Online Appendix
Out of the Woodwork: Enrollment Spillovers in the Oregon Health Insurance Experiment

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Appendix A

The spillover effects of adult Medicaid enrollment through the Oregon lottery on children's Medicaid enrollment have been previously analyzed by DeVoe et al. (2015a). However, the way in which children were matched to parents raised potential concerns about inference.

The data construction used by DeVoe et al. is described in more detail in Angier et. al. (2014). Adults on the lottery list were matched to their children using data on adult and child Medicaid enrollment as well as data on adult and child use of the OCHIN community health center network. Adults were linked to their children if both the adult and the child enrolled in Medicaid (the Medicaid enrollment data includes a household ID) and/or if both used a community health center in the network (the health center data includes an adult guarantor or emergency contact for children; to make the linkage, the child and adult must both receive care at the network). Having assembled an analysis cohort of children of lottery list members, the researchers then tracked their Medicaid enrollment during the Oregon study period, comparing children's enrollment for households in which the adults won the lottery to households in which they did not.

Importantly, these adult-child linkages used data not only from before the lottery (2002-2007), but also from after the lottery (2008-2010). That creates challenges for identifying the impact of winning the lottery on children's enrollment because adult Medicaid enrollment and adult community health center use were significantly higher among lottery winners (DeVoe et al., 2015b; Finkelstein et al., 2012). As a result, we expect that it is easier to match lottery winner adults to their children than lottery loser adults, creating the potential for selection into the analysis cohort of children based on whether the child's parent won the lottery.

The sign (and, in turn, the magnitude) of the resulting bias in the estimate of the woodwork effect is *a priori* uncertain. To see this issue, consider the null hypothesis that there is no woodwork effect. In the community health center network data, winning the lottery increases the chance that parents use the community health center network (DeVoe et al., 2015b), and thus the chance that they are matched to their children. This higher probability of matching lottery winner adults to their children could create bias in either direction depending on the enrollment rate of the children who are selected into the cohort as a result of the lottery. The sign of the bias would depend on whether these children were more or less likely to be enrolled in Medicaid than children matched to control group parents who use the community health center network.

A similar issue arises in matches derived from the Medicaid enrollment data. Since the lottery increases Medicaid enrollment among adults, a set of children are selected into the cohort due to their parents' winning lottery. As with the community health center matches, the presence of these children could bias effects in either direction depending on whether the children were more or less likely to be enrolled in Medicaid than children matched to parents in the control group. These scenarios show that we do not expect balance in the composition of children matched to treatment households vs. children matched to control households, and so composition bias due to differential selection into the sample is the root cause of the concern.

In practice, we tend to estimate smaller woodwork effects and faster fade-out than DeVoe et al. This finding is consistent with the concerns about upward bias, although the estimates are similar enough that the differences could also reflect sampling variation. Since DeVoe et al.'s analyses are at the level of the child while our analyses are at the level of the household, absolute treatment effect estimates are not directly comparable between the studies. Instead, we compare percent effects by dividing absolute effects by the control arm mean. Calculated using this method, DeVoe et al. report woodwork effects in percent terms of 6.3%, 4.2%, and 2.4% at 1-6, 7-12, and 13-18 months, respectively, the first two of which are statistically significant. Our effects transformed to percent terms are 5.3%, 2.1%, and 1.7% at 3 months, 9 months, and 1 year, respectively, and only the first of these estimates is statistically significant.

Appendix B

In this appendix we describe in greater detail our processing of the Oregon reservation list data and the Medicaid enrollment data, including our approach to geocoding addresses in both files.

B.1. Processing addresses

Processing address data was performed on a secure, non-networked computer. We use ArcGIS software to convert text addresses to latitude-longitude pairs, a process called geocoding. Initially, we extracted all addresses from the reservation list as well as all addresses from the location spell records in the 2008, 2009, and 2010 Medicaid enrollment data. In the extremely rare case that a member had two overlapping address spells, we truncate the earlier address spell to end on the day before the later spell begins.

Before the data was run through ArcGIS, we took several steps to pre-process it. For addresses in both datasets, we drop addresses that are not in Oregon, since the lottery requires eligible participants to have an Oregon address. We also remove addresses that could clearly not be geocoded: P.O. Boxes, addresses with all text and no number (e.g. "In Care Of John Smith"), addresses that are entirely numbers (e.g. "315"), and addresses with no street number or street identifier (e.g. no "St", "Rd", etc.; examples include "PMB 15", "SUITE 6A"). This pass to exclude non-geocodable addresses removed 12.11% of unique addresses in the reservation list and 8.57% of unique addresses in the Medicaid enrollment file.

Many reservation list members and Medicaid beneficiaries live at addresses with many units, and the reservation list and Medicaid enrollment file both allow individuals to specify a second address line to indicate the apartment, room, floor, or other detail about their unit (e.g. "Apt 3A"). However, ArcGIS does not extract this information. Given the importance of accurately linking reservation list households in buildings with multiple units, we extracted the second address line from both the reservation list and the Medicaid enrollment data and used it later in merging.

We parse the second address line using a series of regular expressions. Conceptually, we divide the second address line into two components: a designator (e.g. "Apt") and level (e.g. "3A"); when we later merge between the reservation list and the enrollment file, we use only the level and ignore the designator. We standardize the level by removing the number prefix (e.g. "NO" from "NO 3"), any symbols (e.g. "#" from "#3A"), and any spaces within (e.g. "3 A" becomes "3A"). Among unique addresses in each dataset, we are able to identify and parse out a second address line for 25.7% of the reservation list addresses and 33.3% of the enrollment file addresses.

B.2. Geocoding addresses

After pre-processing the addresses, we next loaded them into ArcGIS running on the same secure, non-networked computer. For each address, ArcGIS attempts to identify its location and, if successful, produces a latitude-longitude pair. We use ArcGIS to take advantage of its powerful geocoding engine, which includes algorithms to resolve addresses written with abbreviations, different positions of address components (e.g. "3 Broadway NE" vs. "3 NE Broadway"), different names for address elements (e.g. "3 Main Ave" vs. "3 Main St"), and slight spelling errors. This flexibility is crucial for linking the reservation list to the Medicaid enrollment file because individuals might write the same address differently when joining the reservation list and enrolling in Medicaid.

For each address text imported to ArcGIS, ArcGIS looks for candidate addresses – addresses with the same or similar text as the input address – in its address locator database. For this work, we used the Street_Address_US address locator, a database of all US street addresses as well as their coordinates, to geocode (we note that this address locator will only geocode addresses with a house number).

For each candidate address, ArcGIS assigns a score based on the similarity between the input address and candidate address. The scores range from 0 to 100, with 100 being a perfect match. If no candidate address is found, or all candidate addresses have scores below the minimum threshold score, ArcGIS returns the status “unmatched”. Otherwise, ArcGIS will return the status “matched” along with the latitude-longitude coordinates and standardized address text of the candidate address with the highest match score.

The minimum match score, a user-adjustable parameter in ArcGIS, is the minimum score the best candidate address has to have in order for ArcGIS to return that address. We set the score to 85, the default score in ArcGIS (between 0 and 100). Lowering the minimum match score will result in more geocoded addresses, but the marginal geocoded address is expected to be mis-measured with greater probability. We found little documentation from ArcGIS on how the score measures match quality and thus opted to use the default threshold. We also note another user-set parameter for matching: the spelling sensitivity, which can be set from 0 and 100, with higher values requiring the spelling of the input address and the candidate address to match more closely. Again we found little documentation on the underlying spelling match algorithm, other than a note that reducing the sensitivity would yield more matches. Thus we again opted to use the default score, which was 80.

Besides “matched” and “unmatched”, ArcGIS returns the status “tied” if it finds multiple candidate addresses with the top match score (and this score is higher than the minimum match score threshold). Ties occur for fewer than 1 percent of addresses on the reservation list. We spot checked the ties and noted two reasons they occurred. First, the address locator can have more than one latitude-longitude pair for one address. In the spot check, this reason for a tie was quite rare, although we did observe it occurring. Second, if the input address is missing certain information (e.g. “2345 Orchard” without specifying “Street” or “Road”), it could match to “Orchard Street” and “Orchard Road”, with both having the same score and clearing the minimum threshold. For both of the two reasons, it was not possible to clearly identify the proper geocoded address even with manual inspection of addresses with ties. In turn, we treat tied addresses as unmatched in the study.

Ultimately, we remove all unmatched addresses, limiting the sample to addresses that could be successfully geocoded to one clear address with a sufficiently high match score.

B.3. Measuring enrollment

We now describe how we process Medicaid enrollment spell records to measure adult and child enrollment for reservation list households. We use enrollment spell records for Oregon Medicaid calendar years 2008, 2009, and 2010 (these records also include CHIP enrollment). The spell-level data include, for each spell, the begin and end date, the enrollee's name, Medicaid ID, date of birth, sex, and the Program Eligibility Resource Code (PERC).

The PERC field indicates the eligibility category of each enrollee. This field allows us to distinguish between OHP Standard, OHP Plus, and CHIP enrollment. For our analysis sample, we include enrollment spells for all Medicaid eligibility categories and CHIP categories. We exclude only the small fraction of spells indicating eligibility for secondary coverage for Medicare beneficiaries; this coverage is not well measured in our data and is also not the focus of this study.

B.4. Validity checks on address-based enrollment measures

After we used the geocoded addresses to link the reservation list and the Medicaid enrollment data, we sought to cross-validate our approach. As noted in the main text, the Medicaid enrollment data contains children and adults, and so in addition to observing children enrolled at each reservation list household, we also track enrollment of adults who were listed on the reservation list. To do so, we link the reservation list adults to their Medicaid enrollment spells using geocoded address (as described), birth date, and sex. Then, we bring in alternative data on enrollment to validate the geocoding approach.

In Finkelstein et al. (2012), the authors obtained Medicaid enrollment data for reservation list individuals from the state of Oregon produced by the state Division of Medical Assistance Programs (DMAP). These enrollment records provide a potential "gold standard" for assessing the validity of our match on address. We compare the Medicaid enrollment status of reservation list adults under our address-based match to their enrollment status under the DMAP match.

The two data sources largely agree. Among 52,873 reservation list household heads in the analysis sample (see main text), in December 2008, 92.0% had the same enrollment status in both datasets (11.5% were enrolled in both, and 80.5% were not enrolled in both). Treating the DMAP data as the gold standard, we also note a meaningful rate of apparent false negatives, consistent with failed address matches: 7.2% were enrolled in Medicaid in the DMAP data but not in our data. We also note some apparent "false positives" where the address-based match detected enrollment but the DMAP match did not – 0.8% among all household heads in the analysis sample. These findings are as expected given the inaccuracy that inevitably occurs when matching across administrative data from address text that must be geocoded. It is also possible that the DMAP match could mis-measure enrollment, i.e. what we call false positives may be properly measured enrollment. Regardless, the ability to observe a high quality measure of enrollment for reservation list adults informs our measurement error correction for children's enrollment (see Section IIIC in the main text).

Appendix Figures

OHP Standard reservation list request

You can give us your reservation request in any of the following ways:

- **Electronically –** Use the link on www.oregon.gov/DHS/open to give us your information.
- **Mail –** Mail this form to OHP Standard, PO Box 14520, Salem, OR 97309-5044.
- **Fax –** Fax this form to: 503-373-7866 or 503-378-6295.
- **In person –** Drop this form off at any DHS field office (call 800-699-9075 for locations).
- **Phone –** Call 800-699-9075 or 503-378-7800 (TTY), Mon-Fri, 7a.m. - 7p.m. PST. The call will take 10-20 minutes.

1 Your name (Last, First, M.I.) Maiden or other names used

Phone Number ( ) Message Number ( )

Home Address City State ZIP

Mailing Address (if different) City State ZIP

2 List anyone 19 or older in your household you want to add to the reservation list.

Name (Last, First, M.I.)	Relation to you	Gender	Date of Birth	*(voluntary)* * Social Security Number
	Self	☐ M ☐ F		
		☐ M ☐ F		

*Providing a Social Security Number (SSN) is voluntary for the OHP Standard Reservation List request. DHS is allowed to ask for SSNs by OAR 461-135-1125(5) to help identify people to prevent duplicate reservations. DHS will not deny a request to be placed on the OHP Standard Reservation List if you do not provide an SSN.

3 If you need materials in a language other than English, check the appropriate box.

☐ Spanish ☐ Russian ☐ Vietnamese ☐ Other: ______________________

4 If you want written materials in a different format, check the box that applies:

☐ Braille – information is printed in Braille.
☐ Audio tape – information is recorded on an audiocassette tape.
☐ Large print – materials are printed in this size.
☐ Computer disk – information is saved as “plain text” on a 3.5-inch floppy disk.
☐ Spoken – information is read by a DHS employee in person or over the telephone.

I understand that this request is not an application for medical assistance.

Signature Date

OHP 3203 (10/25/07)

Appendix Figure A1 – Excerpt of Reservation List Request Form

Date of Request	Date Received by Branch	Program	Branch	Case Number	Worker ID
		Case Name			Route to:
		Prime Number		SSN	App Status
		Office use only			

Oregon Health Plan Application (OHP 7210)

If you need help filling this out, call 800-699-9075 or TTY 800-735-2900

DHS Oregon Department of Human Services

(1) Name (Last, First, M.I.) Maiden or other names used

Telephone number ( ) Message number ( )

Home address – proof required, see **YELLOW** sheet City State ZIP

Mailing address (if different) City State ZIP

(2) List yourself and everyone living with you. To list more than four people, use the OHP 7226 form, found in the **PINK** packet.

Social Security numbers (SSNs)* – If you don't have an SSN, write in "none."

Ethnicity/Racial Heritage – Write in all the codes that apply. Title VI of the Civil Rights Act of 1964 allows us to ask for this information. You can choose not to give this information. It will not affect your eligibility for benefits.

Ethnicity

- **H** – Hispanic or Latino
- **N** – Not Hispanic or Latino

Racial Heritage

- **A** – Asian
- **B** – Black or African American
- **I** – American Indian/Alaska Native
- **P** – Native Hawaiian or Other Pacific Islander
- **W** – White

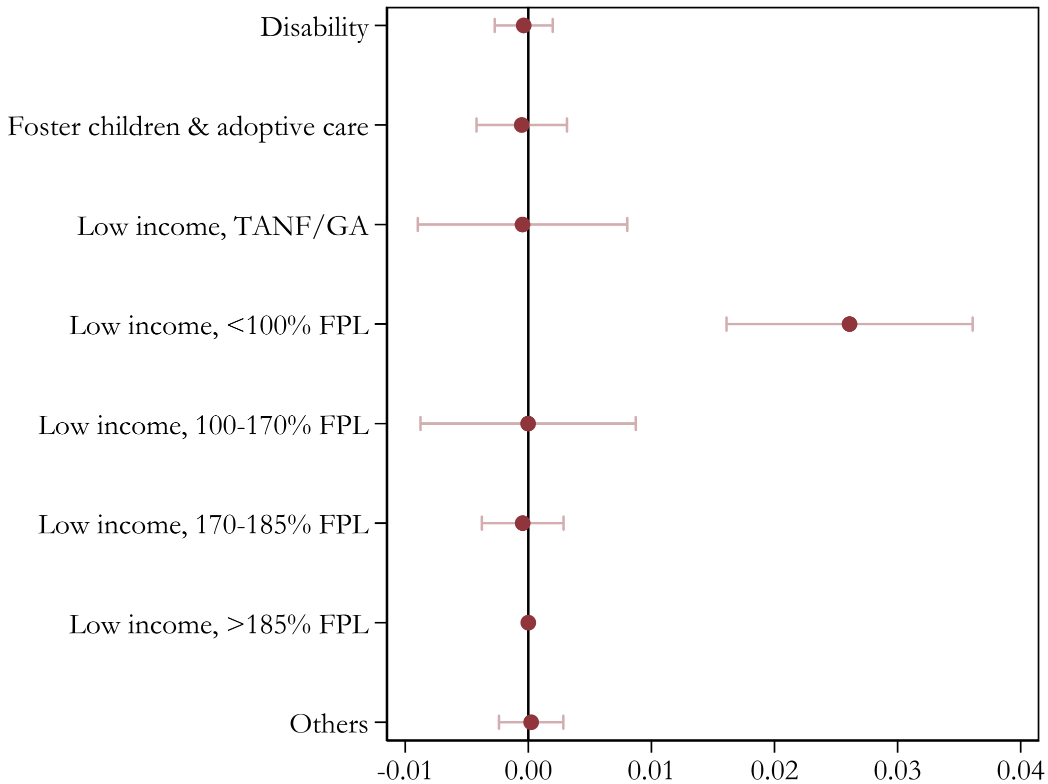
Name (Last, First, M.I.)	Relation to you	Sex	Date and city/state of birth	Applying for benefits	* Social Security Number	* U.S citizen? Proof required, see **YELLOW** sheet	Ethnicity / Racial Heritage
a.	**Self**	☐ M ☐ F		☐ Yes ☐ No		☐ Yes ☐ No, non-citizen# ________	
b.		☐ M ☐ F		☐ Yes ☐ No		☐ Yes ☐ No, non-citizen# ________	
c.		☐ M ☐ F		☐ Yes ☐ No		☐ Yes ☐ No, non-citizen# ________	
d.		☐ M ☐ F		☐ Yes ☐ No		☐ Yes ☐ No, non-citizen# ________	

*** Only required for people who are applying for benefits.**

OHP 7210 (Rev 04/08)

Appendix Figure A2 – Excerpt of Oregon Health Plan Application Form

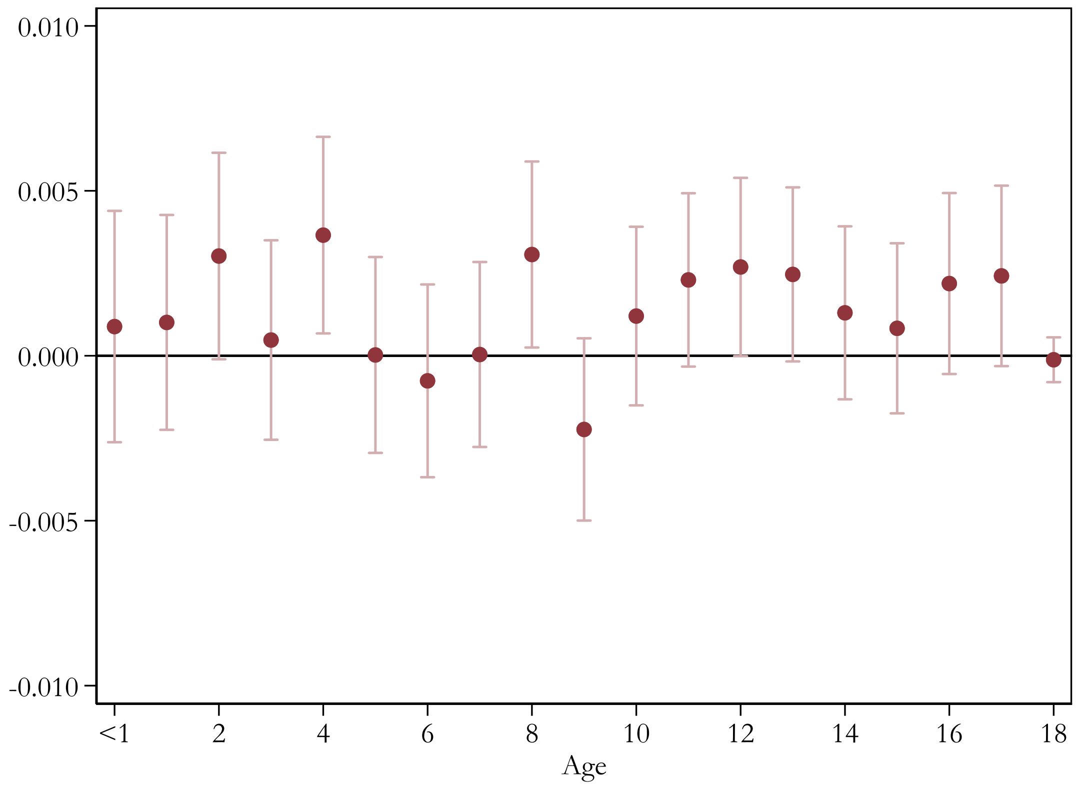
Effect of Winning the Lottery on Number of Children Enrolled, by Child Eligibility Category Grouping



Notes: This figure presents estimates of the effect of a household winning the lottery on the number of children enrolled in each grouping of Medicaid eligibility categories. Specifically, it plots estimates of β_1^k (the coefficient on an indicator for the household winning the lottery) from equation (1) with the outcome redefined as y_h^k (the number of children enrolled at the household in eligibility category grouping k). Enrollment and eligibility category are measured at 90 days after the date of adult eligibility. All regressions also control for household size indicators, lottery draw indicators, and the measures of baseline Medicaid enrollment. The error bars indicate the 95% confidence interval for the effect estimates, based on robust standard errors.
TANF/GA: Temporary Assistance for Needy Families/General Assistance
FPL: Federal Poverty Line

Appendix Figure A3

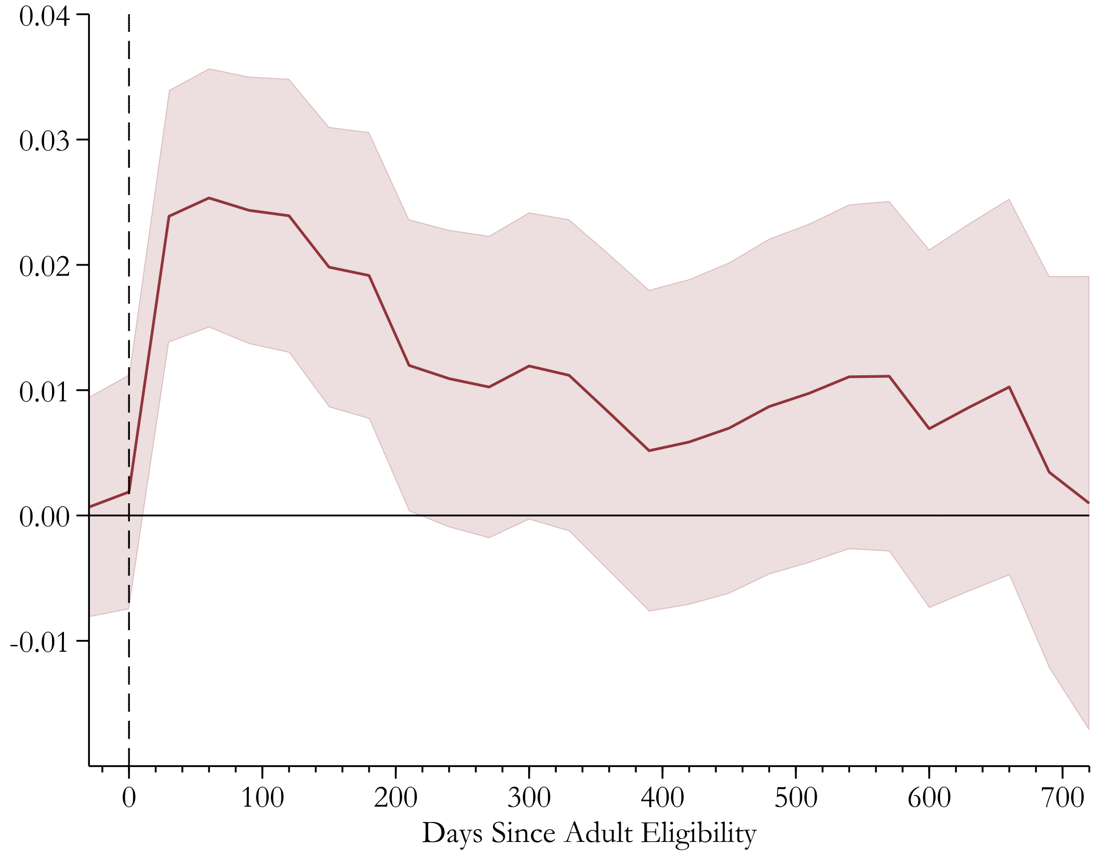
Effect of Winning the Lottery on Number of Children Enrolled, by Child Age



Notes: This figure presents estimates of the effect of a household winning the lottery on the number of children enrolled in Medicaid of each age in years from <1 to 18. Specifically, it plots estimates of β_1^k (the coefficient on an indicator for the household winning the lottery) from equation (1) with the outcome redefined as y_h^k (the number of children enrolled at the household of age k). Enrollment and age are measured at 90 days after the date of adult eligibility. All regressions also control for household size indicators, lottery draw indicators, and the measures of baseline Medicaid enrollment. The error bars indicate the 95% confidence interval for the effect estimates, based on robust standard errors.

Appendix Figure A4

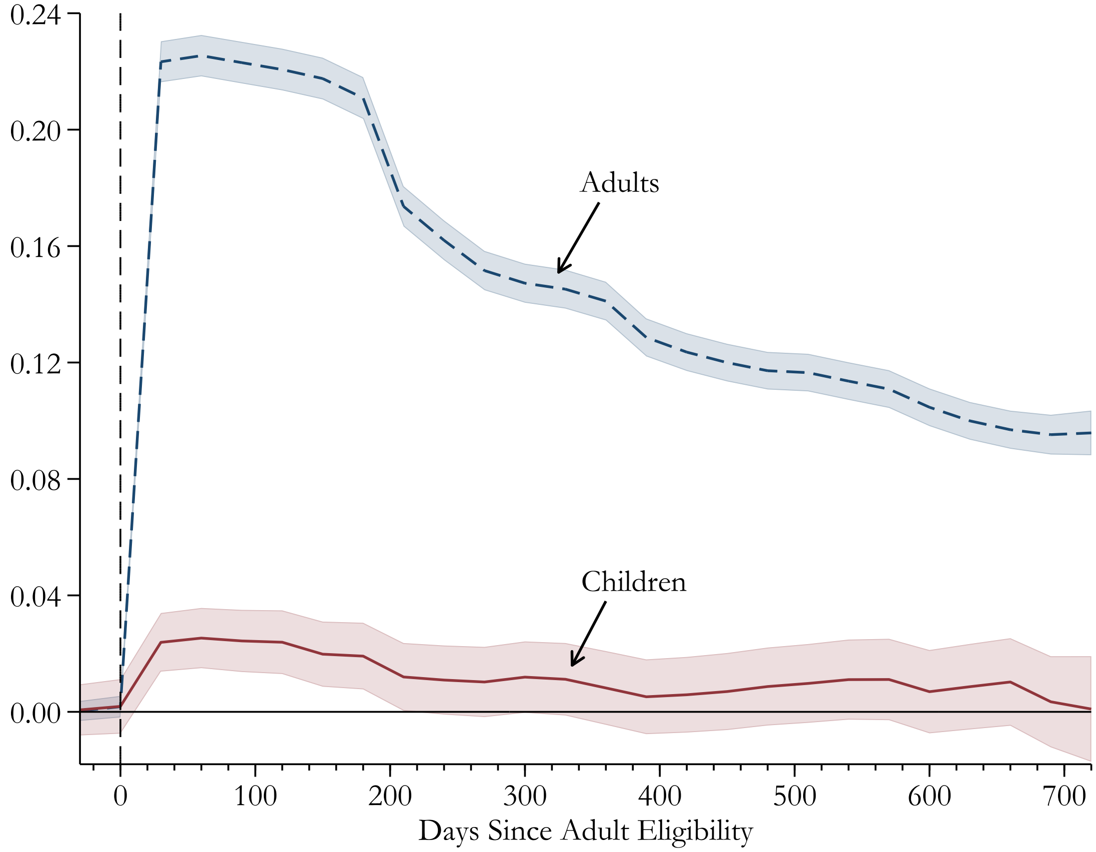
Effect of Winning the Lottery on Number of Children Enrolled, up to 720 days



Notes: This figure presents estimates of the effect of a household winning the lottery on the number of children in the household enrolled in Medicaid. Specifically, it plots estimates of β_1 (the coefficient on an indicator for the household winning the lottery) from equation (1); the outcome variables are the number of children enrolled at different 30-day durations (from -30 to 720) relative to the adult eligibility date. For estimates beyond one year, we use a reweighting approach (described in more detail in Finkelstein et al., 2016) to adjust for a new lottery for OHP Standard which the state conducted beginning in the fall of 2009. All regressions also control for household size indicators, lottery draw indicators, and the measures of baseline Medicaid enrollment. The shaded area indicates the 95% confidence interval for the effect estimates, based on robust standard errors.

Appendix Figure A5

Effect of Winning the Lottery on Number of Adults and Children Enrolled, up to 720 days



Notes: This figure presents estimates of the effect of a household winning the lottery on the number of reservation list adults (blue dashed line) or children (maroon solid line) enrolled in Medicaid. Specifically, it plots estimates of β_1 (the coefficient on an indicator for the household winning the lottery) from equation (1); the outcome variables are the number of children enrolled at different 30-day durations (from -30 to 720) relative to the date of adult eligibility. For estimates beyond one year, we use a reweighting approach (described in more detail in Finkelstein et al., 2016) to adjust for a new lottery for OHP Standard which the state conducted beginning in the fall of 2009. All regressions also control for household size indicators, lottery draw indicators, and the measures of baseline Medicaid enrollment. The shaded areas indicate the 95% confidence interval for the effect estimates, based on robust standard errors.

Appendix Figure A6

Appendix Tables

Table A1. Variable by Variable Balance

Sample and Level	(1) Analysis Sample Household Level		(2) Finkelstein et al. (2012) Household Level		(3) Finkelstein et al. (2012) Individual Level	
Variable	Control Mean (SD)	Treatment - Control Diff	Control Mean (SD)	Treatment - Control Diff	Control Mean (SD)	Treatment - Control Diff
A. Lottery list variables						
Year of birth	1968.4	0.132	1968.0	0.162	1968.0	0.162
	(12.329)	(0.112)	(12.342)	(0.100)	(12.255)	(0.100)
Female	0.577	-0.011	0.573	-0.008	0.557	-0.007
	(0.494)	(0.004)	(0.495)	(0.004)	(0.497)	(0.003)
English as preferred language	0.927	0.001	0.932	0.002	0.922	0.002
	(0.260)	(0.002)	(0.252)	(0.002)	(0.268)	(0.003)
Signed up self	1	0	1	0	0.918	0.000
	(0)	(0)	(0)	(0)	(0.274)	(0.000)
Signed up first day of lottery	0.093	0.001	0.092	0.001	0.093	0.001
	(0.290)	(0.003)	(0.289)	(0.002)	(0.290)	(0.002)
Gave phone number	0.863	-0.005	0.858	-0.003	0.862	-0.003
	(0.344)	(0.003)	(0.349)	(0.003)	(0.345)	(0.003)
Address a PO Box	0	0	0.116	0.001	0.117	0.000
	(0)	(0)	(0.321)	(0.003)	(0.321)	(0.003)
In MSA	0.821	-0.002	0.777	-0.003	0.773	-0.002
	(0.384)	(0.004)	(0.417)	(0.003)	(0.419)	(0.004)
Zip code median household income	39774.1	8.825	39256.0	48.373	39265.4	44.891
	(8436.936)	(77.785)	(8472.162)	(70.155)	(8463.542)	(72.887)
B. Pre-randomization hospital utilization						
Any hospital admission	0.037	0.000	0.038	-0.001	0.035	-0.001
	(0.189)	(0.002)	(0.192)	(0.002)	(0.184)	(0.001)
Any hospital admission (not thru ED)	0.014	0.000	0.015	-0.001	0.014	0.000
	(0.118)	(0.001)	(0.121)	(0.001)	(0.117)	(0.001)
Any hospital admission (thru ED)	0.027	0.000	0.027	-0.001	0.025	-0.001
	(0.161)	(0.002)	(0.162)	(0.001)	(0.156)	(0.001)
Hospital days	0.244	-0.008	0.245	-0.006	0.225	-0.005
	(2.227)	(0.021)	(2.185)	(0.019)	(2.095)	(0.017)
Hospital procedures	0.069	0.000	0.072	-0.002	0.066	-0.002
	(0.605)	(0.006)	(0.664)	(0.005)	(0.636)	(0.005)
Hospital charges	1150.820	-23.965	1169.554	-20.597	1075.539	-19.722
	(11508.577)	(113.548)	(11384.938)	(101.309)	(10915.704)	(88.912)
Hospital days (not thru ED)	0.088	0.014	0.090	0.007	0.083	0.006
	(1.315)	(0.015)	(1.292)	(0.013)	(1.238)	(0.011)
Hospital procedures (not thru ED)	0.030	0.003	0.031	0.002	0.029	0.002
	(0.370)	(0.004)	(0.388)	(0.003)	(0.371)	(0.003)
Hospital charges (not thru ED)	451.770	67.207	464.310	38.183	426.628	33.968
	(8737.394)	(93.584)	(8356.679)	(77.992)	(8006.786)	(68.440)
Hospital days (thru ED)	0.156	-0.022	0.155	-0.012	0.142	-0.011
	(1.602)	(0.013)	(1.581)	(0.013)	(1.516)	(0.011)
Hospital procedures (thru ED)	0.039	-0.003	0.041	-0.004	0.037	-0.004
	(0.452)	(0.004)	(0.502)	(0.004)	(0.481)	(0.003)
Hospital charges (thru ED)	699.049	-91.172	705.244	-58.780	648.910	-53.690
	(6973.385)	(59.395)	(7188.949)	(60.525)	(6894.160)	(53.114)
C. Baseline enrollment variables						
Number children enrolled	0.416	0.007				
	(0.927)	(0.009)				
Any children enrolled	0.218	0.003				
	(0.413)	(0.004)				
Number reservation list adults enrolled	0.027	0.001				
	(0.168)	(0.002)				
Any reservation list adults enrolled	0.026	0.001				
	(0.161)	(0.002)				

Notes: This table presents variable-by-variable balance tests for three samples (across the columns) and three sets of variables (across the rows). Specifically, it reports estimates of β_1 (the coefficient on an indicator for the household winning the lottery) from equation (1). The regressions control for household size indicators but do not control for lottery draw indicators or the measures of baseline Medicaid enrollment, except regressions in Block B, which include lottery draw indicators. Robust standard errors in parentheses.

Column (1) is the analysis sample of this study of 52,873 households; it is the subset of column (2) that was successfully geocoded and did not have an outlier level of pre-randomization child enrollment (see text for details). Column (2) is a household-level version of the analysis sample used in Finkelstein et al. (2012) of 66,210 households (when households have multiple individuals, in Block A we take the lottery list variables of the household head; in Block B we produce the pre-randomization outcome variables by aggregating over the household members). Column (3) is the analysis sample of 74,922 individuals used in Finkelstein et al. (2012).

Block A, which reports the lottery list variables, contains demographics that were provided by participants when they signed up for the lottery or could be derived from this information. Block B, which reports the pre-randomization outcomes, contains measures of hospital utilization from January 1 through the notification date (i.e. pre-randomization) that are derived from a linkage to hospital discharge data. Block C, which reports the baseline enrollment variables, contains the four measures of child and adult enrollment on January 15, 2008 derived from our linkage to Medicaid enrollment data.

Table A2. Treatment - Control Balance, F-tests

Variable Set \ Sample and Level	(1) Analysis Sample Household Level	(2) Finkelstein et al. (2012) Household Level	(3) Finkelstein et al. (2012) Individual Level
A. Lottery list variables			
F-statistic	1.524	1.395	1.286
[p-value]	[0.154]	[0.193]	[0.239]
B. Pre-randomization hospital utilization			
F-statistic	0.766	0.505	0.543
[p-value]	[0.648]	[0.872]	[0.844]
C. Baseline enrollment variables			
F-statistic	0.264		
[p-value]	[0.901]		
D. All of the above			
F-statistic	0.950	0.922	0.915
[p-value]	[0.522]	[0.547]	[0.560]

Notes: This table presents omnibus balance tests for three samples (across the columns) and four sets of variables (across the rows). For a set of variables, we regress each component variable on an indicator for household lottery win as well as household size indicators. Regressions in Block B also control for lottery draw indicators. We use robust standard errors and cluster at the household level in all individual-level regressions. We report the F-statistic and p-value from the joint test that all lottery win effect estimates were zero.

Column (1) is the analysis sample of this study of 52,873 households; it is the subset of column (2) that was successfully geocoded and did not have an outlier level of pre-randomization child enrollment (see text for details). Column (2) is a household-level version of the analysis sample used in Finkelstein et al. (2012) of 66,210 households (when households have multiple individuals, in Block A we take the lottery list variables of the household head; in Block B we produce the pre-randomization outcome variables by aggregating over the household members). Column (3) is the analysis sample of 74,922 individuals used in Finkelstein et al. (2012).

Block A, which reports the lottery list variables, contains demographics that were provided by participants when they signed up for the lottery or could be derived from this information. Block B, which reports the pre-randomization outcomes, contains measures of hospital utilization from January 1 through the notification date (i.e. pre-randomization) that are derived from a linkage to hospital discharge data. Block C, which reports the baseline enrollment variables, contains the four measures of child and adult enrollment on January 15, 2008 derived from our linkage to Medicaid enrollment data. Block D tests all of the variables in the above blocks, with baseline enrollment variables only included for column (3). The component variables are presented in Appendix Table A1.

Table A3. Effects on Enrollment Corrected for Attenuation Bias

	(1)	(2)	(3)	(4)	(5)
	Treatment Effect for Adults		Correction	Treatment Effect for Children	
	Address Data	DMAP Data	Factor	Address Data	Corrected
Number Enrolled					
30 days after adult eligibility	0.224	0.313	0.715	0.023	0.032
	(0.004)	(0.004)	(0.008)	(0.005)	(0.007)
90 days after adult eligibility	0.223	0.312	0.714	0.024	0.034
	(0.004)	(0.004)	(0.008)	(0.005)	(0.008)
180 days after adult eligibility	0.211	0.295	0.714	0.020	0.028
	(0.004)	(0.004)	(0.009)	(0.006)	(0.008)
270 days after adult eligibility	0.152	0.211	0.718	0.010	0.014
	(0.003)	(0.004)	(0.012)	(0.006)	(0.009)
365 days after adult eligibility	0.141	0.192	0.733	0.008	0.011
	(0.003)	(0.004)	(0.013)	(0.007)	(0.009)
Member-Months					
90 days after adult eligibility	0.667	0.934	0.714	0.074	0.103
	(0.011)	(0.012)	(0.008)	(0.015)	(0.021)

N=52,873. Notes: This table presents estimates of the effect of the effect of a household winning the lottery on child Medicaid enrollment correcting for potential attenuation bias due to mis-measurement of addresses. Robust standard errors in parentheses.
Columns (1)-(3) show the calculation of the correction factor. In columns (1) and (4) we repeat estimates of the effect of winning the lottery on adult enrollment and child enrollment, respectively, using the address match (see Table 3). In column (2), we instead calculate the effect on adult enrollment using the "gold standard" measure of adult enrollment provided by the Oregon Division of Medical Assistance Programs (DMAP); this measure is what was used in prior work on the Oregon Health Study. Column (3) reports the ratio of the address-based and DMAP-based treatment effects. Column (5) reports the corrected estimates on child enromment by dividing the estimate in (4) by the correction factor in (3). The estimates in columns (3) and (5) involve nonlinear transformations of coefficients from multiple regressions; for these columns, we use seemingly unrelated regression (SUR) and the delta method to produce robust standard errors. Number enrolled is the count of members enrolled in Medicaid at the specified number of days after adult eligibility. Member-months is the total months of enrollment at the household during the specified period following adult eligibility.

Table A4. Sensitivity and Robustness of Effect Estimates

Alternative	(1) Baseline specification		(2) Omit baseline enrollment controls		(3) Contemporaneous address approach		(4) Remove outliers down to p95		(5) Don't remove outliers	
Outcome	Control Mean	Treatment Effect	Control Mean	Treatment Effect	Control Mean	Treatment Effect	Control Mean	Treatment Effect	Control Mean	Treatment Effect
Number Enrolled	0.457	0.024	0.457	0.030	0.450	0.027	0.387	0.020	0.500	0.015
		(0.005)		(0.009)		(0.006)		(0.005)		(0.011)
Any Enrolled	0.234	0.013	0.234	0.015	0.231	0.014	0.220	0.012	0.237	0.013
		(0.003)		(0.004)		(0.003)		(0.003)		(0.003)
Member-Months	1.372	0.074	1.372	0.091	1.361	0.079	1.159	0.066	1.508	0.053
		(0.015)		(0.027)		(0.016)		(0.014)		(0.028)
N	52,873		52,873		52,873		51,762		53,147	

Notes: This table presents alternative estimates of the effect of a household winning the lottery on child and reservation list adult Medicaid enrollment outcomes 90 days after the adult eligibility date. Specifically, it reports estimates of β_1 (the coefficient on an indicator for the household winning the lottery) from equation (1); all regressions control for household size indicators and lottery draw indicators. Except for column (2), regressions also control for four measures of baseline enrollment on January 15, 2008. Robust standard errors in parentheses. Column (1) repeats estimates from the baseline specification (see Table 2). Column (2) runs the same analyses omitting the four measures of baseline enrollment from the regression. Column (3) does not fix Medicaid enrollees at their baseline (i.e. first) address on file and instead allows locations to evolve according to subsequent spells. Column (4) omits households above the 95th percentile of pre-randomization child Medicaid enrollment (3 children) rather than the baseline cutoff of the 99th percentile (5 children). Column (5) makes no outlier restriction.
Number enrolled is the count of members enrolled in Medicaid at 90 days after adult eligibility. Any enrolled is an indicator for number enrolled > 0. Member-months is the total months of enrollment at the household during the 90 day period following adult eligibility. See text for more details.

References

DeVoe, J.E., Marino, M., Angier, H., O'Malley, J.P., Crawford, C., Nelson, C., Tillotson, C.J., Bailey, S.R., Gallia, C., Gold, R., 2015a. Effect of Expanding Medicaid for Parents on Children's Health Insurance Coverage: Lessons From the Oregon Experiment. JAMA Pediatr 169, e143145. https://doi.org/10.1001/jamapediatrics.2014.3145

DeVoe, J.E., Marino, M., Gold, R., Hoopes, M.J., Cowburn, S., O'Malley, J.P., Heintzman, J., Gallia, C., McConnell, K.J., Nelson, C.A., Huguet, N., Bailey, S.R., 2015b. Community Health Center Use After Oregon's Randomized Medicaid Experiment. The Annals of Family Medicine 13, 312–320. https://doi.org/10.1370/afm.1812

Finkelstein, A., Taubman, S., Wright, B., Bernstein, M., Gruber, J., Newhouse, J.P., Allen, H., Baicker, K., Oregon Health Study Group, 2012. The Oregon Health Insurance Experiment: Evidence from the First Year*. The Quarterly Journal of Economics 127, 1057–1106. https://doi.org/10.1093/qje/qjs020