

1 **SUPPLEMENTARY APPENDIX**

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3 **Methods:** Quality assessment

4 To ascertain the validity of the eligible audit studies, we used  
5 the Cochrane Collaboration's tool for assessing risk of bias  
6 which consists of seven domains: random sequence generation,  
7 allocation concealment, blinding of participants and personnel,  
8 blinding of outcome assessment, incomplete outcome data,  
9 selective reporting, and other bias.<sup>1</sup> One additional domain,  
10 allocation of calls, was used to understand whether studies  
11 called the same office multiple times for each insurance  
12 scenario (low risk of bias) or whether studies called different  
13 offices once with each scenario (high risk of bias), which would  
14 defeat the purpose of each office serving as its own control.  
15 Each domain and overall risk of bias was assessed and

16 categorized as high, low, or unclear for every study. See Table  
17 S2.

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19 **Figure S1:** Ovid MEDLINE Search (1946 to December Week 1 2016),  
20 Performed January 20, 2017

1	exp "Appointments and Schedules"/	18561
2	cherry pick*.mp.	99
3	appointment\$.mp.	22353
4	secret shopper\$.mp.	22
5	hypothetical patient\$.mp.	613
6	simulated patient\$.mp.	1495
7	patient simulation/	4148
8	wait* list*.mp.	17330
9	exp medical assistance/	60224
10	exp insurance, health/	145283
11	exp insurance coverage/ or insurance*.mp.	133108
12	exp "Patient Protection and Affordable Care Act"/	5958
13	(affordable care act* or health care reform act).mp.	6705
14	(medicare or medicaid or aca or obamacare).mp.	86182
15	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8	44473
16	9 or 10 or 11 or 12 or 13 or 14	233360
17	15 and 16	1984
18	exp United States/	1386810
19	united states.mp.	1018831
20	17 and (18 or 19)	1252
21	limit 20 to yr="2001 -Current"	814
22	wait* time*.mp.	8668
23	15 or 22	49462
24	16 and 22	450
25	24 and (18 or 19)	235
26	limit 25 to yr="2001 -Current"	172
27	21 or 26	884

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23 **Table S1.** Study population details

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Study	Year Data Collected	Pre / Post ACA	State vs. Multi-state	State(s)	State Medicaid Expansion Status at Time of Study	Pediatric / Adult Scenario	Specialty
Algothani 2012 <sup>2</sup>	2011	Pre	State	OH	N/A	N/A	Dermatology
Anandasivam 2016 <sup>3</sup>	2016	Post	Multi-state	CA, MA, OH, NY, FL, GA, TX, NC	Expanded; Not Expanded	Adult	Orthopedics
Asplin 2005 <sup>4</sup>	2002	Pre	Multi-state	AZ, CA, CO, FL, GA, IL, MN, NY, TX	N/A	Adult	Family Medicine, Internal Medicine, Obstetrics / Gynecology
Bisgaier 2011 <sup>5</sup>	2010	Pre	State	IL	N/A	Pediatric	Pediatrics
Bisgaier 2011 <sup>6</sup>	2010	Pre	State	IL	N/A	Pediatric	Pediatrics

Bisgaier 2012 <sup>7</sup>	2010	Pre	State	IL	N/A	N/A	Pediatrics
Blanchard 2008 <sup>8</sup>	2005	Pre	State	DC	N/A	Adult	Internal Medicine
Cossman 2014 <sup>9</sup>	2012	Pre	State	MS	N/A	Adult	Primary Care, Pediatrics, Obstetrics / Gynecology
Draeger 2014 <sup>10</sup>	2013	Pre	State	NC	N/A	Adult	Orthopedics
Galbraith 2005 <sup>11</sup>	2003	Pre	Multi- state	GA, MD, IL, TX, MN, PA, CA, WA	N/A	Pediatric	Pediatrics
Hamlyn 2016 <sup>12</sup>	2015	Post	Multi- state	AL, AZ, CA, CO, CT, DC, FL, IL, IA, MD, MA, MI, MN, MO, NH, NJ, NY, NC,	Expanded; Not Expanded	Adult	Oncology

				OH, PA, TN, TX, WA, WI			
Hwang 2005 <sup>13</sup>	2004	Pre	State	CA	N/A	Pediatric	Urology
Iobst 2010 <sup>14</sup>	2009	Pre	State	FL	N/A	Pediatric	Orthopedics
Iobst 2013 <sup>15</sup>	2012	Pre	Multi- state	All states, excluding DC	N/A	Pediatric	Orthopedics
Kim 2015 <sup>16</sup>	2014	Post	Multi- state	CA, MA, OH, NY, FL, PA, TX, NC	Expanded; Not Expanded	Adult	Orthopedics
Kim 2016 <sup>17</sup>	2015	Post	Multi- state	CA, MA, NY, OH, FL, NC, GA, TX	Expanded; Not Expanded	Adult	Orthopedics
Kim 2016 <sup>18</sup>	2015	Post	Multi- state	CA, MA, NY, OH, FL, NC, GA, TX	Expanded; Not Expanded	Adult	Orthopedics
Lavernia 2012 <sup>19</sup>	2011	Pre	State	FL	N/A	Adult	Orthopedics

Mathieu 2012 <sup>20</sup>	2011	Pre	State	DC	N/A	Pediatric	Pediatrics
Medford- Davis 2017 <sup>21</sup>	2016	Post	State	TX	Not Expanded	Adult	Orthopedics
Olsson 2013 <sup>22</sup>	2012	Pre	State	NC	N/A	Adult	Orthopedics
Patterson 2013 <sup>23</sup>	2012	Pre	State	NC	N/A	Adult	Orthopedics
Patterson 2014 <sup>24</sup>	2013	Pre	State	NC	N/A	Adult	Orthopedics
Pierce 2012 <sup>25</sup>	2011	Pre	Multi- state	OH, IN, KY	N/A	Pediatric	Orthopedics
Pollack 2016 <sup>26</sup>	2015	Post	State	PA	Expanded	Adult	Urology, Radiation Oncology
Potak 2017 <sup>27</sup>	2016	Post	State	FL	Not Expanded	Pediatric	Pediatrics
Rhodes 2009 <sup>28</sup>	2002	Pre	Multi- state	AZ, CA, CO, FL, GA, IL, MN, NY, TX	N/A	N/A	Psychiatry

Rhodes 2014 <sup>29</sup>	2012	Pre	State	AR, GA, IL, IA, MA, MT, NJ, OR, PA, TX	N/A	Adult	Primary Care
Sabatini 2012 <sup>30</sup>	2011	Pre	State	CA	N/A	Pediatric	Orthopedics
Skaggs 2001 <sup>31</sup>	1999	Pre	State	CA	N/A	Pediatric	Orthopedics
Steinman 2015 <sup>32</sup>	2012	Pre	State	OH	N/A	Pediatric	Psychiatry
Wiznia 2017 <sup>33</sup>	2015	Post	Multi- state	CA, MA, OH, NY, FL, GA, TX, NC	Expanded; Not Expanded	Adult	Endocrinology
Wiznia 2017 <sup>34</sup>	2015	Post	Multi- state	CA, MA, OH, NY, FL, GA, TX, NC	Expanded; Not Expanded	Adult	Pain Medicine
Wiznia 2017 <sup>35</sup>	2016	Post	Multi- state	CA, MA, OH, NY, FL, GA, TX, NC	Expanded; Not Expanded	Adult	Psychiatry



25 **Table S2:** Risk of bias

Study	Random sequence generation	Allocation concealment	Blinding of participants and personnel	Blinding of outcomes data	Incomplete outcome data	Selective reporting	Other bias	Allocation of calls
Algothani 2012 <sup>2</sup>	+	-	-	+	+	+	+	-
Anandasivam 2016 <sup>3</sup>	+	-	-	+	+	+	+	+
Asplin 2005 <sup>4</sup>	+	-	-	+	+	+	-	+
Bisgaier 2011 <sup>5</sup>	+	-	-	-	+	+	+	-
Bisgaier 2011 <sup>6</sup>	+	-	-	+	+	+	+	+
Bisgaier 2012 <sup>7</sup>	+	-	-	+	+	+	-	+
Blanchard 2008 <sup>8</sup>	+	-	-	+	-	+	+	+
Cossmann 2014 <sup>9</sup>	+	-	-	+	+	+	+	+
Draeger 2014 <sup>10</sup>	+	-	-	+	+	+	+	+
Galbraith 2005 <sup>11</sup>	+	-	-	+	+	+	+	+
Hamlyn 2016 <sup>12</sup>	?	-	-	+	+	+	+	+
Hwang 2005 <sup>13</sup>	+	-	-	-	+	+	-	+
Iobst 2010 <sup>14</sup>	+	-	-	+	+	+	+	+
Iobst 2013 <sup>15</sup>	+	-	-	+	+	+	+	+
Kim 2015 <sup>16</sup>	+	-	-	+	+	+	+	+
Kim 2016 <sup>17</sup>	+	-	-	+	+	+	+	+

Kim 2016 <sup>18</sup>	+	-	-	+	+	+	+	+
Lavernia 2012 <sup>19</sup>	+	-	-	+	+	+	-	+
Mathieu 2012 <sup>20</sup>	+	-	-	+	+	-	+	+
Medford-Davis 2017 <sup>21</sup>	+	-	-	+	+	+	+	+
Olsson 2013 <sup>22</sup>	+	-	-	+	+	+	+	+
Patterson 2013 <sup>23</sup>	+	-	-	+	+	+	+	+
Patterson 2014 <sup>24</sup>	+	-	-	+	+	+	+	+
Pierce 2012 <sup>25</sup>	+	-	-	+	+	+	-	+
Pollack 2016 <sup>26</sup>	-	-	-	+	+	+	+	-
Potak 2017 <sup>27</sup>	+	-	-	+	+	+	+	+
Rhodes 2009 <sup>28</sup>	+	-	-	+	+	+	+	+
Rhodes 2014 <sup>29</sup>	+	-	-	+	+	+	+	-
Sabatini 2012 <sup>30</sup>	+	-	-	+	+	+	+	+
Skaggs 2001 <sup>31</sup>	+	-	-	+	+	+	+	+
Steinman 2015 <sup>32</sup>	+	-	-	+	+	+	+	+
Wiznia 2017 <sup>33</sup>	+	-	-	+	+	+	+	+
Wiznia 2017 <sup>34</sup>	+	-	-	+	+	+	+	+
Wiznia 2017 <sup>35</sup>	+	-	-	+	+	+	+	+
+ Low risk of bias; – High risk of bias; ? Unclear risk of bias								

27 **Table S3:** Studies with call data

Study	Year*	Region	Specialty	Private Insurance			Medicaid			Medicare			Cash Pay		
				Total	Successes	(%)	Total	Successes	(%)	Total	Successes	(%)	Total	Successes	(%)
Skaggs 2001 <sup>31</sup>	1999	California	Orthopedics	50	50	(100%)	50	1	(2%)						
Asplin 2005 <sup>4</sup>	2002	Multi-state	Primary Care	430	277	(64%)	231	79	(34%)				199	125	(63%)
Rhodes 2009 <sup>28</sup>	2002	Multi-state	Psychiatry	78	34	(44%)	55	16	(29%)				23	13	(57%)
Galbraith 2005 <sup>11</sup>	2003-2004	Multi-state	Pediatrics	401	390	(97%)	401	313	(78%)						
Hwang 2005 <sup>13</sup>	2004	California	Urology	46	44	(96%)	46	19	(41%)						
Blanchard 2008 <sup>8</sup>	2005	Washington DC	Primary Care	38	20	(53%)	41	11	(27%)	39	19	(49%)	37	4	(11%)
Iobst 2010 <sup>14</sup>	2009	Florida	Orthopedics	100	36	(36%)	100	8	(8%)						
Bisgaier 2011 <sup>5</sup>	2010	Illinois	Multiple	14	13	(93%)	14	13	(93%)						
Bisgaier 2012 <sup>7</sup>	2010	Illinois	Multiple	273	273	(100%)	273	118	(43%)						
Bisgaier 2011 <sup>6</sup>	2010	Illinois	Multiple	273	244	(89%)	273	94	(34%)						
Alghothani 2012 <sup>2</sup>	2011	Ohio	Dermatology	100	91	(91%)	104	31	(30%)						
Lavernia 2012 <sup>19</sup>	2011	Florida	Orthopedics	77	77	(100%)	77	11	(14%)						
Pierce 2012 <sup>25</sup>	2011	Multi-state	Orthopedics	42	42	(100%)	42	6	(14%)						
Mathieu 2012 <sup>20</sup>	2011	Washington DC	Pediatrics	29	11	(38%)	86	36	(42%)				57	27	(47%)
Sabatini 2012 <sup>30</sup>	2011	California	Orthopedics	45	19	(42%)	45	1	(2%)						
Patterson 2013 <sup>23</sup>	2012	North Carolina	Orthopedics	71	68	(96%)	71	51	(72%)						
Steinman 2015 <sup>32</sup>	2012	Ohio	Psychiatry	406	103	(25%)	431	79	(18%)						
Cossman 2014 <sup>9</sup>	2012	Mississippi	Primary Care	678	532	(78%)	678	343	(51%)	588	383	(65%)			
Iobst 2013 <sup>15</sup>	2012	Multi-state	Orthopedics	250	205	(82%)	250	59	(24%)						
Olsson 2013 <sup>22</sup>	2012	North Carolina	Orthopedics	45	33	(73%)	45	18	(40%)						
Rhodes 2014 <sup>29</sup>	2012-2013	Multi-state	Primary Care	5385	4480	(83%)	4352	2473	(57%)						
Draeger 2014 <sup>10</sup>	2013	North Carolina	Orthopedics	87	71	(82%)	87	58	(67%)						
Patterson 2014 <sup>24</sup>	2013	North Carolina	Orthopedics	132	95	(72%)	132	70	(53%)						
Kim 2015 <sup>16</sup>	2014	Multi-state	Orthopedics	488	472	(97%)	492	171	(35%)	356	339	(95%)			
Hamlyn 2016 <sup>12</sup>	2015	Multi-state	Oncology	78	47	(60%)	79	47	(59%)						
Kim 2016 <sup>17</sup>	2015	Multi-state	Orthopedics	188	170	(90%)	192	38	(20%)	188	173	(92%)			

Kim 2016 <sup>18</sup>	2015	Multi-state	Orthopedics	240	232	(97%)	240	48	(20%)	240	214	(89%)			
Pollack 2016 <sup>26</sup>	2015	Pennsylvania	Multiple	223	198	(89%)	223	115	(52%)	223	222	(100%)	223	199	(89%)
Wiznia 2017 <sup>34</sup>	2015	Multi state	Pain Management	235	97	(41%)	235	17	(7%)	235	93	(40%)	235	63	(27%)
Wiznia 2017 <sup>33</sup>	2015	Multi state	Endocrinology	247	134	(54%)	247	83	(34%)	247	76	(31%)	0	0	
Medford-Davis 2017 <sup>21</sup>	2016	Texas	Orthopedics	59	49	(83%)	43	6	(14%)				102	83	(81%)
Potak 2017 <sup>27</sup>	2016	Florida	Orthopedics	99	99	(100%)	99	75	(76%)						
Wiznia 2017 <sup>35</sup>	2016	Multi state	Psychiatry	240	129	(54%)	240	37	(15%)	240	81	(34%)	240	123	(51%)
Anandasivam 2016 <sup>3</sup>	2016	Multi state	Orthopedics	240	228	(95%)	240	2	(1%)	0	0		0	0	

\* Three studies published prior to 2010 did not explicitly state the timeframe of data collection. The data were assumed to be collected in year prior to publication, and these studies were included in the Pre-ACA group.

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