

Supplementary Material

Increase in telemental health services on the Medicare Benefits Schedule after the start of the coronavirus pandemic: data from 2019 to 2021

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Supplementary file 1: Descriptive statistics and item numbers

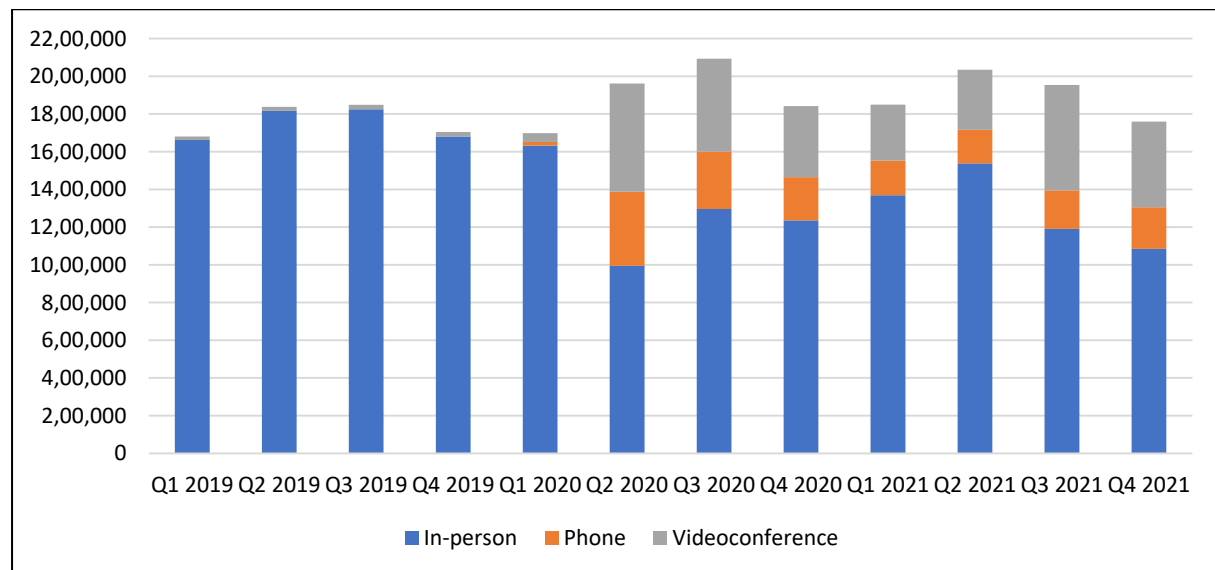


Figure S1. Overall quarterly telehealth use for mental health services Q1 2019 to Q4 2021

Table S1. Item numbers included

Profession	Mode	Code
Psychiatrist	In-person	289
Psychiatrist	In-person	291
Psychiatrist	In-person	293
Psychiatrist	In-person	296
Psychiatrist	In-person	342
Psychiatrist	In-person	344
Psychiatrist	In-person	346
Psychiatrist	In-person	348
Psychiatrist	In-person	350
Psychiatrist	In-person	352
Psychiatrist	In-person	300
Psychiatrist	In-person	302
Psychiatrist	In-person	304
Psychiatrist	In-person	306
Psychiatrist	In-person	308
Psychiatrist	In-person	90260
Psychiatrist	In-person	90266
Psychiatrist	Phone	92474
Psychiatrist	Phone	92475
Psychiatrist	Phone	92476
Psychiatrist	Phone	92477
Psychiatrist	Phone	92495
Psychiatrist	Phone	92496

Psychiatrist	Phone	92497
Psychiatrist	Phone	92498
Psychiatrist	Phone	92499
Psychiatrist	Phone	92500
Psychiatrist	Phone	91837
Psychiatrist	Phone	91838
Psychiatrist	Phone	91839
Psychiatrist	Phone	91840
Psychiatrist	Phone	91841
Psychiatrist	Phone	92166
Psychiatrist	Phone	92178
Psychiatrist	Videoconference	288
Psychiatrist	Videoconference	92434
Psychiatrist	Videoconference	92435
Psychiatrist	Videoconference	92436
Psychiatrist	Videoconference	92437
Psychiatrist	Videoconference	92455
Psychiatrist	Videoconference	92456
Psychiatrist	Videoconference	92457
Psychiatrist	Videoconference	92458
Psychiatrist	Videoconference	92459
Psychiatrist	Videoconference	92460
Psychiatrist	Videoconference	91827
Psychiatrist	Videoconference	91828
Psychiatrist	Videoconference	91829
Psychiatrist	Videoconference	91830
Psychiatrist	Videoconference	91831
Psychiatrist	Videoconference	92162
Psychiatrist	Videoconference	92172
Psychologist	In-person	80000
Psychologist	In-person	80010
Psychologist	In-person	80100
Psychologist	In-person	80110
Psychologist	In-person	93512
Psychologist	In-person	93535
Psychologist	In-person	93557
Psychologist	In-person	93590
Psychologist	In-person	82000
Psychologist	In-person	82015
Psychologist	In-person	82352
Psychologist	In-person	83255
Psychologist	In-person	82360
Psychologist	In-person	82363
Psychologist	Phone	91181
Psychologist	Phone	91182
Psychologist	Phone	91183
Psychologist	Phone	91184
Psychologist	Phone	93538

Psychologist	Phone	93593
Psychologist	Phone	93040
Psychologist	Phone	93043
Psychologist	Phone	93110
Psychologist	Phone	93113
Psychologist	Phone	93118
Psychologist	Phone	93121
Psychologist	Videoconference	80001
Psychologist	Videoconference	80011
Psychologist	Videoconference	80101
Psychologist	Videoconference	80111
Psychologist	Videoconference	91169
Psychologist	Videoconference	91170
Psychologist	Videoconference	91166
Psychologist	Videoconference	91167
Psychologist	Videoconference	93537
Psychologist	Videoconference	93592
Psychologist	Videoconference	93032
Psychologist	Videoconference	93035
Psychologist	Videoconference	93076
Psychologist	Videoconference	93079
Psychologist	Videoconference	93084
Psychologist	Videoconference	93087

Table S2. Overall quarterly telehealth use for mental health services Q1 2019 to Q4 2021

Profession	Mode	Q1 2019	Q2 2019	Q3 2019	Q4 2019	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021
Psychologists	In-person	1255342	1390361	1382271	1263978	1241476	780958	1024098	955305	1066184	1212335	925395	823508
	Phone	0	0	0	0	10766	241779	170267	119588	96332	96304	77433	109461
	Videoconference	2319	3086	3423	3817	19382	441574	363156	268104	207985	230704	422332	328172
Psychiatrists	In-person	406720	426025	442553	416971	390906	213959	272004	280163	303007	325788	265254	261371
	Phone	0	0	0	0	8903	151000	134700	110173	87099	81749	126237	111072
	Videoconference	16204	18531	20305	19838	27285	132569	129454	108858	88874	87627	137231	126358
TOTAL		1680585	1838003	1848552	1704604	1698718	1961839	2093679	1842191	1849481	2034507	1953882	1759942
TOTAL	In-person	1662062	1816386	1824824	1680949	1632382	9949172	1296102	1235468	1369191	1538123	1190649	1084879
TOTAL	Phone	0	0	0	0	196	392	304	229	183	178	203	220

						69	779	967	761	431	053	670	533
%	Phone	0.0 %	0.0 %	0.0 %	0.0 %	1.2 %	20.0 %	14.6 %	12.5 %	9.9 %	8.8 %	10.4 %	12.5 %
TOTAL	Videocon ference	185 23	216 17	237 28	236 55	466 67	574 143	492 610	376 962	296 859	318 331	559 563	454 530
%	Videocon ference	1.1 %	1.2 %	1.3 %	1.4 %	2.7 %	29.3 %	23.5 %	20.5 %	16.1 %	15.6 %	28.6 %	25.8 %

Table S3. Psychiatrist new and review consultations by modality 2019-2021

	New Total (%)		VC %	Telephone %	Review Total (%)		VC %	Telephone %
Q1 2019	38732	(9.9%)			353850	(90.1%)		
Q2 2019	40871	(9.9%)			372314	(90.1%)		
Q3 2019	43256	(10.2%)			382891	(89.8%)		
Q4 2019	38534	(9.5%)			366417	(90.5%)		
Q1 2020	39634	(10.1%)	0.0%	0.0%	352159	(87.6%)	0.0%	2.5%
Q2 2020	37619	(7.5%)	15.8%	8.9%	340612	(52.0%)	0.1%	42.2%
Q3 2020	47149	(8.7%)	15.8%	7.4%	368500	(58.0%)	0.1%	34.5%
Q4 2020	41494	(8.5%)	12.9%	6.0%	355139	(63.2%)	0.0%	29.4%
Q1 2021	42690	(9.5%)	8.6%	3.8%	350034	(68.0%)	0.0%	23.7%
Q2 2021	45173	(9.8%)	7.7%	3.0%	364696	(69.9%)	0.0%	21.4%
Q3 2021	48425	(9.2%)	17.8%	5.5%	356470	(58.5%)	0.0%	33.5%
Q4 2021	36925	(7.2%)	19.4%	5.5%	348324	(62.9%)	0.1%	30.3%

VC=videoconference

Table S4. Psychiatrist group consultations by modality 2019-2021

Values	Group Total	Videoconference %	Phone %
Q1 2019	8512		
Q2 2019	8790		
Q3 2019	11759		
Q4 2019	8686		
Q1 2020	7421	0.0%	0.0%
Q2 2020	6724	8.4%	2.7%
Q3 2020	8570	14.0%	1.5%
Q4 2020	6696	12.8%	1.4%
Q1 2021	6643	15.7%	1.8%
Q2 2021	6549	18.9%	1.8%
Q3 2021	6933	22.0%	3.3%
Q4 2021	6480	23.6%	4.2%

Table S5. Cost of psychiatrist and psychologist services 2019 to 2021 by modality

	In-person (%)		Phone (%)		Videoconference (%)		Grand Total
Q1 2019	\$182,880,249	(93.2%)	\$0	(0.0%)	\$13,376,685	(6.8%)	\$196,256,934
Q2 2019	\$206,310,784	(93.0%)	\$0	(0.0%)	\$15,528,753	(7.0%)	\$221,839,537
Q3 2019	\$216,611,329	(92.6%)	\$0	(0.0%)	\$17,359,767	(7.4%)	\$233,971,096
Q4 2019	\$205,971,871	(92.4%)	\$0	(0.0%)	\$16,952,694	(7.6%)	\$222,924,565
Q1 2020	\$179,549,798	(88.3%)	\$2,160,626	(1.1%)	\$21,722,675	(10.7%)	\$203,433,099
Q2 2020	\$106,202,526	(43.9%)	\$43,472,397	(18.0%)	\$92,485,251	(38.1%)	\$242,160,174
Q3 2020	\$147,210,186	(54.3%)	\$35,905,780	(13.3%)	\$87,649,287	(32.4%)	\$270,765,253
Q4 2020	\$146,373,425	(59.4%)	\$27,646,594	(11.2%)	\$72,592,479	(29.4%)	\$246,612,498
Q1 2021	\$146,600,789	(65.2%)	\$20,841,906	(9.3%)	\$57,255,999	(25.5%)	\$224,698,694
Q2 2021	\$173,336,884	(67.6%)	\$20,635,482	(8.1%)	\$62,319,679	(24.3%)	\$256,292,045
Q3 2021	\$137,326,234	(50.5%)	\$33,597,259	(12.3%)	\$101,149,068	(37.2%)	\$272,072,561
Q4 2021	\$132,342,063	(53.3%)	\$27,691,613	(11.1%)	\$88,384,687	(35.6%)	\$248,418,363

Supplementary file 2: Interrupted time-series regression analysis

Tables

Table S2.1: Changes in telehealth uptake and activity by psychiatrists after the implementation of interventions

Interventions (March 2020)		Coefficient (95% CI)	p-value	Coefficient (95% CI)	p-value	Coefficient (95% CI)	p-value
		Telephone consultations		Videoconference consultations		In-person consultations	
Initial activity		1781 (-101 to 3662)	0.061	2347 (1383 to 3311)	0.001	-2746 (-16,272 to 10,780)	0.652
Change in uptake	Level change (<i>Immediate effect</i>)	125,146 (93,888 to 156,404)	<0.0001	90,984 (61,668 to 120,301)	<0.0001	-139,611 (-189,305 to -89,916)	<0.0001
Change in quarterly activity	Slope change (<i>Sustained effect</i>)	-7678 (-18,066 to 2709)	0.127	-3215 (-12,482 to 6051)	0.447	8572 (-14,439 to 31,583)	0.415
Difference in quarterly activity trend between pre-and post-policy period		-5897 (-15,461 to 3,666)	0.193	-868 (-9770 to 8033)	0.828	5826 (-8489 to 20,141)	0.375
The rate of telehealth uptake and activity was examined using interrupted time-series analysis							

Table S2.2: Changes in telehealth uptake and activity by psychologists after the implementation of interventions

First interventions (March 2020)		Coefficient (95% CI)	p-value	Coefficient (95% CI)	p-value	Coefficient (95% CI)	p-value
		Telephone consultations		Videoconference consultations		In-person consultations	
Initial activity		2153 (-635 to 4941)	0.108	3486 (-1582 to 8553)	0.143	-15,412 (-71,132 to 40,309)	0.524
Change in uptake	Level change (<i>Immediate effect</i>)	233,166 (223,583 to 242,550)	<0.0001	424,712 (404,536 to 444,887)	<0.0001	-479,493 (-641,922 to -317,064)	<0.0001
Change in quarterly activity	Slope change (<i>Sustained effect</i>)	-73,665 (-76,453 to -70,877)	<0.0001	-81,904 (-86,971 to -76,836)	<0.0001	258,552 (202,831 to 314,272)	<0.0001
Difference in monthly activity trend between pre-and post-policy period		-71,512 (-71,512 to -71,511)	<0.0001	-78,418 (-78,417 to -78,418)	<0.0001	243,140 (243,139 to 243,140)	<0.0001
Second Intervention (October 2020)		Coefficient (95% CI)	p-value	Coefficient (95% CI)	p-value	Coefficient (95% CI)	p-value
		Telephone consultations		Videoconference consultations		In-person consultations	
Change in uptake	Level change (<i>Immediate effect</i>)	8899 (-14,736 to 32,534)	0.392	-60,175 (-183,350 to 64,000)	0.277	-189,816 (-389,706 to -177,450)	0.125
Change in quarterly activity	Slope change (<i>Sustained effect</i>)	-3915 (-15,732 to 7901)	0.448	33,448 (-19,284 to 86,181)	-0.172	-40,438 (-146,566 to 65,670)	0.387
Difference in monthly activity trend between pre- and post-policy period		67,597 (55,780 to 79,413)	<0.0001	111,866 (59,134 to 164,599)	0.002	-283,578 (-389,707 to -177,450)	<0.0001

The rate of telehealth uptake and activity was examined using interrupted time-series analysis

Figures

Figure S2.1: Interrupted time-series analysis for interventions on psychiatrist telephone consultation activity

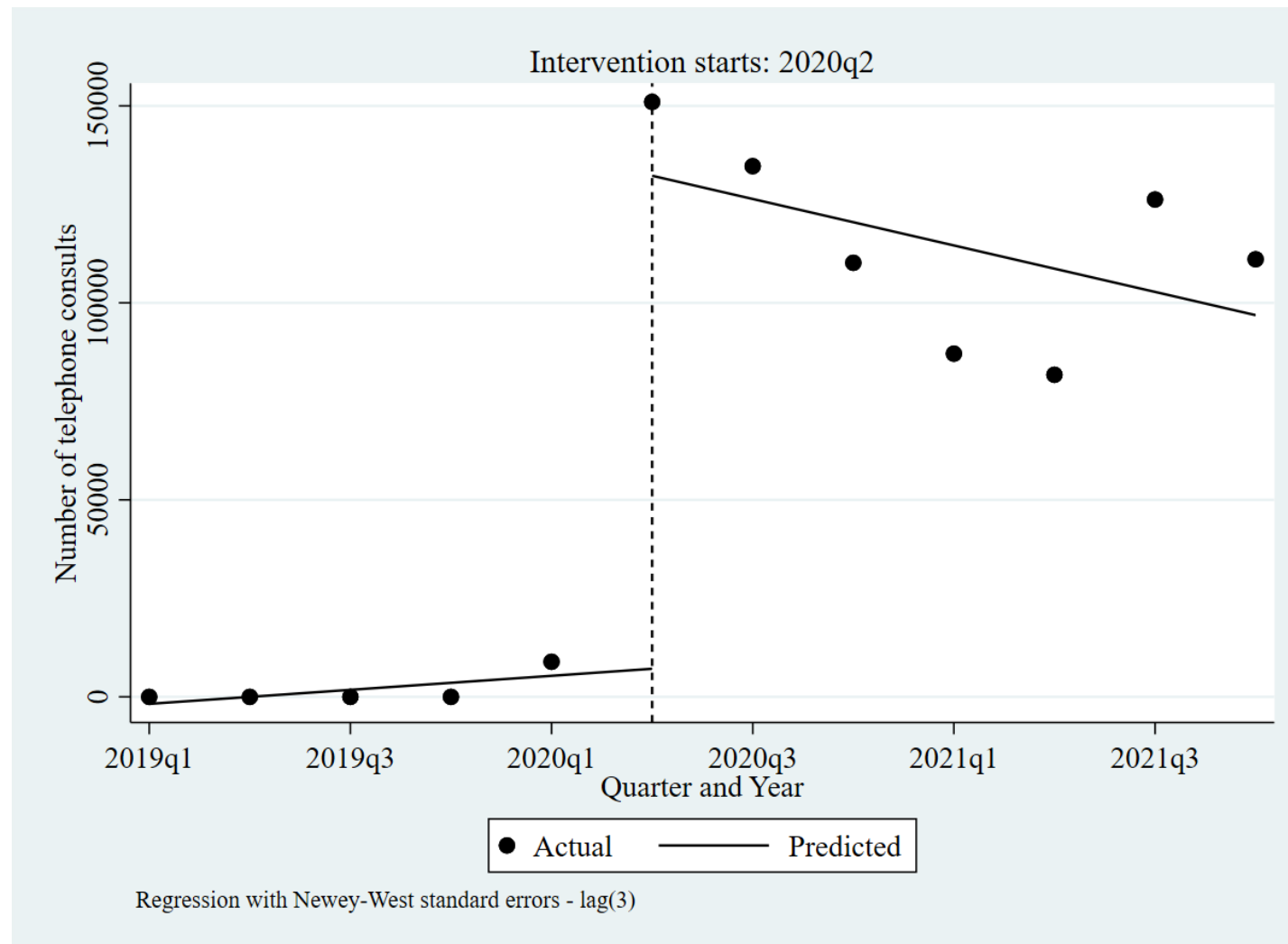


Figure S2.2: Interrupted time-series analysis for interventions on psychiatrist videoconference consultation activity

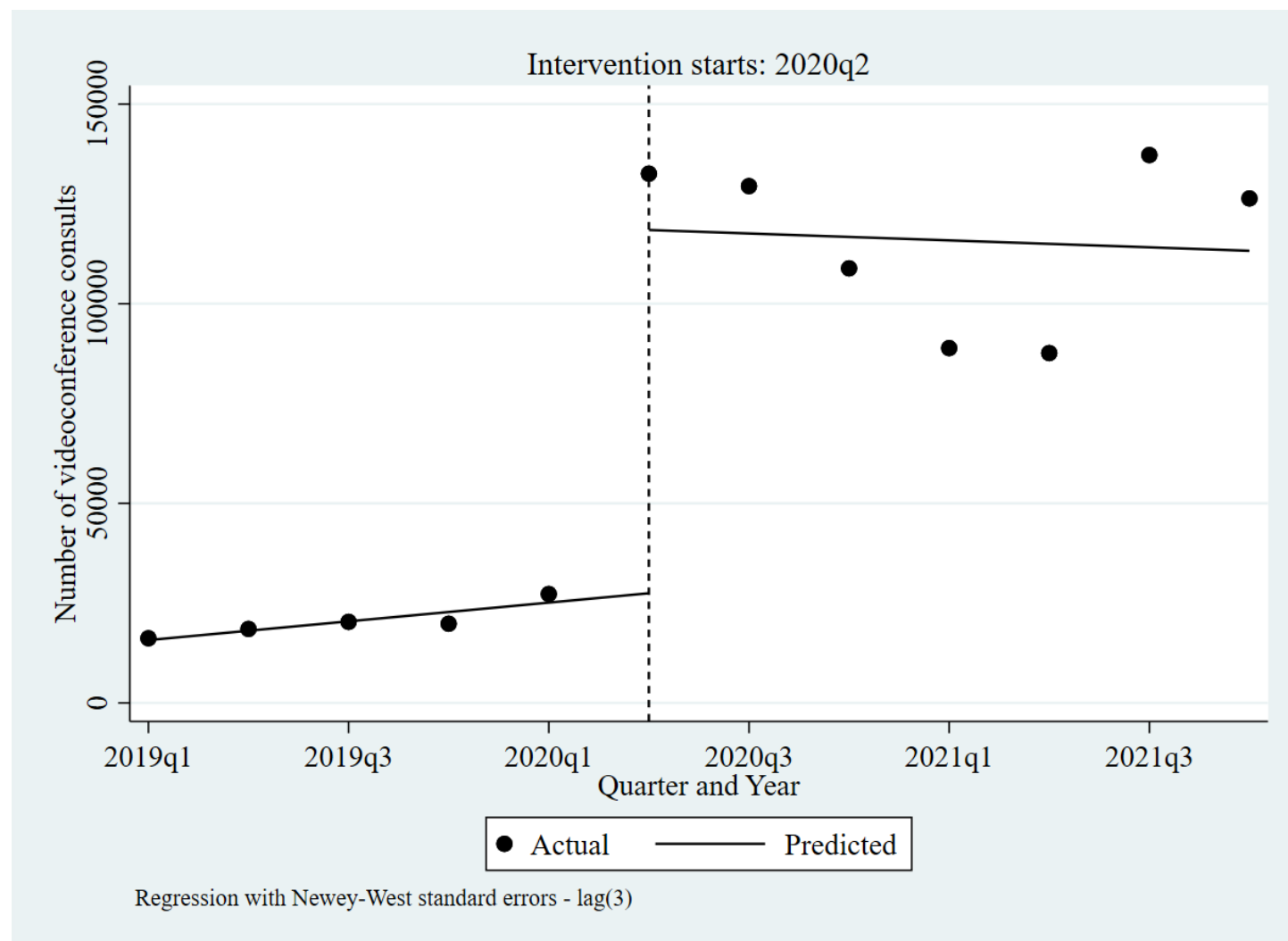


Figure S2.3: Interrupted time-series analysis for interventions on psychiatrist in-person consultation activity

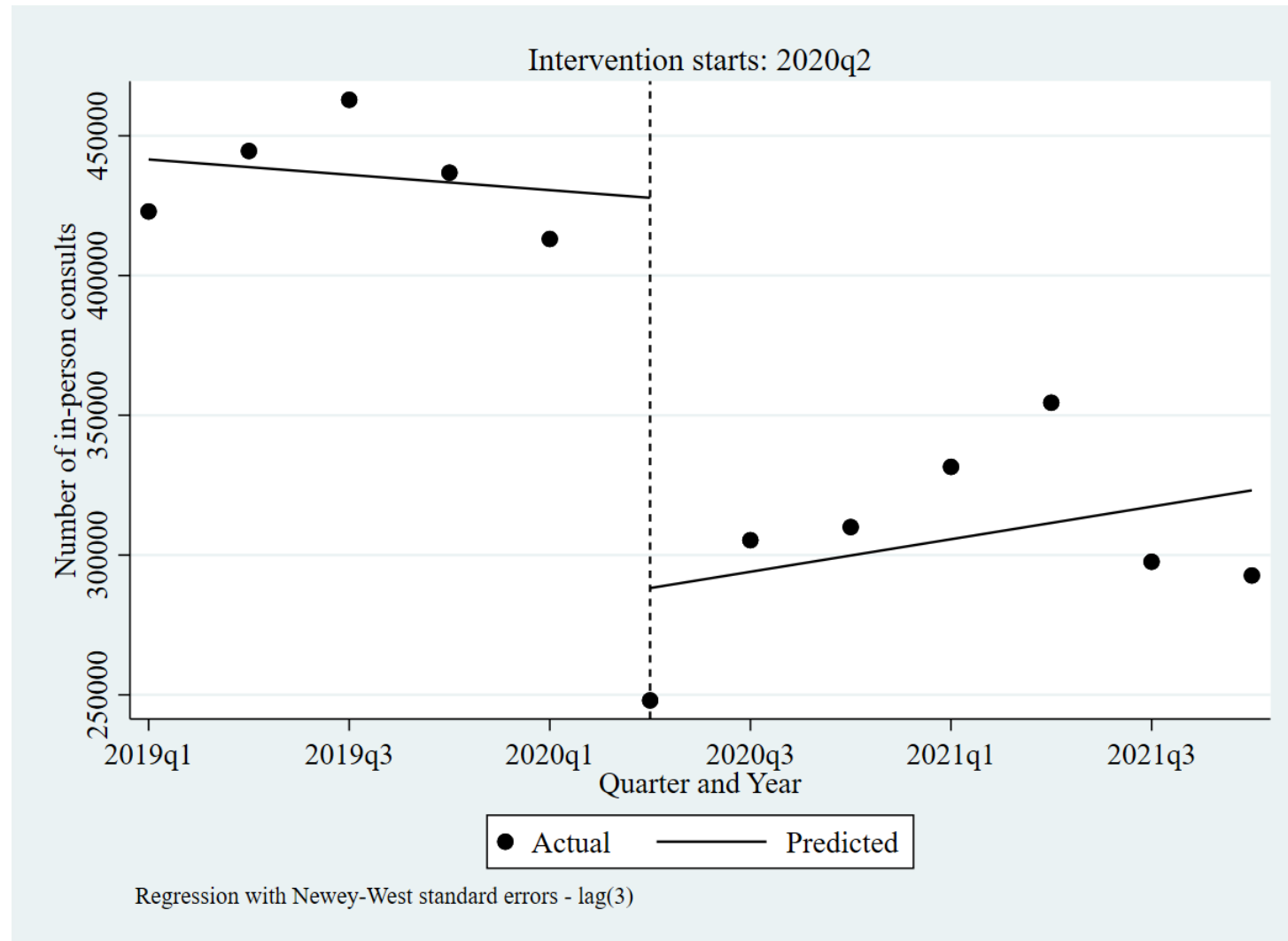


Figure S2.4: Interrupted time-series analysis for interventions on psychologist telephone consultation activity

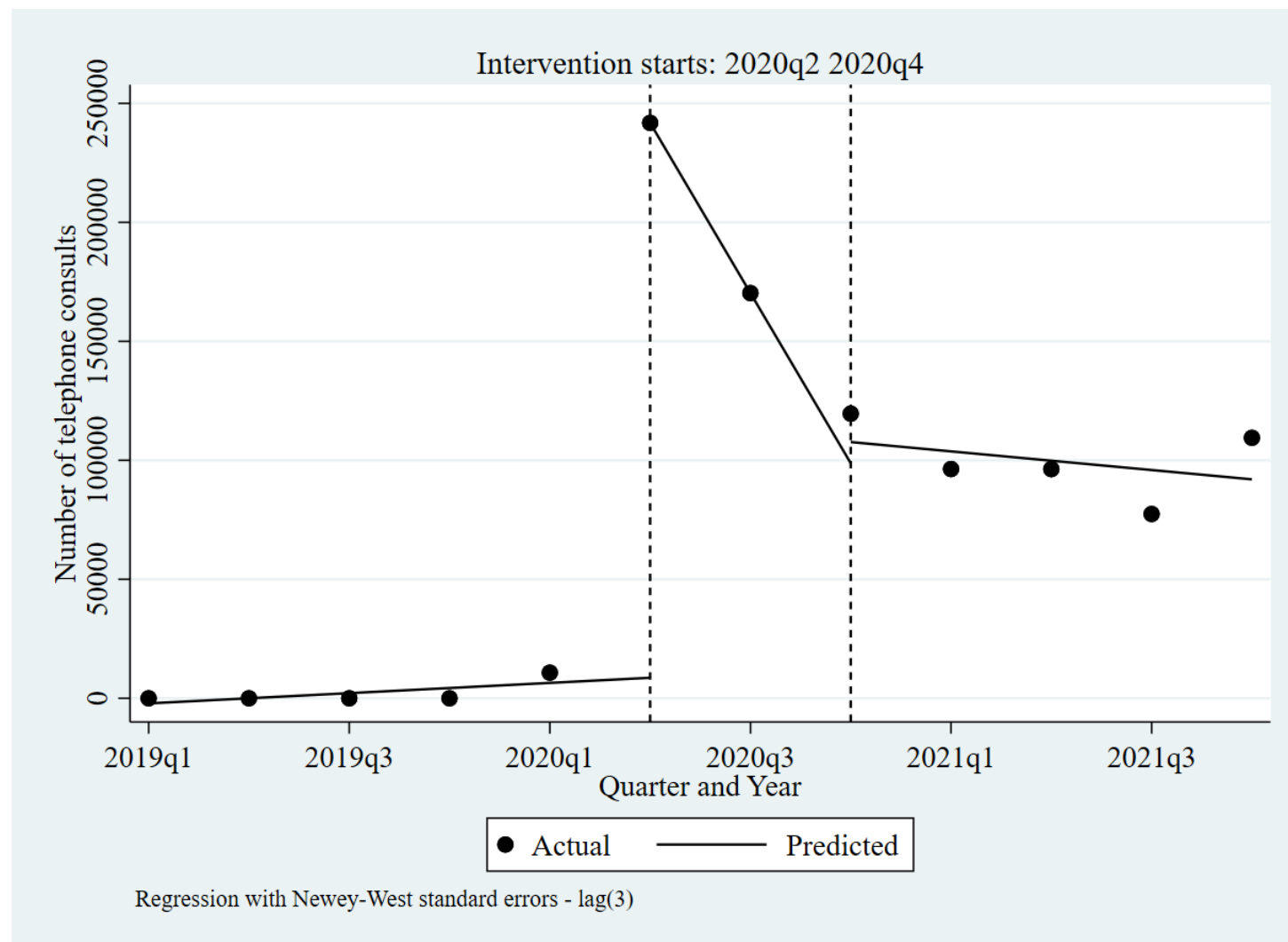


Figure S2.5: Interrupted time-series analysis for interventions on psychologist videoconference consultation activity

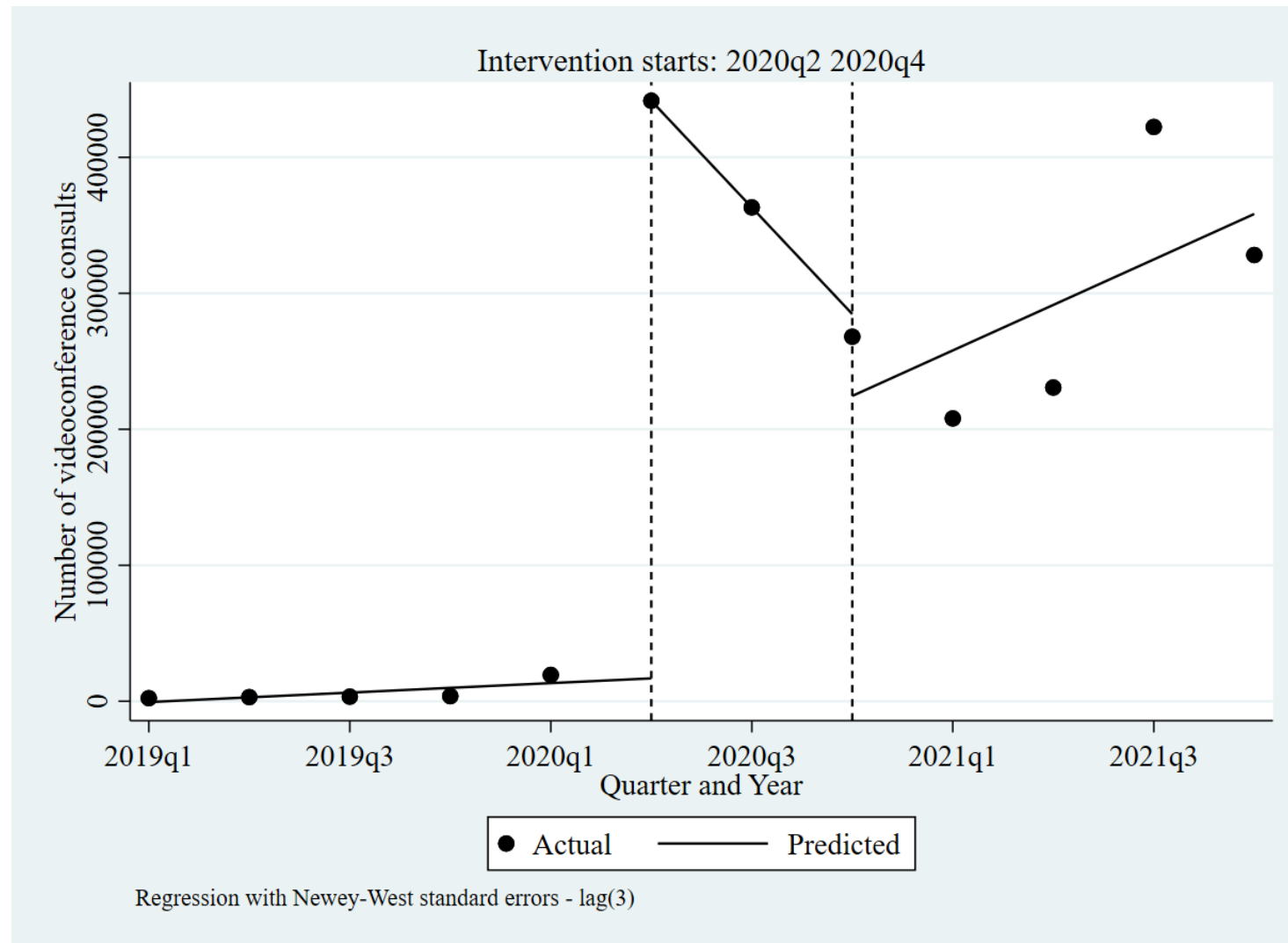


Figure S2.6: Interrupted time-series analysis for interventions on psychologist in-person consultation activity

