

Online clinical pathway for chronic kidney disease management in primary care: a retrospective cohort study

SUPPLEMENTARY MATERIAL (Contents):

Supplementary Tables:

- Table S1. Characteristics of cohorts used for assessing the secondary outcomes of ACEi/ARB and Statin dispense (p 2-3).
- Table S2. Sensitivity analyses for the primary outcome: estimates of the pre-to-post change in slope for ACR measurements by zone (p 4).
- Table S3. Sensitivity analyses for ACEi/ARB use: estimates of the pre-post change in slope for ACEi/ARB use in a modified quarter, for the diabetes cohort and the cohort with severe albuminuria and no diabetes (p 5).
- Table S4. Sensitivity analyses for statin use: estimates of the pre-post change in slope for statin use in a modified calendar quarter, for the diabetes cohort and the no diabetes/older than 50 cohort (p 6).

Supplementary Figures:

- Figure S1. Alberta Health Services Zone Map (p 7).
- Figure S2. Adjusted proportion of patients in the Calgary zone with an ACR measurement in a 28-day period (p 8).
- Figure S3. Adjusted proportion of patients in the Edmonton zone with an ACR measurement in a 28 day period (p 9).
- Figure S4. Adjusted proportion of patients with diabetes who were prescribed an ACEi/ARB in a 28-day period by zone (p 10).
- Figure S5. Adjusted proportion of patients without diabetes but with severe albuminuria who were prescribed an ACEi/ARB in a 28-day period by zone (p 11).
- Figure S6. Adjusted proportion of patients with diabetes who were prescribed a statin in a 28-day period by zone (p 12).
- Figure S7. Adjusted proportion of patients without diabetes but over the age of 50 who were prescribed a statin in a 28-day period by zone (p 13).

Table S1. Characteristics of cohorts used for assessing the secondary outcomes of ACEi/ARB and Statin dispense (% unless noted).

	Diabetes (N = 3,414,791 patient records)	Severe albuminuria, no diabetes (N = 70,897 patient records)	No diabetes, aged 50 years or older (N = 6,695,062 patient records)
Number of unique patients	103,106	4,887	241,172
Number of times each patient appears in the cohort, median (IQR)	26 (12, 52)	13 (6,18)	20 (11,42)
Age, years, median (IQR)	76.5 (68.8, 83.3)	68.1 (54.3, 79.9)	77.6 (68.9, 84.8)
Female	50.6	37.3	59.5
Zone			
Calgary Zone	30.5	36.3	36.8
Edmonton Zone	32.9	35.6	28.5
Other Health Zones	36.6	28.1	34.7
Most recent ACR in past year			
Normal/mild (A1: <30 mg/g)	24.2	0	8.3
Moderate (A2: 30-300 mg/g)	15.1	0	2.6
Severe (A3: >300 mg/g)	8.0	100	0.9
Unmeasured	52.7	0	88.2
eGFR category (ml/min/1.73m ²)			
3a (45-59)	57.3	32.3	71.2
3b (30-44)	30.2	32.1	22.9
4 (15-29)	11.0	27.4	5.3
5 (<15)	1.5	8.2	0.6
Number of outpatient serum creatinine measurements in past year			
1	31.1	15.5	51.8
2-3	39.5	34.1	33.2
≥4	29.4	50.7	15.0
Alcohol misuse	4.0	5.0	2.7
Asthma	6.2	4.3	4.1
Atrial fibrillation	20.1	14.5	17.0
Cancer	13.7	10.6	14.0
Chronic heart failure	29.1	19.0	17.8
Chronic pulmonary disease	31.1	23.6	24.8
Chronic viral hepatitis B	0.2	0.5	0.1
Cirrhosis	1.1	0.9	0.5
Dementia	12.4	5.3	11.4
Diabetes	100	0	0
Epilepsy	2.4	2.2	2.3
Hypertension	94.0	87.2	77.8
Hypothyroidism	22.8	15.8	23.7
Inflammatory bowel disease	1.6	1.8	1.9
Irritable bowel syndrome	3.1	1.5	3.3
Metastatic cancer	4.1	3.5	4.1
Multiple sclerosis	0.8	0.6	0.7
Myocardial infarction	11.5	7.2	6.9
Parkinson's disease	2.4	1.0	2.1
Peripheral vascular disease	7.1	5.4	4.5

	Diabetes (N = 3,414,791 patient records)	Severe albuminuria, no diabetes (N = 70,897 patient records)	No diabetes, aged 50 years or older (N = 6,695,062 patient records)
Psoriasis	1.6	1.4	1.2
Rheumatoid arthritis	5.7	7.0	6.1
Schizophrenia	1.8	1.3	1.2
Stroke or TIA	24.6	17.3	19.4
Neighborhood income quintile			
1 (lowest)	28.0	29.4	24.2
2	23.9	24.4	22.4
3	19.6	18.5	19.8
4	15.1	14.5	16.3
5 (highest)	13.4	13.1	17.1
Unknown	0.1	0.1	0.1
Rural residence	22.9	21.7	22.1

IQR – interquartile range; ACR – urine albumin/creatinine ratio; eGFR – estimated glomerular filtration rate; TIA – transient ischemic attack

Table S2. Sensitivity analyses for the primary outcome (reduced cohorts including only patient records where the mean eGFR was based on 2 or more serum creatinine measurements in the prior year): estimates of the pre-to-post change in slope for ACR measurements by zone.

Cohort	Patient records	Odds Ratios (per year) for pre-to-post changes in slope		
		Calgary Zone	Edmonton Zone	Other Zones
Patient records where the mean eGFR was based on 2 or more serum creatinine measurements	3,911,495	1.13 (1.10 – 1.17)	0.90 (0.87 – 0.93)	1.01 (0.98 – 1.04)
As above, but only patients with diabetes	1,122,632	1.08 (1.04 – 1.13)	0.93 (0.89 – 0.97)	1.01 (0.97 – 1.05)
As above, but only patients without diabetes	2,788,863	1.16 (1.11 – 1.20)	0.87 (0.83 – 0.91)	0.99 (0.95 – 1.04)

P for interaction between zone and the primary outcome was <.001 in all cases. Adjusted for age, sex, eGFR category, ACR category, the thirteen 28-day periods, neighborhood income quintile, rural residence, and all comorbidities in Table 1.

Table S3. Sensitivity analyses for ACEi/ARB use: Estimates of the pre-post change in slope for ACEi/ARB use in a modified quarter, for the diabetes cohort and the cohort with severe albuminuria and no diabetes.

	Diabetes cohort (N = 1,080,128 patient records)		No diabetes, severe albuminuria cohort (N = 22,976 patient records)	
	P for interaction	Odds ratio, per year (95% CI)	P for interaction	Odds ratio, per year (95% CI)
Overall		1.03 (1.02-1.04)		--
Calgary Zone	Ref.		Ref.	0.84 (0.73-0.96)
Edmonton Zone	0.32		0.01	1.07 (0.94-1.22)
Other zones	0.77		0.10	1.00 (0.85-1.17)

Adjusted for age, sex, eGFR category, ACR category, the thirteen 28-day periods, neighborhood income quintile, rural residence, and all comorbidities in Table 1.

Table S4. Sensitivity analyses for statin use: Estimates of the pre-post change in slope for statin use in a modified calendar quarter, for the diabetes cohort and the no diabetes/older than 50 cohort.

	Diabetes cohort (N=1,082,126 patient records)		No diabetes, older than 50 cohort (N=2,184,098 patient records)	
	P value for interaction	OR (95% CI) per year	P value for interaction	OR (95% CI) per year
Calgary Zone	Ref	1.05 (1.03-1.07)	Ref	1.03 (1.01-1.04)
Edmonton Zone	0.01	1.09 (1.07-1.11)	0.002	1.06 (1.05-1.08)
Other zones	0.29	1.04 (1.02-1.06)	0.18	1.04 (1.03-1.06)

Adjusted for age, sex, eGFR category, ACR category, the thirteen 28-day periods, neighborhood income quintile, rural residence, and all comorbidities in Table 1.

Supplemental figures

Figure S1. Alberta Health Services Zone Map

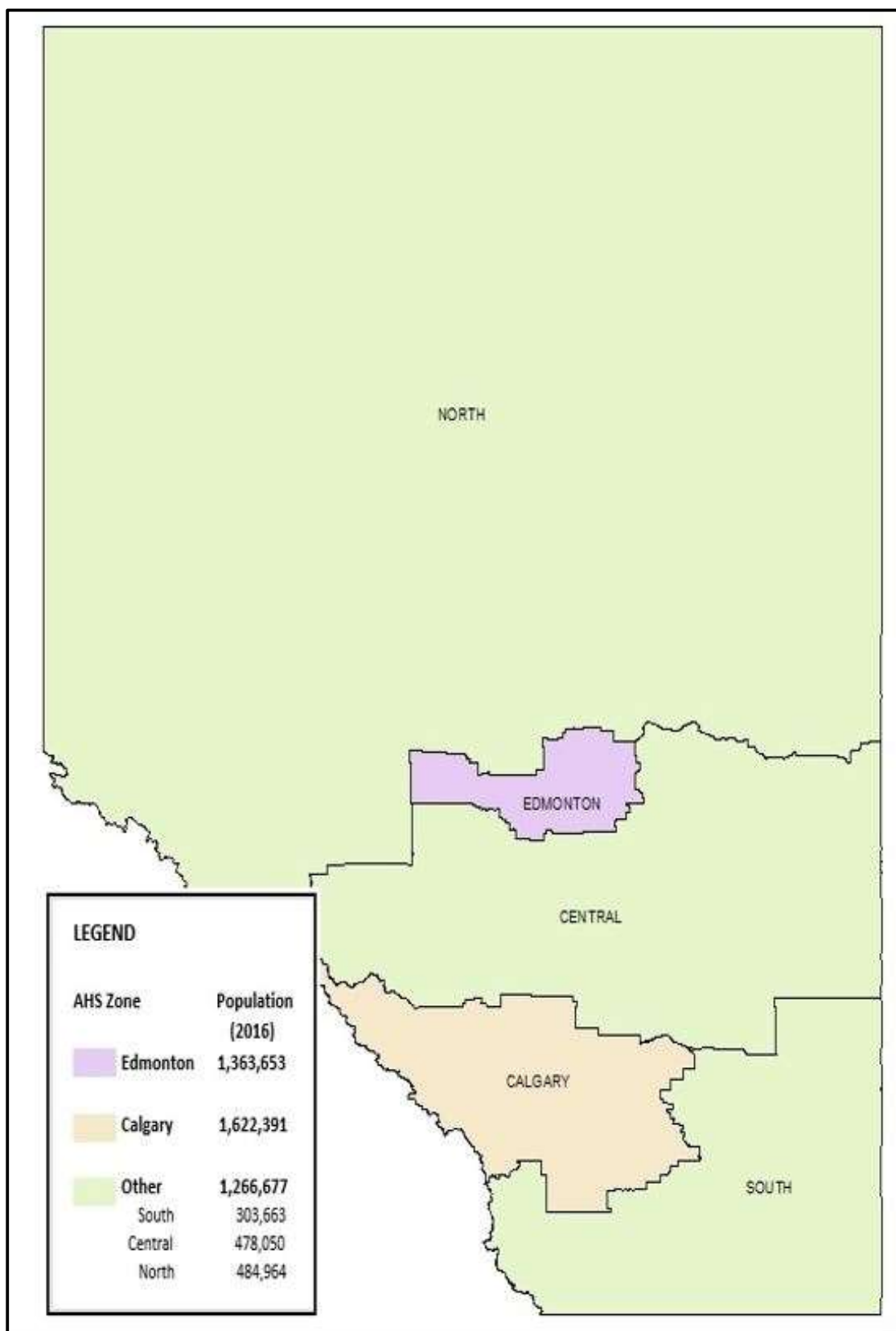


Figure S2. Adjusted proportion of patients in the Calgary zone with an ACR measurement in a 28-day period, from the segmented regression model and a model with period treated categorically. Both models were adjusted for age, sex, eGFR category, neighborhood income quintile, rural residence, and all comorbidities in Table 1; the segmented regression model was also adjusted for the thirteen 28-day periods and the linear trends.

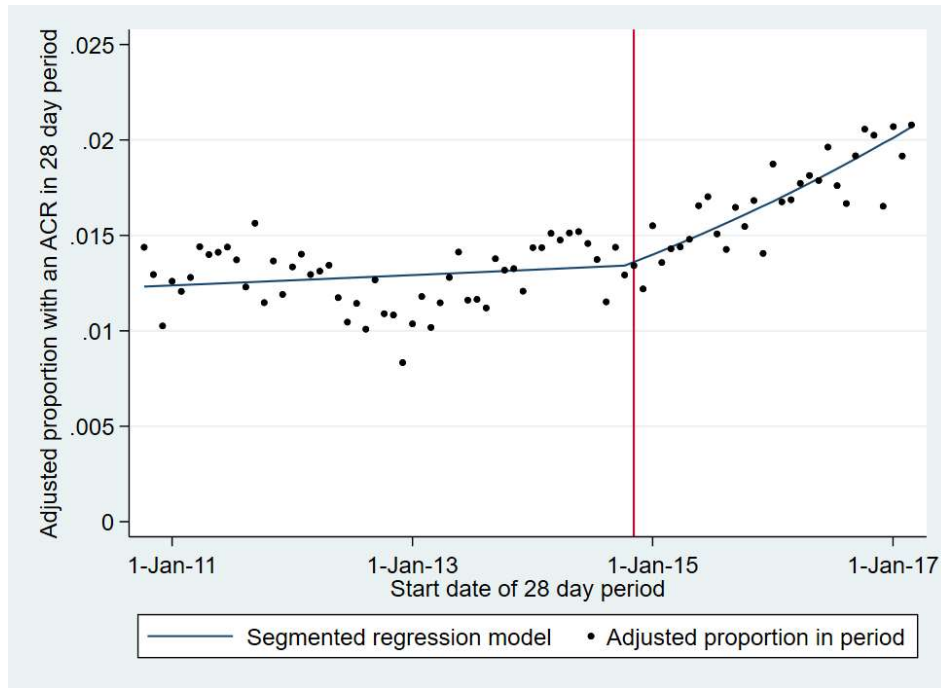


Figure S4. Adjusted proportion of patients with diabetes who were prescribed an ACEi/ARB in a 28-day period by zone, from a segmented regression model. Adjusted for age, sex, eGFR category, ACR category, the thirteen 28-day periods, neighborhood income quintile, rural residence, and all comorbidities in Table 1.

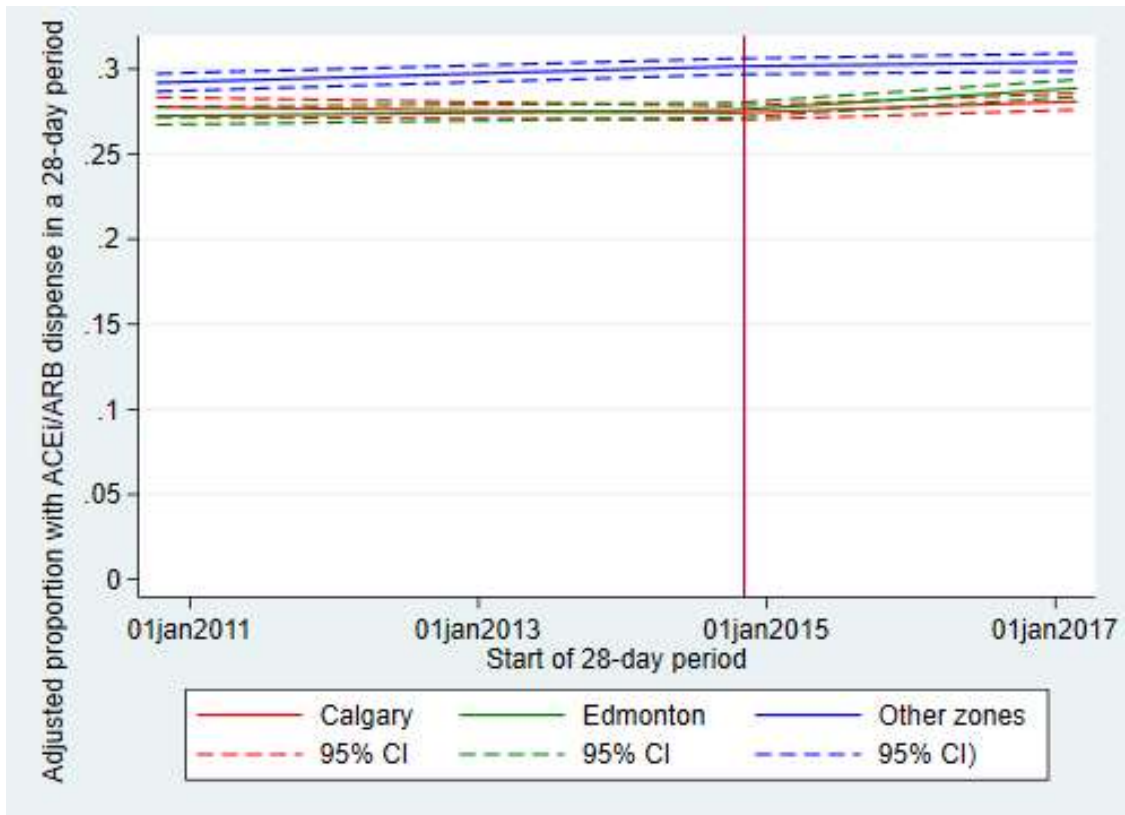


Figure S5. Adjusted proportion of patients without diabetes but with severe albuminuria who were prescribed an ACEi/ARB in a 28-day period by zone, from a segmented regression model. Adjusted for age, sex, eGFR category, the thirteen 28-day periods, neighborhood income quintile, rural residence, and all comorbidities in Table 1.

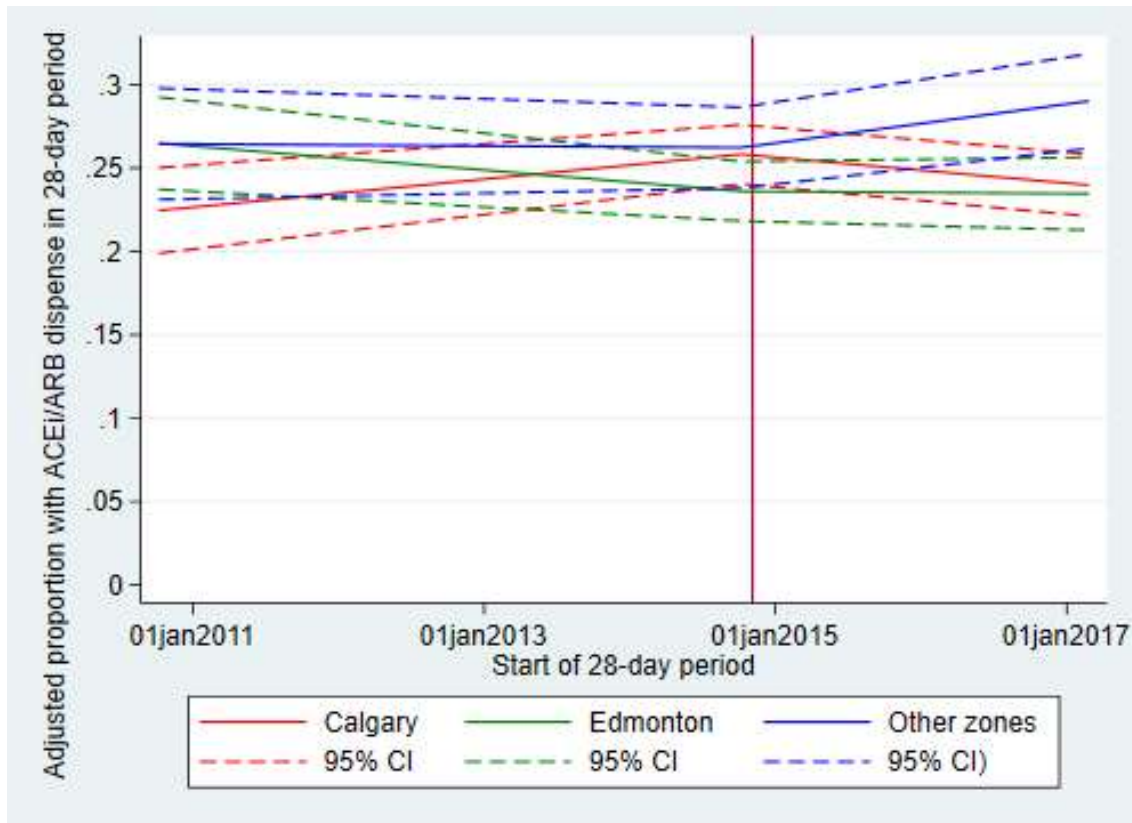


Figure S6. Adjusted proportion of patients with diabetes who were prescribed a statin in a 28-day period by zone, from a segmented regression model. Adjusted for age, sex, eGFR category, ACR category, the thirteen 28-day periods, neighborhood income quintile, rural residence, and all comorbidities in Table 1.

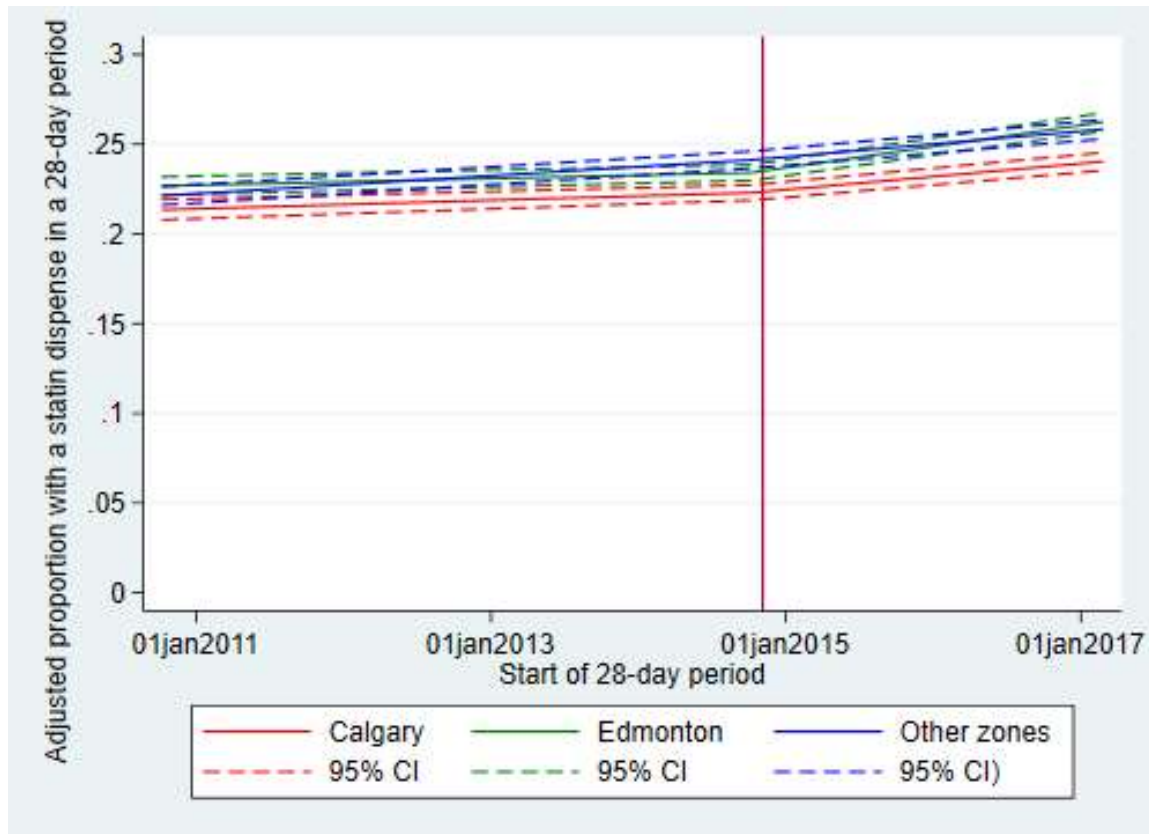


Figure S7. Adjusted proportion of patients without diabetes but over the age of 50 who were prescribed a statin in a 28-day period by zone, from a segmented regression model. Adjusted for age, sex, eGFR category, ACR category, the thirteen 28-day periods, neighborhood income quintile, rural residence, and all comorbidities in Table 1.

