

# First Stage Analysis

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## 1 Results

In general, figures are organized in two parts:

1. Effect estimates on each (or any) program enrollment in general (capturing mean impacts on the *marginal* distribution of take-up).
2. Effect estimates on each possible bundle of program enrollment (capturing mean impacts on take-up of *each possible choice*).

Brief summary of figures and tables:

- **(Updated:)** Figures 1 and 2 plot raw monthly trends. Control group mean trend is normalized to be the treatment group mean three months prior to CommonHelp.
- **(Updated:)** Figures 3 and 4 plot event-study estimates under both specifications.
- **(Updated:)** Table 1 reports DD estimates for alternative treatment definitions.
- **(New:)** Figures 5 and 6 plots DD estimates against subsets of the treated zip-LDSS counties based on their percentile distance away from their assigned LDSS office.
- **(New:)** Figure 7 plot event-study estimates on the incidence of incorrect LDSS office in the VDSS data. Note: These estimates come from the restricted sample of zip-LDSS county-by-month observations with at least one SNAP, TANF, or Medicaid recipient.
- **(New:)** Figure 8 plots DD estimates of CommonHelp’s effect on entrance into and exits out of each combination of programs.

## 2 Data

The base population comprises of all individuals born between 1978–1987 who received a VDSS program between 2009–2016. We focus specifically on monthly records on Medicaid, SNAP, and

TANF receipt. These data also indicate the zip code of residence of each individual at the time of program receipt as well as the LDSS county that initially opened the case.<sup>1</sup> If the zip code of residence is not served by the LDSS county on record (which occurs in less than 2% of panels), we replace the county on record with the LDSS county serving that zip code that is closest to the county on record. We prioritize zip codes and counties based on program popularity (first SNAP, then Medicaid, then TANF).<sup>2</sup>

Critically, since we link individuals across monthly Medicaid, SNAP, and TANF records, we are able to observe if they participate in multiple programs simultaneously. Our main outcomes of interest are participation in each individual program, pairwise combinations of the programs, any of the three programs, and all three programs. We also consider participating in *only* Medicaid, *only* SNAP, or *only* TANF in order to highlight CommonHelp’s effect on multiple program participation. These outcomes are aggregated at the residential zip–LDSS county level in monthly panels. Note that zip codes often lie in multiple counties and are thus served by multiple LDSS offices, so our aggregated data separate populations residing in the same zip codes that are served by distinct offices.<sup>3</sup>

We restrict zip–LDSS county units that have complete panels between January 2009 and December 2016. In our estimation sample, we further restrict attention to LDSS counties with at least two zip codes.

We assign zip–LDSS county units to treatment status based on their proximity to their LDSS office. We consider three alternative treatments:

1. *Global, 50th percentile*: Zip’s distance to LDSS office is in top 50% of the distribution of all zip–LDSS counties.
2. *Local, 50th percentile*: Zip code’s distance to LDSS office is in top 50% of the distribution of zip–LDSS counties served by that LDSS.
3. *No LDSS office*: LDSS office is not located in the zip–LDSS county.

In each case, control groups are defined as the complementary set of zip–LDSS counties. *All plots show results for treatment and control groups defined by global, 50th percentile.*

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1. In less than 5% of panels, there are spells in which individuals appear in more than one case number in the same month, which is typically associated with more than one zip code and LDSS county. To avoid double-counting individuals and resolve conflicts in geographic units, we prioritize the case that appears after such spells.

2. **N.B.: Need to assess if there are conflicts in zips and LDSS counties across the SNAP, TANF, and Medicaid records.**

3. Note that there are a few cases where a zip code lies in more than one county that happens to be served by the same LDSS office. In these cases, zip-county pairs are aggregated up to the same zip–LDSS county pair.

### 3 Empirical Analysis

Let  $i$  index zip-LDSS county pairs and  $t$  index monthly calendar time. We run the DD regression

$$\text{arsinh}(Y_{it}) = \beta(D_i \times \text{CommonHelp}) + \delta_i + \delta_{\ell(i)t} + \varepsilon_{it} \quad (1)$$

where  $Y_{it}$  is enrollment count of zip-LDSS county  $i$  at month  $t$ ,  $D_i$  indicates a treated zip-LDSS county,  $\text{CommonHelp} \equiv \mathbb{1}\{t \geq \text{October 2012}\}$ ,  $\delta_i$  are zip-LDSS county fixed effects, and  $\delta_{\ell(i)t}$  are LDSS county-by-month fixed effects, where  $\ell(i)$  indicates  $i$ 's LDSS county.

We also run the counterpart event-study regression

$$\text{arsinh}(Y_{it}) = \sum_{\substack{-15 \leq k \leq 16, \\ k \neq -1}} \beta_k(D_i \times \mathbb{1}\{q(t) = k\}) + \delta_i + \delta_{\ell(i)t} + \varepsilon_{it} \quad (2)$$

where  $q(t)$  indicates the calendar quarter of calendar month  $t$  relative to the launch of CommonHelp (2012, Q4). As an alternative specification, we also try an alternative event-study specification:

$$\text{arsinh}(Y_{it}) = \sum_{\substack{-15 \leq k \leq 16, \\ k \neq -1}} \beta_k(D_i \times \mathbb{1}\{q(t) = k\}) + \delta_d D_i + \delta_t + \delta_{\ell(i)} + \varepsilon_{it} \quad (2')$$

Results are essentially identical under a more classic two-way FE specification.<sup>4</sup>

Standard errors are clustered by LDSS county.

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4. That is:  $\text{arsinh}(Y_{it}) = \sum_{\substack{-15 \leq k \leq 16, \\ k \neq -1}} \beta_k(D_i \times \mathbb{1}\{q(t) = k\}) + \delta_i + \delta_t + \varepsilon_{it}$ .

Figure 1: Raw enrollment counts in programs

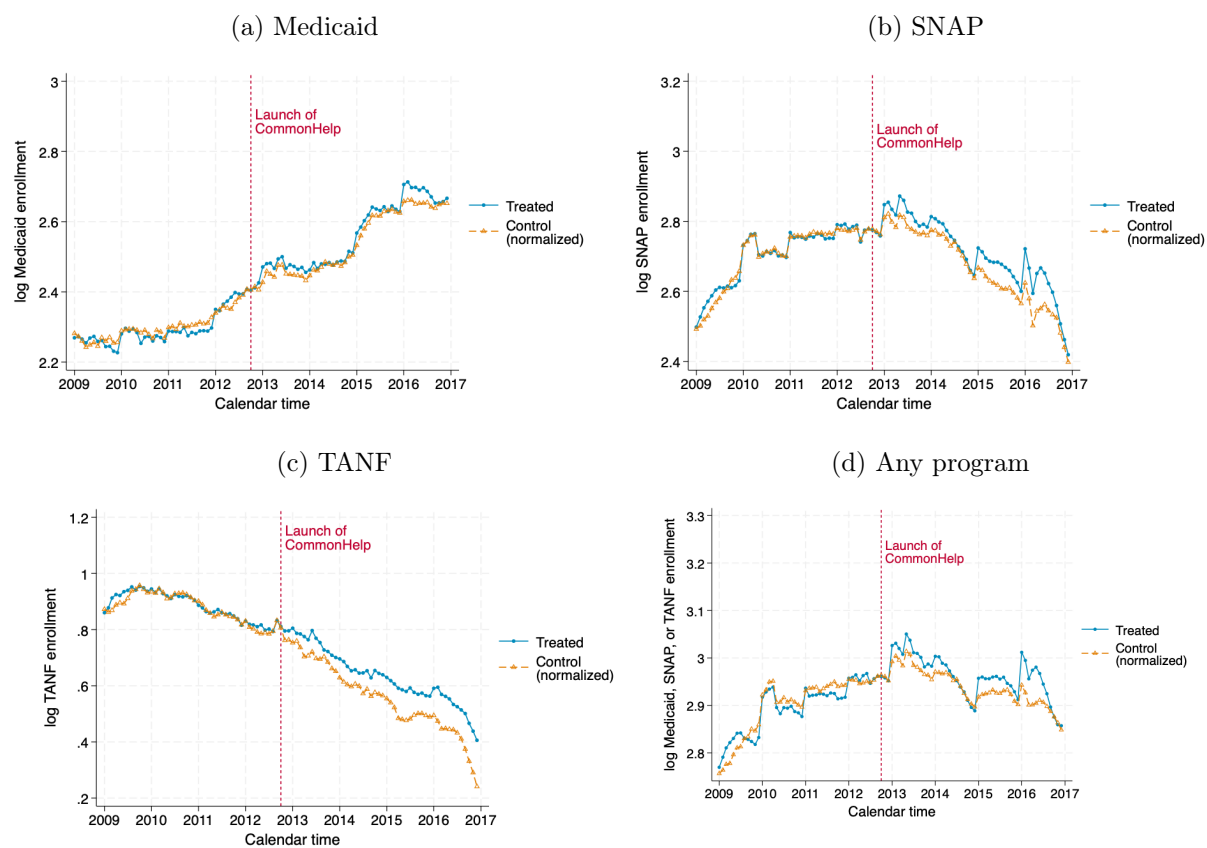


Figure 2: Raw enrollment counts in single and multiple programs

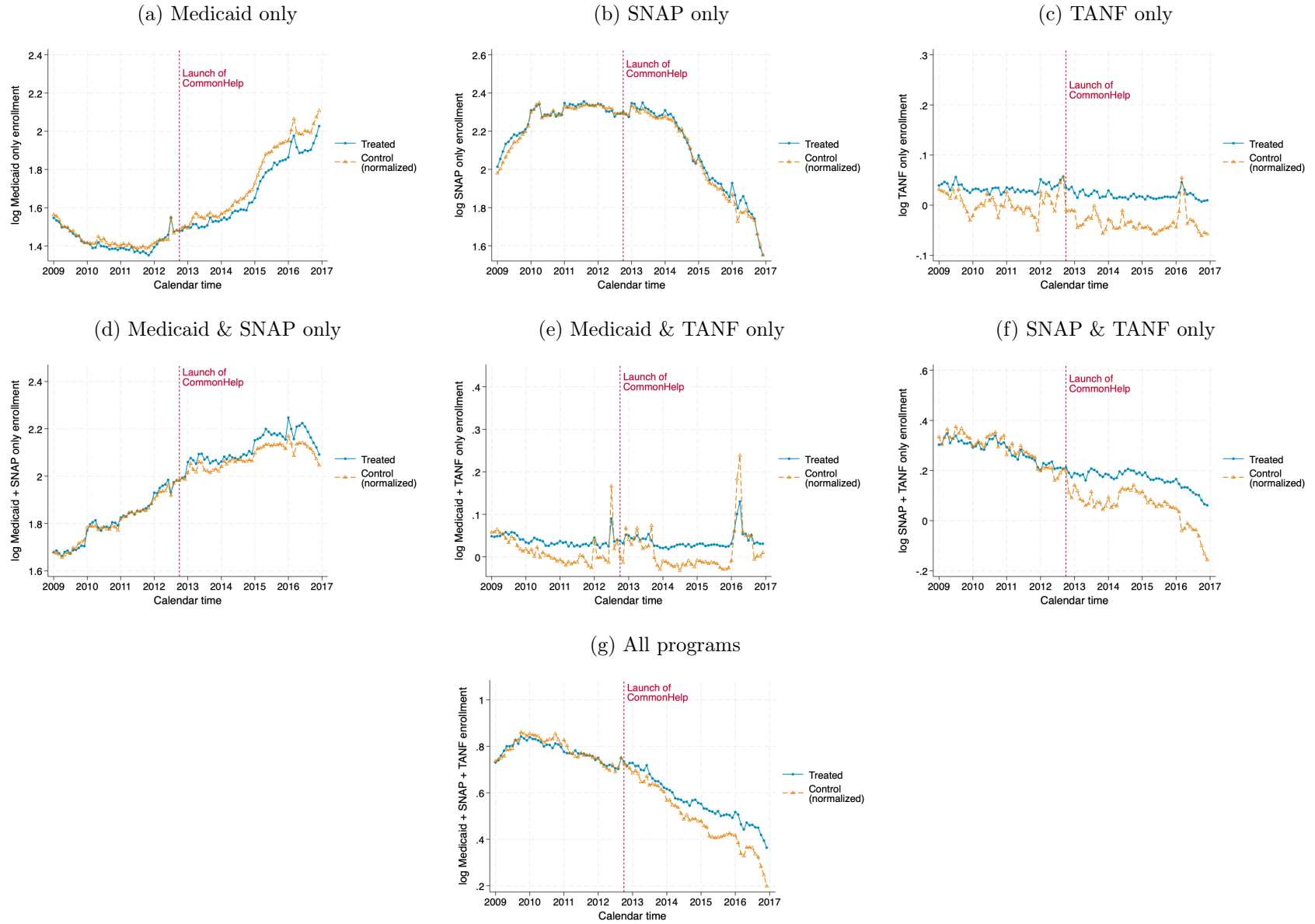
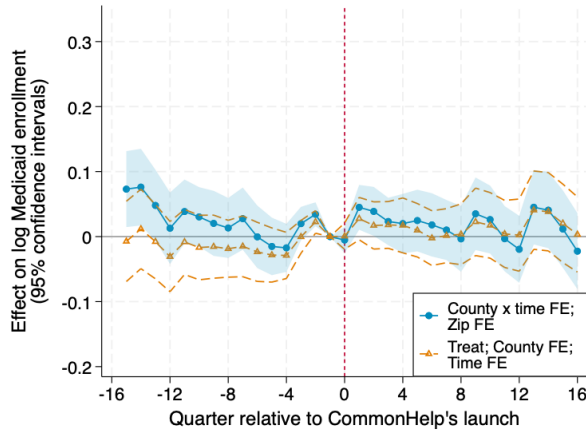
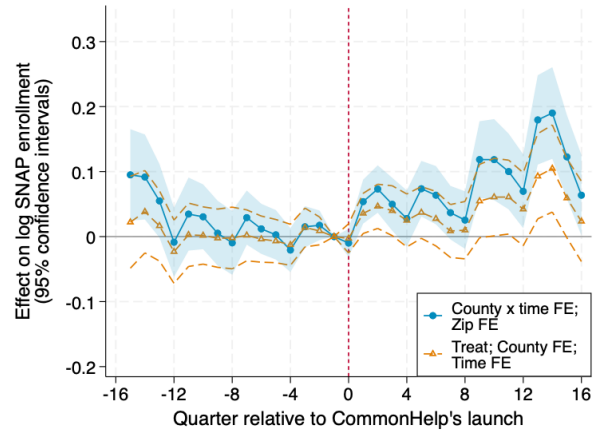


Figure 3: Dynamic effects on enrollment in programs

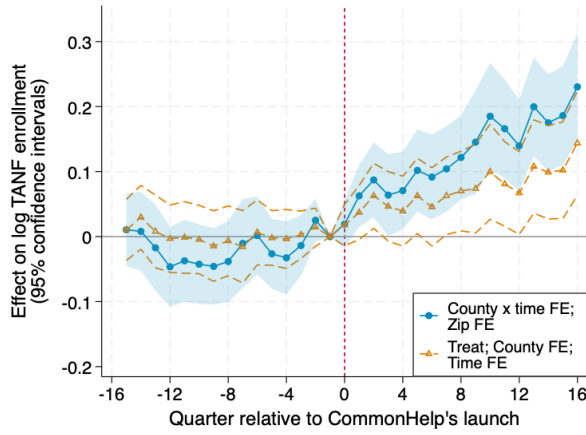
(a) Medicaid



(b) SNAP



(c) TANF



(d) Any program

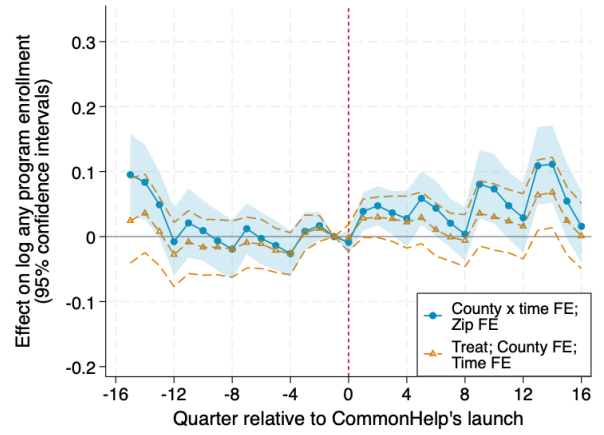


Figure 4: Dynamic effects on enrollment in single and multiple programs

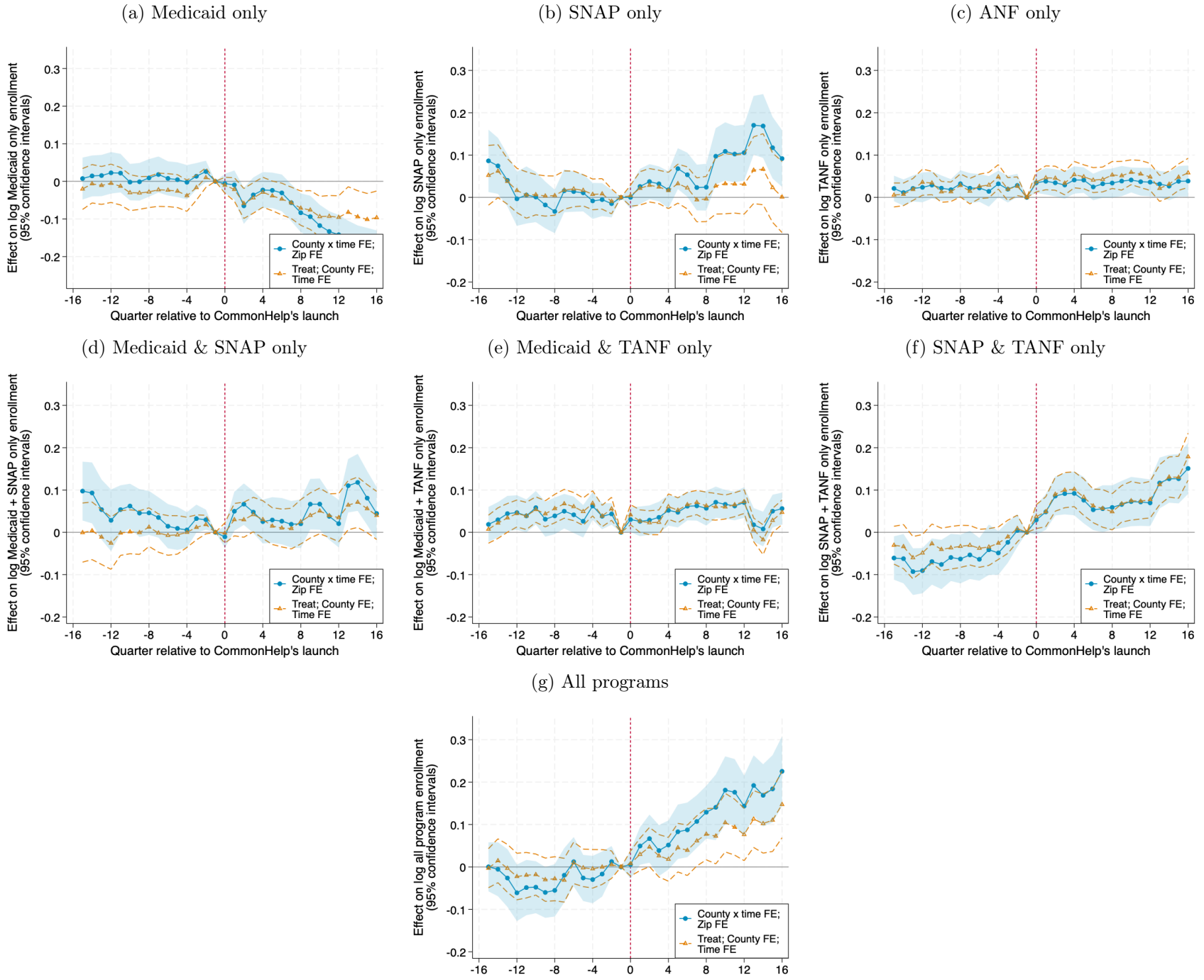


Table 1: DD estimates on bundles of programs, by treatment specification

Treatment type	Any	Individual programs			Multiple programs			
		Medicaid	SNAP	TANF	Medicaid & SNAP	Medicaid & TANF	SNAP & TANF	All
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
Global, 50th perc.	0.0319* (0.0180)	−0.0073 (0.0173)	0.0565*** (0.0200)	0.1442*** (0.0222)	0.0242 (0.0184)	0.1432*** (0.0217)	0.1457*** (0.0224)	0.1441*** (0.0220)
Local, 50th perc.	0.0289* (0.0159)	−0.0132 (0.0174)	0.0551*** (0.0153)	0.1440*** (0.0238)	0.0154 (0.0168)	0.1392*** (0.0238)	0.1477*** (0.0241)	0.1413*** (0.0241)
No LDSS office	0.0002 (0.0167)	−0.0777*** (0.0247)	0.0187 (0.0200)	0.2915*** (0.0390)	−0.0646** (0.0281)	0.2830*** (0.0403)	0.2940*** (0.0394)	0.2881*** (0.0405)
Outcome mean	3.0559	2.7515	2.7785	0.5294	2.3506	0.4648	0.5097	0.4469
No. zip codes	1,170	1,170	1,170	1,170	1,170	1,170	1,170	1,170
No. counties	118	118	118	118	118	118	118	118



Figure 5: Heterogeneous effects in treated zip-LDSS counties' distance to LDSS office:  
Enrollment in programs

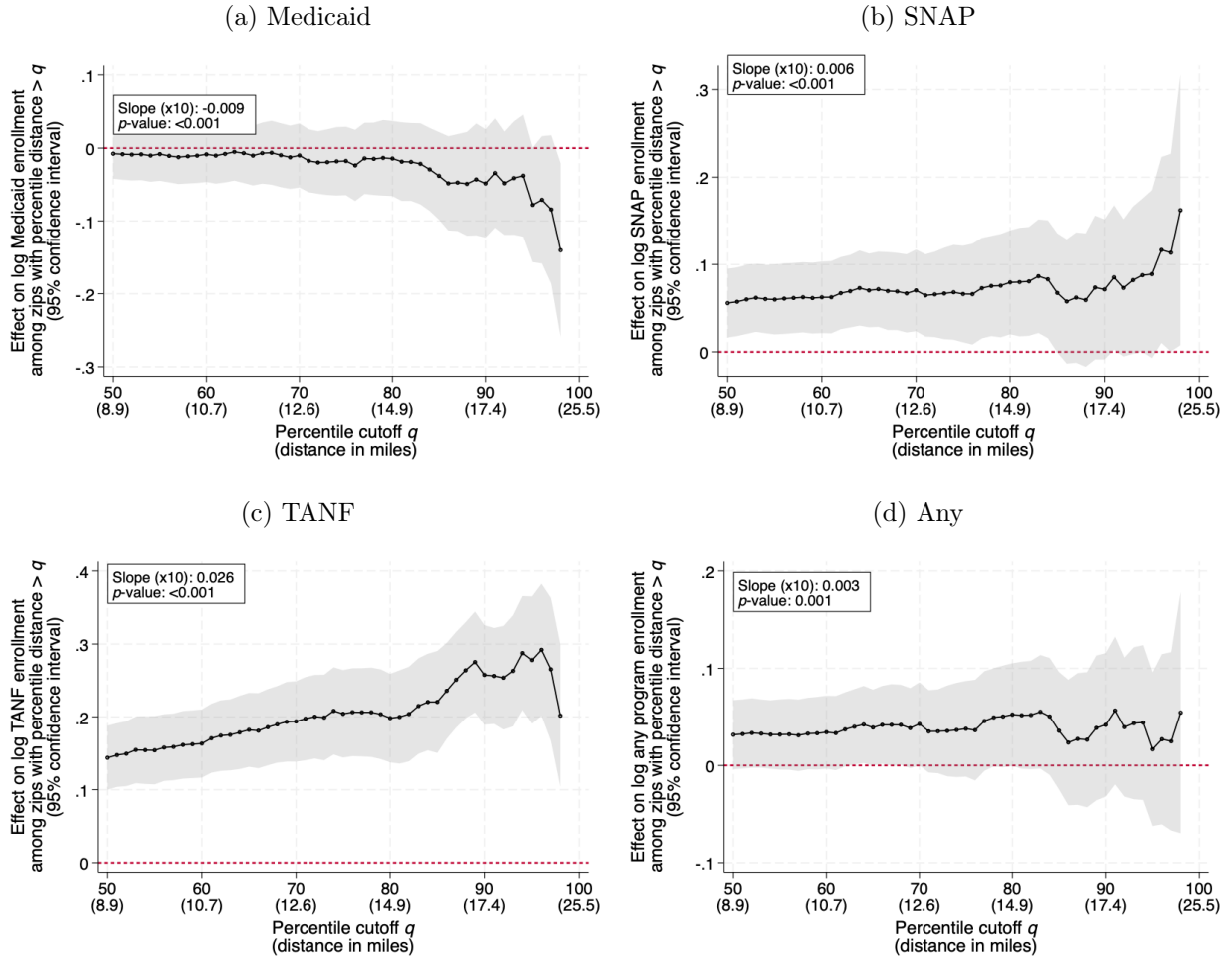


Figure 6: Heterogeneous effects in treated zip-LDSS counties' distance to LDSS office:  
Enrollment in single and multiple programs

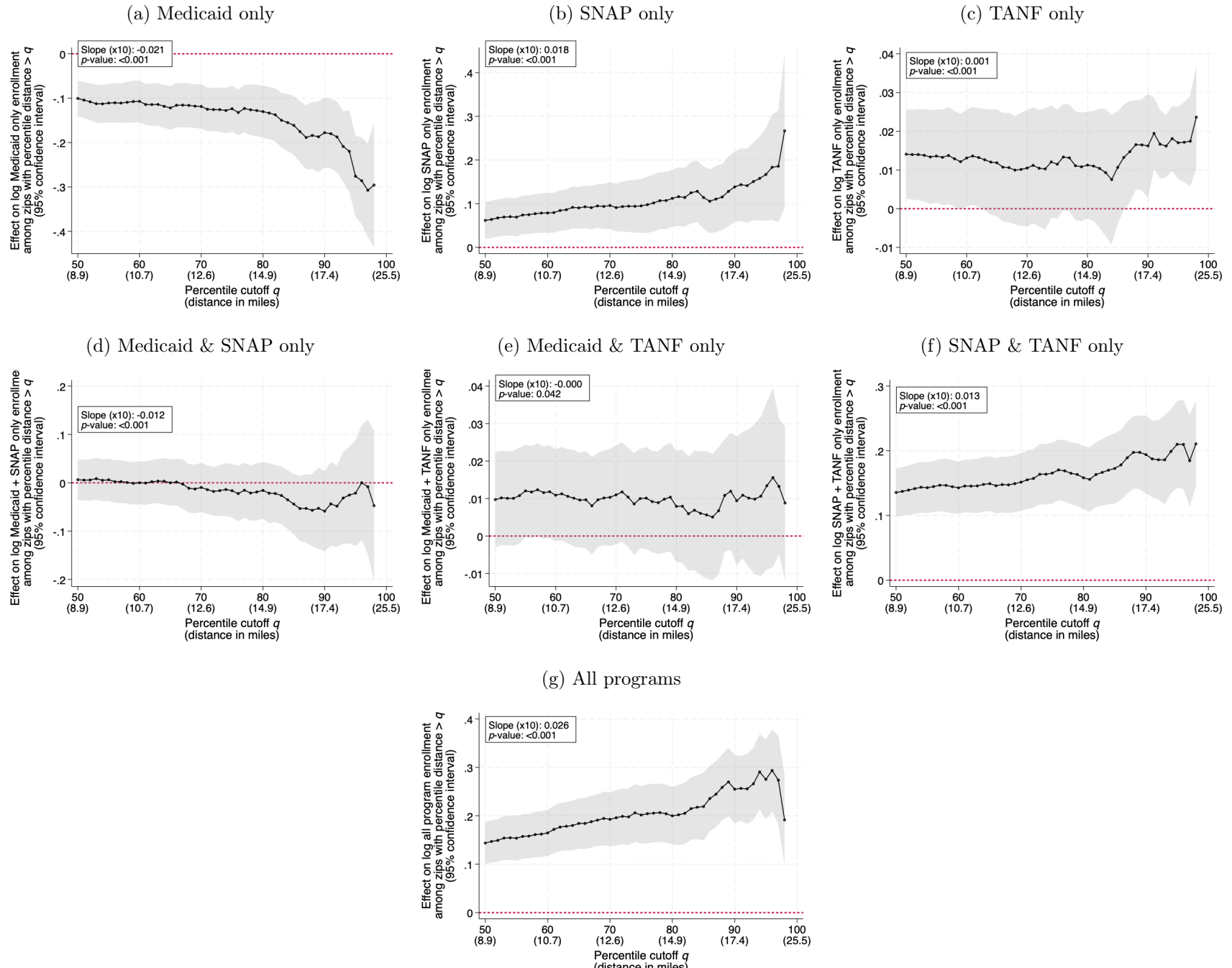


Figure 7: Dynamic effects on program case opened by incorrect LDSS county office

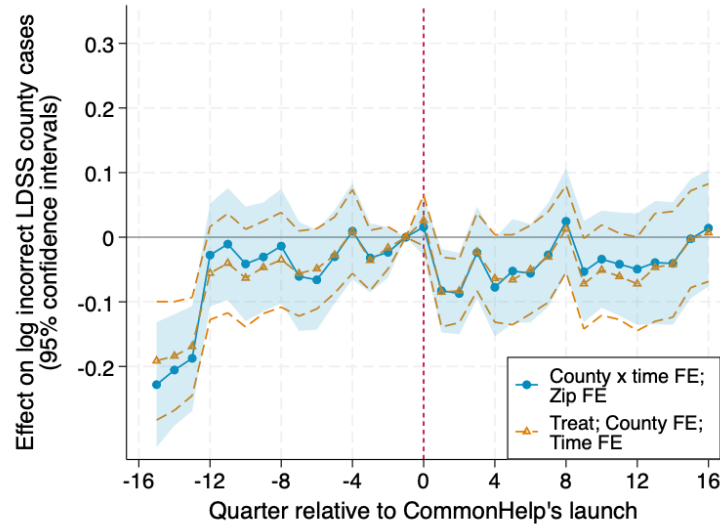


Figure 8: Effects on entrance into and exits out of different combinations of programs

