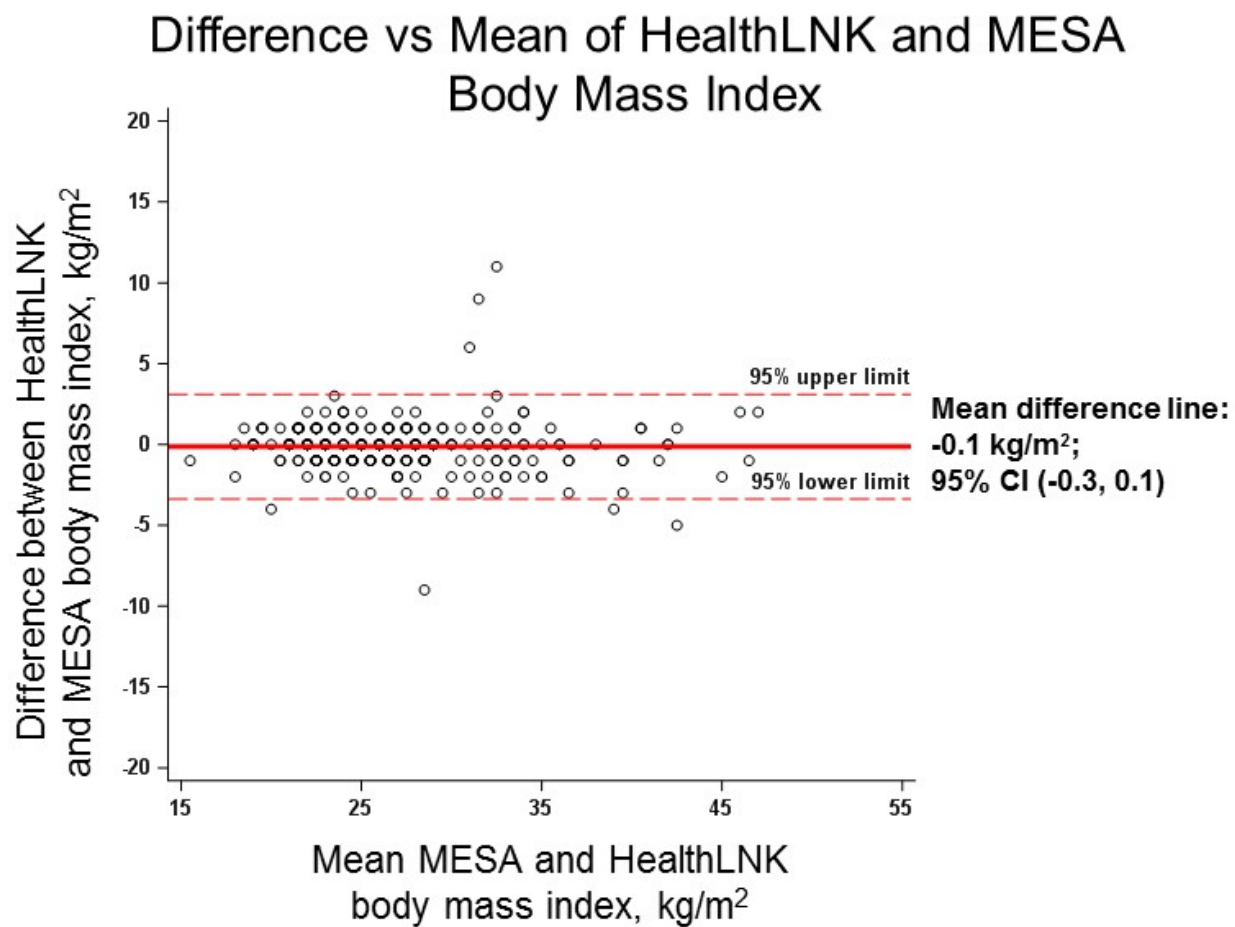


D. Diastolic blood pressure measurement within three months of MESA examination date (n=185)



Supplemental Figure 8. Sensitivity analysis for body mass index measurements

A. Body mass index measurement within one year of MESA examination date (n=262)



B. Body mass index measurement within three months of MESA examination date (n=139)

