

ONLINE-ONLY SUPPLEMENTAL MATERIAL

Appendix A: Data

Appendix B: ICD-10-CM Diabetes Type 2 Codes

Appendix C: Empirical Strategy & Statistical Analyses

Appendix D: Additional Analyses

Appendix A: Data

The Medicaid claims data from the West Virginia Bureau of Medical Services (BMS) include demographic (age, race, sex, and country of residence) and eligibility data on enrolled beneficiaries as well as all professional, facility, and pharmacy claims that are reimbursed by Medicaid. Claims data include CPT/HCPC procedure codes and IDC-9/ICD-10 diagnosis codes in addition to other standard data fields reported on administrative claims. The rate of hypoglycemia / hyperglycemia encounters, our outcome of interest, is defined as the number of encounters divided by the number of observations for that week. Hypoglycemia / hyperglycemia encounters were identified as professional or facility claims with hypoglycemia or hyperglycemia diagnosis codes respectively. Administrative SNAP records include amount of benefit received, gross income, and net income. SNAP records were linked to Medicaid claims data using Member IDs. Hypoglycemia encounters are identified using ICD-10-CM codes E08.641, E08.649, E09.641, E09.649, E10.641, E10.649, E11.641, E11.649, E13.641, E13.649, E15, E16.0, E16.1, E16.2, T38.3X1A, T38.3X1D, T38.3X1S, T38.3X2A, T38.3X2D, T38.3X2S, T38.3X3A, T38.3X3D, T38.3X3S, T38.3X4A, T38.3X4D, T38.3X4S, T38.3X5A, T38.3X5D, and T38.3X5S. (Based on Seligman HK, Bolger AF, Bibbins-Domingo K, Guzman D, López A. Exhaustion Of Food Budgets At Month's End And Hospital Admissions For Hypoglycemia. *Health Aff (Millwood)*. 2014;33(1):116-123. doi:10.1377/hlthaff.2013.0096 and Karter AJ, Warton EM, Moffet HH, et al. Revalidation of the Hypoglycemia Risk Stratification Tool Using ICD-10 Codes. *Diabetes Care*. 2019;42(January): dc182154. doi:10.2337/dc18-2154) Hyperglycemia encounters are identified by codes E11.65 and R73.9. The unit of observation is person-week.

Table A1 provides descriptive statistics for the full sample as well as separately for the samples in 2017-18 and 2018-19. The two samples are comparable in demographics and income.

SNAP benefit amount is slightly larger in the 2018-19 sample, which is expected given that benefits are adjusted for inflation each year.

APPENDIX TABLE A1: Descriptive Statistics

Individual characteristic	2017-18 (N=17,641)	2018-19 (N=16,529)
Age	49.94 (10.02)	50.28 (9.99)
Female	0.62 (0.49)	0.62 (0.49)
NH White	0.90 (0.3)	0.90 (0.29)
NH Black	0.04 (0.19)	0.04 (0.19)
NH AIAN	0.00 (0.03)	0.00 (0.03)
Unknown Race/Ethnicity	0.06 (0.23)	0.06 (0.23)
Hispanic	0.00 (0.02)	0.00 (0.01)
Gross monthly income	818.05 (539.53)	846.71 (558.66)
Monthly net income	420.16 (463.37)	462.68 (480.76)
SNAP benefit amount at last receipt	199.14 (159.46)	182.87 (155.01)
Any hyperglycemia encounter	0.030 (0.169)	0.028 (0.165)
Any hypoglycemia encounter	0.001 (0.033)	0.002 (0.032)
Any appendicitis, kidney stones, or pharyngitis emergency or urgent care encounter	0.002 (0.039)	0.001 (0.032)

Caption: Descriptive statistics for West Virginia residents enrolled in both Medicaid and SNAP from November through April – Full sample and 2017-18 and 2018-19 subsamples

Source/Notes: SOURCE Authors' calculation from West Virginia Medicaid, SNAP, and TANF administrative files. NOTES Income and benefit amount variables were unavailable for 44 and 40 individuals in period 1 (2017-18) and period 2 (2018-19), respectively. Note that the same individual may appear in both years and so the total sample may contain duplicate individuals. Appendicitis, kidney stones and pharyngitis encounters are defined as claims with a diagnosis code for one of these conditions as well as a place of service of ED or inpatient hospital.

Standard deviation in parentheses.

Appendix B: ICD-10-CM Diabetes Type 2 Codes

APPENDIX TABLE B1: ICD-10-CM Codes to Identify the Sample of Patients with Diabetes

<u>'CD-10-CM CODE'</u>	<u>ICD-10-CM CODE DESCRIPTION</u>
'E089'	Diabetes due to underlying condition w/o complications
'E099'	Drug or chemical induced diabetes mellitus w/o complications
'E109'	Type 1 diabetes mellitus without complications
'E119'	Type 2 diabetes mellitus without complications
'E139'	Other specified diabetes mellitus without complications
'R7301'	Impaired fasting glucose
'R7302'	Impaired glucose tolerance (oral)
'R7303'	Prediabetes
'R7309'	Other abnormal glucose
'R739'	Hyperglycemia, unspecified
'R81'	Glycosuria
'R824'	Acetonuria
'Z4681'	Encounter for fitting and adjustment of insulin pump
'Z9641'	Presence of insulin pump (external) (internal)
'E0800'	Diab d/t undrl cond w hyprosm w/o nonket hyprgly-hypros coma
'E0801'	Diabetes due to underlying condition w hyprosm w coma
'E0810'	Diabetes due to underlying condition w ketoacidosis w/o coma
'E0811'	Diabetes due to underlying condition w ketoacidosis w coma
'E0821'	Diabetes due to underlying condition w diabetic nephropathy
'E0822'	Diabetes due to undrl cond w diabetic chronic kidney disease
'E0829'	Diabetes due to undrl condition w oth diabetic kidney comp
'E08311'	Diab due to undrl cond w unsp diabetic rtnop w macular edema
'E08319'	Diab due to undrl cond w unsp diab rtnop w/o macular edema
'E08321'	Diabetes mellitus due to underlying condition with mild nonp
'E083211'	Diabetes with mild nonp rtnop with macular edema, right eye
'E083212'	Diabetes with mild nonp rtnop with macular edema, left eye
'E083213'	Diabetes with mild nonp rtnop with macular edema, bilateral
'E083219'	Diabetes with mild nonp rtnop with macular edema, unsp
'E08329'	Diabetes mellitus due to underlying condition with mild nonp
'E083291'	Diabetes with mild nonp rtnop without macular edema, r eye
'E083292'	Diab with mild nonp rtnop without macular edema, left eye
'E083293'	Diabetes with mild nonp rtnop without macular edema, bi
'E083299'	Diabetes with mild nonp rtnop without macular edema, unsp
'E08331'	Diabetes mellitus due to underlying condition with moderate
'E083311'	Diabetes with moderate nonp rtnop with macular edema, r eye
'E083312'	Diab with moderate nonp rtnop with macular edema, left eye
'E083313'	Diabetes with moderate nonp rtnop with macular edema, bi

'E083319'	Diabetes with moderate nonp rtnop with macular edema, unsp
'E08339'	Diabetes mellitus due to underlying condition with moderate
'E083391'	Diab with moderate nonp rtnop without macular edema, r eye
'E083392'	Diab with moderate nonp rtnop without macular edema, l eye
'E083393'	Diabetes with moderate nonp rtnop without macular edema, bi
'E083399'	Diab with moderate nonp rtnop without macular edema, unsp
'E08341'	Diabetes mellitus due to underlying condition with severe no
'E083411'	Diabetes with severe nonp rtnop with macular edema, r eye
'E083412'	Diabetes with severe nonp rtnop with macular edema, left eye
'E083413'	Diabetes with severe nonp rtnop with macular edema, bi
'E083419'	Diabetes with severe nonp rtnop with macular edema, unsp
'E08349'	Diabetes mellitus due to underlying condition with severe no
'E083491'	Diabetes with severe nonp rtnop without macular edema, r eye
'E083492'	Diab with severe nonp rtnop without macular edema, left eye
'E083493'	Diabetes with severe nonp rtnop without macular edema, bi
'E083499'	Diabetes with severe nonp rtnop without macular edema, unsp
'E08351'	Diabetes mellitus due to underlying condition with prolifera
'E083511'	Diab with prolif diabetic rtnop with macular edema, r eye
'E083512'	Diab with prolif diabetic rtnop with macular edema, left eye
'E083513'	Diabetes with prolif diabetic rtnop with macular edema, bi
'E083519'	Diabetes with prolif diabetic rtnop with macular edema, unsp
'E083521'	Diab with prolif diab rtnop with trctn dtch macula, r eye
'E083522'	Diab with prolif diab rtnop with trctn dtch macula, left eye
'E083523'	Diab with prolif diabetic rtnop with trctn dtch macula, bi
'E083529'	Diab with prolif diabetic rtnop with trctn dtch macula, unsp
'E083531'	Diab with prolif diab rtnop with trctn dtch n-mcla, r eye
'E083532'	Diab with prolif diab rtnop with trctn dtch n-mcla, left eye
'E083533'	Diab with prolif diabetic rtnop with trctn dtch n-mcla, bi
'E083539'	Diab with prolif diabetic rtnop with trctn dtch n-mcla, unsp
'E083541'	Diabetes with prolif diabetic rtnop with comb detach, r eye
'E083542'	Diab with prolif diabetic rtnop with comb detach, left eye
'E083543'	Diabetes with prolif diabetic rtnop with combined detach, bi
'E083549'	Diabetes with prolif diabetic rtnop with comb detach, unsp
'E083551'	Diabetes with stable prolif diabetic retinopathy, right eye
'E083552'	Diabetes with stable prolif diabetic retinopathy, left eye
'E083553'	Diabetes with stable prolif diabetic retinopathy, bilateral
'E083559'	Diabetes with stable prolif diabetic retinopathy, unsp
'E08359'	Diabetes mellitus due to underlying condition with prolifera
'E083591'	Diab with prolif diabetic rtnop without macular edema, r eye
'E083592'	Diab with prolif diab rtnop without macular edema, left eye
'E083593'	Diab with prolif diabetic rtnop without macular edema, bi

'E083599'	Diab with prolif diabetic rtnop without macular edema, unsp
'E0836'	Diabetes due to underlying condition w diabetic cataract
'E0837X1'	Diab with diabetic macular edema, resolved fol trtmnt, r eye
'E0837X2'	Diab with diab macular edema, resolved fol trtmnt, left eye
'E0837X3'	Diabetes with diabetic macular edema, resolved fol trtmnt, bi
'E0837X9'	Diab with diabetic macular edema, resolved fol trtmnt, unsp
'E0839'	Diabetes due to undrll condition w oth diabetic opth comp
'E0840'	Diabetes due to underlying condition w diabetic neurop, unsp
'E0841'	Diabetes due to undrll condition w diabetic mononeuropathy
'E0842'	Diabetes due to underlying condition w diabetic polyneurop
'E0843'	Diab due to undrll cond w diabetic autonm (poly)neuropathy
'E0844'	Diabetes due to underlying condition w diabetic amyotrophy
'E0849'	Diabetes due to undrll condition w oth diabetic neuro comp
'E0851'	Diab due to undrll cond w diab prph angiopath w/o gangrene
'E0852'	Diab due to undrll cond w diabetic prph angiopath w gangrene
'E0859'	Diabetes due to underlying condition w oth circulatory comp
'E08610'	Diabetes due to undrll cond w diabetic neuropathic arthrop
'E08618'	Diabetes due to underlying condition w oth diabetic arthrop
'E08620'	Diabetes due to underlying condition w diabetic dermatitis
'E08621'	Diabetes mellitus due to underlying condition w foot ulcer
'E08622'	Diabetes due to underlying condition w oth skin ulcer
'E08628'	Diabetes due to underlying condition w oth skin comp
'E08630'	Diabetes due to underlying condition w periodontal disease
'E08638'	Diabetes due to underlying condition w oth oral comp
'E08641'	Diabetes due to underlying condition w hypoglycemia w coma
'E08649'	Diabetes due to underlying condition w hypoglycemia w/o coma
'E0865'	Diabetes due to underlying condition w hyperglycemia
'E0869'	Diabetes due to underlying condition w oth complication
'E088'	Diabetes due to underlying condition w unsp complications
'E0900'	Drug/chem diab w hyprosm w/o nonket hyprgly-hypros coma
'E0901'	Drug/chem diabetes mellitus w hyperosmolarity w coma
'E0910'	Drug/chem diabetes mellitus w ketoacidosis w/o coma
'E0911'	Drug/chem diabetes mellitus w ketoacidosis w coma
'E0921'	Drug/chem diabetes mellitus w diabetic nephropathy
'E0922'	Drug/chem diabetes w diabetic chronic kidney disease
'E0929'	Drug/chem diabetes w oth diabetic kidney complication
'E09311'	Drug/chem diabetes w unsp diabetic rtnop w macular edema
'E09319'	Drug/chem diabetes w unsp diabetic rtnop w/o macular edema
'E09321'	Drug or chemical induced diabetes mellitus with mild nonprol
'E093211'	Drug/chem diab with mild nonp rtnop with mclr edema, r eye
'E093212'	Drug/chem diab with mild nonp rtnop with mclr edema, l eye

'E093213'	Drug/chem diab with mild nonp rtnop with macular edema, bi
'E093219'	Drug/chem diab with mild nonp rtnop with macular edema, unsp
'E09329'	Drug or chemical induced diabetes mellitus with mild nonprol
'E093291'	Drug/chem diab with mild nonp rtnop w/o mclr edema, r eye
'E093292'	Drug/chem diab with mild nonp rtnop w/o mclr edema, l eye
'E093293'	Drug/chem diab with mild nonp rtnop without mclr edema, bi
'E093299'	Drug/chem diab with mild nonp rtnop without mclr edema, unsp
'E09331'	Drug or chemical induced diabetes mellitus with moderate non
'E093311'	Drug/chem diab with mod nonp rtnop with macular edema, r eye
'E093312'	Drug/chem diab with mod nonp rtnop with macular edema, l eye
'E093313'	Drug/chem diab with mod nonp rtnop with macular edema, bi
'E093319'	Drug/chem diab with mod nonp rtnop with macular edema, unsp
'E09339'	Drug or chemical induced diabetes mellitus with moderate non
'E093391'	Drug/chem diab with mod nonp rtnop without mclr edema, r eye
'E093392'	Drug/chem diab with mod nonp rtnop without mclr edema, l eye
'E093393'	Drug/chem diab with mod nonp rtnop without macular edema, bi
'E093399'	Drug/chem diab with mod nonp rtnop without mclr edema, unsp
'E09341'	Drug or chemical induced diabetes mellitus with severe nonpr
'E093411'	Drug/chem diab with severe nonp rtnop with mclr edema, r eye
'E093412'	Drug/chem diab with severe nonp rtnop with mclr edema, l eye
'E093413'	Drug/chem diab with severe nonp rtnop with macular edema, bi
'E093419'	Drug/chem diab with severe nonp rtnop with mclr edema, unsp
'E09349'	Drug or chemical induced diabetes mellitus with severe nonpr
'E093491'	Drug/chem diab with severe nonp rtnop w/o mclr edema, r eye
'E093492'	Drug/chem diab with severe nonp rtnop w/o mclr edema, l eye
'E093493'	Drug/chem diab with severe nonp rtnop without mclr edema, bi
'E093499'	Drug/chem diab with severe nonp rtnop w/o mclr edema, unsp
'E09351'	Drug or chemical induced diabetes mellitus with proliferativ
'E093511'	Drug/chem diab with prolif diab rtnop with mclr edema, r eye
'E093512'	Drug/chem diab with prolif diab rtnop with mclr edema, l eye
'E093513'	Drug/chem diab with prolif diab rtnop with macular edema, bi
'E093519'	Drug/chem diab with prolif diab rtnop with mclr edema, unsp
'E093521'	Drug/chem diab w prolif diab rtnop w trctn dtch macula,r eye
'E093522'	Drug/chem diab w prolif diab rtnop w trctn dtch macula,l eye
'E093523'	Drug/chem diab w prolif diab rtnop w trctn dtch macula, bi
'E093529'	Drug/chem diab w prolif diab rtnop w trctn dtch macula, unsp
'E093531'	Drug/chem diab w prolif diab rtnop w trctn dtch n-mcla,r eye
'E093532'	Drug/chem diab w prolif diab rtnop w trctn dtch n-mcla,l eye
'E093533'	Drug/chem diab w prolif diab rtnop w trctn dtch n-mcla, bi
'E093539'	Drug/chem diab w prolif diab rtnop w trctn dtch n-mcla, unsp
'E093541'	Drug/chem diab w prolif diab rtnop with comb detach, r eye

'E093542'	Drug/chem diab w prolif diab rtnop with comb detach, l eye
'E093543'	Drug/chem diab with prolif diab rtnop with comb detach, bi
'E093549'	Drug/chem diab with prolif diab rtnop with comb detach, unsp
'E093551'	Drug/chem diabetes with stable prolif diabetic rtnop, r eye
'E093552'	Drug/chem diab with stable prolif diabetic rtnop, left eye
'E093553'	Drug/chem diabetes with stable prolif diabetic rtnop, bi
'E093559'	Drug/chem diabetes with stable prolif diabetic rtnop, unsp
'E09359'	Drug or chemical induced diabetes mellitus with proliferativ
'E093591'	Drug/chem diab with prolif diab rtnop w/o mclr edema, r eye
'E093592'	Drug/chem diab with prolif diab rtnop w/o mclr edema, l eye
'E093593'	Drug/chem diab with prolif diab rtnop without mclr edema, bi
'E093599'	Drug/chem diab with prolif diab rtnop w/o mclr edema, unsp
'E0936'	Drug/chem diabetes mellitus w diabetic cataract
'E0937X1'	Drug/chem diab w diab mclr edma, resolved fol trtmt, r eye
'E0937X2'	Drug/chem diab w diab mclr edma, resolved fol trtmt, l eye
'E0937X3'	Drug/chem diab with diab mclr edema, resolved fol trtmt, bi
'E0937X9'	Drug/chem diab with diab mclr edma, resolved fol trtmt, unsp
'E0939'	Drug/chem diabetes w oth diabetic ophthalmic complication
'E0940'	Drug/chem diabetes w neuro comp w diabetic neuropathy, unsp
'E0941'	Drug/chem diabetes w neuro comp w diabetic mononeuropathy
'E0942'	Drug/chem diabetes w neurological comp w diabetic polyneurop
'E0943'	Drug/chem diab w neuro comp w diab autonm (poly)neuropathy
'E0944'	Drug/chem diabetes w neurological comp w diabetic amyotrophy
'E0949'	Drug/chem diabetes w neuro comp w oth diabetic neuro comp
'E0951'	Drug/chem diabetes w diabetic prph angiopath w/o gangrene
'E0952'	Drug/chem diabetes w diabetic prph angiopath w gangrene
'E0959'	Drug/chem diabetes mellitus w oth circulatory complications
'E09610'	Drug/chem diabetes w diabetic neuropathic arthropathy
'E09618'	Drug/chem diabetes mellitus w oth diabetic arthropathy
'E09620'	Drug/chem diabetes mellitus w diabetic dermatitis
'E09621'	Drug or chemical induced diabetes mellitus with foot ulcer
'E09622'	Drug or chemical induced diabetes mellitus w oth skin ulcer
'E09628'	Drug/chem diabetes mellitus w oth skin complications
'E09630'	Drug/chem diabetes mellitus w periodontal disease
'E09638'	Drug/chem diabetes mellitus w oth oral complications
'E09641'	Drug/chem diabetes mellitus w hypoglycemia w coma
'E09649'	Drug/chem diabetes mellitus w hypoglycemia w/o coma
'E0965'	Drug or chemical induced diabetes mellitus w hyperglycemia
'E0969'	Drug/chem diabetes mellitus w oth complication
'E098'	Drug/chem diabetes mellitus w unsp complications
'E1010'	Type 1 diabetes mellitus with ketoacidosis without coma

'E1011'	Type 1 diabetes mellitus with ketoacidosis with coma
'E1021'	Type 1 diabetes mellitus with diabetic nephropathy
'E1022'	Type 1 diabetes mellitus w diabetic chronic kidney disease
'E1029'	Type 1 diabetes mellitus w oth diabetic kidney complication
'E10311'	Type 1 diabetes w unsp diabetic retinopathy w macular edema
'E10319'	Type 1 diabetes w unsp diabetic rtnop w/o macular edema
'E10321'	Type 1 diabetes mellitus with mild nonproliferative diabetic
'E103211'	Type 1 diab with mild nonp rtnop with macular edema, r eye
'E103212'	Type 1 diab with mild nonp rtnop with macular edema, l eye
'E103213'	Type 1 diabetes with mild nonp rtnop with macular edema, bi
'E103219'	Type 1 diab with mild nonp rtnop with macular edema, unsp
'E10329'	Type 1 diabetes mellitus with mild nonproliferative diabetic
'E103291'	Type 1 diab with mild nonp rtnop without mclr edema, r eye
'E103292'	Type 1 diab with mild nonp rtnop without mclr edema, l eye
'E103293'	Type 1 diab with mild nonp rtnop without macular edema, bi
'E103299'	Type 1 diab with mild nonp rtnop without macular edema, unsp
'E10331'	Type 1 diabetes mellitus with moderate nonproliferative diab
'E103311'	Type 1 diab with mod nonp rtnop with macular edema, r eye
'E103312'	Type 1 diab with mod nonp rtnop with macular edema, l eye
'E103313'	Type 1 diab with moderate nonp rtnop with macular edema, bi
'E103319'	Type 1 diab with mod nonp rtnop with macular edema, unsp
'E10339'	Type 1 diabetes mellitus with moderate nonproliferative diab
'E103391'	Type 1 diab with mod nonp rtnop without macular edema, r eye
'E103392'	Type 1 diab with mod nonp rtnop without macular edema, l eye
'E103393'	Type 1 diab with mod nonp rtnop without macular edema, bi
'E103399'	Type 1 diab with mod nonp rtnop without macular edema, unsp
'E10341'	Type 1 diabetes mellitus with severe nonproliferative diabet
'E103411'	Type 1 diab with severe nonp rtnop with macular edema, r eye
'E103412'	Type 1 diab with severe nonp rtnop with macular edema, l eye
'E103413'	Type 1 diab with severe nonp rtnop with macular edema, bi
'E103419'	Type 1 diab with severe nonp rtnop with macular edema, unsp
'E10349'	Type 1 diabetes mellitus with severe nonproliferative diabet
'E103491'	Type 1 diab with severe nonp rtnop without mclr edema, r eye
'E103492'	Type 1 diab with severe nonp rtnop without mclr edema, l eye
'E103493'	Type 1 diab with severe nonp rtnop without macular edema, bi
'E103499'	Type 1 diab with severe nonp rtnop without mclr edema, unsp
'E10351'	Type 1 diabetes mellitus with proliferative diabetic retinop
'E103511'	Type 1 diab with prolif diab rtnop with macular edema, r eye
'E103512'	Type 1 diab with prolif diab rtnop with macular edema, l eye
'E103513'	Type 1 diab with prolif diab rtnop with macular edema, bi
'E103519'	Type 1 diab with prolif diab rtnop with macular edema, unsp

'E103521'	Type 1 diab w prolif diab rtnop w trctn dtch macula, r eye
'E103522'	Type 1 diab w prolif diab rtnop w trctn dtch macula, l eye
'E103523'	Type 1 diab w prolif diab rtnop with trctn dtch macula, bi
'E103529'	Type 1 diab w prolif diab rtnop with trctn dtch macula, unsp
'E103531'	Type 1 diab w prolif diab rtnop w trctn dtch n-mcla, r eye
'E103532'	Type 1 diab w prolif diab rtnop w trctn dtch n-mcla, l eye
'E103533'	Type 1 diab w prolif diab rtnop with trctn dtch n-mcla, bi
'E103539'	Type 1 diab w prolif diab rtnop with trctn dtch n-mcla, unsp
'E103541'	Type 1 diab with prolif diab rtnop with comb detach, r eye
'E103542'	Type 1 diab with prolif diab rtnop with comb detach, l eye
'E103543'	Type 1 diab with prolif diabetic rtnop with comb detach, bi
'E103549'	Type 1 diab with prolif diab rtnop with comb detach, unsp
'E103551'	Type 1 diabetes with stable prolif diabetic rtnop, right eye
'E103552'	Type 1 diabetes with stable prolif diabetic rtnop, left eye
'E103553'	Type 1 diabetes with stable prolif diabetic rtnop, bilateral
'E103559'	Type 1 diabetes with stable prolif diabetic rtnop, unsp
'E10359'	Type 1 diabetes mellitus with proliferative diabetic retinop
'E103591'	Type 1 diab with prolif diab rtnop without mclr edema, r eye
'E103592'	Type 1 diab with prolif diab rtnop without mclr edema, l eye
'E103593'	Type 1 diab with prolif diab rtnop without macular edema, bi
'E103599'	Type 1 diab with prolif diab rtnop without mclr edema, unsp
'E1036'	Type 1 diabetes mellitus with diabetic cataract
'E1037X1'	Type 1 diab with diab mclr edema, resolved fol trtmt, r eye
'E1037X2'	Type 1 diab with diab mclr edema, resolved fol trtmt, l eye
'E1037X3'	Type 1 diab with diab macular edema, resolved fol trtmt, bi
'E1037X9'	Type 1 diab with diab mclr edema, resolved fol trtmt, unsp
'E1039'	Type 1 diabetes w oth diabetic ophthalmic complication
'E1040'	Type 1 diabetes mellitus with diabetic neuropathy, unsp
'E1041'	Type 1 diabetes mellitus with diabetic mononeuropathy
'E1042'	Type 1 diabetes mellitus with diabetic polyneuropathy
'E1043'	Type 1 diabetes w diabetic autonomic (poly)neuropathy
'E1044'	Type 1 diabetes mellitus with diabetic amyotrophy
'E1049'	Type 1 diabetes w oth diabetic neurological complication
'E1051'	Type 1 diabetes w diabetic peripheral angiopath w/o gangrene
'E1052'	Type 1 diabetes w diabetic peripheral angiopathy w gangrene
'E1059'	Type 1 diabetes mellitus with oth circulatory complications
'E10610'	Type 1 diabetes mellitus w diabetic neuropathic arthropathy
'E10618'	Type 1 diabetes mellitus with other diabetic arthropathy
'E10620'	Type 1 diabetes mellitus with diabetic dermatitis
'E10621'	Type 1 diabetes mellitus with foot ulcer
'E10622'	Type 1 diabetes mellitus with other skin ulcer

'E10628'	Type 1 diabetes mellitus with other skin complications
'E10630'	Type 1 diabetes mellitus with periodontal disease
'E10638'	Type 1 diabetes mellitus with other oral complications
'E10641'	Type 1 diabetes mellitus with hypoglycemia with coma
'E10649'	Type 1 diabetes mellitus with hypoglycemia without coma
'E1065'	Type 1 diabetes mellitus with hyperglycemia
'E1069'	Type 1 diabetes mellitus with other specified complication
'E108'	Type 1 diabetes mellitus with unspecified complications
'E1100'	Type 2 diab w hyposm w/o nonket hyprgly-hypros coma (NKHHC)
'E1101'	Type 2 diabetes mellitus with hyperosmolarity with coma
'E1110'	Type 2 diabetes mellitus with ketoacidosis without coma
'E1111'	Type 2 diabetes mellitus with ketoacidosis with coma
'E1121'	Type 2 diabetes mellitus with diabetic nephropathy
'E1122'	Type 2 diabetes mellitus w diabetic chronic kidney disease
'E1129'	Type 2 diabetes mellitus w oth diabetic kidney complication
'E11311'	Type 2 diabetes w unsp diabetic retinopathy w macular edema
'E11319'	Type 2 diabetes w unsp diabetic rtnop w/o macular edema
'E11321'	Type 2 diabetes mellitus with mild nonproliferative diabetic
'E113211'	Type 2 diab with mild nonp rtnop with macular edema, r eye
'E113212'	Type 2 diab with mild nonp rtnop with macular edema, l eye
'E113213'	Type 2 diabetes with mild nonp rtnop with macular edema, bi
'E113219'	Type 2 diab with mild nonp rtnop with macular edema, unsp
'E11329'	Type 2 diabetes mellitus with mild nonproliferative diabetic
'E113291'	Type 2 diab with mild nonp rtnop without mclr edema, r eye
'E113292'	Type 2 diab with mild nonp rtnop without mclr edema, l eye
'E113293'	Type 2 diab with mild nonp rtnop without macular edema, bi
'E113299'	Type 2 diab with mild nonp rtnop without macular edema, unsp
'E11331'	Type 2 diabetes mellitus with moderate nonproliferative diab
'E113311'	Type 2 diab with mod nonp rtnop with macular edema, r eye
'E113312'	Type 2 diab with mod nonp rtnop with macular edema, l eye
'E113313'	Type 2 diab with moderate nonp rtnop with macular edema, bi
'E113319'	Type 2 diab with mod nonp rtnop with macular edema, unsp
'E11339'	Type 2 diabetes mellitus with moderate nonproliferative diab
'E113391'	Type 2 diab with mod nonp rtnop without macular edema, r eye
'E113392'	Type 2 diab with mod nonp rtnop without macular edema, l eye
'E113393'	Type 2 diab with mod nonp rtnop without macular edema, bi
'E113399'	Type 2 diab with mod nonp rtnop without macular edema, unsp
'E11341'	Type 2 diabetes mellitus with severe nonproliferative diabet
'E113411'	Type 2 diab with severe nonp rtnop with macular edema, r eye
'E113412'	Type 2 diab with severe nonp rtnop with macular edema, l eye
'E113413'	Type 2 diab with severe nonp rtnop with macular edema, bi

'E113419'	Type 2 diab with severe nonp rtnop with macular edema, unsp
'E11349'	Type 2 diabetes mellitus with severe nonproliferative diabet
'E113491'	Type 2 diab with severe nonp rtnop without mclr edema, r eye
'E113492'	Type 2 diab with severe nonp rtnop without mclr edema, l eye
'E113493'	Type 2 diab with severe nonp rtnop without macular edema, bi
'E113499'	Type 2 diab with severe nonp rtnop without mclr edema, unsp
'E11351'	Type 2 diabetes mellitus with proliferative diabetic retinop
'E113511'	Type 2 diab with prolif diab rtnop with macular edema, r eye
'E113512'	Type 2 diab with prolif diab rtnop with macular edema, l eye
'E113513'	Type 2 diab with prolif diab rtnop with macular edema, bi
'E113519'	Type 2 diab with prolif diab rtnop with macular edema, unsp
'E113521'	Type 2 diab w prolif diab rtnop w trctn dtch macula, r eye
'E113522'	Type 2 diab w prolif diab rtnop w trctn dtch macula, l eye
'E113523'	Type 2 diab w prolif diab rtnop with trctn dtch macula, bi
'E113529'	Type 2 diab w prolif diab rtnop with trctn dtch macula, unsp
'E113531'	Type 2 diab w prolif diab rtnop w trctn dtch n-mcla, r eye
'E113532'	Type 2 diab w prolif diab rtnop w trctn dtch n-mcla, l eye
'E113533'	Type 2 diab w prolif diab rtnop with trctn dtch n-mcla, bi
'E113539'	Type 2 diab w prolif diab rtnop with trctn dtch n-mcla, unsp
'E113541'	Type 2 diab with prolif diab rtnop with comb detach, r eye
'E113542'	Type 2 diab with prolif diab rtnop with comb detach, l eye
'E113543'	Type 2 diab with prolif diabetic rtnop with comb detach, bi
'E113549'	Type 2 diab with prolif diab rtnop with comb detach, unsp
'E113551'	Type 2 diabetes with stable prolif diabetic rtnop, right eye
'E113552'	Type 2 diabetes with stable prolif diabetic rtnop, left eye
'E113553'	Type 2 diabetes with stable prolif diabetic rtnop, bilateral
'E113559'	Type 2 diabetes with stable prolif diabetic rtnop, unsp
'E11359'	Type 2 diabetes mellitus with proliferative diabetic retinop
'E113591'	Type 2 diab with prolif diab rtnop without mclr edema, r eye
'E113592'	Type 2 diab with prolif diab rtnop without mclr edema, l eye
'E113593'	Type 2 diab with prolif diab rtnop without macular edema, bi
'E113599'	Type 2 diab with prolif diab rtnop without mclr edema, unsp
'E1136'	Type 2 diabetes mellitus with diabetic cataract
'E1137X1'	Type 2 diab with diab mclr edema, resolved fol trtmnt, r eye
'E1137X2'	Type 2 diab with diab mclr edema, resolved fol trtmnt, l eye
'E1137X3'	Type 2 diab with diab macular edema, resolved fol trtmnt, bi
'E1137X9'	Type 2 diab with diab mclr edema, resolved fol trtmnt, unsp
'E1139'	Type 2 diabetes w oth diabetic ophthalmic complication
'E1140'	Type 2 diabetes mellitus with diabetic neuropathy, unsp
'E1141'	Type 2 diabetes mellitus with diabetic mononeuropathy
'E1142'	Type 2 diabetes mellitus with diabetic polyneuropathy

'E1143'	Type 2 diabetes w diabetic autonomic (poly)neuropathy
'E1144'	Type 2 diabetes mellitus with diabetic amyotrophy
'E1149'	Type 2 diabetes w oth diabetic neurological complication
'E1151'	Type 2 diabetes w diabetic peripheral angiopath w/o gangrene
'E1152'	Type 2 diabetes w diabetic peripheral angiopathy w gangrene
'E1159'	Type 2 diabetes mellitus with oth circulatory complications
'E11610'	Type 2 diabetes mellitus w diabetic neuropathic arthropathy
'E11618'	Type 2 diabetes mellitus with other diabetic arthropathy
'E11620'	Type 2 diabetes mellitus with diabetic dermatitis
'E11621'	Type 2 diabetes mellitus with foot ulcer
'E11622'	Type 2 diabetes mellitus with other skin ulcer
'E11628'	Type 2 diabetes mellitus with other skin complications
'E11630'	Type 2 diabetes mellitus with periodontal disease
'E11638'	Type 2 diabetes mellitus with other oral complications
'E11641'	Type 2 diabetes mellitus with hypoglycemia with coma
'E11649'	Type 2 diabetes mellitus with hypoglycemia without coma
'E1165'	Type 2 diabetes mellitus with hyperglycemia
'E1169'	Type 2 diabetes mellitus with other specified complication
'E118'	Type 2 diabetes mellitus with unspecified complications
'E1300'	Oth diab w hyprosm w/o nonket hyprgly-hypros coma (NKHHC)
'E1301'	Oth diabetes mellitus with hyperosmolarity with coma
'E1310'	Oth diabetes mellitus with ketoacidosis without coma
'E1311'	Oth diabetes mellitus with ketoacidosis with coma
'E1321'	Other specified diabetes mellitus with diabetic nephropathy
'E1322'	Oth diabetes mellitus with diabetic chronic kidney disease
'E1329'	Oth diabetes mellitus with oth diabetic kidney complication
'E13311'	Oth diabetes w unsp diabetic retinopathy w macular edema
'E13319'	Oth diabetes w unsp diabetic retinopathy w/o macular edema
'E13321'	Other specified diabetes mellitus with mild nonproliferative
'E133211'	Oth diabetes with mild nonp rtnop with macular edema, r eye
'E133212'	Oth diab with mild nonp rtnop with macular edema, left eye
'E133213'	Oth diabetes with mild nonp rtnop with macular edema, bi
'E133219'	Oth diabetes with mild nonp rtnop with macular edema, unsp
'E13329'	Other specified diabetes mellitus with mild nonproliferative
'E133291'	Oth diab with mild nonp rtnop without macular edema, r eye
'E133292'	Oth diab with mild nonp rtnop without macular edema, l eye
'E133293'	Oth diabetes with mild nonp rtnop without macular edema, bi
'E133299'	Oth diab with mild nonp rtnop without macular edema, unsp
'E13331'	Other specified diabetes mellitus with moderate nonprolifera
'E133311'	Oth diab with moderate nonp rtnop with macular edema, r eye
'E133312'	Oth diab with moderate nonp rtnop with macular edema, l eye

'E133313'	Oth diabetes with moderate nonp rtnop with macular edema, bi
'E133319'	Oth diab with moderate nonp rtnop with macular edema, unsp
'E13339'	Other specified diabetes mellitus with moderate nonprolifera
'E133391'	Oth diab with mod nonp rtnop without macular edema, r eye
'E133392'	Oth diab with mod nonp rtnop without macular edema, l eye
'E133393'	Oth diab with moderate nonp rtnop without macular edema, bi
'E133399'	Oth diab with mod nonp rtnop without macular edema, unsp
'E13341'	Other specified diabetes mellitus with severe nonproliferati
'E133411'	Oth diab with severe nonp rtnop with macular edema, r eye
'E133412'	Oth diab with severe nonp rtnop with macular edema, left eye
'E133413'	Oth diabetes with severe nonp rtnop with macular edema, bi
'E133419'	Oth diabetes with severe nonp rtnop with macular edema, unsp
'E13349'	Other specified diabetes mellitus with severe nonproliferati
'E133491'	Oth diab with severe nonp rtnop without macular edema, r eye
'E133492'	Oth diab with severe nonp rtnop without macular edema, l eye
'E133493'	Oth diab with severe nonp rtnop without macular edema, bi
'E133499'	Oth diab with severe nonp rtnop without macular edema, unsp
'E13351'	Other specified diabetes mellitus with proliferative diabeti
'E133511'	Oth diab with prolif diab rtnop with macular edema, r eye
'E133512'	Oth diab with prolif diab rtnop with macular edema, left eye
'E133513'	Oth diab with prolif diabetic rtnop with macular edema, bi
'E133519'	Oth diab with prolif diabetic rtnop with macular edema, unsp
'E133521'	Oth diab w prolif diab rtnop with trctn dtch macula, r eye
'E133522'	Oth diab w prolif diab rtnop with trctn dtch macula, l eye
'E133523'	Oth diab with prolif diab rtnop with trctn dtch macula, bi
'E133529'	Oth diab with prolif diab rtnop with trctn dtch macula, unsp
'E133531'	Oth diab w prolif diab rtnop with trctn dtch n-mcla, r eye
'E133532'	Oth diab w prolif diab rtnop with trctn dtch n-mcla, l eye
'E133533'	Oth diab with prolif diab rtnop with trctn dtch n-mcla, bi
'E133539'	Oth diab with prolif diab rtnop with trctn dtch n-mcla, unsp
'E133541'	Oth diab with prolif diabetic rtnop with comb detach, r eye
'E133542'	Oth diab with prolif diab rtnop with comb detach, left eye
'E133543'	Oth diabetes with prolif diabetic rtnop with comb detach, bi
'E133549'	Oth diab with prolif diabetic rtnop with comb detach, unsp
'E133551'	Oth diabetes with stable prolif diabetic rtnop, right eye
'E133552'	Oth diabetes with stable prolif diabetic rtnop, left eye
'E133553'	Oth diabetes with stable prolif diabetic rtnop, bilateral
'E133559'	Oth diabetes with stable prolif diabetic retinopathy, unsp
'E13359'	Other specified diabetes mellitus with proliferative diabeti
'E133591'	Oth diab with prolif diab rtnop without macular edema, r eye
'E133592'	Oth diab with prolif diab rtnop without macular edema, l eye

'E133593'	Oth diab with prolif diab rtnop without macular edema, bi
'E133599'	Oth diab with prolif diab rtnop without macular edema, unsp
'E1336'	Other specified diabetes mellitus with diabetic cataract
'E1337X1'	Oth diab with diab macular edema, resolved fol trtmt, r eye
'E1337X2'	Oth diab with diab macular edema, resolved fol trtmt, l eye
'E1337X3'	Oth diab with diabetic macular edema, resolved fol trtmt, bi
'E1337X9'	Oth diab with diab macular edema, resolved fol trtmt, unsp
'E1339'	Oth diabetes mellitus w oth diabetic ophthalmic complication
'E1340'	Oth diabetes mellitus with diabetic neuropathy, unspecified
'E1341'	Oth diabetes mellitus with diabetic mononeuropathy
'E1342'	Oth diabetes mellitus with diabetic polyneuropathy
'E1343'	Oth diabetes mellitus w diabetic autonomic (poly)neuropathy
'E1344'	Other specified diabetes mellitus with diabetic amyotrophy
'E1349'	Oth diabetes w oth diabetic neurological complication
'E1351'	Oth diabetes w diabetic peripheral angiopathy w/o gangrene
'E1352'	Oth diabetes w diabetic peripheral angiopathy w gangrene
'E1359'	Oth diabetes mellitus with other circulatory complications
'E13610'	Oth diabetes mellitus with diabetic neuropathic arthropathy
'E13618'	Oth diabetes mellitus with other diabetic arthropathy
'E13620'	Other specified diabetes mellitus with diabetic dermatitis
'E13621'	Other specified diabetes mellitus with foot ulcer
'E13622'	Other specified diabetes mellitus with other skin ulcer
'E13628'	Oth diabetes mellitus with other skin complications
'E13630'	Other specified diabetes mellitus with periodontal disease
'E13638'	Oth diabetes mellitus with other oral complications
'E13641'	Oth diabetes mellitus with hypoglycemia with coma
'E13649'	Oth diabetes mellitus with hypoglycemia without coma
'E1365'	Other specified diabetes mellitus with hyperglycemia
'E1369'	Oth diabetes mellitus with other specified complication
'E138'	Oth diabetes mellitus with unspecified complications
'G3289'	Oth degeneratv disord of nervous sys in dis classd elswhr

Appendix C: Empirical Strategy & Statistical Analyses

Our empirical strategy using a fixed effects model is defined as follows:

$$DiabManage_{icwmy} = \alpha + \Phi_w + \Psi_m + \Theta_y + \beta_1(Jan2019_m * \Phi_w) + \beta_2(Feb2019_m * \Phi_w) + \Pi_c + \beta_3 X_{imy} + \varepsilon_{icwmy}$$

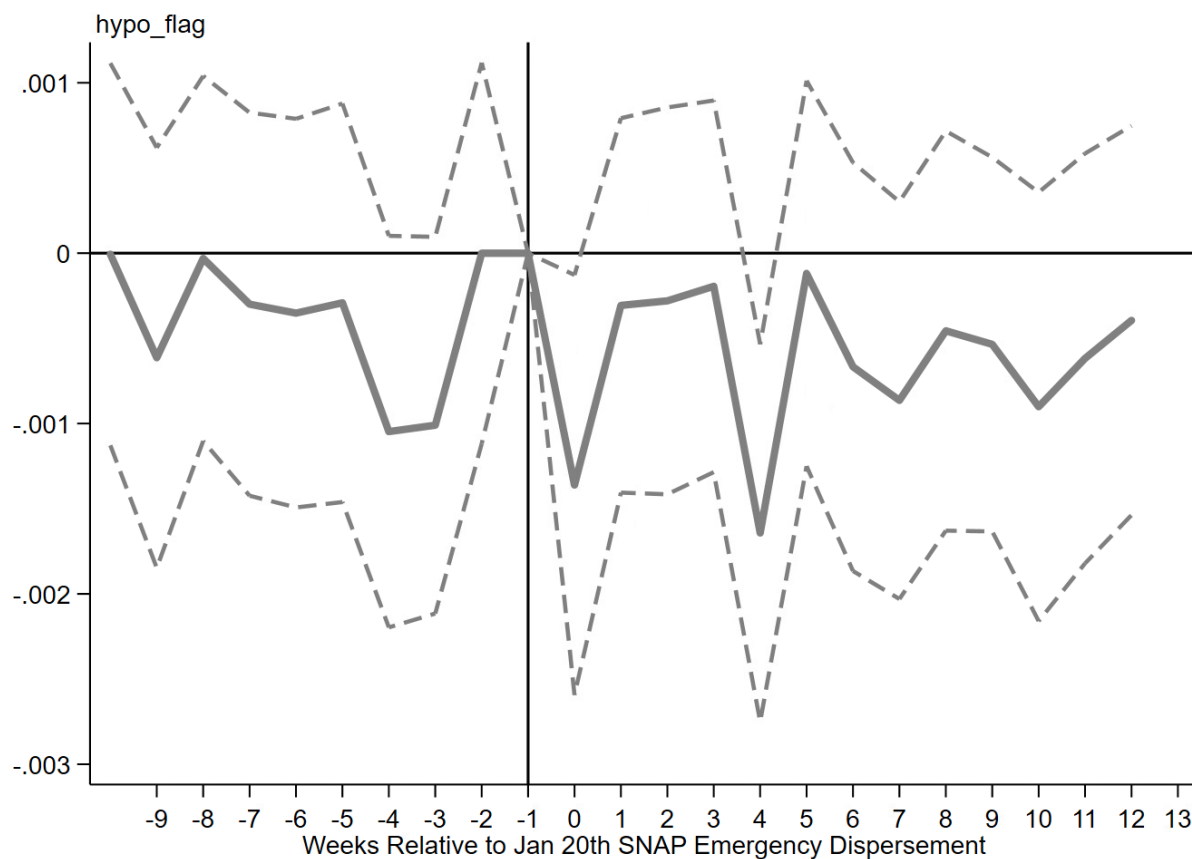
Observations are at the person-week level. DiabManage is an indicator of diabetes management – either at least one medical encounter for hypoglycemia or for hyperglycemia in that week. The coefficient on the interaction between January 2019 and the week dummies will describe any changes in the monthly distribution of diabetes management during the month of early benefit disbursement – i.e., the effect of a shortened monthly SNAP cycle. Likewise, the interaction between February 2019 and the week dummies will describe any changes in the monthly distribution of diabetes management during the month with no benefit disbursement – i.e., the effect of a lengthened monthly SNAP cycle. Weekly fixed effects control for typical fluctuations across the month. Monthly fixed effects control for seasonality. Year fixed effects control for differences in the SNAP population (and therefore economy, since SNAP is responsive to the economy) by year. Π_c includes county fixed effects to control for public health authorities (which are run by county) and local area conditions. X_{imy} is a vector of individual characteristics, including age at the start of the month of observation, gender, race, gross income, and net income. Individual characteristics should not have an impact since SNAP benefit distribution timing is random. Standard errors are clustered by person. The model assumes that week of month effects do not vary by month or calendar year.

The main assumption underlying our model is that in the absence of the government shutdown, health outcomes for diabetic patients would have evolved similarly over the months of Nov - Apr in both the 2017-2018 period and the 2018-2019 period. To test this claim we

conducted an event study analysis for our outcomes of interest and find evidence in support of the parallel trends assumption holding. We run an event study for our two main outcomes of interest: hyperglycemia and hypoglycemia.

The coefficients of interest (dichotomous week indicators) from the event study model are plotted in the figures below. They measure the covariate-adjusted relationship between the two periods of observation in the 10 weeks leading up to the government shutdown and the 13 weeks after the one-time benefit distribution in the third week of Jan 2019. The indicator for the week before the shutdown induced early distribution is set as the reference period, which normalizes the estimates to zero in that week. The weeks leading up to this are a test of the common trends assumption. The figures show coefficients that are not statistically different from each other in the weeks preceding the one-time distribution. This is true for all preceding weeks in the hypoglycemia event study. There are statistically different coefficients in the hyperglycemia event study. These coefficients occur in the early part of the 10-week pre-period (prior to the start of the shutdown). In the weeks immediately preceding (Dec-Jan) the shutdown early disbursement the coefficients are not statistically different from each other. This supports our model's underlying assumption that in the absence of the government shutdown trends from Nov 2018 to April 2019 would have evolved similarly to the trends from Nov 2017 to April 2018.

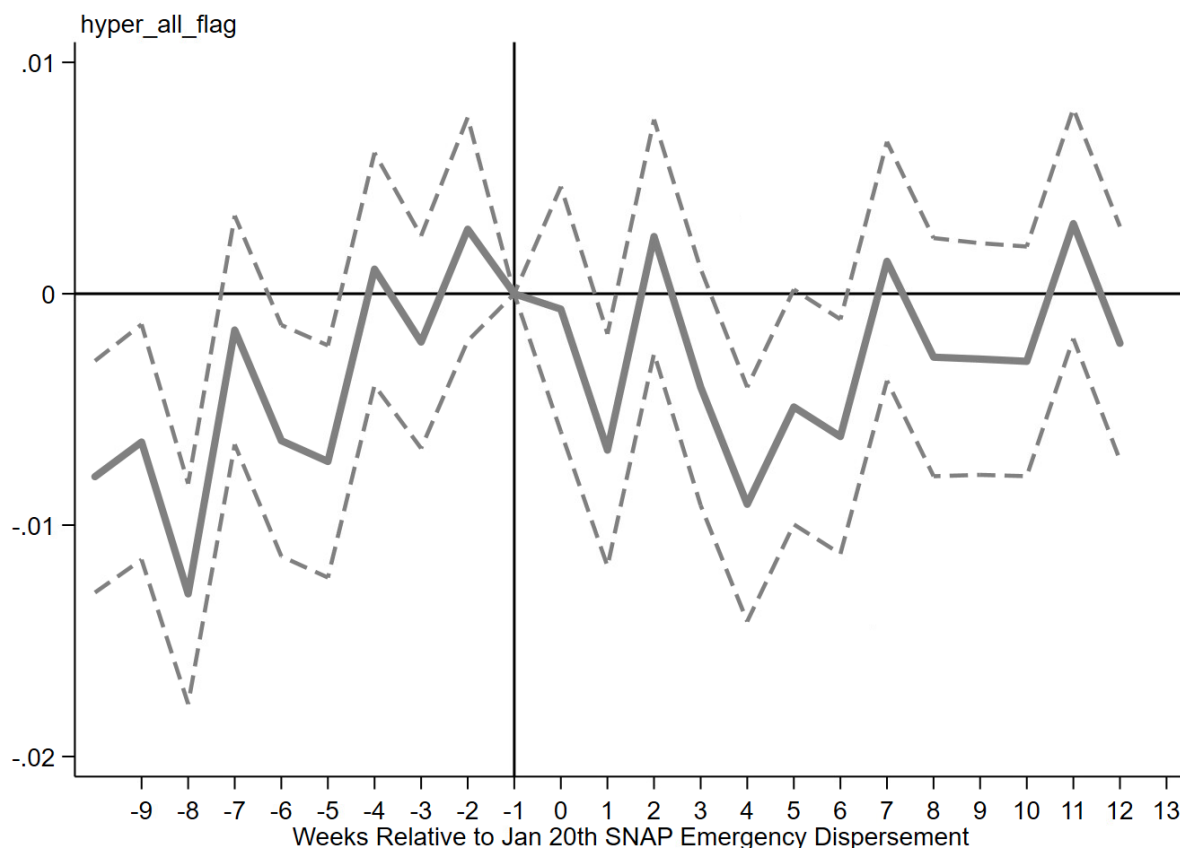
APPENDIX FIGURE C1. Hypoglycemia event study



SOURCE Authors' analysis of data from West Virginia Medicaid, SNAP, and TANF administrative files.

NOTES This figure shows regression adjusted estimates of the relationship between the two periods of observation and the one-time benefit distribution in the 3rd week of January 2019. The dependent variable is the indicator variable for whether or not an individual had a hypoglycemia medical visit in the week. The solid line plots the estimated event study coefficient on interactions between weeks leading up to the one-time distribution and if observation occurs in the period affect by the one-time disbursement. The week prior to the distribution is omitted the time period of observation is omitted. The model includes controls for age at the start of the month of observation, gender, race, gross income, and net income. The dashed lines are pointwise 95-percent confidence intervals. Standard errors are clustered by person ID.

APPENDIX FIGURE C2. Hyperglycemia event study



SOURCE Authors' analysis of data from West Virginia Medicaid, SNAP, and TANF administrative files.

NOTES This figure shows regression adjusted estimates of the relationship between the two periods of observation and the one-time benefit distribution in the 3rd week of January 2019. The dependent variable is the indicator variable for whether or not an individual had a hyperglycemia medical visit in the week. The solid line plots the estimated event study coefficient on interactions between weeks leading up to the one-time distribution and if observation occurs in the period affect by the one-time disbursement. The week prior to the distribution is omitted the time period of observation is omitted. The model includes controls for age at the start of the month of observation, gender, race, gross income, and net income. The dashed lines are pointwise 95-percent confidence intervals. Standard errors are clustered by person ID.

APPENDIX TABLE C1. Change in hyperglycemia encounters among WV SNAP/Medicaid participants during the 2018-2019 federal government shutdown

	(1) Typical Month	(2) January 2019	(3) February 2019
Week 1	[referent]	-0.0009 (0.0015)	0.0035* (0.0016)
Week 2	0.0045*** (0.0006)	0.0034* (0.0016)	-0.0024 (0.0016)
Week 3	0.0022*** (0.0006)	0.0086*** (0.0016)	-0.0041** (0.0015)
Week 4	-0.0022*** (0.0006)	-0.0009 (0.0014)	0.0023 (0.0015)

SOURCE Authors' analysis of data from West Virginia Medicaid, SNAP, and TANF administrative files.

NOTES This table contains coefficients from a regression of hyperglycemia encounters by week of the month in December 2017 to March 2018 (Period 1) and one with data from December 2018 to March 2019, with separate coefficients for the months of treatment – January and February 2019. Limited to individuals aged 18 – 64 diagnosed with diabetes in 2017 or 2018 who were continuously enrolled in both SNAP and Medicaid from November 2017 – April 2018 or November 2018 – April 2019 (N=819,913 person-weeks). Covariates include age at start of month of observation, gender, race, gross income, and net income. Standard errors clustered by person ID. *p<0.05, **p<0.01, ***p<0.001

APPENDIX TABLE C2. Change in hypoglycemia encounters among WV SNAP/Medicaid participants during the 2018-2019 federal government shutdown

	(1) Typical Month	(2) January 2019	(3) February 2019
Week 1	[referent]	0.0002 (0.0004)	0.0003 (0.0004)
Week 2	0.0000 (0.0001)	0.0002 (0.0004)	-0.0001 (0.0003)
Week 3	0.0000 (0.0001)	0.0002 (0.0004)	-0.0006* (0.0003)
Week 4	-0.0003* (0.0001)	0.0001 (0.0003)	0.0005 (0.0004)

SOURCE Authors' analysis of data from West Virginia Medicaid, SNAP, and TANF administrative files.

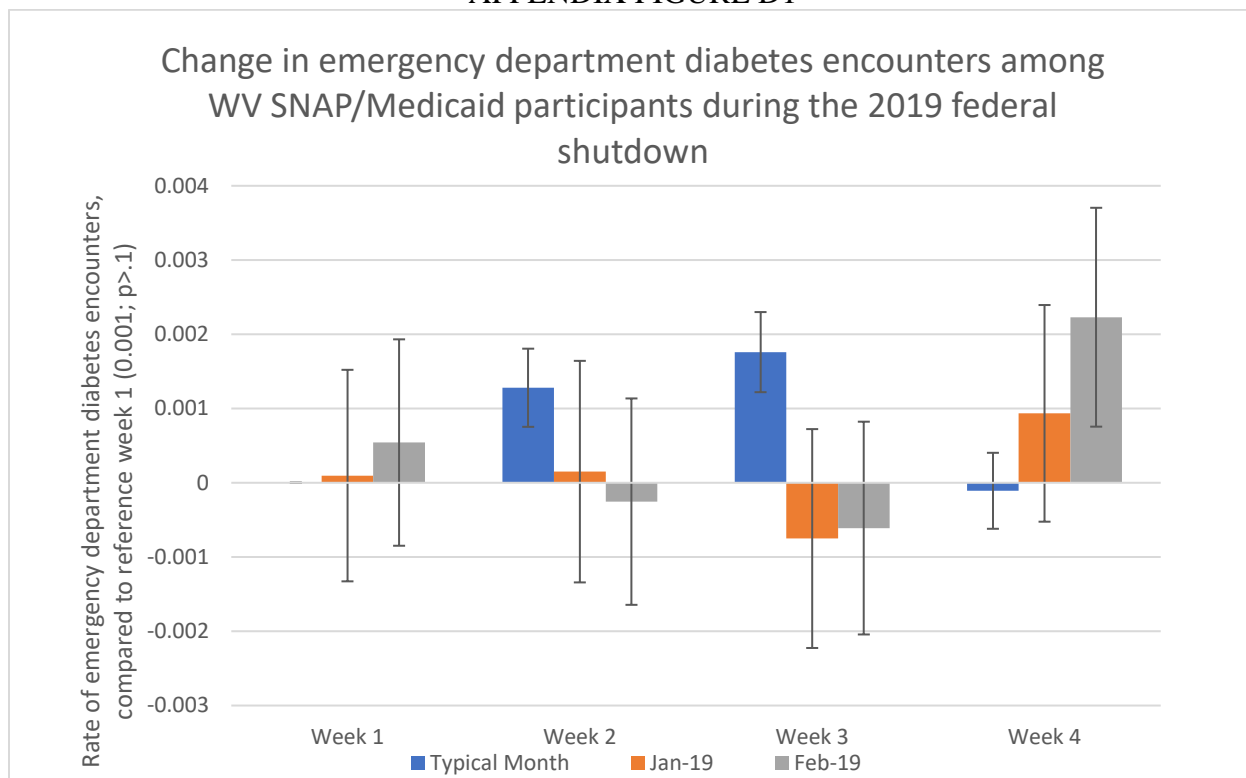
NOTES This table contains coefficients from a regression of hypoglycemia encounters by week of the month in December 2017 to March 2018 (Period 1) and one with data from December 2018 to March 2019, with separate coefficients for the months of treatment – January and February 2019. Limited to individuals aged 18 – 64 diagnosed with diabetes in 2017 or 2018 who were continuously enrolled in both SNAP and Medicaid from November 2017 – April 2018 or November 2018 – April 2019 (N=819,913 person-weeks). Covariates include age at start of month of observation, gender, race, gross income, and net income. Standard errors clustered by person ID. *p<0.05, **p<0.01, ***p<0.001

Appendix D: Additional Analyses

Diabetes encounters

Figure D1 depicts trends for emergency department encounters related to diabetes. These encounters were defined as claims with a diagnosis code of diabetes and a place of service of emergency department or inpatient hospital and are listed in Appendix B. There is a statistically significant increase in weeks 2 and 3 of a typical month in our data, and the only change in the treatment months is an increase in encounters in the final week of February – that is, the furthest days from the January 20th early disbursement. Because diabetes complications are many, these results are difficult to interpret. For this reason, we did not include diabetes encounters with the main results of the paper.

APPENDIX FIGURE D1



Caption: Change in diabetes encounters among WV SNAP/Medicaid participants during the 2019 federal shutdown

SOURCE Authors' analysis of data from West Virginia Medicaid, SNAP, and TANF administrative files. NOTES This graph contains coefficients from a regression of hyperglycemia encounters by week of the month in December 2017 to March 2018 (Period 1) and one with data from December 2018 to March 2019, with separate coefficients for the months of treatment – January and February 2019. The constant represents the rate during week 1 of a typical month, 0.002 ($p > .1$). Includes 90 percent confidence interval. Limited to individuals aged 18 – 64 diagnosed with diabetes in 2017 or 2018 who were continuously enrolled in both SNAP and Medicaid from November 2017 – April 2018 or November 2018 – April 2019 ($N=819,913$ person-weeks). Standard errors clustered by person ID. Covariates include age at start of month of observation, gender, race, gross income, and net income.

Continuous sample

To test for sensitivity of our results to the sample selection, we restrict our analyses to only patients who are continuously enrolled in both time periods. (Our primary sample requires continuous enrollment in only one of the two time periods – i.e., November 2017 – April 2018 or November 2018 – April 2019.) This subsample composes 42 percent of the individuals and 60 percent of the total observations in our primary sample. We then use this restricted subsample and add individual fixed effects to the model. The coefficients of interest for each of these regressions are presented below in Tables D1 (hyperglycemia) and D2 (hypoglycemia). The first panel of results in the table are the from main analysis as presented in Table C1 and C2 using the full sample, the second panel includes only those individuals present in both time periods, and the final panel presents the results when including individual fixed effects. The coefficients after restricting the sample are consistent with the main model results both in magnitude and statistical significance.

APPENDIX TABLE D1. Change in hyperglycemia encounters among WV SNAP/Medicaid participants during the 2018-2019 federal government shutdown, full and restricted samples

	(1) Main Analysis Sample			(2) Restricted to Individuals Observed in Both Periods			(3) Individual Fixed Effects for Individuals Observed in Both Periods		
	Typical Month	January 2019	February 2019	Typical Month	January 2019	February 2019	Typical Month	January 2019	February 2019
Week 1	[referent]	-0.0009 (0.0015)	0.0035* (0.0016)	[referent]	-0.0022 (0.0020)	0.0054* (0.0022)	[referent]	-0.0022 (0.0020)	0.0053* (0.0022)
Week 2	0.0045*** (0.0006)	0.0034* (0.0016)	-0.0024 (0.0016)	0.0051*** (0.0009)	0.0033 (0.0022)	-0.0051* (0.0021)	0.0051*** (0.0009)	0.0033 (0.0022)	-0.0051* (0.0021)
Week 3	0.0022*** (0.0006)	0.0086*** (0.0016)	-0.0041** (0.0015)	0.0023* (0.0009)	0.0100*** (0.0023)	-0.0040 (0.0021)	0.0023* (0.0009)	0.0100*** (0.0023)	-0.0040 (0.0021)
Week 4	-0.0022*** (0.0006)	-0.0009 (0.0014)	0.0023 (0.0015)	-0.0025** (0.0009)	-0.0020 (0.0020)	0.0025 (0.0021)	-0.0025** (0.0009)	-0.0020 (0.0020)	0.0025 (0.0021)
Full sample	X	X	X						
Restricted sample				X	X	X	X	X	X
Individual FEs							X	X	X
Observations		819,913			485,667			485,667	

SOURCE Authors' analysis of data from West Virginia Medicaid, SNAP, and TANF administrative files.

NOTES This table contains coefficients from regressions of hyperglycemia encounters by week of the month in December 2017 to March 2018 (Period 1) and one with data from December 2018 to March 2019, with separate coefficients for the months of treatment – January and February 2019. Main analysis sample in column (1) limited to individuals aged 18 – 64 diagnosed with diabetes in 2017 or 2018 who were continuously enrolled in both SNAP and Medicaid from November 2017 – April 2018 or November 2018 – April 2019 (N=819,913 person-weeks). Restricted sample in columns (2) and (3) limited to individuals continuously enrolled in both time periods. Each numbered column represents a single regression. Covariates include age at start of month of observation, gender, race, gross income, and net income. Standard errors clustered by person ID. *p<0.05, **p<0.01, ***p<0.001

APPENDIX TABLE D2. Change in hypoglycemia encounters among WV SNAP/Medicaid participants during the 2018-2019 federal government shutdown, full and restricted samples

	(1) Main Analysis Sample			(2) Restricted to Individuals Observed in Both Periods			(3) Individual Fixed Effects for Individuals Observed in Both Periods		
	Typical Month	January 2019	February 2019	Typical Month	January 2019	February 2019	Typical Month	January 2019	February 2019
Week 1	0.0000 (0.0000)	0.0002 (0.0004)	0.0003 (0.0004)	0.0000 (0.0000)	0.0001 (0.0005)	0.0001 (0.0005)	0.0000 (0.0000)	-0.0001 (0.0005)	0.0001 (0.0005)
Week 2	0.0000 (0.0001)	0.0002 (0.0004)	-0.0001 (0.0003)	-0.0000 (0.0001)	-0.0003 (0.0005)	0.0001 (0.0005)	-0.0000 (0.0002)	-0.0003 (0.0005)	0.0001 (0.0005)
Week 3	0.0000 (0.0001)	0.0002 (0.0004)	-0.0006* (0.0003)	0.0000 (0.0002)	-0.0003 (0.0004)	-0.0006 (0.0004)	0.0000 (0.0002)	-0.0000 (0.0005)	-0.0006 (0.0004)
Week 4	-0.0003* (0.0001)	0.0001 (0.0003)	0.0005 (0.0004)	-0.0003 (0.0002)	-0.0002 (0.0004)	0.0004 (0.0005)	-0.0003 (0.0002)	-0.0002 (0.0004)	0.0004 (0.0005)
Full sample	X	X	X						
Restricted sample				X	X	X	X	X	X
Individual FEs							X	X	X
Observations		819,913			485,667			485,667	

SOURCE Authors' analysis of data from West Virginia Medicaid, SNAP, and TANF administrative files.

NOTES This table contains coefficients from regressions of hypoglycemia encounters by week of the month in December 2017 to March 2018 (Period 1) and one with data from December 2018 to March 2019, with separate coefficients for the months of treatment – January and February 2019. Main analysis sample in column (1) limited to individuals aged 18 – 64 diagnosed with diabetes in 2017 or 2018 who were continuously enrolled in both SNAP and Medicaid from November 2017 – April 2018 or November 2018 – April 2019 (N=819,913 person-weeks). Restricted sample in columns (2) and (3) limited to individuals continuously enrolled in both time periods. Each numbered column represents a single regression. Covariates include age at start of month of observation, gender, race, gross income, and net income. Standard errors clustered by person ID. *p<0.05, **p<0.01, ***p<0.001

Date of disbursement analysis

In a typical month, the state of West Virginia disburses SNAP benefits by last name of the primary beneficiary across the first nine days of the month. (While basing disbursement on day of the month may in some instances lead to selection bias due to common last names of certain race/ethnic groups, this is unlikely to be an issue for the West Virginia population, which is almost exclusively Non-Hispanic White.) Due to the federal government shutdown in 2018-2019, SNAP benefits for February 2019 were early for all participating households on January 20th. Since households received benefits between the 1st and 9th of January, some had a longer gap since the previous disbursement (between 11 and 20 days). There was also variation in how long the gap was between the January 20th disbursement and the March 1st transfer received by all households for March. We exploit this variation by running our analysis separately for households receiving in the first, second, and third three days of the month – i.e., on days 1-3, 4-6, and 7-9 – to test for a dose-response effect. The results of this analysis are presented in tables D3 and D4. We find no statistically differential effects for the subgroups. Given the relatively narrow distribution window in West Virginia, along with the small number of hypoglycemia and hyperglycemia events in our data, finding little to no difference across groups for the outcomes of interest is not surprising.

APPENDIX TABLE D3. Change in hypoglycemia encounters among WV SNAP/Medicaid participants during the 2018-2019 federal government shutdown, by typical date of disbursement

	(1) Typical disbursement on 1 st -3 rd day of month			(2) Typical disbursement on 4 th -6 th day of month			(3) Typical disbursement on 7 th -9 th day of month		
	Typical Month	January 2019	February 2019	Typical Month	January 2019	February 2019	Typical Month	January 2019	February 2019
Week 1	[referent]	0.0008 (0.0026)	0.0062* (0.0028)	[referent]	0.0002 (0.0027)	0.0058* (0.0028)	[referent]	-0.0036 (0.0025)	-0.0005 (0.0027)
Week 2	0.0041*** (0.0012)	0.0030 (0.0022)	-0.0018 (0.0028)	0.0060*** (0.0011)	0.0035 (0.0029)	-0.0036 (0.0028)	0.0042*** (0.0011)	0.0030 (0.0028)	-0.0034 (0.0027)
Week 3	0.0018 (0.0012)	0.0152*** (0.0031)	-0.0049 (0.0026)	0.0022* (0.0011)	0.0065* (0.0028)	-0.0039 (0.0026)	0.0027* (0.0010)	0.0061* (0.0028)	-0.0030 (0.0026)
Week 4	-0.0027* (0.0012)	-0.0002 (0.0020)	0.0022 (0.0027)	-0.0029** (0.0010)	-0.0002 (0.0025)	0.0012 (0.0026)	-0.0011 (0.0010)	-0.0016 (0.0026)	0.0026 (0.0026)
Observations		256,300			252,173			274,789	

SOURCE Authors' analysis of data from West Virginia Medicaid, SNAP, and TANF administrative files.

NOTES This table contains coefficients from regressions of hyperglycemia encounters by week of the month in December 2017 to March 2018 (Period 1) and one with data from December 2018 to March 2019, with separate coefficients for the months of treatment – January and February 2019. Limited to individuals aged 18 – 64 diagnosed with diabetes in 2017 or 2018 who were continuously enrolled in both SNAP and Medicaid from November 2017 – April 2018 or November 2018 – April 2019 who typically receive SNAP benefits on the 1st to 3rd (column (1)), 4th to 6th (column (2)), or 7th to 9th (column (3)) day of the month. Each numbered column represents a single regression. Observations do not sum to total sample since each month a small fraction of individuals receive benefits outside of the typical timeframe due to recertification or other administrative issues. (See figure one for the distribution of benefit receipt dates.) Covariates include age at start of month of observation, gender, race, gross income, and net income. Standard errors clustered by person ID. *p<0.05, **p<0.01, ***p<0.001

APPENDIX TABLE D4. Change in hypoglycemia encounters among WV SNAP/Medicaid participants during the 2018-2019 federal government shutdown, by typical date of disbursement

	(1)			(2)			(3)		
	Typical disbursement on 1 st -3 rd day of month			Typical disbursement on 4 th -6 th day of month			Typical disbursement on 7 th -9 th day of month		
	Typical Month	January 2019	February 2019	Typical Month	January 2019	February 2019	Typical Month	January 2019	February 2019
Week 1	0.0000 (0.0000)	-0.0004 (0.0005)	0.0003 (0.0006)	0.0000 (0.0000)	0.0012 (0.0007)	0.0010 (0.0007)	0.0000 (0.0000)	-0.0001 (0.0006)	-0.0003 (0.0006)
Week 2	0.0001 (0.0003)	0.0004 (0.0007)	-0.0000 (0.0007)	0.0002 (0.0002)	0.0002 (0.0006)	-0.0000 (0.0006)	-0.0002 (0.0003)	-0.0001 (0.0007)	-0.0003 (0.0006)
Week 3	-0.0002 (0.0003)	0.0012 (0.0007)	-0.0005 (0.0005)	0.0003 (0.0002)	-0.0001 (0.0006)	-0.0006 (0.0005)	0.0001 (0.0003)	0.0002 (0.0007)	-0.0009 (0.0006)
Week 4	-0.0005* (0.0002)	0.0001 (0.0006)	0.0004 (0.0006)	0.0002 (0.0002)	0.0000 (0.0005)	-0.0000 (0.0005)	-0.0002 (0.0002)	0.0000 (0.0006)	0.0013 (0.0008)
Observations		256,300			252,173			274,789	

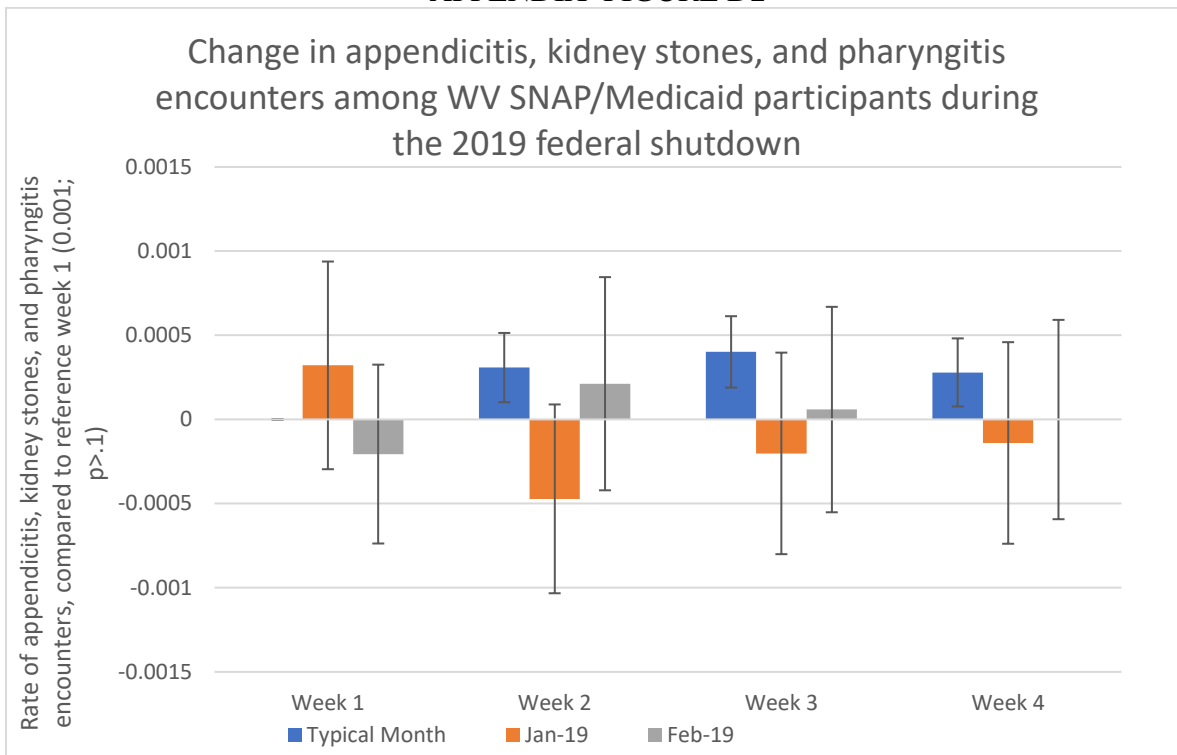
SOURCE Authors' analysis of data from West Virginia Medicaid, SNAP, and TANF administrative files.

NOTES This table contains coefficients from regressions of hypoglycemia encounters by week of the month in December 2017 to March 2018 (Period 1) and one with data from December 2018 to March 2019, with separate coefficients for the months of treatment – January and February 2019. Limited to individuals aged 18 – 64 diagnosed with diabetes in 2017 or 2018 who were continuously enrolled in both SNAP and Medicaid from November 2017 – April 2018 or November 2018 – April 2019 who typically receive SNAP benefits on the 1st to 3rd (column (1)), 4th to 6th (column (2)), or 7th to 9th (column (3)) day of the month. Each numbered column represents a single regression. Observations do not sum to total sample since each month a small fraction of individuals receive benefits outside of the typical timeframe due to recertification or other administrative issues. (See figure one for the distribution of benefit receipt dates.) Covariates include age at start of month of observation, gender, race, gross income, and net income. Standard errors clustered by person ID. *p<0.05, **p<0.01, ***p<0.001

Negative control analysis

To test for other underlying trends in health or health utilization during the study period, we implement a negative control analysis, or placebo test. Using the same study design, we examine trends in emergency department or inpatient hospital claims related to appendicitis, kidney stones, or pharyngitis. These acute conditions should not be affected by diet or financial condition and we expected to find no significant difference in trends using our model. Figure D2 depicts results for these placebo outcomes. While there is a small, statistically significant increase in across the month, there is no change in January or February 2019.

APPENDIX FIGURE D2



Caption: Change in appendicitis, kidney stones, and pharyngitis encounters among WV SNAP/Medicaid participants during the 2019 federal shutdown

SOURCE Authors' analysis of data from West Virginia Medicaid, SNAP, and TANF administrative files. **NOTES** This graph contains coefficients from a regression of hyperglycemia encounters by week of the month in December 2017 to March 2018 (Period 1) and one with data from December 2018 to March 2019, with separate coefficients for the months of treatment – January and February 2019. The constant represents the rate during week 1 of a typical month, 0.00119 ($p > .1$). Includes 90 percent confidence interval. Limited to individuals aged 18 – 64 diagnosed with diabetes in 2017 or 2018 who were continuously enrolled in both SNAP and Medicaid from November 2017 – April 2018 or November 2018 – April 2019 (N=819,913 person-weeks). Standard errors clustered by person ID. Covariates include age at start of month of observation, gender, race, gross income, and net income.