

Appendix

Association between Hemoglobin A1c Variability and Hypoglycemia-related Hospitalizations in Veterans with Diabetes Mellitus

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Table of Contents

Table 1: A1c Coefficient of Variation and HRH Risk in Two-Year Follow-up Period

Table 2: A1c Standard Deviation and HRH risk in Two-Year Follow-up Period

Table 3: Adjusted A1c Standard Deviation and HRH risk in Two-Year Follow-up Period

Table 4: Sensitivity Analysis of A1c Coefficient of Variation and HRH Risk in One-Year Follow Up Period

Table 5: Sensitivity Analysis of A1c Coefficient of Variation and HRH Risk in Three-Year Follow Up Period

Table 6: Sensitivity Analysis of Prior HRH on A1c Coefficient of Variation and HRH risk in Two-Year Follow-up Period

Table 7: Sensitivity Analysis of Prior HRH Risk on A1c Standard Deviation and HRH risk in Two-Year Follow-up Period

Table 8: Sensitivity Analysis of Prior HRH on Adjusted A1c Standard Deviation and HRH risk in Two-Year Follow-up Period

Table 1: A1c Coefficient of Variation and HRH risk in Two-Year Follow-up Period (N=342,058)

	Odds Ratio (95% CI)	P
A1c coefficient of variation (%) (ref < 4)		
4-5.9	1.19 (1.04-1.36)	0.011
6-9.4	1.28 (1.13-1.47)	<0.001
9.5-66	1.44 (1.26-1.65)	<0.001
A1c mean (%) (ref= 7-7.9)		
< 6	0.66 (0.56-0.78)	<0.001
6-6.9	0.78 (0.71-0.86)	<0.001
8-8.9	1.11 (1.00-1.24)	0.060
≥ 9	1.53 (1.33-1.75)	<0.001
Insulin use	1.98 (1.82-2.17)	<0.001
Metformin use	0.85 (0.79-0.93)	<0.001
Sulfonylurea use	1.43 (1.31-1.55)	<0.001
Alpha glucosidase inhibitor use	0.89 (0.70-1.12)	0.321
Thiazolidinedione use	0.95 (0.86-1.04)	0.261
Other medication use*	0.78 (0.57-1.07)	0.118
Serum creatinine (mg/dL) (ref = 0.6 -1.2)		
< 0.6	1.49 (0.47-4.71)	0.496
> 1.2	1.40 (1.28-1.52)	<0.001
Missing†	1.23 (0.95-1.60)	0.123
Urine albumin to creatinine ratio (mg/g) (ref < 30)		
30 – 300	1.32 (1.17-1.50)	<0.001
> 300	1.50 (1.21-1.84)	<0.001
Missing†	1.13 (1.02-1.24)	0.018
Body mass index (kg/m ²) (ref=18.5-24.9)		
< 18.5	1.83 (0.93-3.62)	0.080
25 – 29	0.85 (0.76-0.95)	0.005
30 – 39	0.81 (0.72-0.91)	<0.001
≥ 40	0.71 (0.58-0.88)	0.001

Missing [†]	0.89 (0.71-1.10)	0.273
Serum albumin (g/dL) (ref ≥ 3.5)		
< 3.5	1.10 (0.98-1.24)	0.105
Missing [†]	0.89 (0.78-1.03)	0.111
Age (years) (ref = 65-74)		
75+	1.67 (1.55-1.81)	<0.001
Female	1.27 (0.93-1.72)	0.128
Race (ref = White)		
Black	1.88 (1.71-2.06)	<0.001
Hispanic	1.03 (0.78-1.35)	0.833
Asian	1.38 (0.81-2.35)	0.235
Other	1.05 (0.72-1.53)	0.804
Financial means test (ref = exempt)		
Copayment required	0.95 (0.86-1.04)	0.268
Missing [†]	0.92 (0.84-1.01)	0.086
Service connected disability (%) (ref < 50)		
≥ 50	0.93 (0.82-1.05)	0.226
Log # of outpatient visits	1.31 (1.22-1.41)	<0.001
Log # of inpatient visits	1.41 (1.33-1.50)	<0.001
Follow up year		
2009	0.65 (0.55-0.77)	<0.001
2010	0.49 (0.38-0.63)	<0.001
2011	0.47 (0.36-0.62)	<0.001
2012	0.33 (0.24-0.45)	<0.001
2013	0.38 (0.29-0.50)	<0.001
2014	0.36 (0.21-0.59)	<0.001

* Other medications: amylin analog, bile acid sequestrants, dipeptidyl peptidase inhibitors, dopamine receptor agonist, glucagon-like peptide, meglitinides, sodium-glucose cotransporter inhibitor.

[†] Values missing from source database.

Table 2: A1c Standard Deviation and HRH risk in Two-Year Follow-up Period (N=342,058)

	Odds Ratio (95% CI)	P
A1c standard deviation (ref < 0.25)		
0.25-0.40	1.26 (1.10-1.45)	0.001
0.41-0.68	1.36 (1.18-1.56)	<0.001
0.69-6.46	1.56 (1.35-1.81)	<0.001
A1c mean (%) (ref= 7-7.9)		
< 6	0.71 (0.59-0.84)	<0.001
6-6.9	0.81 (0.73-0.89)	<0.001
8-8.9	1.09 (0.98-1.22)	0.125
≥ 9	1.49 (1.30-1.72)	<0.001
Insulin use	1.97 (1.80-2.16)	<0.001
Metformin use	0.85 (0.78-0.92)	<0.001
Sulfonylurea use	1.42 (1.31-1.55)	<0.001
Alpha-glucosidase inhibitor use	0.89 (0.70-1.12)	0.322
Thiazolidinedione use	0.95 (0.86-1.04)	0.251
Other medication use*	0.78 (0.57-1.07)	0.119
Serum creatinine (mg/dL) (ref = 0.6 -1.2)		
< 0.6	1.48 (0.47-4.69)	0.501
> 1.2	1.39 (1.28-1.52)	<0.001
Missing†	1.23 (0.95-1.60)	0.124
Urine albumin to creatinine ratio (mg/g) (ref < 30)		
30 – 300	1.32 (1.17-1.50)	<0.001
> 300	1.49 (1.21-1.84)	<0.001
Missing†	1.13 (1.02-1.24)	0.019
Body mass index (kg/m ²) (ref=18.5-24.9)		
< 18.5	1.83 (0.93-3.62)	0.080
25 – 29	0.85 (0.76-0.95)	0.005
30 – 39	0.81 (0.72-0.91)	<0.001
≥ 40	0.71 (0.58-0.88)	0.001

Missing [†]	0.89 (0.71-1.10)	0.272
Serum albumin (g/dL) (ref ≥ 3.5)		
< 3.5	1.10 (0.98-1.24)	0.106
Missing [†]	0.89 (0.78-1.03)	0.108
Age (years) (ref = 65-74)		
75+	1.68 (1.55-1.81)	<0.001
Female	1.27 (0.93-1.72)	0.131
Race (ref = White)		
Black	1.88 (1.71-2.06)	<0.001
Hispanic	1.03 (0.78-1.35)	0.843
Asian	1.38 (0.81-2.36)	0.235
Other	1.05 (0.72-1.53)	0.807
Financial means test (ref = exempt)		
Copayment required	0.95 (0.86-1.04)	0.271
Missing [†]	0.92 (0.84-1.01)	0.087
Service connected disability (%) (ref < 50)		
≥ 50	0.93 (0.82-1.05)	0.226
Log # of outpatient visits	1.31 (1.22-1.41)	<0.001
Log # of inpatient visits	1.41 (1.33-1.50)	<0.001
Follow up year		
2009	0.65 (0.55-0.77)	<0.001
2010	0.49 (0.39-0.63)	<0.001
2011	0.47 (0.36-0.62)	<0.001
2012	0.33 (0.24-0.45)	<0.001
2013	0.38 (0.29-0.50)	<0.001
2014	0.36 (0.21-0.60)	<0.001

*Other medications: amylin analog, bile acid sequestrants, dipeptidyl peptidase inhibitors, dopamine receptor agonist, glucagon-like peptide, meglitinides, sodium-glucose cotransporter inhibitor.

[†]Values missing from source database.

Table 3: Adjusted A1c Standard Deviation and HRH risk in Two-Year Follow-up Period

(N=342,058)

	Odds Ratio (95% CI)	P
Adjusted A1c standard deviation (ref < 0.62)		
0.62-0.97	1.08 (0.95-1.24)	0.239
0.98-1.56	1.12 (0.98-1.27)	0.103
1.57-17.40	1.37 (1.20-1.57)	<0.001
A1c mean (%) (ref= 7-7.9)		
< 6	0.67 (0.56-0.79)	<0.001
6-6.9	0.79 (0.71-0.87)	<0.001
8-8.9	1.09 (0.98-1.22)	0.115
≥ 9	1.48 (1.29-1.70)	<0.001
Insulin use	2.01 (1.83-2.19)	<0.001
Metformin use	0.86 (0.79-0.93)	<0.001
Sulfonylurea use	1.44 (1.32-1.56)	<0.001
Alpha-glucosidase inhibitor use	0.89 (0.71-1.13)	0.344
Thiazolidinedione use	0.95 (0.87-1.05)	0.303
Other medication use [*]	0.77 (0.56-1.06)	0.109
Serum creatinine (mg/dL) (ref = 0.6 -1.2)		
< 0.6	1.51 (0.48-4.78)	0.479
> 1.2	1.40 (1.29-1.52)	<0.001
Missing [†]	1.23 (0.95-1.60)	0.120
Urine albumin to creatinine ratio (mg/g) (ref < 30)		
30 – 300	1.33 (1.17-1.50)	<0.001
> 300	1.50 (1.22-1.85)	<0.001
Missing [†]	1.13 (1.02-1.24)	0.018
Body mass index (kg/m ²) (ref=18.5-24.9)		
< 18.5	1.83 (0.93-3.62)	0.081
25 – 29	0.85 (0.76-0.95)	0.005
30 – 39	0.81 (0.72-0.91)	<0.001
≥ 40	0.71 (0.58-0.88)	0.001
Missing [†]	0.88 (0.71-1.09)	0.243

Serum albumin (g/dL) (ref ≥ 3.5)		
< 3.5	1.10 (0.98-1.24)	0.097
Missing [†]	0.89 (0.77-1.02)	0.086
Age (years) (ref = 65-74)		
75+	1.66 (1.54-1.80)	<0.001
Female	1.27 (0.93-1.72)	0.132
Race (ref = White)		
Black	1.88 (1.71-2.06)	<0.001
Hispanic	1.07 (0.82-1.41)	0.608
Asian	1.39 (0.81-2.37)	0.229
Other	1.06 (0.73-1.54)	0.768
Financial means test (ref = exempt)		
Copayment required	0.94 (0.85-1.04)	0.210
Missing [†]	0.92 (0.84-1.00)	0.063
Service connected disability (%) (ref < 50)		
≥ 50	0.93 (0.83-1.05)	0.249
Log # of outpatient visits	1.33 (1.23-1.43)	<0.001
Log # of inpatient visits	1.41 (1.32-1.49)	<0.001
Follow up year		
2009	0.64 (0.54-0.76)	<0.001
2010	0.49 (0.38-0.62)	<0.001
2011	0.47 (0.36-0.61)	<0.001
2012	0.33 (0.24-0.44)	<0.001
2013	0.38 (0.28-0.50)	<0.001
2014	0.36 (0.21-0.59)	<0.001

*Other medications: amylin analog, bile acid sequestrants, dipeptidyl peptidase inhibitors, dopamine receptor agonist, glucagon-like peptide, meglitinides, sodium-glucose cotransporter inhibitor.

[†]Values missing from source database.

Table 4: Sensitivity Analysis of A1c Coefficient of Variation and HRH Risk in One-Year Follow-up Period (N=375,519)

	Odds Ratio (95% CI)	P
A1c coefficient of variation (%) (ref < 4%)		
4-5.9	1.10 (0.92-1.31)	0.286
6-9.4	1.12 (0.94-1.33)	0.201
9.5-66	1.33 (1.12-1.58)	0.001
A1c mean (%) (ref= 7-7.9)		
< 6	0.73 (0.59-0.91)	0.005
6-6.9	0.83 (0.73-0.95)	0.005
8-8.9	1.15 (1.00-1.34)	0.055
≥ 9	1.52 (1.27-1.82)	<0.001
Insulin use	1.97 (1.75-2.21)	<0.001
Metformin use	0.89 (0.80-0.99)	0.035
Sulfonylurea use	1.39 (1.25-1.55)	<0.001
Alpha-glucosidase inhibitor use	0.95 (0.71-1.29)	0.763
Thiazolidinedione use	0.91 (0.80-1.03)	0.121
Other medication use*	0.60 (0.38-0.97)	0.035
Serum creatinine (mg/dL) (ref = 0.6 -1.2)		
< 0.6	1.72 (0.42-7.00)	0.446
> 1.2	1.53 (1.36-1.71)	<0.001
Missing†	1.31 (0.92-1.84)	0.130
Urine albumin to creatinine ratio (mg/g) (ref < 30)		
30 – 300	1.18 (1.00-1.40)	0.048
> 300	1.19 (0.89-1.58)	0.235
Missing†	1.11 (0.97-1.26)	0.125
Body mass index (kg/m ²) (ref=18.5-24.9)		
< 18.5	1.27 (0.47-3.44)	0.641
25 – 29	0.87 (0.75-1.01)	0.059
30 – 39	0.82 (0.71-0.95)	0.009
≥ 40	0.75 (0.57-0.99)	0.039

Missing [†]	0.88 (0.66-1.17)	0.365
Serum albumin (g/dL) (ref ≥ 3.5)		
< 3.5	1.11 (0.96-1.29)	0.173
Missing [†]	0.97 (0.82-1.16)	0.768
Age (years) (ref = 65-74)		
75+	1.55 (1.40-1.72)	<0.001
Female	0.97 (0.62-1.54)	0.908
Race (ref = White)		
Black	1.80 (1.59-2.04)	<0.001
Hispanic	1.05 (0.73-1.50)	0.798
Asian	1.39 (0.69-2.79)	0.363
Other	1.20 (0.75-1.92)	0.442
Financial means test (ref = exempt)		
Copayment required	0.94 (0.83-1.07)	0.361
Missing [†]	0.91 (0.81-1.03)	0.121
Service connected disability (%) (ref < 50)		
≥ 50	0.85 (0.73-1.00)	0.051
Log # of outpatient visits	1.40 (1.27-1.54)	<0.001
Log # of inpatient visits	1.38 (1.27-1.49)	<0.001
Follow up year		
2009	0.58 (0.46-0.73)	<0.001
2010	0.53 (0.39-0.72)	<0.001
2011	0.47 (0.33-0.67)	<0.001
2012	0.28 (0.18-0.44)	<0.001
2013	0.31 (0.21-0.47)	<0.001
2014	0.34 (0.17-0.68)	0.002
2015	0.15 (0.05-0.47)	0.001

* Other medications: amylin analog, bile acid sequestrants, dipeptidyl peptidase inhibitors, dopamine receptor agonist, glucagon-like peptide, meglitinides, sodium-glucose cotransporter inhibitor.

[†]Values missing from source database.

Table 5: Sensitivity Analysis of A1c Coefficient of Variation and HRH Risk in Three-Year Follow-up Period (N = 308, 241)

	Odds Ratio (95% CI)	P
A1c coefficient of variation (%) (ref < 4%)		
4-5.9	1.20 (1.06-1.35)	0.003
6-9.4	1.35 (1.20-1.52)	<0.001
9.5-66	1.48 (1.31-1.67)	<0.001
A1c mean (%) (ref= 7-7.9)		
< 6	0.65 (0.56-0.76)	<0.001
6-6.9	0.83 (0.76-0.90)	<0.001
8-8.9	1.16 (1.05-1.28)	0.004
≥ 9	1.42 (1.25-1.62)	<0.001
Insulin use	1.90 (1.76-2.06)	<0.001
Metformin use	0.87 (0.81-0.94)	<0.001
Sulfonylurea use	1.39 (1.29-1.50)	<0.001
Alpha-glucosidase inhibitor use	0.96 (0.78-1.18)	0.688
Thiazolidinedione use	0.95 (0.88-1.04)	0.252
Other medication use*	0.96 (0.74-1.24)	0.741
Serum creatinine (mg/dL) (ref = 0.6 -1.2)		
< 0.6	0.42 (0.06-3.03)	0.391
> 1.2	1.38 (1.28-1.49)	<0.001
Missing†	1.27 (1.01-1.60)	0.038
Urine albumin to creatinine ratio (mg/g) (ref < 30)		
30 – 300	1.30 (1.16-1.45)	<0.001
> 300	1.68 (1.39-2.03)	<0.001
Missing†	1.16 (1.06-1.26)	0.001
Body mass index (kg/m ²) (ref=18.5-24.9)		
< 18.5	1.44 (0.67-3.10)	0.353
25 – 29	0.83 (0.75-0.92)	0.001
30 – 39	0.84 (0.75-0.93)	0.001
≥ 40	0.77 (0.64-0.92)	0.005

Missing [†]	0.90 (0.74-1.09)	0.299
Serum albumin (g/dL) (ref ≥ 3.5)		
< 3.5	1.14 (1.02-1.27)	0.024
Missing [†]	0.90 (0.80-1.02)	0.088
Age (years) (ref = 65-74)		
75+	1.66 (1.55-1.78)	<0.001
Female	1.24 (0.94-1.63)	0.127
Race (ref = White)		
Black	1.83 (1.68-1.99)	<0.001
Hispanic	1.15 (0.91-1.44)	0.253
Asian	1.10 (0.65-1.88)	0.722
Other	0.97 (0.69-1.37)	0.869
Financial means test (ref = exempt)		
Copayment required	0.90 (0.83-0.98)	0.021
Missing [†]	0.92 (0.85-1.00)	0.051
Service connected disability (%) (ref < 50)		
≥ 50	0.92 (0.83-1.03)	0.156
Log # of outpatient visits	1.31 (1.23-1.40)	<0.001
Log # of inpatient visits	1.35 (1.27-1.42)	<0.001
Follow up year		
2009	0.60 (0.52-0.70)	<0.001
2010	0.50 (0.40-0.62)	<0.001
2011	0.45 (0.36-0.58)	<0.001
2012	0.35 (0.27-0.46)	<0.001
2013	0.38 (0.30-0.49)	<0.001

* Other medications: amylin analog, bile acid sequestrants, dipeptidyl peptidase inhibitors, dopamine receptor agonist, glucagon-like peptide, meglitinides, sodium-glucose cotransporter inhibitor.

[†] Values missing from source database.

Table 6: Sensitivity Analysis of Prior HRH Risk on A1c Coefficient of Variation and HRH Risk in Two-Year Follow-up Period (N=342, 058)

	Odds Ratio (95% CI)	P
A1c coefficient of variation (%) (ref < 4%)		
4-5.9	1.19 (1.04-1.37)	0.010
6-9.4	1.28 (1.12-1.46)	<0.001
9.5-66	1.42 (1.24-1.63)	<0.001
Prior HRH		
	3.12 (2.65-3.67)	<0.001
A1c mean (%) (ref= 7-7.9)		
< 6		
6-6.9	0.67 (0.56-0.79)	<0.001
8-8.9	0.78 (0.71-0.86)	<0.001
≥ 9	1.11 (1.00-1.25)	0.057
	1.53 (1.33-1.75)	<0.001
Insulin use		
	1.96 (1.79-2.15)	<0.001
Metformin use		
	0.85 (0.79-0.93)	<0.001
Sulfonylurea use		
	1.43 (1.31-1.55)	<0.001
Alpha-glucosidase inhibitor use		
	0.88 (0.70-1.12)	0.295
Thiazolidinedione use		
	0.93 (0.85-1.03)	0.157
Other medication use*		
	0.77 (0.56-1.06)	0.112
Serum creatinine (mg/dL) (ref = 0.6 -1.2)		
< 0.6		
> 1.2	1.57 (0.50-4.95)	0.443
Missing†	1.39 (1.27-1.51)	<0.001
	1.23 (0.95-1.60)	0.123
Urine albumin to creatinine ratio (mg/g) (ref < 30)		
30 – 300		
> 300	1.32 (1.16-1.49)	<0.001
Missing†	1.46 (1.18-1.80)	<0.001
	1.12 (1.02-1.24)	0.021
Body mass index (kg/m ²) (ref=18.5-24.9)		
< 18.5		
25 – 29	1.80 (0.91-3.58)	0.092

30 – 39	0.85 (0.76-0.96)	0.007
≥ 40	0.82 (0.73-0.92)	0.001
Missing [†]	0.73 (0.59-0.90)	0.003
	0.90 (0.73-1.12)	0.354
Serum albumin (g/dL) (ref ≥ 3.5)		
< 3.5		
Missing [†]	1.09 (0.97-1.23)	0.153
	0.89 (0.78-1.02)	0.101
Age (years) (ref = 65-74)		
75+		
	1.65 (1.53-1.79)	<0.001
Female		
	1.26 (0.93-1.71)	0.141
Race (ref = White)		
Black		
Hispanic	1.83 (1.66-2.01)	<0.001
Asian	1.01 (0.77-1.33)	0.943
Other	1.37 (0.80-2.34)	0.247
	1.04 (0.71-1.51)	0.846
Financial means test (ref = exempt)		
Copayment required		
Missing [†]	0.95 (0.87-1.05)	0.335
	0.92 (0.84-1.01)	0.088
Service connected disability (%) (ref < 50)		
≥ 50		
	0.93 (0.83-1.05)	0.250
Log # of outpatient visits		
Log # of inpatient visits	1.32 (1.23-1.42)	<0.001
	1.33 (1.25-1.41)	<0.001
Follow up year		
2009	0.65 (0.55-0.77)	<0.001
2010	0.49 (0.38-0.63)	<0.001
2011	0.48 (0.37-0.63)	<0.001
2012	0.33 (0.24-0.45)	<0.001
2013	0.39 (0.29-0.51)	<0.001
2014	0.36 (0.22-0.60)	<0.001

* Other medications: amylin analog, bile acid sequestrants, dipeptidyl peptidase inhibitors, dopamine receptor agonist, glucagon-like peptide, meglitinides, sodium-glucose cotransporter inhibitor.

[†]Values missing from source database.

Table 7: Sensitivity Analysis of Prior HRH Risk on A1c Standard Deviation and HRH risk in Two-Year Follow-up Period (N = 342, 058)

	Odds Ratio (95% CI)	P
A1c standard deviation (ref<0.25)		
0.25-0.40	1.26 (1.10-1.45)	0.001
0.41-0.68	1.35 (1.17-1.55)	<0.001
0.69-6.46	1.54 (1.33-1.79)	<0.001
Prior HRH	3.12 (2.65-3.67)	<0.001
A1c mean (%) (ref= 7-7.9)		
< 6	0.71 (0.60-0.85)	<0.001
6-6.9	0.81 (0.73-0.89)	<0.001
8-8.9	1.09 (0.98-1.23)	0.117
≥ 9	1.49 (1.30-1.72)	<0.001
Insulin use	1.95 (1.78-2.13)	<0.001
Metformin use	0.85 (0.78-0.92)	<0.001
Sulfonylurea use	1.42 (1.31-1.55)	<0.001
Alpha-glucosidase inhibitor use	0.88 (0.70-1.12)	0.295
Thiazolidinedione use	0.93 (0.85-1.03)	0.150
Other medication use*	0.77 (0.56-1.06)	0.113
Serum creatinine (mg/dL) (ref = 0.6 -1.2)		
< 0.6	1.56 (0.49-4.93)	0.448
> 1.2	1.38 (1.27-1.51)	<0.001
Missing†	1.23 (0.94-1.60)	0.125
Urine albumin to creatinine ratio (mg/g) (ref < 30)		
30 – 300	1.32 (1.16-1.49)	<0.001
> 300	1.46 (1.18-1.80)	<0.001
Missing†	1.12 (1.02-1.24)	0.022
Body mass index (kg/m ²) (ref=18.5-24.9)		
< 18.5	1.80 (0.91-3.58)	0.092
25 – 29	0.85 (0.76-0.96)	0.007

30 – 39	0.82 (0.73-0.92)	0.001
≥ 40	0.73 (0.59-0.90)	0.003
Missing [†]	0.90 (0.73-1.12)	0.352
Serum albumin (g/dL) (ref ≥ 3.5)		
< 3.5	1.09 (0.97-1.23)	0.155
Missing [†]	0.89 (0.78-1.02)	0.099
Age (years) (ref = 65-74)		
75+	1.66 (1.53-1.79)	<0.001
Female	1.26 (0.92-1.71)	0.144
Race (ref = White)		
Black	1.82 (1.66-2.00)	<0.001
Hispanic	1.01 (0.77-1.33)	0.953
Asian	1.37 (0.80-2.34)	0.246
Other	1.04 (0.71-1.51)	0.848
Financial means test (ref = exempt)		
Copayment required	0.95 (0.87-1.05)	0.338
Missing [†]	0.92 (0.84-1.01)	0.089
Service connected disability (%) (ref < 50)		
≥ 50	0.93 (0.83-1.05)	0.250
Log # of outpatient visits	1.32 (1.23-1.42)	<0.001
Log # of inpatient visits	1.33 (1.25-1.41)	<0.001
Follow up year		
2009	0.66 (0.55-0.78)	<0.001
2010	0.49 (0.39-0.63)	<0.001
2011	0.48 (0.37-0.63)	<0.001
2012	0.33 (0.24-0.45)	<0.001
2013	0.39 (0.29-0.51)	<0.001
2014	0.36 (0.22-0.60)	<0.001

* Other medications: amylin analog, bile acid sequestrants, dipeptidyl peptidase inhibitors, dopamine receptor agonist, glucagon-like peptide, meglitinides, sodium-glucose cotransporter inhibitor.

[†]Values missing from source database.

Table 8: Sensitivity Analysis of Prior HRH on Adjusted A1c Standard Deviation and HRH risk in Two-Year Follow-up Period (N = 342, 058)

	Odds Ratio (95% CI)	P
Adjusted A1c standard deviation (ref <0.62)		
0.62-0.97	1.08 (0.95-1.23)	0.253
0.98-1.56	1.11 (0.97-1.26)	0.127
1.57-17.40	1.36 (1.19-1.56)	<0.001
Prior HRH	3.12 (2.65-3.68)	<0.001
A1c mean (%) (ref= 7-7.9)		
< 6	0.67 (0.57-0.80)	<0.001
6-6.9	0.79 (0.71-0.87)	<0.001
8-8.9	1.10 (0.98-1.23)	0.113
≥ 9	1.48 (1.29-1.70)	<0.001
Insulin use	1.98 (1.81-2.17)	<0.001
Metformin use	0.86 (0.79-0.93)	<0.001
Sulfonylurea use	1.44 (1.32-1.56)	<0.001
Alpha-glucosidase inhibitor use	0.89 (0.70-1.12)	0.314
Thiazolidinedione use	0.94 (0.85-1.03)	0.184
Other medication use*	0.77 (0.56-1.06)	0.105
Serum creatinine (mg/dL) (ref = 0.6 -1.2)		
< 0.6	1.59 (0.50-5.02)	0.428
> 1.2	1.39 (1.28-1.51)	<0.001
Missing†	1.23 (0.95-1.60)	0.120
Urine albumin to creatinine ratio (mg/g) (ref < 30)		
30 – 300	1.32 (1.17-1.50)	<0.001
> 300	1.46 (1.19-1.80)	<0.001
Missing†	1.12 (1.02-1.24)	0.021
Body mass index (kg/m ²) (ref=18.5-24.9)		
< 18.5	1.80 (0.91-3.58)	0.092
25 – 29	0.86 (0.76-0.96)	0.007

30 – 39	0.82 (0.73-0.92)	0.001
≥ 40	0.73 (0.59-0.90)	0.003
Missing [†]	0.90 (0.72-1.11)	0.319
Serum albumin (g/dL) (ref ≥ 3.5)		
< 3.5	1.09 (0.97-1.23)	0.144
Missing [†]	0.88 (0.77-1.01)	0.079
Age (years) (ref = 65-74)		
75+	1.64 (1.52-1.78)	<0.001
Female	1.26 (0.92-1.71)	0.146
Race (ref = White)		
Black	1.83 (1.66-2.01)	<0.001
Hispanic	1.05 (0.80-1.38)	0.723
Asian	1.37 (0.81-2.34)	0.242
Other	1.05 (0.72-1.53)	0.814
Financial means test (ref = exempt)		
Copayment required	0.95 (0.86-1.04)	0.269
Missing [†]	0.92 (0.84-1.01)	0.065
Service connected disability (%) (ref < 50)		
≥ 50	0.94 (0.83-1.05)	0.276
Log # of outpatient visits	1.34 (1.24-1.44)	<0.001
Log # of inpatient visits	1.32 (1.24-1.41)	<0.001
Follow up year		
2009	0.65 (0.55-0.77)	<0.001
2010	0.49 (0.38-0.62)	<0.001
2011	0.48 (0.36-0.62)	<0.001
2012	0.33 (0.24-0.44)	<0.001
2013	0.38 (0.29-0.51)	<0.001
2014	0.36 (0.22-0.60)	<0.001

* Other medications: amylin analog, bile acid sequestrants, dipeptidyl peptidase inhibitors, dopamine receptor agonist, glucagon-like peptide, meglitinides, sodium-glucose cotransporter inhibitor.

[†]Values missing from source database.

