

Supplemental Tables

Supplemental Table 1

	Univariate OR with Diabetes (95% CI)	p-value
Model 1 Variables: Age (n=11,313)		
Age, years	1.04 (1.04–1.05)	<0.001
DNN Score, per SD	3.02 (2.75–3.33)	<0.001
Model 2 Variables: Age, gender and race (n=7,851)		
Age, years	1.04 (1.04–1.05)	<0.001
Gender		0.113
Males	Ref.	
Females	0.86 (0.71 – 1.04)	0.113
Race/Ethnicity		
Non-Hispanic White, n (%)	Ref.	-
Black or African American, n (%)	1.68 (1.01–2.80)	0.047
Hispanic, Latino or Spanish origin/ancestry, n (%)	0.59 (0.41 – 0.87)	0.007
Asian, n (%)	1.40 (0.99 – 1.98)	0.059
Multi-ethnic, n (%)	1.17 (0.72 – 1.88)	0.532
Other, n (%)	0.78 (0.40 – 1.55)	0.482
DNN Score, per SD	3.03 (2.69 – 3.41)	<0.001
Model 3 Variables: Age, gender, race and BMI (n=1,033)		
Age, years	1.03 (1.02 – 1.05)	<0.001
Gender		
Males	Ref.	
Females	0.69 (0.43 – 1.11)	0.112
Race		
Non-Hispanic White	Ref.	
Black or African American	0.65 (0.09 – 4.96)	0.678
Hispanic, Latino or Spanish origin or ancestry	0.84 (0.33 – 2.15)	0.713
Asian or Pacific Islander	1.73 (0.65 – 4.58)	0.271
Multi-ethnic	0.48 (0.15 – 1.57)	0.225
Other/prefer not to disclose	0 (0)	0.999
BMI	1.13 (1.09 – 1.16)	<0.001
DNN Score, per SD	2.50 (1.92 – 3.26)	<0.001
Model 4 Variables: Heart Rate and Heart Rate Variability (n=11,313)		
HR, bpm	1.02 (1.01–1.02)	<0.001
HRV–RMSSD, per 10 ms	0.97 (0.95 – 1.00)	0.005

DNN Score, per SD	3.02 (2.75 – 3.33)	<0.001
Model 5 Variables: Comorbidities (n=11,313)		
Hypertension, n (%)	6.27 (5.35 – 7.34)	<0.001
Hypercholesterolemia, n (%)	4.52 (3.88 – 5.26)	<0.001
Coronary artery disease, n (%)	4.42 (3.65 – 5.34)	<0.001
Prior MI, n (%)	4.89 (3.81 – 6.27)	<0.001
CHF, n (%)	7.76 (5.85 – 10.29)	<0.001
PVD, n (%)	6.41 (4.73 – 8.69)	<0.001
Prior Stroke, n (%)	5.03 (3.86 – 6.55)	<0.001
Sleep apnea n (%)	3.83 (3.25 – 4.51)	<0.001
DNN Score, per SD	3.02 (2.75 – 3.33)	<0.001

Supplemental Table 1: Univariate odds ratios of predictors for prevalent diabetes in the Test Dataset. Model numbers shown correspond to LogReg Models from Table 2. Univariate logistic regression models are then performed within the subgroup of the Test Dataset individuals that have all variables available. Subgroup sample sizes are shown and are the same as those from LogReg Models in Table 2. Sample sizes reported indicate individual people. Abbreviations: LogReg: logistic regression; OR: diagnostic odds-ratio; BMI: body mass index; CI: Confidence Interval; DNN: Deep neural network; SD: standard deviation; AUC: area under the receiver operating characteristic curve; HR: Heart Rate; HRV: Heart Rate Variability; RMSSD: Root Mean Square of Successive RR interval differences; y: years. Independent variables were standardized using the Z-score. †p-value is calculated using the Wald test for the odds ratio (two-sided).

Supplemental Table 2

	Positive DNN Score * (n = 4,214)	Negative DNN Score * (n = 7,099)	p-value
Age, years, mean ± SD	54.9±13.3	39.8±13.1	<0.001
Gender	<i>N=2,551</i>	<i>N=5,248</i>	
Females, n (%)	1,511 (56.1%)	2,002 (42.7%)	<0.001
Males, n (%)	1,511 (43.9%)	3,023 (57.3%)	
Race and ethnic group	<i>N=2,826</i>	<i>N=5,025</i>	<0.001
Non-Hispanic White, n (%)	2,187 (77.9%) ^a	3,756 (74.9%) ^b	
Black or African American, n (%)	94 (3.4%) ^a	80 (1.8%) ^b	
Hispanic, Latino or Spanish origin/ancestry, n (%)	237 (8.3%) ^a	579 (2.1%) ^b	
Asian, n (%)	155 (4.7%) ^a	304 (6.2%) ^a	
Multi-ethnic, n (%)	92 (3.6%) ^a	180 (11.0%) ^a	
Other, n (%)	61 (1.8%) ^a	126 (3.2%) ^a	
Waveform data			
Number of recordings per user, mean ± SD	51.3±100.7	46.0±88.6	0.004
Duration of waveform, seconds, mean ± SD	21.9±10.5	21.9±10.6	0.776
Heart rate, bpm, mean ± SD	84.3±13.5	78.5±15.6	<0.001
Anthropometric data	<i>N=450</i>	<i>N=715</i>	
Height, meters, mean ± SD	1.72±0.11	1.74±0.10	<0.001
Weight, kg, mean ± SD	87.0±22.0	82.4±20.2	<0.001
BMI, mean ± SD	29.4±6.6	27.1±5.9	<0.001
Medical conditions	<i>N=4214</i>	<i>N=7099</i>	
No reported medical conditions, n (%)	1291 (30.6%)	4,458 (62.7%)	<0.001
Diabetes mellitus, n (%)	562 (13.3%)	188 (2.6%)	<0.001
Hypertension, n (%)	1,805 (42.8%)	1,195 (16.8%)	<0.001
Hypercholesterolemia, n (%)	1,783 (42.3%)	1,373 (19.3%)	<0.001
Coronary artery disease, n (%)	515 (12.2%)	285 (4.0%)	<0.001
Prior MI, n (%)	263 (6.2%)	114 (1.6%)	<0.001
CHF, n (%)	171 (4.1%)	63 (0.9%)	<0.001
PVD, n (%)	144 (3.4%)	68 (1.0%)	<0.001
Prior Stroke, n (%)	210 (4.9%)	115 (1.6%)	<0.001
Sleep apnea n (%)	841 (20.0%)	626 (8.8%)	<0.001

Supplemental Table 2. Group differences between users with positive vs negative DNN Score for Diabetes in the Test Dataset. Test Dataset sample size was 11,313 individual people. Where data was only available for subgroups of the full cohort, subgroup sample size is denoted by N. Differences in means of continuous variables between 2 groups were compared using the two-sample t-test. Differences in proportions of categorical variables

between 2 groups were compared using the Chi-Squared test. Tests of significance were 2 sided; no adjustments were made for multiple comparisons. Abbreviations: SD: standard deviation; BMI: body mass index; CAD: Coronary artery disease; CHF: Congestive heart failure; COPD: Chronic obstructive pulmonary disease; HR: Heart rate, MI: Myocardial Infarction; PVD: Peripheral Vascular Disease; s: seconds; bpm: beats per minute. ^{a, b}: Each subscript letter denotes a subset of dataset categories whose column proportions do not differ significantly from each other at the 0.05 level. *The DNN Score was considered positive for diabetes if the value was ≥ 0.427 . This value was chosen because it maximizes the sensitivity between diabetes/no-diabetes in our training set.

Supplemental Table 3

	With Diabetes (n = 679)	Without Diabetes (n = 7,127)	p-value
Age, years, mean ± SD	54.4±14.3	43.6±16.1	<0.001
Gender	<i>N=318</i>	<i>N=3,618</i>	
Females, n (%)	152 (47.7%)	2,085 (57.6%)	<0.001
Males, n (%)	166 (52.2%)	1,533 (21.5%)	
Race and ethnic group	<i>N=318</i>	<i>N=3,618</i>	
Non-Hispanic White, n (%)	229 (72.0%)	2,731 (75.4%)	
Black or African American, n (%)	15 (4.7%)	92 (2.5%)	
Hispanic, Latino or Spanish origin/ancestry, n (%)	37 (11.6%)	419 (11.5%)	0.226
Asian, n (%)	14 (4.4%)	169 (4.7%)	
Multi-ethnic, n (%)	11 (3.5%)	108 (3.0%)	
Other, n (%)	12 (3.7%)	99 (2.7%)	
Anthropometric data	<i>N=56</i>	<i>N= 594</i>	
Height, meters	1.72±0.12	1.71±0.10	0.310
Weight, kg	98.2±53.3	81.2±21.0	<0.001
BMI	33.1±6.6	27.7±6.5	<0.001
Waveform data	<i>N=679</i>	<i>N=7,127</i>	
Total number of recordings, mean ± SD	24,979	218,999	-
Number of recordings per user, mean ± SD	36.8±77.2	30.8±63.1	0.020
Duration of waveform, s, mean ± SD	20.3±8.3	20.7±9.5	0.334
Heart rate, bpm, mean ± SD	83.3±13.1	80.6±14.1	<0.001
Medical conditions	<i>N=679</i>	<i>N=7,127</i>	
No reported medical conditions, n (%)	0 (0%)	3,517 (49.3%)	<0.001
Diabetes mellitus, n (%)	679 (100%)	0 (0%)	<0.001
Hypertension, n (%)	491 (72.3%)	1,961 (27.5%)	<0.001
Hypercholesterolemia, n (%)	442 (65.1%)	1,918 (26.9%)	<0.001
Coronary artery disease, n(%)	163 (24.0%)	492 (6.9%)	<0.001
Prior MI, n (%)	94 (13.8%)	207 (2.9%)	<0.001
CHF, n (%)	79 (11.6%)	153 (2.1%)	<0.001
PVD, n (%)	59 (8.6%)	120 (1.6%)	<0.001
Prior Stroke, n (%)	74 (10.9%)	215 (3.0%)	<0.001
Sleep apnea n (%)	258 (37.8%)	1,005 (14.1%)	<0.001

Supplemental Table 3. Baseline Characteristics of the Contemporary Cohort by Diabetes Status. Contemporary Cohort sample size was 7,806 individual people. Where data was only

available for subgroups of the full cohort, subgroup sample size is denoted by N. Differences in means of continuous variables between 2 groups were compared using the two-sample t-test. Differences in proportions of categorical variables between 2 groups were compared using the Chi-Squared test. Tests of significance were 2 sided. Abbreviations: SD: standard deviation; CAD: Coronary artery disease; CHF: Congestive heart failure; COPD: Chronic obstructive pulmonary disease; HR: Heart rate, MI: Myocardial Infarction; PVD: Peripheral Vascular Disease; s: seconds.

Supplemental Table 4

	With Diabetes (n = 38)	Without Diabetes (n = 143)	<i>p</i>-value
Age, years, mean ± SD	65.2±11.8	62.5±15.2	0.320
Gender			
Females, n (%)	16 (42.0%)	50 (34.9%)	0.420
Males, n (%)	22 (57.9%)	93 (65.0%)	
Waveform data			
Heart rate, bpm, mean ± SD	0.77±109.0	93.4±101.7	0.330
Duration of waveform, s, mean ± SD	71.8±104.3	97.9±106.3	0.180
Medical conditions			
No reported medical conditions, n (%)	0 (0%)	48 (35.6%)	<0.001
Diabetes mellitus, n (%)	38 (100%)	0 (0%)	-
Hypertension, n (%)	29 (76.3%)	70 (49.0%)	0.003
Hypercholesterolemia, n (%)	27 (71.8%)	60 (42.0%)	0.001
Coronary artery disease, n (%)	5 (13.1%)	6 (4.2%)	0.013
Prior MI, n (%)	5 (13.1%)	6 (4.2%)	0.040
CHF, n (%)	3 (7.9%)	8 (5.6%)	0.598
PVD, n (%)	3 (7.9%)	3 (2.1%)	0.295
Prior Stroke, n (%)	4 (10.5%)	1 (0.7%)	0.007
Sleep apnea, n (%)	2 (5.3%)	11 (7.7%)	0.931
Lab work	<i>N</i> = 38	<i>N</i> = 63	
Glycated hemoglobin (HbA1c)	7.5±0.3	5.6±0.4	<0.001

Supplemental Table 4. Clinic Cohort characteristics by Diabetes Status. Clinic Cohort sample size was 181 individual people. Where data was only available for subgroups of the full cohort, subgroup sample size is denoted by N. Differences in means of continuous variables between 2 groups were compared using the two-sample t-test. Differences in proportions of categorical variables between 2 groups were compared using the Chi-Squared test. Tests of significance were 2 sided. Abbreviations: SD: standard deviation; bpm: beats per minute; CAD: Coronary artery disease; CHF: Congestive heart failure; COPD: Chronic obstructive pulmonary disease; HR: Heart rate, MI: Myocardial Infarction; PVD: Peripheral Vascular Disease; HbA1c: glycated hemoglobin %.