**Supplemental Materials**

**Supplemental Table 1. Values of measures included in the analysis (n=6620).**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Zone** | **Number (%)** | **Age in years n=6522** | **BMI (mg/ kg2)** | **Over-weight (%)** | **Male (%)** | **G0\* mg/dl** | **G30\* mg/dl** | **G60\* mg/dl** | **G90\* mg/dl** | **G120\*mg/dl** | **C0\* ng/ml** | **C30\* ng/ml** | **C60\* ng/ml** | **C90\* ng/ml** | **C120\* ng/ml** | **Ind60\*** | **mIAA (%)** | **IA-2A (%)** | **GADA (%)** | **≥2Ab (%)** | **DR3/ DR4 (%)** | **5-yr Risk (%)** |
| **A1** | **364 (5.5)** | **8.7 (8.3)** | **16.6 (3.2)** | **7.1** | **63.5** | **84 (9)** | **114 (18)** | **107.2 (20.2)** | **97.2 (16.6)** | **98 (17)** | **0.9 (0.3)** | **2.6 (1.1)** | **3.0 (1.0)** | **2.7 (0.9)** | **2.8 (1.1)** | **0.6 (0.4)** | **61.0** | **29.4** | **79.7** | **51.9** | **19.2** | **27.7** |
| **A2** | **282 (4.3)** | **7.5 (6.7)** | **16.8 (3.4)** | **15.5** | **59.4** | **87 (9)** | **134 (20)** | **133.1 (18.9)** | **116.6 (16.1)** | **110 (18)** | **0.8 (0.3)** | **2.6 (0.9)** | **3.3 (0.9)** | **3.2 (0.8)** | **3.0 (0.9)** | **0.9 (0.4)** | **66.7** | **46.1** | **83.0** | **65.2** | **22.8** | **34.9** |
| **A3** | **213 (3.2)** | **6.3 (4.6)** | **16.1 (1.9)** | **14.6** | **60.6** | **86 (9)** | **145 (21)** | **151.0 (18.9)** | **137.6 (19.6)** | **122 (20)** | **0.7 (0.3)** | **2.3 (0.8)** | **3.1 (0.9)** | **3.3 (0.8)** | **3.2 (1.0)** | **1.2 (0.3)** | **75.1** | **54.9** | **83.1** | **76.1** | **26.3** | **52.1** |
| **A4** | **138 (2.1)** | **6.7 (4.6)** | **16.1 (1.9)** | **12.9** | **63.8** | **87 (11)** | **157 (23)** | **174.1 (19.1)** | **154.8 (20.5)** | **137 (28)** | **0.7 (0.3)** | **2.2 (0.7)** | **3.1 (0.8)** | **3.5 (0.8)** | **3.5 (1.0)** | **1.6 (0.3)** | **71.7** | **65.9** | **85.5** | **79.0** | **29.9** | **64.2** |
| **A5** | **139 (2.1)** | **7.4 (6.5)** | **16.3 (2.4)** | **14.5** | **58.3** | **89 (11)** | **172 (24)** | **199.8 (22.1)** | **188.2 (24.1)** | **155 (27)** | **0.7 (0.3)** | **2.1 (0.6)** | **3.0 (0.7)** | **3.5 (0.7)** | **3.5 (0.9)** | **2.0 (0.4)** | **74.8** | **74.1** | **82.0** | **83.5** | **28.2** | **87.6** |
| **B1** | **487 (7.4)** | **17.8 (12.6)** | **20.0 (4.9)** | **14.2** | **49.1** | **88 (7)** | **121 (17)** | **101.4 (19.2)** | **91.9 (14.9)** | **93 (16)** | **1.3 (0.4)** | **4.5 (1.1)** | **5.0 (1.1)** | **4.4 (0.9)** | **4.3 (1.1)** | **-0.1 (0.4)** | **38.8** | **22.2** | **80.3** | **34.9** | **15.3** | **12.6** |
| **B2** | **446 (6.7)** | **12.3 (10.1)** | **18.0 (3.8)** | **13.4** | **58.0** | **90 (8)** | **142 (17)** | **127.5 (19.5)** | **112.6 (14.3)** | **109 (17)** | **1.2 (0.4)** | **4.2 (1.1)** | **5.0 (1.1)** | **4.6 (0.9)** | **4.5 (1.2)** | **0.3 (0.4)** | **43.9** | **34.5** | **83.0** | **50.4** | **20.4** | **20.3** |
| **B3** | **335 (5.1)** | **10.7 (9.0)** | **17.7 (3.9)** | **14.4** | **58.4** | **90 (8)** | **156 (19)** | **147.1 (22.0)** | **128.9 (16.3)** | **119 (19)** | **1.1 (0.4)** | **4.0 (1.0)** | **5.0 (1.0)** | **4.9 (0.9)** | **4.6 (1.2)** | **0.6 (0.4)** | **50.7** | **34.9** | **77.9** | **48.7** | **27.1** | **31.7** |
| **B4** | **175 (2.6)** | **11.6 (9.4)** | **18.1 (4.9)** | **15.2** | **53.7** | **91 (9)** | **164 (21)** | **172.5 (19.3)** | **149.9 (19.5)** | **131 (22)** | **1.1 (0.5)** | **3.6 (0.9)** | **4.8 (0.8)** | **5.2 (0.9)** | **4.9 (1.2)** | **1.1 (0.4)** | **56.0** | **56.6** | **84.6** | **66.9** | **20.6** | **53.2** |
| **B5** | **188 (2.8)** | **12.0 (9.5)** | **18.4 (3.9)** | **14.5** | **49.7** | **93 (13)** | **179 (26)** | **204.7 (26.3)** | **186.1 (25.4)** | **153 (27)** | **1.2 (0.4)** | **3.4 (0.8)** | **4.7 (0.8)** | **5.4 (0.9)** | **5.4 (1.2)** | **1.7 (0.5)** | **52.1** | **62.8** | **89.4** | **73.9** | **29.1** | **75.8** |
| **C1** | **417 (6.3)** | **22.9 (12.8)** | **22.1 (4.6)** | **13.8** | **38.4** | **90 (7)** | **122 (17)** | **102.0 (19.7)** | **90.3 (16.0)** | **91 (17)** | **1.7 (0.6)** | **5.9 (1.5)** | **6.8 (1.4)** | **5.9 (1.2)** | **5.5 (1.5)** | **-0.6 (0.5)** | **31.2** | **20.6** | **77.0** | **25.4** | **16.0** | **7.7** |
| **C2** | **386 (5.8)** | **17.6 (11.9)** | **21.4 (5.3)** | **24.0** | **53.6** | **91 (7)** | **142 (16)** | **128.3 (18.5)** | **111.1 (14.4)** | **108 (16)** | **1.6 (0.5)** | **5.7 (1.4)** | **6.8 (1.3)** | **6.2 (1.2)** | **6.0 (1.5)** | **-0.2 (0.4)** | **36.5** | **27.5** | **78.2** | **35.8** | **15.3** | **12.8** |
| **C3** | **297 (4.5)** | **17.0 (12.2)** | **20.3 (5.1)** | **17.6** | **48.5** | **93 (9)** | **157 (20)** | **148.2 (19.5)** | **128.6 (16.6)** | **117 (20)** | **1.5 (0.5)** | **5.4 (1.2)** | **6.8 (1.2)** | **6.6 (1.1)** | **6.0 (1.4)** | **0.1 (0.4)** | **40.4** | **31.6** | **83.5** | **43.1** | **19.2** | **25.2** |
| **C4** | **175 (2.6)** | **16.4 (11.2)** | **20.9 (5.2)** | **22.4** | **50.9** |  | **163 (21)** | **171.2 (19.0)** | **151.6 (19.2)** | **132 (24)** | **1.6 (0.5)** | **4.9 (1.0)** | **6.5 (1.0)** | **7.1 (1.0)** | **6.7 (1.6)** | **0.6 (0.4)** | **36.0** | **45.7** | **86.9** | **52.0** | **22.8** | **42.4** |
| **C5** | **146 (2.2)** | **16.5 (11.9)** | **20.2 (5.3)** | **17.5** | **44.5** | **95 (11)** | **181 (23)** | **204.1 (25.0)** | **184.1 (27.4)** | **150 (29)** | **1.5 (0.5)** | **4.6 (1.1)** | **6.3 (1.0)** | **7.3 (1.1)** | **6.8 (1.5)** | **1.2 (0.5)** | **52.1** | **54.8** | **87.0** | **67.1** | **23.7** | **69.8** |
| **D1** | **284 (4.3)** | **24.0 (12.2)** | **24.4 (5.8)** | **20.0** | **28.4** | **89 (7)** | **122 (16)** | **102.6 (18.2)** | **92.8 (14.4)** | **93 (17)** | **2.1 (0.7)** | **7.5 (1.8)** | **8.3 (1.6)** | **7.6 (1.4)** | **7.1 (1.7)** | **-1.1 (0.5)** | **28.6** | **21.2** | **74.9** | **22.6** | **15.2** | **1.0** |
| **D2** | **300 (4.5)** | **20.6 (12.4)** | **23.4 (6.2)** | **26.3** | **40.0** | **92 (7)** | **141 (16)** | **128.0 (17.0)** | **113.6 (14.8)** | **108 (18)** | **2.0 (0.5)** | **7.1 (1.6)** | **8.4 (1.5)** | **7.9 (1.3)** | **7.4 (1.7)** | **-0.7 (0.4)** | **37.0** | **19.0** | **77.3** | **29.3** | **13.0** | **7.5** |
| **D3** | **224 (3.4)** | **21.1 (12.8)** | **23.3 (6.7)** | **29.9** | **48.2** | **94 (8)** | **154 (19)** | **147.3 (18.9)** | **129.7 (16.7)** | **120 (20)** | **1.9 (0.6)** | **6.8 (1.5)** | **8.3 (1.4)** | **8.2 (1.3)** | **7.7 (1.8)** | **-0.4 (0.5)** | **39.3** | **30.4** | **77.2** | **40.6** | **15.5** | **21.8** |
| **D4** | **144 (2.2)** | **22.9 (14.1)** | **24.3 (7.2)** | **25.0** | **34.7** | **95 (9)** | **160 (21)** | **170.7 (18.8)** | **152.1 (18.1)** | **130 (23)** | **1.9 (0.6)** | **6.1 (1.3)** | **8.2 (1.3)** | **8.9 (1.1)** | **8.2 (2.0)** | **0.0 (0.5)** | **36.1** | **31.9** | **77.8** | **38.9** | **16.7** | **18.6** |
| **D5** | **138 (2.1)** | **21.0 (12.8)** | **24.0 (6.2)** | **27.1** | **47.8** | **99 (11)** | **182 (26)** | **201.5 (28.0)** | **181.8 (24.2)** | **151 (24)** | **1.9 (0.7)** | **5.8 (1.3)** | **8.0 (1.1)** | **9.2 (1.1)** | **8.9 (1.8)** | **0.6 (0.5)** | **38.4** | **43.5** | **89.1** | **55.1** | **23.6** | **49.4** |
| **E1** | **179 (2.7)** | **23.7 (11.9)** | **27.0 (6.9)** | **36.6** | **20.1** | **90 (7)** | **124 (16)** | **103.7 (18.6)** | **92.2 (15.2)** | **92 (17)** | **2.7 (0.8)** | **10.4 (3.0)** | **11.6 (3.0)** | **9.8 (2.6)** | **9.3 (3.0)** | **-1.9 (0.6)** | **26.8** | **18.4** | **78.2** | **21.2** | **9.2** | **1.5** |
| **E2** | **297 (4.5)** | **22.6 (11.7)** | **26.4 (6.3)** | **36.5** | **36.1** | **93 (7)** | **141 (15)** | **128.1 (17.4)** | **114.0 (14.4)** | **107 (18)** | **2.7 (0.9)** | **10.1 (3.0)** | **11.8 (3.1)** | **10.8 (2.9)** | **10.1 (3.1)** | **-1.6 (0.6)** | **27.9** | **18.9** | **82.8** | **27.3** | **12.5** | **8.9** |
| **E3** | **351 (5.3)** | **22.7 (12.7)** | **26.1 (6.8)** | **36.1** | **39.4** | **94 (7)** | **153 (16)** | **148.7 (17.8)** | **131.7 (14.6)** | **120 (19)** | **2.7 (0.9)** | **9.7 (3.0)** | **11.9 (3.3)** | **11.7 (3.1)** | **11.0 (3.5)** | **-1.3 (0.7)** | **30.5** | **22.8** | **79.2** | **28.8** | **14.6** | **14.5** |
| **E4** | **264 (4.0)** | **26.6 (13.4)** | **28.1 (8.0)** | **34.7** | **48.1** | **97 (8)** | **163 (18)** | **167.3 (16.4)** | **150.7 (16.5)** | **133 (21)** | **2.8 (1.0)** | **9.6 (3.1)** | **12.3 (3.4)** | **12.7 (3.2)** | **12.1 (3.6)** | **-1.1 (0.7)** | **33.3** | **22.7** | **76.5** | **28.0** | **15.0** | **10.2** |
| **E5** | **251 (3.8)** | **26.2 (13.6)** | **28.2 (7.8)** | **37.7** | **48.2** | **99 (9)** | **179 (22)** | **199.4 (24.5)** | **184.1 (24.7)** | **154 (27)** | **3.1 (1.3)** | **9.3 (3.4)** | **12.6 (4.3)** | **14.2 (4.7)** | **13.4 (4.8)** | **-0.5 (0.8)** | **30.7** | **30.7** | **86.9** | **36.7** | **21.3** | **41.1** |

**G=glucose; C=C-peptide; \*mean (STD) values. (Age missing from 101; BMI and BMI percentile missing from 718; Index60 missing from 147)**

**Supplemental Table 2. Characteristics at baseline of individuals who were studied**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **All (n=6620)** | **Sample 1 (n=3362)** | **Sample 2 (n=3258)** | **P-Value Sample 1 vs. Sample 2** |
| **Age at Screen (yrs)\*** | **17.2±12.8** | **17.4±13.0** | **17.0±12.6** | **0.214** |
| **MIAA (%)** | **42.9** | **41.9** | **44.1** | **0.070** |
| **IA-2A (%)** | **33.0** | **33.2** | **32.9** | **0.788** |
| **GAD65 (%)** | **80.9** | **81.6** | **80.3** | **0.168** |
| **≥ 2 AB (%)** | **43.8** | **43.3** | **44.2** | **0.489** |
| **DR3/DR4 (%)** | **18.8** | **18.6** | **18.9** | **0.777** |
| **BMI (kg/m2)\*** | **21.3±6.5** | **21.3±6.6** | **21.3±6.4** | **0.906** |
| **Glucose AUC (mg/dl)\*** | **131.4±24.4** | **132.1±24.8** | **130.7±24.0** | **0.026** |
| **C-peptide AUC (ng/ml)\*** | **6.0±2.9** | **6.0±2.8** | **6.1±2.9** | **0.217** |
| **Index60\*** | **-0.03±1.04** | **0.03±1.04** | **-0.03±1.05** | **0.008** |
| **Male (%)** | **48.3** | **48.7** | **47.9** | **0.541** |

**\*mean values (Age missing from 101; BMI missing from 718; Index60 missing from 147)**

**Supplemental Table 3. Percentages of autoantibodies, DR3/DR4, and risk of lowest and highest AUC glucose rows and AUC C-peptide columns**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Percent** | **AUC Glucose** | |  | **AUC C-peptide** | |
| **Row 1 (Lowest) n=1730** | **Row 5 (Highest) n=862** |  | **Column A (Lowest)**  **n=1136** | **Column E (Highest) n=679** |
| **MIAA** | **38.7** | **47.3\*** |  | **68.1** | **30.0\*** |
| **IA-2A** | **22.8** | **50.8\*** |  | **48.2** | **22.8\*** |
| **GADA** | **78.3** | **87.0\*** |  | **82.1** | **80.8** |
| **≥2Abs** | **32.8** | **60.4\*** |  | **66.9** | **28.8\*** |
| **DR3/DR4** | **15.6** | **24.9\*** |  | **23.8** | **14.7\*** |
| **5-yr Risk** | **12.6** | **65.0\*** |  | **46.0** | **15.6\*** |

**\*p<0.001 for comparisons between row 1 and row 5 (with Bonferroni adjustment, significance was at 0.008)**

**Supplemental Table 4. Regression coefficients (mean difference±SE) comparing AUCGLU between column E and other columns with and without adjustments**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **AUC Glucose Difference (mg/dl) (Column E – Other Columns)** | **t-Value** | **p-Value** |
| **Unadjusted** | **10.6±0.8** | **14** | **<0.001** |
| **Index60****1 Adjusted** | **36.6±0.7** | **49** | **<0.001** |
| **Age2 Adjusted** | **12.0±0.8** | **15** | **<0.001** |
| **Index603+Age****4 Adjusted** | **36.2±0.7** | **49** | **<0.001** |

**1** **t-Value=61, p-Value<0.0001 for Index60;  2 t-Value=-7, p-Value<0.0001 for Age; 3 t-Value=62, p-Value<0.0001 for Index60 4 t-Value=9, p-Value<0.0001 for Age**

**Legends for Supplemental Figures**

**Supplemental Figure 1**

The 25 zones demarcated by AUC glucose and AUC-C-peptide are shown along with their labeling: 1 to 5 for increasing values of AUC glucose rows and A to E for increasing values of AUC C-peptide columns.

**Supplemental Figure 2**

GCRCs and their centroids are shown for the 25 zones of each split sample. There is little difference between the split samples. Of the 75 possible comparisons of the GCRC sides (3 sides for each of the 25 GCRCs), only 3 of their slopes differed significantly (between p>0.01 and p<0.05).

**Supplemental Figure 3**

Shown are scatterplots of 5-year risk of type 1 diabetes with IA-2A prevalence for the 25 zones. Sample 1 and sample 2 are color-coded. The correlations were very high in both samples and the slopes were similar.