

Appendix 2 – Phase 1 results tables and figures

Appendix 2 Table 1: Bibliometric data

Country	GDP (million)	Pop. (thousand)	Pubs.	Cit.	F-a pubs.	F-a cit.	2008 pubs.	2017 pubs.	Int. Coll.	Nat. Coll.	Inst. Coll.	Single author
Algeria	159,049	40,606	8,043	57,188	6,473	28,931	437	1,138	52.7	10.1	34.4	2.7
Angola	95,335	28,813	446	4,827	120	489	21	85	92.5	0.3	7.2	0.0
Benin	8,583	10,872	2,427	22,042	1,166	7,435	161	290	80.7	1.0	17.8	0.6
Botswana	15,581	2,250	1,766	28,298	756	4,583	113	245	79.7	3.5	12.9	3.8
Burkina Faso	11,693	18,646	3,104	36,231	1,336	8,663	216	388	84.5	0.8	14.2	0.4
Burundi	3,007	10,524	243	2,250	67	311	6	40	87.4	0.0	11.4	1.2
Cameroon	32,218	23,439	5,973	69,384	3,356	21,499	376	814	73.7	7.5	17.0	1.8
Cape Verde	1,617	540	124	1,052	19	52	6	20	94.4	1.1	3.3	1.1
Central African Republic	1,756	4,595	333	4,490	137	797	19	40	77.7	1.0	15.8	5.4
Chad	9,601	14,453	203	2,105	55	357	15	41	94.8	0.0	5.2	0.0
Comoros	617	796	61	419	13	33	2	7	77.8	2.8	19.4	0.0
Democratic Republic of the Congo	35,382	78,736	1,535	26,099	609	3,330	64	261	86.2	0.5	12.2	1.2
Djibouti	1,727	942	61	419	30	166	2	7	77.8	2.8	19.4	0.0
Egypt	332,791	95,689	60,693	-	-	-	2,481	8,206	46.4	14.1	32.7	6.9
Equatorial Guinea	10,685	1,221	114	1,714	12	43	6	12	100.0	0.0	0.0	0.0
Eritrea	2,608	4,475	154	1,252	54	176	15	18	83.3	0.0	14.6	2.1
Ethiopia	72,374	102,403	9,926	95,131	6,630	43,786	398	1,768	57.1	6.5	32.2	4.2
Gabon	14,214	1,980	1,203	20,122	446	6,199	84	141	89.5	0.0	9.3	1.1
Gambia	965	2,039	1,175	32,033	363	6,243	92	156	95.7	0.3	2.0	2.0
Ghana	42,690	28,207	7,005	96,341	3,681	19,958	307	1,118	68.7	5.1	22.6	3.6
Guinea	8,200	12,396	1,547	28,939	418	3,416	126	231	91.2	0.2	6.4	2.2
Guinea-Bissau	1,165	1,816	333	5,016	111	1,963	18	48	99.1	0.5	0.0	0.5
Ivory Coast	36,373	23,696	2,622	31,674	1,573	5,637	251	284	67.8	1.1	30.4	0.7

Table 1: Bibliometric data

Country	GDP (million)	Pop. (thousand)	Pubs.	Cit.	F-a pubs.	F-a cit.	2008 pubs.	2017 pubs.	Int. Coll.	Nat. Coll.	Inst. Coll.	Single author
Kenya	70,529	48,462	14,286	243,026	6,071	61,021	943	1,909	83.2	5.6	9.0	2.2
Lesotho	2,291	2,204	186	2,581	64	478	14	22	88.6	0.0	9.5	1.9
Liberia	2,101	4,614	258	3,733	45	296	7	57	92.8	1.4	3.4	2.4
Libya	34,699	6,293	1,513	14,307	735	3,379	77	151	81.3	0.2	14.9	3.5
Madagascar	10,001	24,895	1,999	23,688	680	4,113	157	264	86.2	0.3	12.5	0.9
Malawi	5,433	18,092	3,442	56,398	1,204	13,344	228	540	90.5	1.1	6.0	2.3
Mali	14,035	17,995	1,691	26,428	495	4,014	114	244	89.9	0.3	9.4	0.4
Mauritania	4,739	4,301	227	1,719	83	400	13	32	90.9	0.0	8.4	0.7
Mauritius	12,168	1,263	737	8,004	404	2,294	37	104	65.3	0.2	30.4	4.0
Morocco	103,606	35,277	12,051	80,662	9,514	32,877	744	1,537	36.8	14.2	47.3	1.8
Mozambique	11,015	28,829	1,731	39,885	542	5,014	81	290	93.4	1.2	3.8	1.6
Namibia	10,948	2,480	1,026	10,156	337	1,386	44	154	83.9	0.4	8.3	7.4
Niger	7,528	20,673	804	9,075	278	1,808	56	99	84.7	1.3	12.4	1.7
Nigeria	404,653	185,990	31,023	205,135	25,853	109,386	2,443	3,369	36.3	14.1	45.1	4.5
Republic of the Congo	7,834	5,126	921	11,026	351	1,496	50	102	80.9	0.3	17.1	1.6
Rwanda	8,376	11,918	1,519	23,953	538	4,022	50	245	90.1	0.5	7.1	2.4
Sao Tome and Principe	343	200	25	335	4	56	0	7	100.0	0.0	0.0	0.0
Senegal	14,684	15,412	3,667	37,424	1,759	10,138	234	473	73.1	4.5	21.1	1.3
Seychelles	1,427	95	339	5,631	57	567	31	44	83.0	0.5	4.5	2.0
Sierra Leone	3,737	7,396	530	7,489	102	975	15	114	94.5	0.2	4.2	1.0
Somalia	6,217	14,318	73	685	24	74	3	21	96.2	0.0	1.9	1.9
South Africa	295,456	56,015	63,171	-	-	-	4,210	8,325	57.2	10.6	26.3	5.9

Table 1: Bibliometric data

Country	GDP (million)	Pop. (thousand)	Pubs.	Cit.	F-a pubs.	F-a cit.	2008 pubs.	2017 pubs.	Int. Coll.	Nat. Coll.	Inst. Coll.	Single author
Sudan	95,584	39,579	3,620	46,793	1,949	10,599	214	442	76.2	0.1	20.1	3.6
Swaziland	3,721	1,343	542	5,871	199	1,727	31	92	86.8	0.7	7.9	4.6
Tanzania	47,340	55,572	7,716	119,936	3,167	26,771	429	1,061	83.2	1.4	13.3	2.0
Togo	4,400	7,606	924	6,331	562	1,739	51	107	65.2	0.0	34.5	0.3
Tunisia	42,063	11,403	20,532	182,898	17,138	117,263	1,592	2,373	47.6	7.8	43.5	1.1
Uganda	24,079	41,488	8,250	145,435	3,496	34,353	441	1,171	85.6	2.2	10.8	1.5
Zambia	21,064	16,591	2,758	49,329	861	8,047	218	446	90.8	2.2	5.5	1.5
Zimbabwe	16,620	16,150	3,005	45,515	1,320	9,604	205	469	75.2	1.8	19.6	3.4

Cit., citations; coll., collaboration; F-A, first-author; GDP, gross domestic product; inst., institutional; int., international; nat., national; pop., population; pubs., publications

Collaboration figures are from SciVal and reflect outputs published in 2013-2017. All other data cover outputs published in 2008-2017.

Appendix 2 Table 2: Clinical trial infrastructures and intellectual property rights

	GDP (million)	Pop. (thousand)	Trials (ICTRP)	Trials per 1 mill.	Trials (ct.gov)	Patent apps	Patent apps per 1 mill.
Algeria	159,049	40,606	165	4.06	95	106	2.61
Angola	95,335	28,813	16	0.56	3	-	-
Benin	8,583	10,872	54	4.97	38	-	-
Botswana	15,581	2,250	93	41.33	64	1	0.44
Burkina Faso	11,693	18,646	186	9.98	126	2	0.11
Burundi	3,007	10,524	19	1.81	11	-	-
Cameroon	32,218	23,439	113	4.82	68	-	-
Cape Verde	1,617	540	0	0.00	0	-	-
Central African Republic	1,756	4,595	13	2.83	6	-	-
Chad	9,601	14,453	12	0.83	7	-	-
Comoros	617	796	3	3.77	1	-	-
Democratic Republic of the Congo	35,382	78,736	87	1.10	55	-	-
Djibouti	1,727	942	4	4.24	1	1	1.06
Egypt	332,791	95,689	3,711	38.78	2,409	918	9.59
Equatorial Guinea	10,685	1,221	6	4.91	3	-	-
Eritrea	2,608	4,475	6	1.34	0	-	-
Ethiopia	72,374	102,403	188	1.84	124	12	0.12
Gabon	14,214	1,980	63	31.82	44	-	-
Gambia	965	2,039	119	58.38	67	-	-
Ghana	42,690	28,207	238	8.44	137	14	0.50
Guinea	8,200	12,396	31	2.50	20	-	-
Guinea-Bissau	1,165	1,816	62	34.15	51	-	-
Ivory Coast	36,373	23,696	72	3.04	39	26	1.10

Table 2: Clinical trial infrastructures and intellectual property rights

	GDP (million)	Pop. (thousand)	Trials (ICTRP)	Trials per 1 mill.	Trials (ct.gov)	Patent apps	Patent apps per 1 mill.
Kenya	70,529	48,462	639	13.19	417	144	2.97
Lesotho	2,291	2,204	22	9.98	16	-	-
Liberia	2,101	4,614	25	5.42	16	-	-
Libya	34,699	6,293	19	3.02	6	-	-
Madagascar	10,001	24,895	27	1.08	15	6	0.24
Malawi	5,433	18,092	317	17.52	201	3	0.17
Mali	14,035	17,995	170	9.45	128	-	-
Mauritania	4,739	4,301	10	2.33	1	-	-
Mauritius	12,168	1,263	34	26.91	20	2	1.58
Morocco	103,606	35,277	191	5.41	96	237	6.72
Mozambique	11,015	28,829	97	3.36	68	15	0.52
Namibia	10,948	2,480	7	2.82	3	-	-
Niger	7,528	20,673	34	1.64	26	-	-
Nigeria	404,653	185,990	342	1.84	139	50	0.27
Republic of the Congo	7,834	5,126	52	10.14	37	-	-
Rwanda	8,376	11,918	97	8.14	71	2	0.17
Sao Tome and Principe	343	200	2	10.00	0	-	-
Senegal	14,684	15,412	103	6.68	75	-	-
Seychelles	1,427	95	3	31.69	1	-	-
Sierra Leone	3,737	7,396	39	5.27	17	-	-
Somalia	6,217	14,318	14	0.98	0	-	-
South Africa	295,456	56,015	4,341	77.50	2,505	2,783	49.68
South Sudan	9,015	12,231	2	0.16	0	-	-

Table 2: Clinical trial infrastructures and intellectual property rights

	GDP (million)	Pop. (thousand)	Trials (ICTRP)	Trials per 1 mill.	Trials (ct.gov)	Patent apps	Patent apps per 1 mill.
Sudan	95,584	39,579	71	1.79	34	284	7.18
Swaziland	3,721	1,343	22	16.38	13	-	-
Tanzania	47,340	55,572	433	7.79	290	1	0.02
Togo	4,400	7,606	16	2.10	8	-	-
Tunisia	42,063	11,403	426	37.36	255	235	20.61
Uganda	24,079	41,488	651	15.69	447	16	0.39
Zambia	21,064	16,591	262	15.79	171	14	0.84
Zimbabwe	16,620	16,150	190	11.76	111	8	0.50

Apps, applications; GDP, gross domestic product; ICTRP, International Clinical Trials Registry Platform.

Appendix 2 Table 3: R&D personnel

	GDP (million)	Pop. (thousand)	R&D staff per mill.	Researchers per mill.	Researchers (% M&HS)	Researchers (% PhD)
Algeria	159,049	40,606	220.23	168.02	6.87	16.22
Angola	95,335	28,813	84.15	47.48		20.09
Benin	8,583	10,872	-	-	-	-
Botswana	15,581	2,250	570.35	179.47	18.31	29.37
Burkina Faso	11,693	18,646	131.33	47.58	46.37	41.85
Burundi	3,007	10,524	-	-	-	-
Cameroon	32,218	23,439	-	-	-	-
Cape Verde	1,617	540	72.83	49.21	0.00	72.00
Central African Republic	1,756	4,595	-	-	-	-
Chad	9,601	14,453	75.90	58.33	6.49	29.72
Comoros	617	796	-	-	-	-
Democratic Republic of the Congo	35,382	78,736	19.45	7.23	7.68	11.95
Djibouti	1,727	942	-	-	-	-
Egypt	332,791	95,689	1,208.51	680.30	29.80	55.86
Equatorial Guinea	10,685	1,221	-	-	-	-
Eritrea	2,608	4,475	-	-	-	-
Ethiopia	72,374	102,403	121.21	44.97	12.98	16.66
Gabon	14,214	1,980	-	-	-	-
Gambia	965	2,039	603.31	33.56	40.96	55.63
Ghana	42,690	28,207	122.57	38.37	14.40	34.39
Guinea	8,200	12,396	-	-	-	-
Guinea-Bissau	1,165	1,816	-	-	-	-
Ivory Coast	36,373	23,696	-	69.21	-	-

Table 3: R&D personnel

Country	GDP (million)	Pop. (thousand)	R&D staff per mill.	Researchers per mill.	Researchers (% M&HS)	Researchers (% PhD)
Kenya	70,529	48,462	1,029.40	225.03	25.82	6.07
Lesotho	2,291	2,204	32.90	22.83	0.00	28.06
Liberia	2,101	4,614	-	-	-	-
Libya	34,699	6,293	-	-	-	-
Madagascar	10,001	24,895	113.00	24.70	13.17	46.99
Malawi	5,433	18,092	113.44	48.27	18.99	9.89
Mali	14,035	17,995	73.45	30.79	11.25	61.79
Mauritania	4,739	4,301	-	-	-	-
Mauritius	12,168	1,263	500.18	181.83	6.59	27.58
Morocco	103,606	35,277	1,149.30	1,068.96	9.22	16.24
Mozambique	11,015	28,829	82.83	41.48	11.65	13.99
Namibia	10,948	2,480	235.68	143.32	3.47	21.76
Niger	7,528	20,673	43.69	7.42	-	-
Nigeria	404,653	185,990	77.38	38.77	-	34.11
Republic of the Congo	7,834	5,126	67.27	31.54	-	-
Rwanda	8,376	11,918	-	12.35	-	37.66
Sao Tome and Principe	343	200	-	-	-	-
Senegal	14,684	15,412	622.86	549.32	14.07	38.68
Seychelles	1,427	95	2,028.31	146.49		15.38
Sierra Leone	3,737	7,396	-	-	-	-
Somalia	6,217	14,318	-	-	-	-
South Africa	295,456	56,015	742.51	473.12		35.22
South Sudan	9,015	12,231	-	-	-	-

Table 3: R&D personnel

Country	GDP	Pop.	R&D staff	Researchers	Researchers	Researchers
	(million)	(thousand)	per mill.	per mill.	(% M&HS)	(% PhD)
Sudan	95,584	39,579	-	-	-	-
Swaziland	3,721	1,343	308.97	119.14	33.93	24.98
Tanzania	47,340	55,572	38.84	18.34	-	32.78
Togo	4,400	7,606	42.42	31.77	16.11	68.88
Tunisia	42,063	11,403	2,068.71	1,964.97	-	35.07
Uganda	24,079	41,488	41.54	26.47	19.55	30.51
Zambia	21,064	16,591	162.81	40.97	-	-
Zimbabwe	16,620	16,150	118.34	88.72	0.23	13.45

GDP, gross domestic product; M&HS, medical and health sciences; mill., million; pop., population; PhD, doctor of philosophy; R&D, research and development.

All data are from 2016 or most recent year available.

Appendix 2 Table 4: R&D expenditure

Country	GDP (million)	Pop. (thousand)	GERD	GERD (% GDP)	GERD per capita	GERD (M&HS)	GERD per researcher	GERD (M&HS %)
Algeria	159,049	40,606	241,204.78	0.07	7.25	-	43.13	-
Angola	95,335	28,813	-	-	-	-	-	-
Benin	8,583	10,872	-	-	-	-	-	-
Botswana	15,581	2,250	184,247.17	0.54	86.56	23,143.69	482.32	30.04
Burkina Faso	11,693	18,646	65,025.67	0.22	3.70	2,910.88	-	4.48
Burundi	3,007	10,524	8,460.33	0.12	0.94	-	-	-
Cameroon	32,218	23,439	-	-	-	-	-	-
Cape Verde	1,617	540	2,211.43	0.07	4.35	-	88.46	-
Central African Republic	1,756	4,595	-	-	-	-	-	-
Chad	9,601	14,453	91,046.10	0.32	6.30	14,722.82	108.00	16.17
Comoros	617	796	-	-	-	-	-	-
Democratic Republic of the Congo	35,382	78,736	10,234.03	0.02	0.13	-	18.58	-
Djibouti	1,727	942	-	-	-	-	-	-
Egypt	332,791	95,689	7,562,293.01	0.71	79.03	-	116.17	-
Equatorial Guinea	10,685	1,221	-	-	-	-	-	-
Eritrea	2,608	4,475	-	-	-	-	-	-
Ethiopia	72,374	102,403	787,274.45	0.60	8.30	34,522.66	184.52	15.50
Gabon	14,214	1,980	131,865.44	0.58	83.10	-	-	-
Gambia	965	2,039	3,543.77	0.13	2.03	-	60.47	-
Ghana	42,690	28,207	276,671.79	0.38	11.29	-	294.14	-
Guinea	8,200	12,396	-	-	-	-	-	-
Guinea-Bissau	1,165	1,816	-	-	-	-	-	-
Ivory Coast	36,373	23,696	-	-	-	-	-	-

Table 4: R&D expenditure

Country	GDP (million)	Pop. (thousand)	GERD	GERD (% GDP)	GERD per capita	GERD (M&HS)	GERD per researcher	GERD (M&HS %)
Kenya	70,529	48,462	788,176.89	0.79	19.06	216,530.58	84.70	27.47
Lesotho	2,291	2,204	3,018.33	0.05	1.39	0.00	60.79	0.00
Liberia	2,101	4,614	-	-	-	-	-	-
Libya	34,699	6,293	-	-	-	-	-	-
Madagascar	10,001	24,895	5,626.29	0.01	0.23	768.68	9.15	13.66
Malawi	5,433	18,092						
Mali	14,035	17,995	112,531.28	0.31	6.44	9,256.23	209.22	8.23
Mauritania	4,739	4,301	-	-	-	-	-	-
Mauritius	12,168	1,263	38,856.48	0.18	31.00	1,714.62	170.50	4.41
Morocco	103,606	35,277	1,483,610.29	0.71	45.78		63.73	
Mozambique	11,015	28,829	112,790.11	0.34	4.03	32,234.22	97.08	28.58
Namibia	10,948	2,480	81,658.45	0.34	34.44	1,585.30	240.31	1.94
Niger	7,528	20,673	-	-	-	-	-	-
Nigeria	404,653	185,990	1,374,848.32	0.22	9.39	142,133.56	242.20	10.34
Republic of the Congo	7,834	5,126	-	-	-	-	-	-
Rwanda	8,376	11,918	-	-	-	-	-	-
Sao Tome and Principe	343	200	-	-	-	-	-	-
Senegal	14,684	15,412	275,579.68	0.75	18.40	-	33.50	-
Seychelles	1,427	95	5,961.26	0.22	63.26	-	305.37	-
Sierra Leone	3,737	7,396	-	-	-	-	-	-
Somalia	6,217	14,318	-	-	-	-	-	-
South Africa	295,456	56,015	5,823,288.67	0.80	105.32	905,563.36	222.61	18.19
South Sudan	9,015	12,231	-	-	-	-	-	-

Table 4: R&D expenditure

Country	GDP (million)	Pop. (thousand)	GERD	GERD (% GDP)	GERD per capita	GERD (M&HS)	GERD per researcher	GERD (M&HS %)
Sudan	95,584	39,579	281,296.26	0.30	9.10	-	-	-
Swaziland	3,721	1,343	29,493.90	0.27	22.36	8,923.15	187.68	30.25
Tanzania	47,340	55,572	623,754.21	0.53	12.32	-	671.75	-
Togo	4,400	7,606	27,209.82	0.27	3.76	4,317.74	100.19	15.87
Tunisia	42,063	11,403	794,749.43	0.60	69.70	-	35.47	-
Uganda	24,079	41,488	114,149.62	0.17	2.94	14,811.03	111.06	12.98
Zambia	21,064	16,591	100,756.29	0.28	7.70	-	187.98	-
Zimbabwe	16,620	16,150	-	-	-	-	-	-

GERD, gross expenditure on research and development; GDP, gross domestic product; M&HS, medical and health sciences; pop., population; PhD, doctor of philosophy; R&D, research and development.

All data are from 2016 or most recent year available.

Appendix 2 Table 5: Regulatory capacities

Country	GDP (million)	Pop. (thousand)	Organizations	Legislation	Regulations	Guidelines	NPHI	NEC	IRBs
Algeria	159,049	40,606	1	0	2	0	-	Y	1
Angola	95,335	28,813	-	-	-	-	Y	-	0
Benin	8,583	10,872	0	1	0	0	-	Y	3
Botswana	15,581	2,250	3	2	1	5	-	Y	4
Burkina Faso	11,693	18,646	1	0	2	0	-	Y	4
Burundi	3,007	10,524	-	-	-	-	Y	-	0
Cameroon	32,218	23,439	1	0	1	1	Y	-	8
Cape Verde	1,617	540	-	-	-	-	Y	Y	0
Central African Republic	1,756	4,595	-	-	-	-	-	-	1
Chad	9,601	14,453	-	-	-	-	-	-	0
Comoros	617	796	-	-	-	-	-	-	0
Democratic Republic of the Congo	35,382	78,736	0	1	0	0	-	Y	4
Djibouti	1,727	942	-	-	-	-	-	-	0
Egypt	332,791	95,689	2	1	1	0	-	Y	23
Equatorial Guinea	10,685	1,221	-	-	-	-	-	-	0
Eritrea	2,608	4,475	-	-	-	-	-	-	0
Ethiopia	72,374	102,403	3	1	1	2	Y	Y	7
Gabon	14,214	1,980	-	-	-	-	-	Y	1
Gambia	965	2,039	1	0	0	1	-	Y	1
Ghana	42,690	28,207	1	1	1	4	Y	Y	3
Guinea	8,200	12,396	2	2	1	1	Y	-	0
Guinea-Bissau	1,165	1,816	-	-	-	-	Y	-	0
Ivory Coast	36,373	23,696	1	0	1	0	Y	Y	1

Table 5: Regulatory capacities

Country	GDP (million)	Pop. (thousand)	Organizations	Legislation	Regulations	Guidelines	NPHI	NEC	IRBs
Kenya	70,529	48,462	4	3	2	2	Y	-	4
Lesotho	2,291	2,204	-	-	-	-	-	-	1
Liberia	2,101	4,614	2	0	2	1	Y	-	2
Libya	34,699	6,293	-	-	-	-	Y	-	1
Madagascar	10,001	24,895	0	1	0	0	Y	Y	2
Malawi	5,433	18,092	8	5	2	8	Y	Y	2
Mali	14,035	17,995	1	1	0	0	-	Y	1
Mauritania	4,739	4,301	-	-	-	-	-	-	0
Mauritius	12,168	1,263	-	-	-	-	-	Y	2
Morocco	103,606	35,277	-	-	-	-	Y	-	2
Mozambique	11,015	28,829	0	0	0	1	Y	-	0
Namibia	10,948	2,480	-	-	-	-	-	-	1
Niger	7,528	20,673	-	-	-	-	-	-	1
Nigeria	404,653	185,990	5	2	0	6	Y	Y	26
Republic of the Congo	7,834	5,126	-	-	-	-	-	Y	2
Rwanda	8,376	11,918	1	0	0	1	Y	Y	3
Sao Tome and Principe	343	200	-	-	-	-	Y	-	0
Senegal	14,684	15,412	1	1	0	0	-	Y	2
Seychelles	1,427	95	-	-	-	-	-	-	0
Sierra Leone	3,737	7,396	3	0	3	3	Y	-	0
Somalia	6,217	14,318	-	-	-	-	Y	-	0
South Africa	295,456	56,015	11	5	7	9	Y	Y	30
South Sudan	9,015	12,231	-	-	-	-	-	-	0

Table 5: Regulatory capacities

Country	GDP (million)	Pop. (thousand)	Organizations	Legislation	Regulations	Guidelines	NPHI	NEC	IRBs
Sudan	95,584	39,579	5	3	0	4	Y	Y	7
Swaziland	3,721	1,343	-	-	-	-	-	-	0
Tanzania	47,340	55,572	5	5	3	3	Y	-	5
Togo	4,400	7,606	2	0	1	2	Y	Y	1
Tunisia	42,063	11,403	-	-	-	-	-	Y	2
Uganda	24,079	41,488	2	2	0	1	Y	Y	9
Zambia	21,064	16,591	2	3	0	1	Y	-	3
Zimbabwe	16,620	16,150	5	6	3	4	-	-	3

GDP, gross domestic product; IRB, institutional review board; NEC, national ethics committee NPHI, national public health institute; pop., population.

Appendix 2 Table 6: Funding

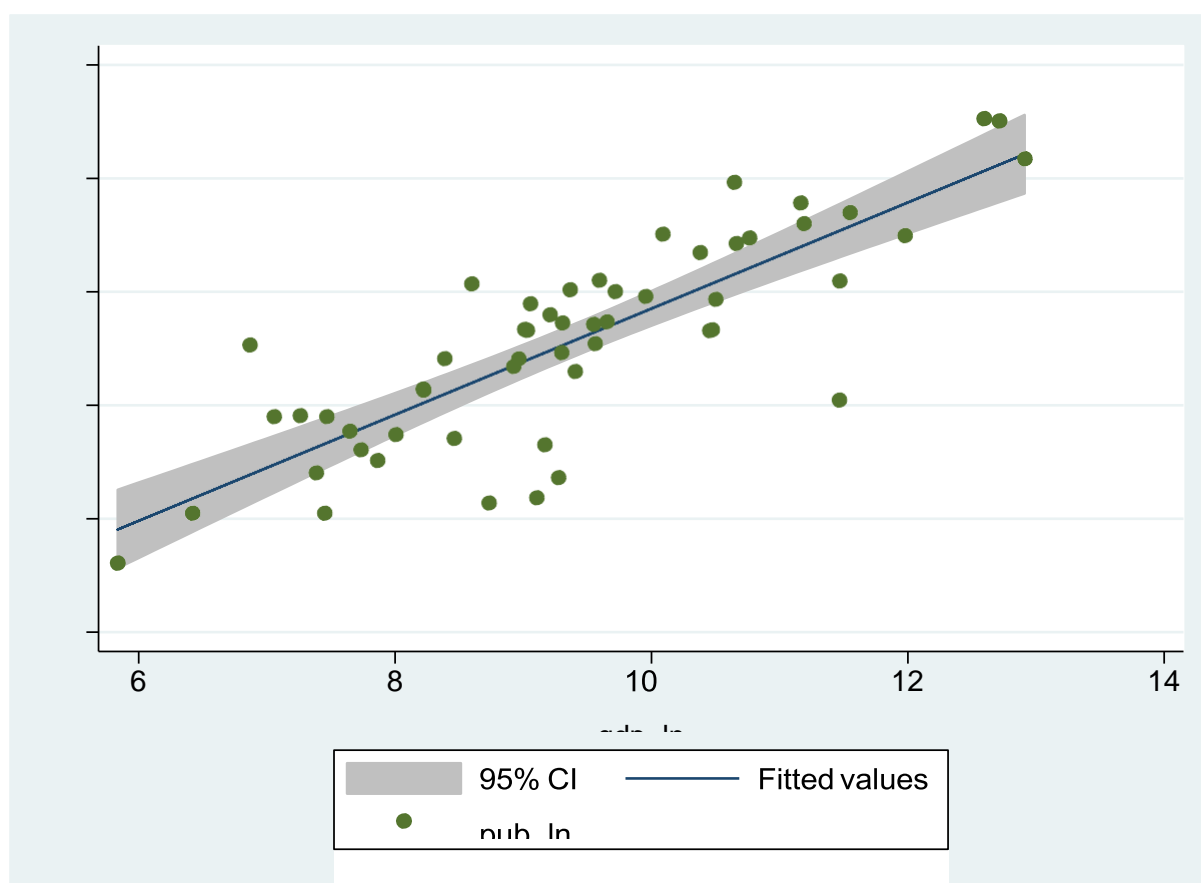
Country	WT	MRC	NIH	CIHR	NHMRC	INSERM	DFG	HHMI	EC	CDMRP
Benin	-	-	1,446,653.00	-	-	-	-	-	-	-
Botswana	184,186.00	-	7,356,998.00	-	-	-	-	-	-	-
Burkina Faso	39,300.00	-		-	-	-	-	-	-	-
Cameroon	133,593.80	-		-	-	-	-	-	-	-
Ivory Coast	9,177,381.85	-		-	-	-	-	-	-	-
Democratic Republic of the Congo	0.00	-	451,242.00	-	-	-	-	-	-	-
Egypt	0.00	-	384,112.00	-	-	-	-	-	-	-
Ethiopia	0.00	156,726.38	4,045,740.00	-	-	-	-	-	-	-
Gambia	2,201,155.01	93,350,867.24	220,300.00	-	-	-	-	-	-	-
Ghana	6,802,150.11	-	19,915,940.00	-	-	-	-	-	-	-
Kenya	120,959,548.23	762,618.20	23,965,606.00	-	-	-	-	-	-	-
Madagascar	0.00	-	269,867.00	-	-	-	-	-	-	-
Malawi	8,620,144.53	-	3,239,240.00	-	-	-	-	-	-	-
Mali	1,317,039.94	-	7,315,257.00	-	-	-	-	-	-	-
Mozambique	0.00	-	14,014,017.00	-	-	-	-	-	-	-
Namibia	0.00	-		-	-	-	-	-	-	-
Nigeria	1,002,984.47	-	34,273,898.00	-	-	-	-	-	-	-
Rwanda	0.00	-	1,539,861.00	-	-	-	-	-	-	-
Senegal	1,373,601.81	1,720,283.81	-	-	-	-	-	-	-	-
South Africa	77,994,865.15	13,302,915.07	388,950,849.00	-	-	-	-	-	-	-
Sudan	0.00	-	-	-	-	-	-	-	-	-
Tanzania	16,673,318.44	-	4,764,355.00	-	-	-	-	-	-	-
Tunisia	0.00	-	2,178,511.00	-	-	-	-	-	-	-
Uganda	17,943,085.72	40,607,133.72	35,999,665.00	-	-	-	-	-	-	-

Table 6: Funding

Country	WT	MRC	NIH	CIHR	NHMRC	INSERM	DFG	HHMI	EC	CDMRP
Zambia	15,720.00	-	13,073,179.00	-	-	-	-	-	-	-
Zimbabwe	1,389,486.87	-	21,663,497.00	-	-	-	-	-	-	-

CIHR, Canadian Institutes of Health Research; CDMRP, Congressional Directed Medical Research Programs (Department of Defence); DFG, German Research Foundation (Deutsche Forschungsgemeinschaft); EC, European Commission; HHMI, Howard Hughes Medical Institute; INSERM, Institut national de la santé et de la recherche médicale; MRC, Medical Research Council; NHMRC, National health and Medical Research Council; NIH, National Institutes of Health; WT, Wellcome Trust

*Cells for CIHR, NHMRC, INSERM, HHMI, CDMRP are empty because data did not meet inclusion criteria. We excluded funding for research projects in which the principal investigators were based at non-African institutions, even if these projects included collaborators, field sites, or locations of research in Africa.



Appendix 2 Figure 1. The relationship between gross domestic product and publications

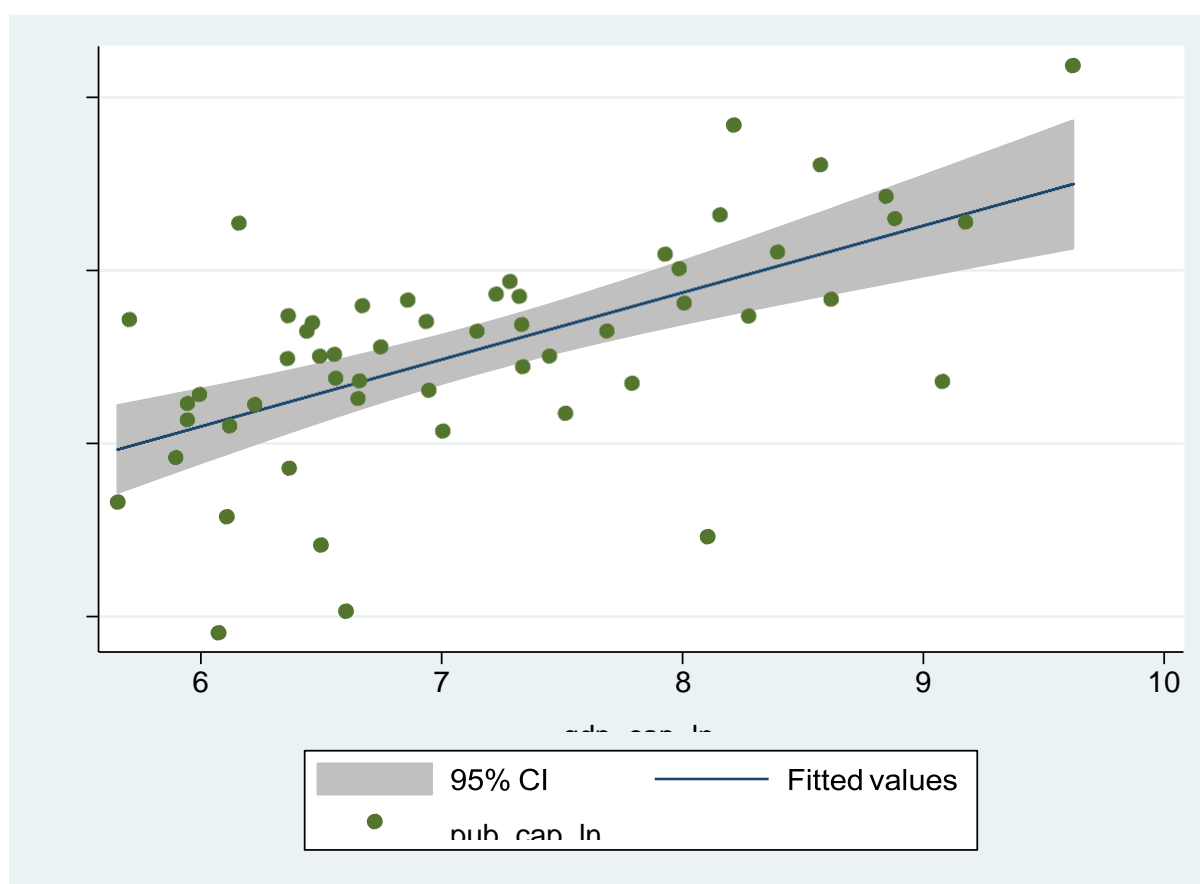
Note: Both variables are expressed as natural logs.

Appendix 2 Table 7. Regression summary for gross domestic product and number of publications

	(1) pub_ln
gdp_ln	0.934*** (10.52)
Constant	-1.630 (-1.93)
Observations	54
R^2	0.680
Adjusted R^2	0.674

t statistics in parentheses

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



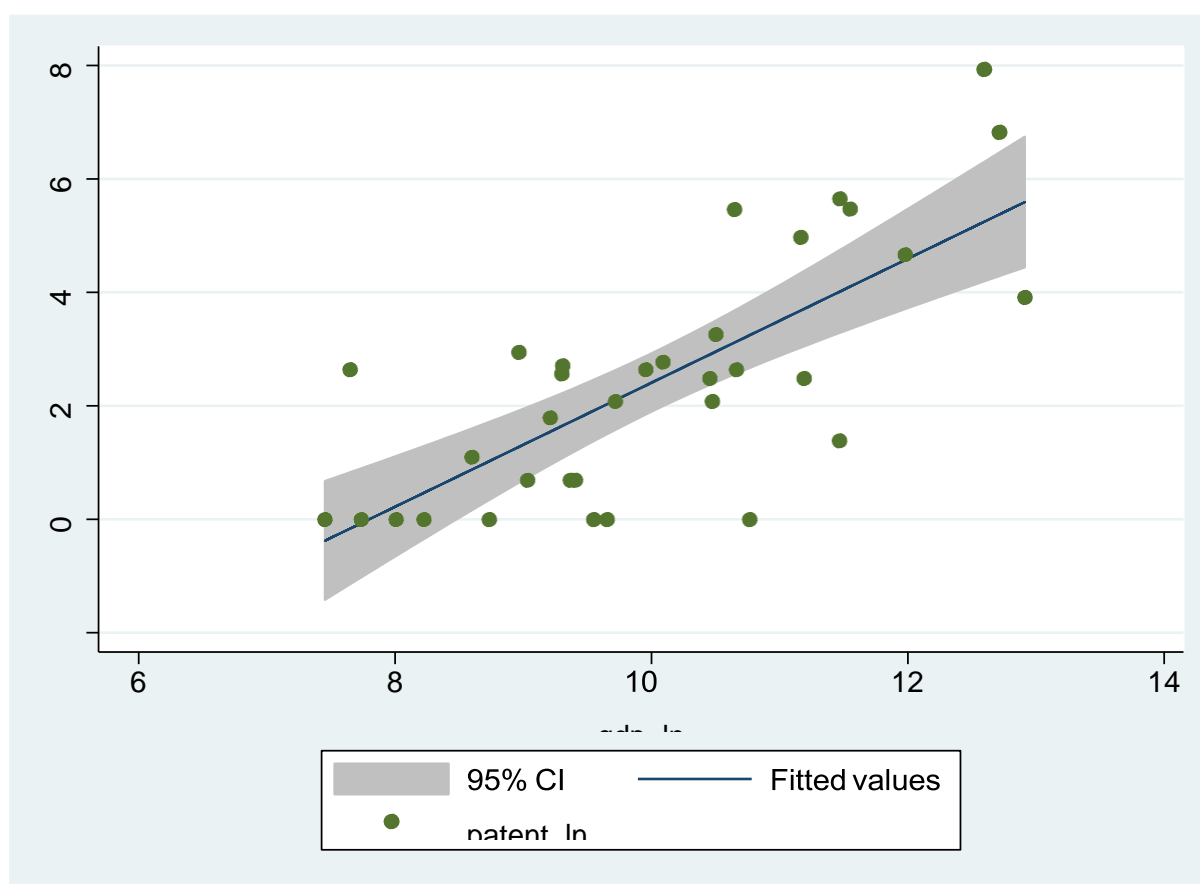
Appendix 2 Figure 2. The relationship between gross domestic product per capita and publications per capita

Note: Both variables are expressed as natural logs.

Appendix 2 Table 8. Regression summary for gross domestic product per capita and the number of publications per capita

	(1) pub_cap_ln
gdp_cap_ln	0.771*** (5.56)
Constant	-14.42*** (-14.39)
Observations	54
R^2	0.373
Adjusted R^2	0.361
<i>t</i> statistics in parentheses	

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



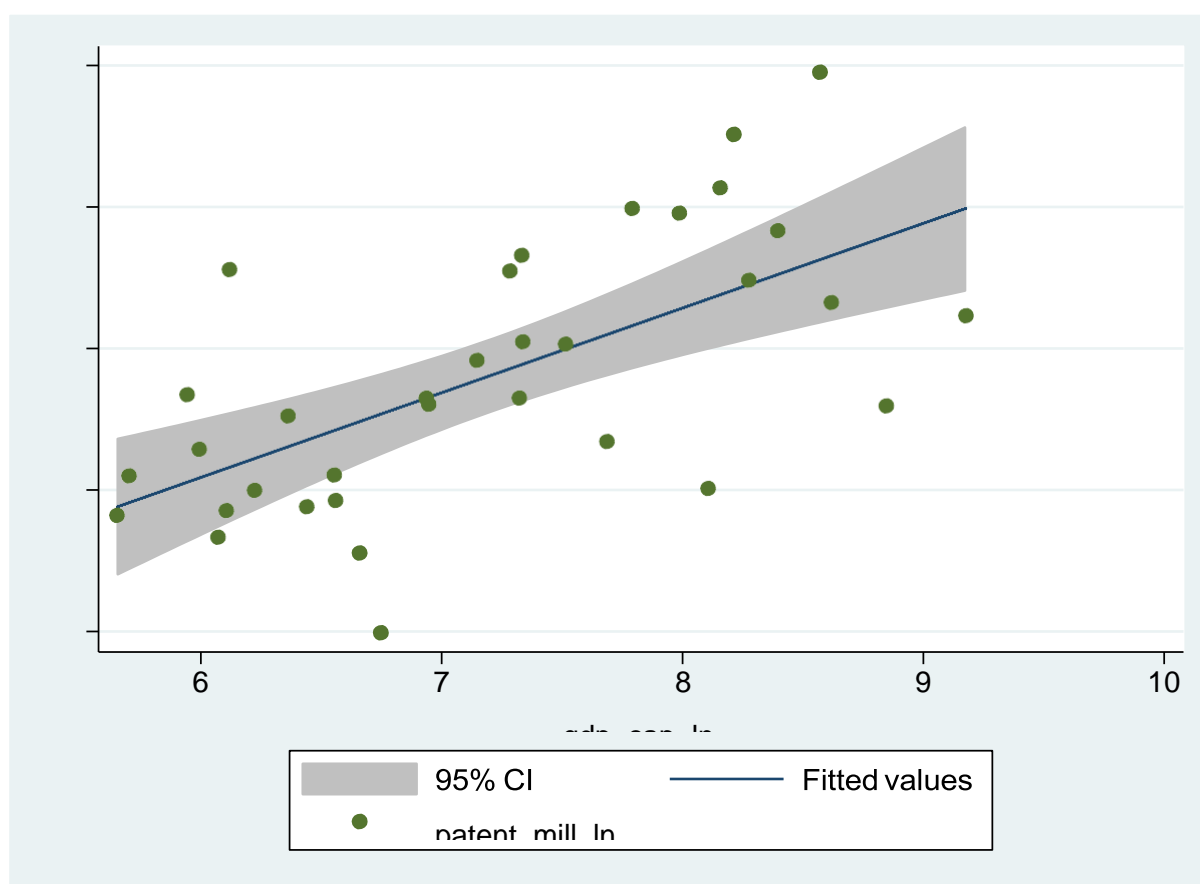
Appendix 2 Figure 3. The relationship between gross domestic product and patent applications

Note: Both variables are expressed as natural logs.

Appendix 2 Table 9. Regression summary for gross domestic product and patent applications

	(1) patent_ln
gdp_ln	1.093*** (6.27)
Constant	-8.519*** (-4.83)
Observations	34
R^2	0.551
Adjusted R^2	0.537
<i>t</i> statistics in parentheses	

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



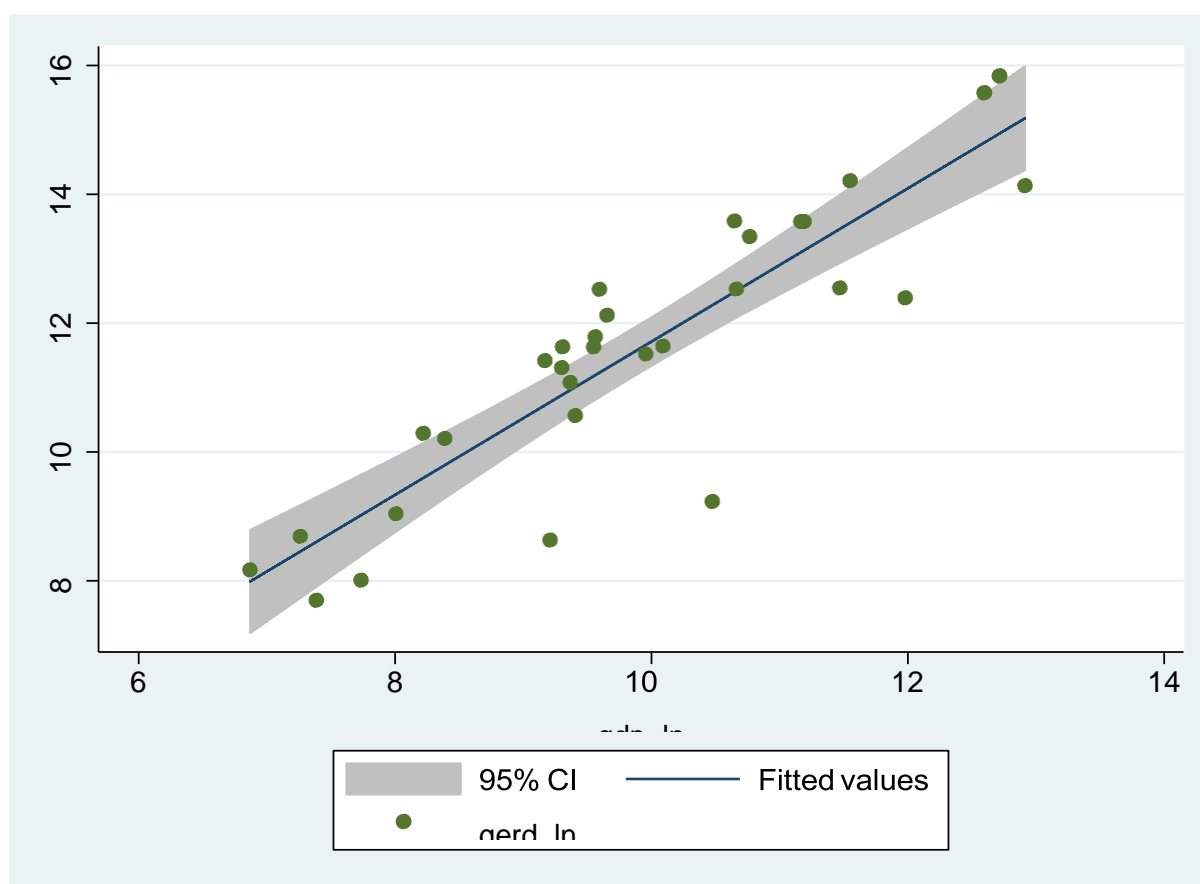
Appendix 2 Figure 4. The relationship between gross domestic product per capita and patent applications per capita

Note: Both variables are expressed as natural logs.

Appendix 2 Table 10. Regression summary for gross domestic product per capita and patent applications per capita

	(1) patent_mill_ln
gdp_cap_ln	1.196*** (4.65)
Constant	-8.996*** (-4.81)
Observations	34
R^2	0.403
Adjusted R^2	0.384
<i>t</i> statistics in parentheses	

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



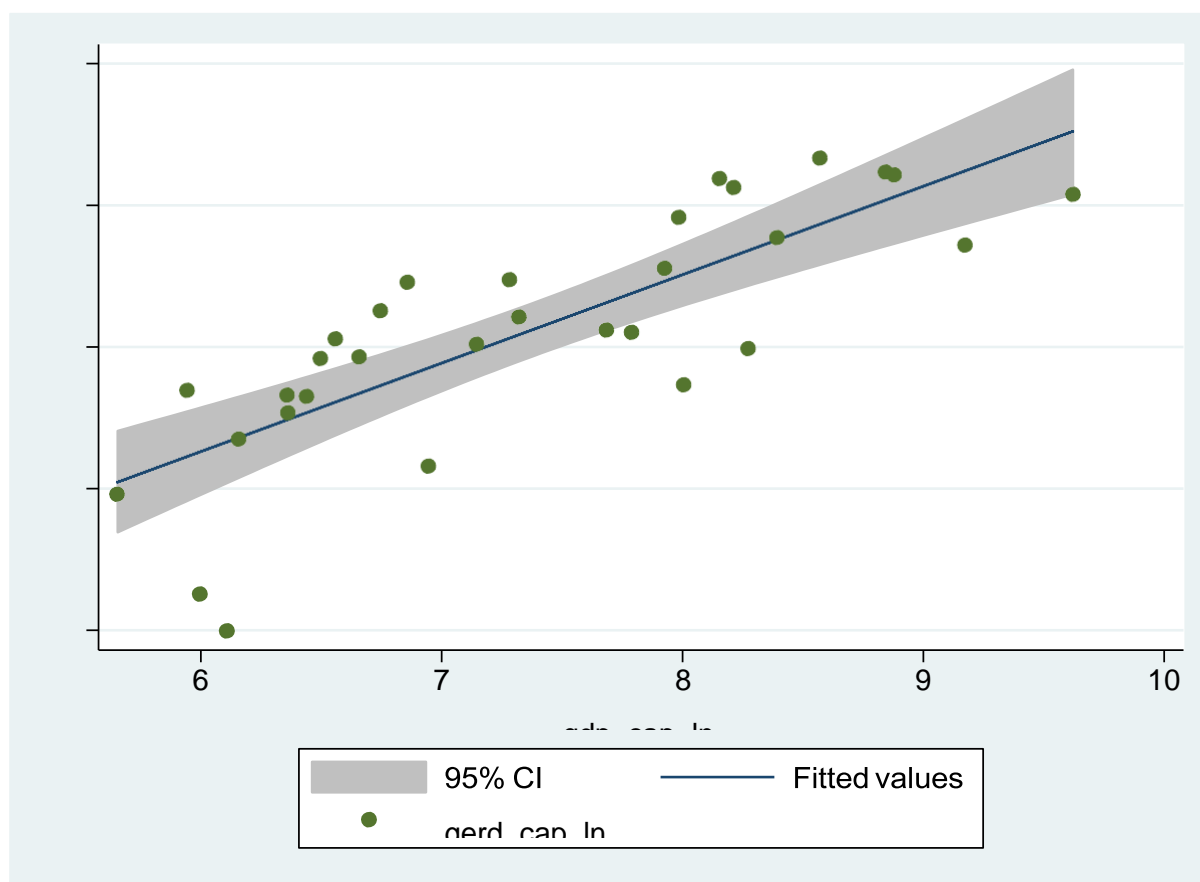
Appendix 2 Figure 5. The relationship between gross domestic product and GERD

Note: Both variables are expressed as natural logs.

Appendix 2 Table 11. Regression summary for gross domestic product and GERD

	(1) gerd_ln
gdp_ln	1.190*** (10.38)
Constant	-0.188 (-0.16)
Observations	31
R^2	0.788
Adjusted R^2	0.781
<i>t</i> statistics in parentheses	

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



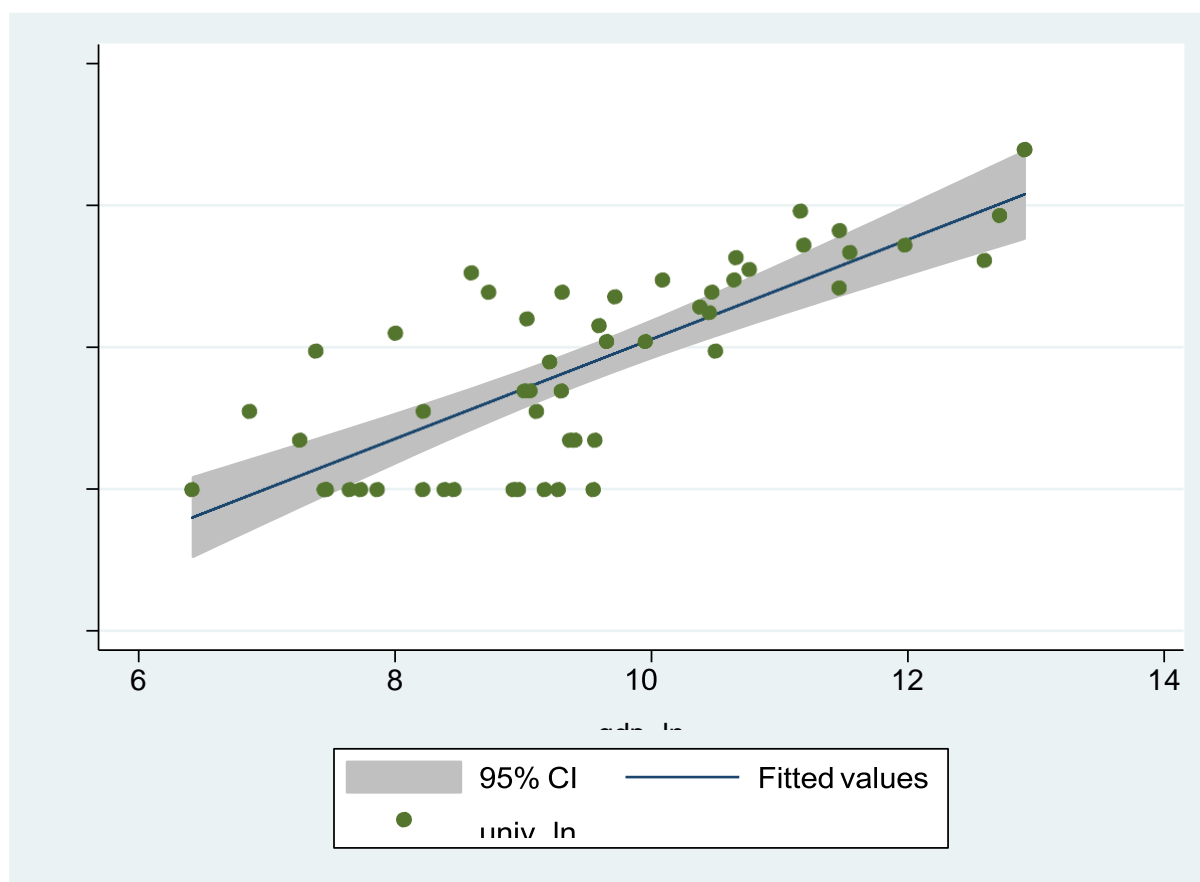
Appendix 2 Figure 6. The relationship between gross domestic product per capita and GERD per capita

Note: Both variables are expressed as natural logs.

Appendix 2 Table 12. Regression summary for gross domestic product per capita and GERD per capita

(1) gerd_cap_ln	
gdp_cap_ln	1.244*** (7.17)
Constant	−6.935*** (−5.37)
Observations	31
R^2	0.639
Adjusted R^2	0.627
<i>t</i> statistics in parentheses	

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



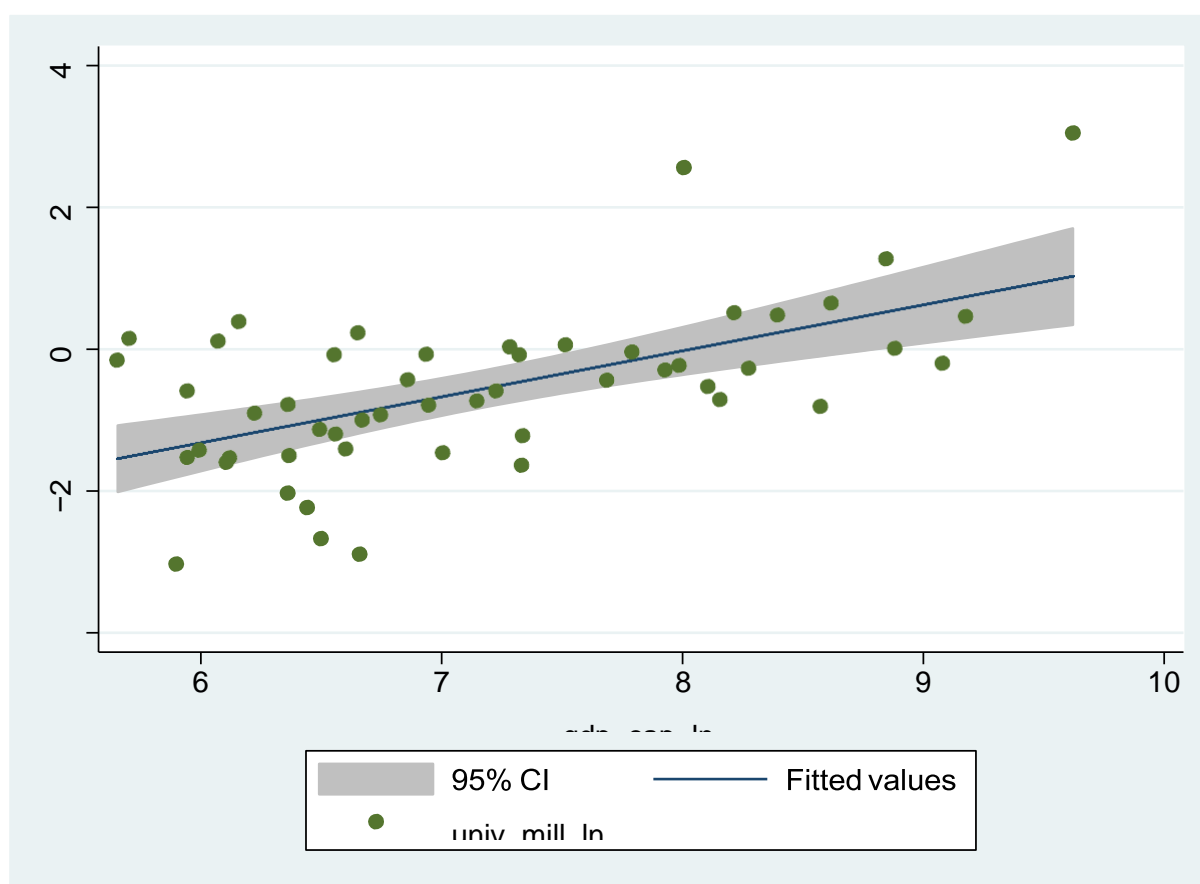
Appendix 2 Figure 7. The relationship between gross domestic product and universities

Note: Both variables are expressed as natural logs.

Appendix 2 Table 13. Regression summary for gross domestic product and universities

	(1) univ_ln
gdp_ln	0.700*** (8.55)
Constant	-4.893*** (-6.22)
Observations	52
R^2	0.594
Adjusted R^2	0.586
<i>t</i> statistics in parentheses	

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



Appendix 2 Figure 8. The relationship between gross domestic product per capita and universities per capita

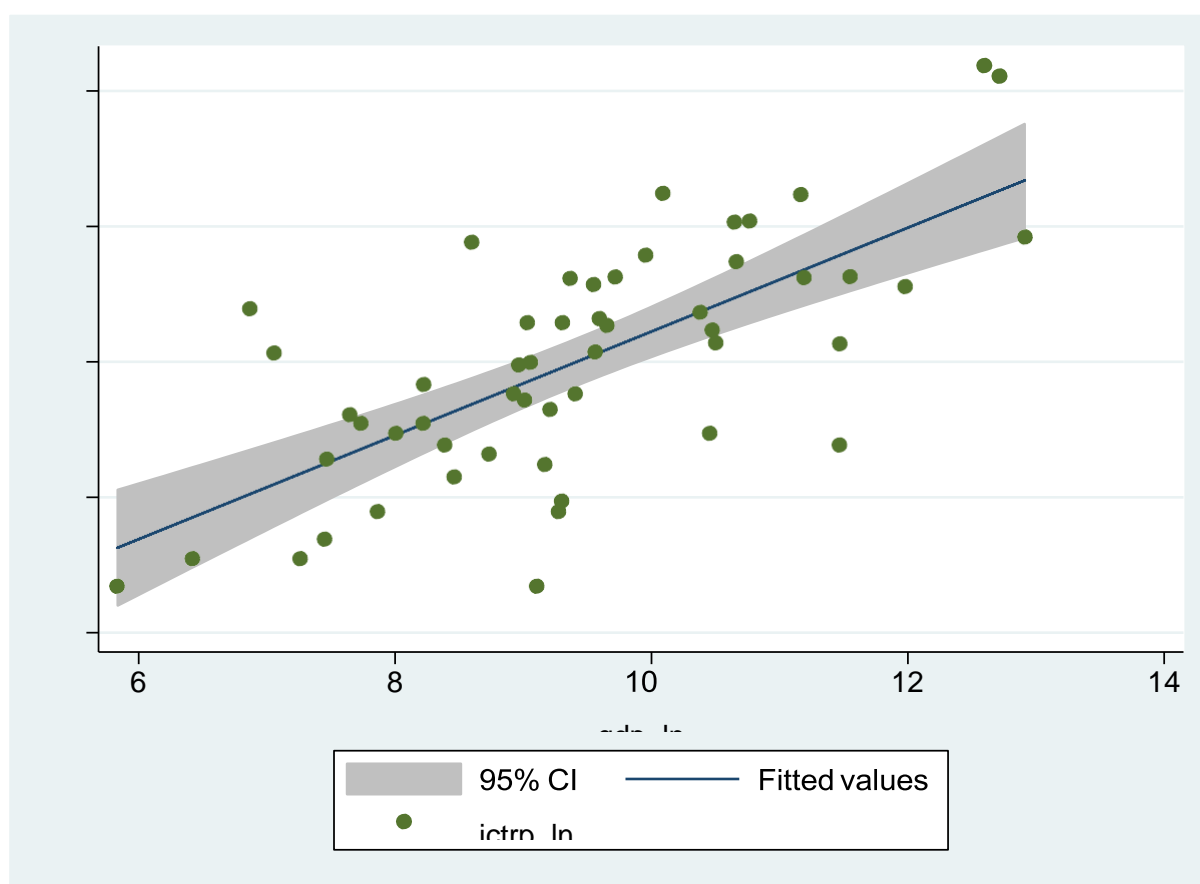
Note: Both variables are expressed as natural logs.

Appendix 2 Table 14. Regression summary for gross domestic product per capita and universities per capita

	(1) univ_mill_ln
gdp_cap_ln	0.648*** (5.06)
Constant	-5.207*** (-5.62)
Observations	52
R^2	0.339
Adjusted R^2	0.326

t statistics in parentheses

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



Appendix 2 Figure 9. The relationship between gross domestic product and clinical trials

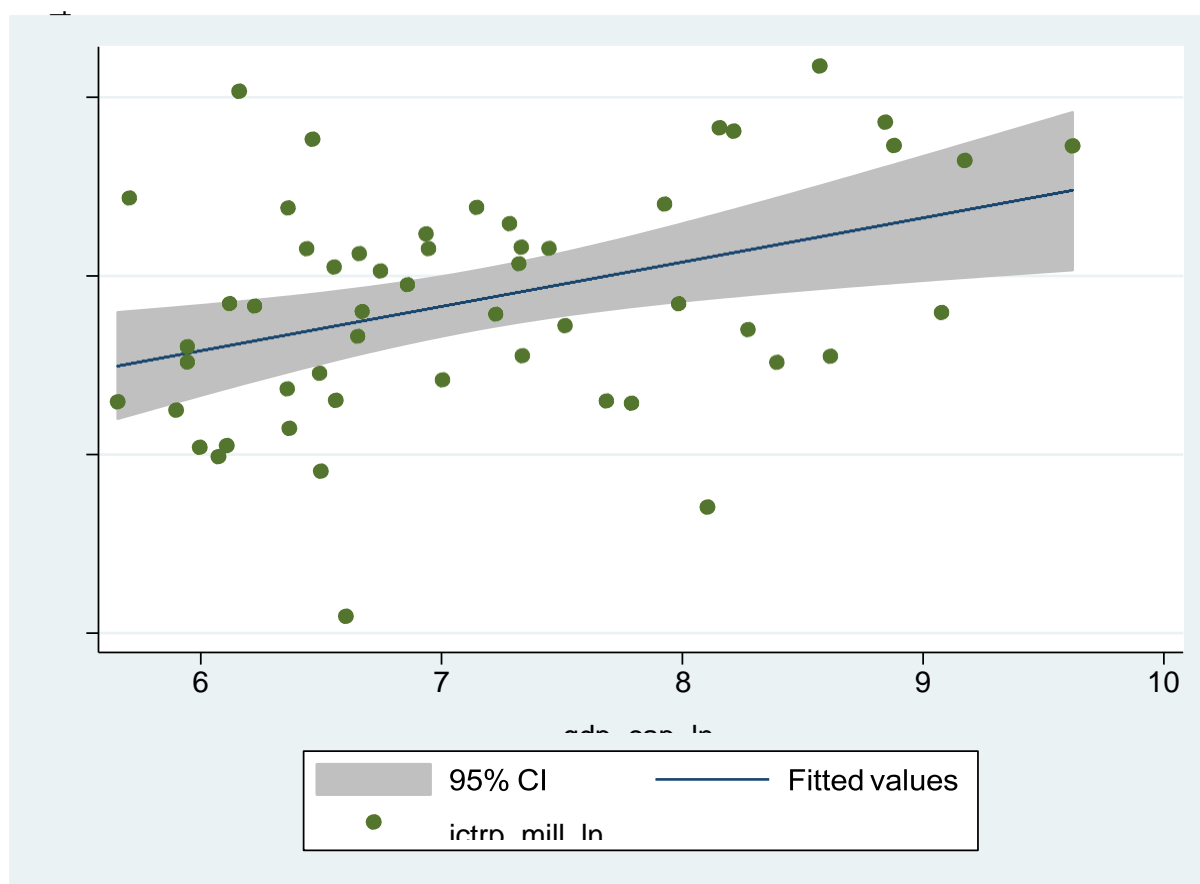
Note: Both variables are expressed as natural logs.

Appendix 2 Table 15. Regression summary for gross domestic product and clinical trials

	(1) ictrp_ln
gdp_ln	0.765*** (7.03)
Constant	−3.212** (−3.09)
Observations	53
R^2	0.492
Adjusted R^2	0.482

t statistics in parentheses

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



Appendix 2 Figure 10. The relationship between gross domestic product per capita and clinical trials per capita

Note: Both variables are expressed as natural logs.

Appendix 2Table 16. Regression summary for gross domestic product per capita and clinical trials per capita

	(1) ictrp_mill_ ln
gdp_cap_ln	0.492** (2.98)
Constant	-1.789 (-1.50)
Observations	53
R^2	0.149
Adjusted R^2	0.132

t statistics in parentheses

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