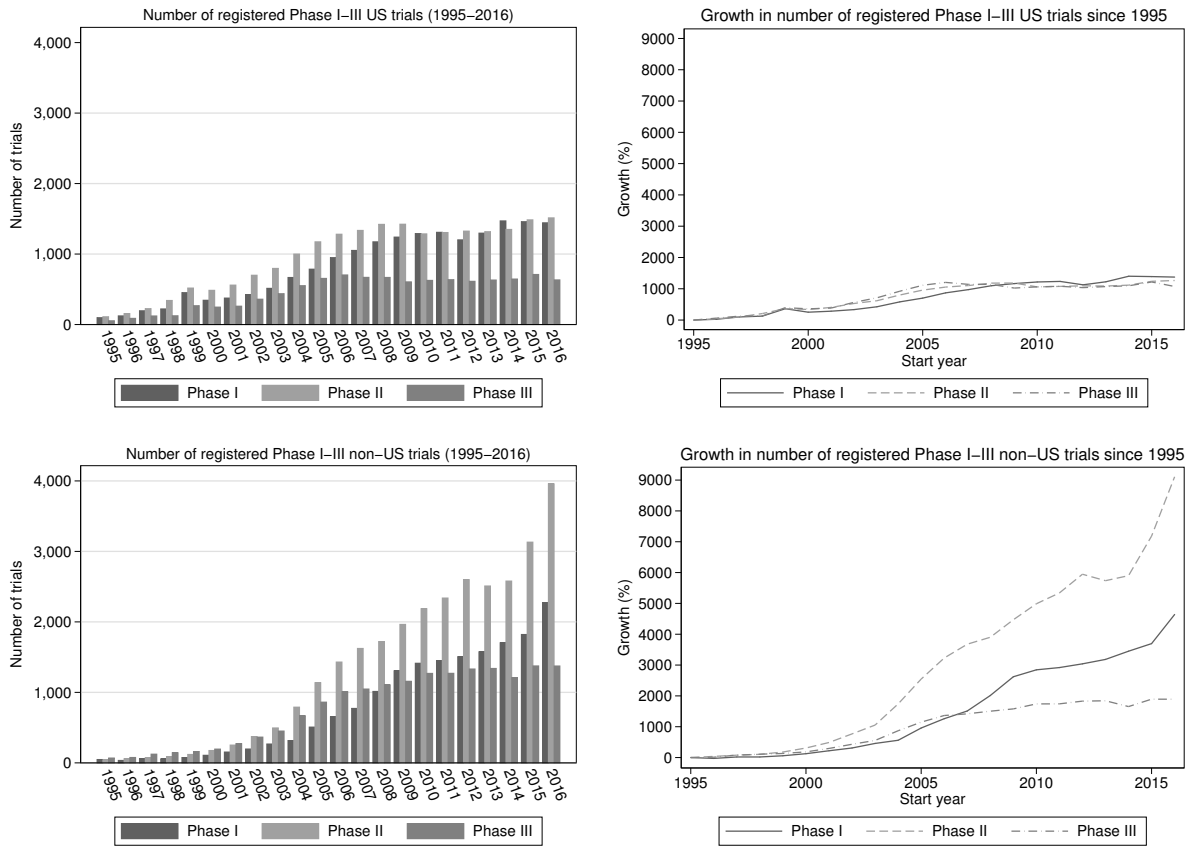
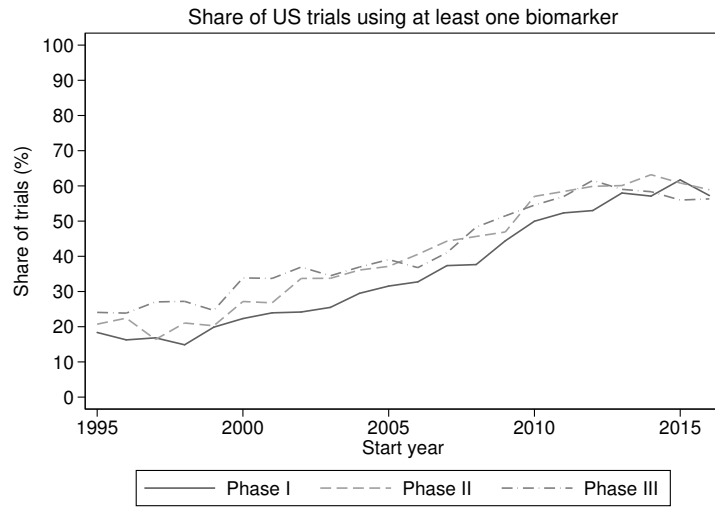
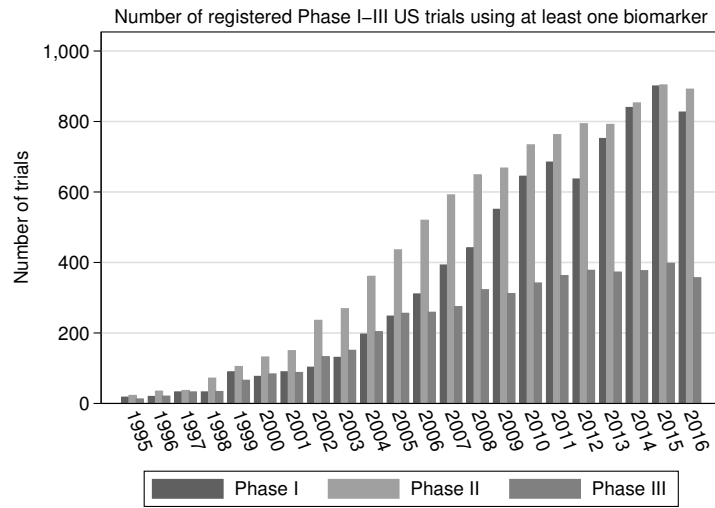


Appendices

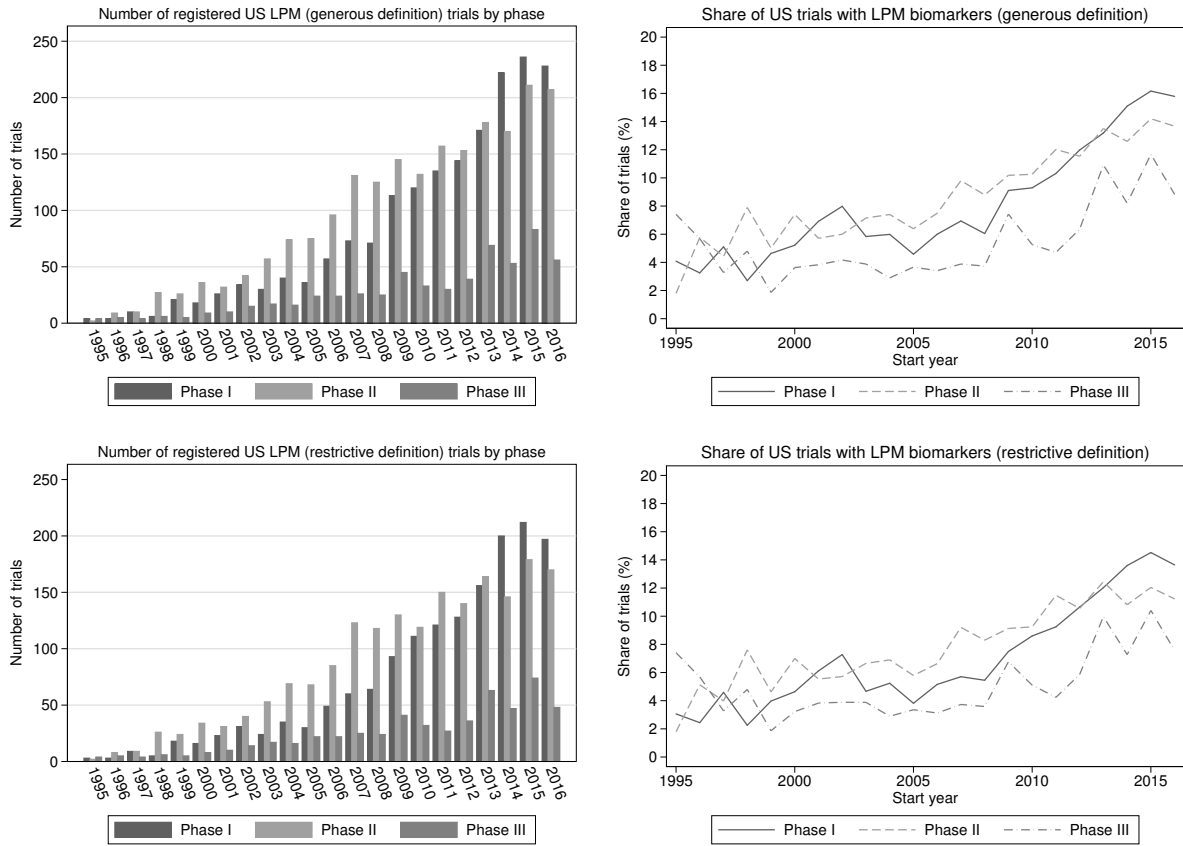
Appendix Figure A: U.S. Clinical trials over time



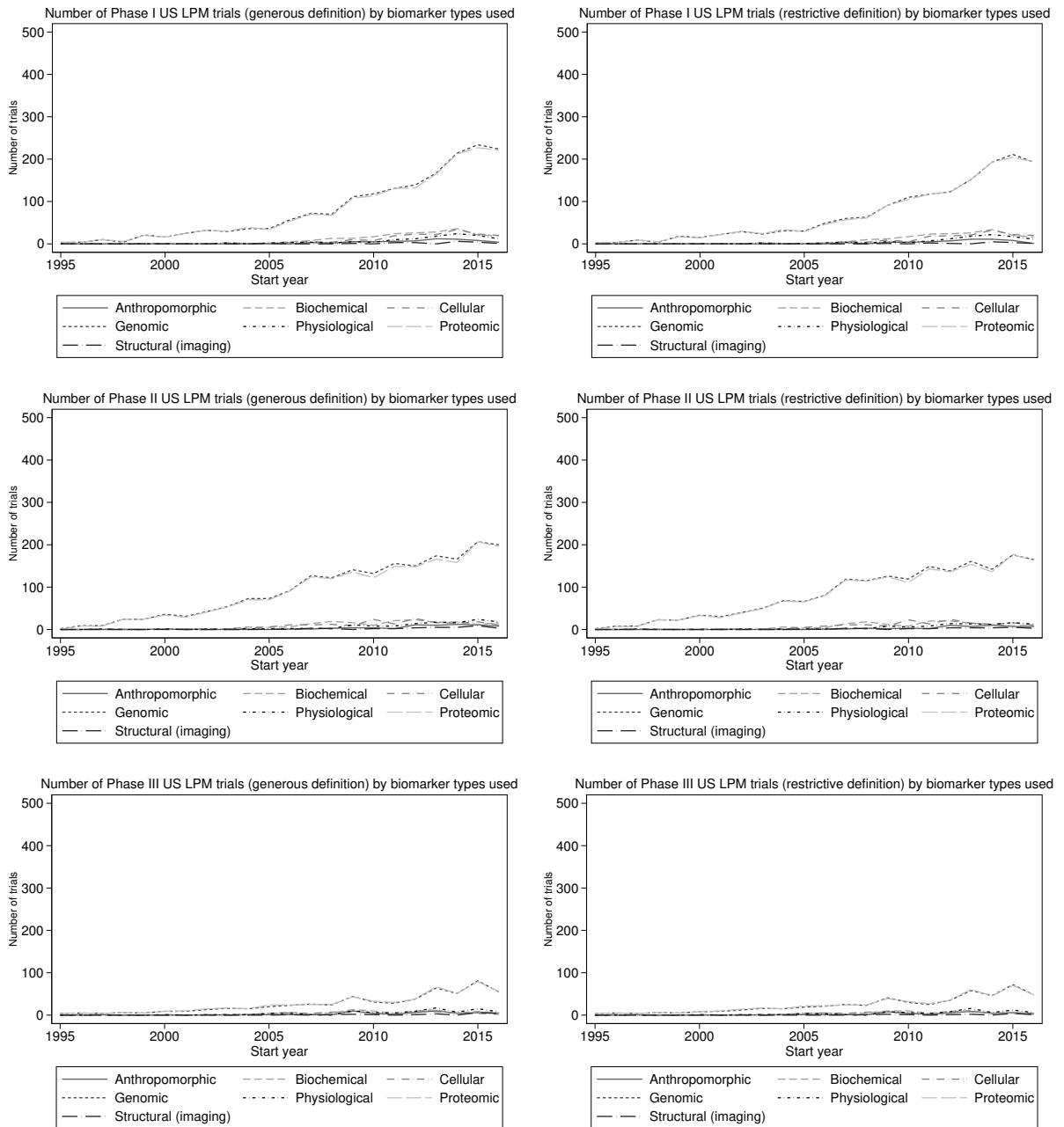
Appendix Figure B: U.S. Clinical trials using biomarkers



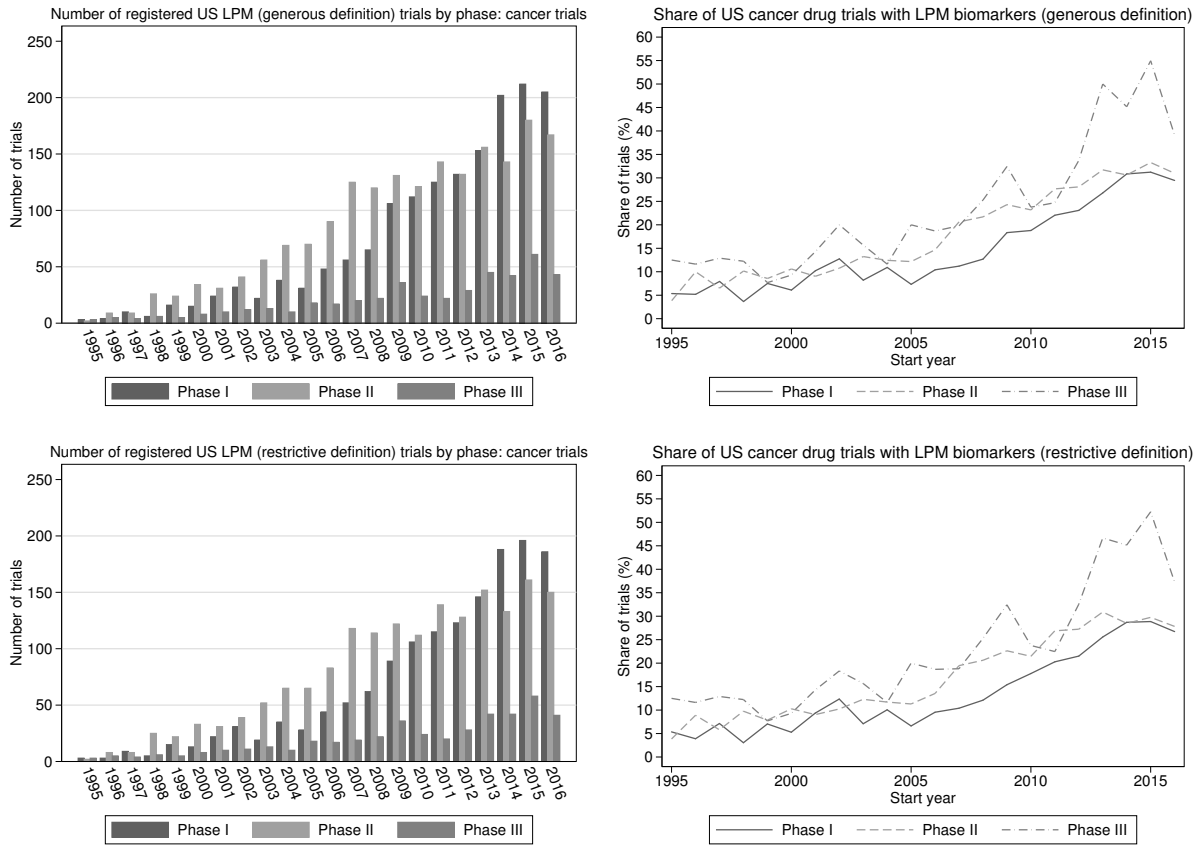
Appendix Figure C: U.S. Clinical trials for LPMs



Appendix Figure D: Types of biomarkers used in U.S. LPM trials



Appendix Figure E: U.S. clinical trials for LPMs, cancer indications only



Appendix Table I: U.S. likely precision medicine (LPM) trials (1995-2016):

Generous definition								
	All	All	P1	P1	P2	P2	P3	P3
	Count	%	Count	%	Count	%	Count	%
1995	8	6.15	3	5.36	2	4	3	12.5
1996	18	8.57	4	5.19	9	10	5	11.6
1997	23	7.82	10	7.94	9	6.57	4	12.9
1998	38	8.15	6	3.66	26	10.3	6	12.2
1999	45	8.09	16	7.55	24	8.57	5	7.81
2000	57	8.78	15	6.1	34	10.7	8	9.3
2001	65	10.1	24	10.2	31	9.09	10	14.3
2002	85	12.3	32	12.8	41	10.8	12	20
2003	91	11.8	22	8.21	56	13.2	13	15.7
2004	117	11.8	38	10.9	69	12.5	10	11.6
2005	119	11	31	7.33	70	12.2	18	20
2006	155	13.3	48	10.4	90	14.7	17	18.7
2007	201	16.7	56	11.2	125	20.7	20	19.8
2008	207	18	65	12.7	120	21.7	22	25.3
2009	271	22.2	106	18.3	129	24.1	36	32.7
2010	257	21.1	112	18.8	121	23.3	24	24
2011	290	24.8	125	22	143	27.8	22	24.7
2012	293	26.1	132	23.1	132	28.3	29	34.1
2013	354	30.8	153	26.8	156	31.9	45	50
2014	387	31.9	202	30.8	143	30.8	42	45.2
2015	453	34.2	212	31.3	180	33.5	61	55
2016	413	30.9	205	29.5	165	31	43	39.4
Restrictive definition								
	All	All	P1	P1	P2	P2	P3	P3
	Count	%	Count	%	Count	%	Count	%
1995	8	6.15	3	5.36	2	4	3	12.5
1996	16	7.62	3	3.9	8	8.89	5	11.6
1997	21	7.14	9	7.14	8	5.84	4	12.9
1998	36	7.73	5	3.05	25	9.88	6	12.2
1999	42	7.55	15	7.08	22	7.86	5	7.81
2000	54	8.32	13	5.28	33	10.4	8	9.3
2001	63	9.75	22	9.36	31	9.09	10	14.3
2002	81	11.7	31	12.4	39	10.3	11	18.3
2003	84	10.9	19	7.09	52	12.3	13	15.7
2004	110	11.1	35	10.1	65	11.7	10	11.6
2005	111	10.2	28	6.62	65	11.3	18	20
2006	144	12.4	44	9.54	83	13.5	17	18.7
2007	189	15.7	52	10.4	118	19.6	19	18.8
2008	198	17.2	62	12.1	114	20.7	22	25.3
2009	245	20	89	15.4	120	22.4	36	32.7
2010	242	19.9	106	17.8	112	21.5	24	24
2011	274	23.4	115	20.3	139	27	20	22.5
2012	279	24.8	123	21.5	128	27.4	28	32.9
2013	340	29.6	146	25.6	152	31.1	42	46.7
2014	363	30	188	28.7	133	28.7	42	45.2
2015	415	31.3	196	29	161	30	58	52.3
2016	376	28.1	186	26.8	149	28	41	37.6

Appendix Table II: U.S. likely precision medicine (LPM) trials: cancer only (1995-2016):

Generous definition								
	All	All	P1	P1	P2	P2	P3	P3
	Count	%	Count	%	Count	%	Count	%
1995	8	6.15	3	5.36	2	4	3	12.5
1996	18	8.57	4	5.19	9	10	5	11.6
1997	23	7.82	10	7.94	9	6.57	4	12.9
1998	38	8.15	6	3.66	26	10.3	6	12.2
1999	45	8.09	16	7.55	24	8.57	5	7.81
2000	57	8.78	15	6.1	34	10.7	8	9.3
2001	65	10.1	24	10.2	31	9.09	10	14.3
2002	85	12.3	32	12.8	41	10.8	12	20
2003	91	11.8	22	8.21	56	13.2	13	15.7
2004	117	11.8	38	10.9	69	12.5	10	11.6
2005	119	11	31	7.33	70	12.2	18	20
2006	155	13.3	48	10.4	90	14.7	17	18.7
2007	201	16.7	56	11.2	125	20.7	20	19.8
2008	207	18	65	12.7	120	21.7	22	25.3
2009	271	22.2	106	18.3	129	24.1	36	32.7
2010	257	21.1	112	18.8	121	23.3	24	24
2011	290	24.8	125	22	143	27.8	22	24.7
2012	293	26.1	132	23.1	132	28.3	29	34.1
2013	354	30.8	153	26.8	156	31.9	45	50
2014	387	31.9	202	30.8	143	30.8	42	45.2
2015	453	34.2	212	31.3	180	33.5	61	55
2016	413	30.9	205	29.5	165	31	43	39.4
Restrictive definition								
	All	All	P1	P1	P2	P2	P3	P3
	Count	%	Count	%	Count	%	Count	%
1995	8	6.15	3	5.36	2	4	3	12.5
1996	16	7.62	3	3.9	8	8.89	5	11.6
1997	21	7.14	9	7.14	8	5.84	4	12.9
1998	36	7.73	5	3.05	25	9.88	6	12.2
1999	42	7.55	15	7.08	22	7.86	5	7.81
2000	54	8.32	13	5.28	33	10.4	8	9.3
2001	63	9.75	22	9.36	31	9.09	10	14.3
2002	81	11.7	31	12.4	39	10.3	11	18.3
2003	84	10.9	19	7.09	52	12.3	13	15.7
2004	110	11.1	35	10.1	65	11.7	10	11.6
2005	111	10.2	28	6.62	65	11.3	18	20
2006	144	12.4	44	9.54	83	13.5	17	18.7
2007	189	15.7	52	10.4	118	19.6	19	18.8
2008	198	17.2	62	12.1	114	20.7	22	25.3
2009	245	20	89	15.4	120	22.4	36	32.7
2010	242	19.9	106	17.8	112	21.5	24	24
2011	274	23.4	115	20.3	139	27	20	22.5
2012	279	24.8	123	21.5	128	27.4	28	32.9
2013	340	29.6	146	25.6	152	31.1	42	46.7
2014	363	30	188	28.7	133	28.7	42	45.2
2015	415	31.3	196	29	161	30	58	52.3
2016	376	28.1	186	26.8	149	28	41	37.6

Appendix Table III: Dependent variable: Trial duration in months (cancer trials only)

	LPM Trials		Non-LPM Trials	
Phase 2 Clinical (includes Phase 2/Phase 3 trials)	1.478 (1.129)	1.503 (1.127)	3.120*** (0.484)	3.049*** (0.484)
Phase 3 Clinical	15.967*** (1.887)	16.119*** (1.877)	12.922*** (0.932)	12.847*** (0.928)
Trial site in US	3.902*** (1.067)	4.208*** (1.073)	3.946*** (0.473)	4.209*** (0.473)
Public firm (lower bound)	-2.993** (1.052)		-6.125*** (0.467)	
Public firm (upper bound)		-4.447*** (1.074)		-6.703*** (0.460)
Constant	70.280*** (6.449)	70.194*** (6.415)	58.384*** (1.781)	58.429*** (1.782)
N	2289	2289	12423	12423
R^2	0.303	0.306	0.192	0.195

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Sample includes all trials launched after 2000 with known end dates. Duration is winsorized to remove extreme outliers. All OLS models include year fixed effects, and robust standard errors.