

For Online Publication

Appendix to the study

“HOUSEHOLD AND INDIVIDUAL ECONOMIC RESPONSES TO DIFFERENT HEALTH SHOCKS:
THE ROLE OF MEDICAL INNOVATIONS”

Volha Lazuka

Appendix A

Table A1 – Disease groups used in the study (based on the ICD-10)

Group number	Group name	ICD-chapter group
1	Malignant neoplasms of lip, oral cavity and pharynx	cancer
2	Malignant neoplasm of oesophagus	cancer
3	Malignant neoplasm of stomach	cancer
4	Malignant neoplasm of small intestine, colon, rectosigmoid junction, rectum, anus and anal canal	cancer
5	Malignant neoplasm of liver and intrahepatic bile ducts	cancer
6	Malignant neoplasm of gallbladder	cancer
7	Malignant neoplasm of pancreas	cancer
8	Malignant neoplasm of respiratory and intrathoracic organs	cancer
9	Malignant neoplasm of bone and articular cartilage	cancer
10	Melanoma and other malignant neoplasms of skin	cancer
11	Malignant neoplasms of mesothelial and soft tissue	cancer
12	Malignant neoplasm of breast	cancer
13	Malignant neoplasms of vulva, vagina, cervix uteri, corpus uteri and parts of uterus	cancer
14	Malignant neoplasms of ovary and placenta	cancer
15	Malignant neoplasms of penis, prostate, testis and other male genital organs	cancer
16	Malignant neoplasm of kidney, renal pelvis and ureter	cancer
17	Malignant neoplasm of bladder	cancer
18	Malignant neoplasms of eye and adnexa, meninges, brain, spinal cord, cranial nerves and other parts of central nervous system	cancer
19	Malignant neoplasms of thyroid gland, adrenal gland, and other endocrine glands	cancer
20	Hodgkin's disease	cancer
21	Non-Hodgkin's lymphoma	cancer
22	Malignant immunoproliferative diseases, multiple myeloma and malignant plasma cell neoplasms	cancer
23	Leukaemia	cancer
24	In situ neoplasms	cancer
25	Benign neoplasms	cancer
26	Acute rheumatic fever and chronic rheumatic heart diseases	circulatory diseases
27	Hypertensive diseases	circulatory diseases
28	Ischaemic heart diseases	circulatory diseases
29	Pulmonary heart disease and diseases of pulmonary circulation	circulatory diseases
30	Pericarditis	circulatory diseases
31	Endocarditis and myocarditis and cardiomyopathy	circulatory diseases
32	Cardiac arrhythmias and heart failure	circulatory diseases
33	Cerebrovascular diseases	circulatory diseases
34	Diseases of arteries, arterioles and capillaries	circulatory diseases
35	Diseases of veins, lymphatic vessels and lymph nodes, not elsewhere classified	circulatory diseases
36	Organic, including symptomatic, mental disorders and Alzheimer disease. Systemic atrophies.	mental diseases
37	Mental and behavioural disorders due to use of alcohol and other substances	mental diseases
38	Schizophrenia, schizotypal and delusional disorders	mental diseases
39	Mood (affective) disorders	mental diseases
40	Neurotic, stress-related and somatoform disorders	mental diseases
41	Disorders of adult personality and behaviour	mental diseases
42	Mental retardation. Disorders of psychological development, behavioral and emotional disorders	mental diseases
43	Inflammatory diseases of the central nervous system	nervous diseases
44	Demyelinating diseases of the central nervous system	nervous diseases
45	Epilepsy	nervous diseases
46	Migraine and other headache syndromes	nervous diseases
47	Sleep disorders	nervous diseases
48	Nerve, nerve root and plexus disorders, polyneuropathies and myoneuropathies	nervous diseases
49	Diseases of oesophagus, stomach and duodenum	digestive diseases
50	Diseases of appendix	digestive diseases
51	Hernia	digestive diseases
52	Inflammatory bowel disease and other diseases of intestines	digestive diseases
53	Diseases of peritoneum	digestive diseases
54	Diseases of liver	digestive diseases
55	Diseases of gallbladder, biliary tract and pancreas	digestive diseases
56	Infectious arthropathies	musculoskeletal diseases
57	Rheumatoid and juvenile arthritis. Gout	musculoskeletal diseases
58	Arthrosis and systemic connective tissue disorders	musculoskeletal diseases

59	Deforming dorsopathies, osteopathies and chondropathies. Disorders of muscles	musculoskeletal diseases
60	Glomerular diseases and renal tubulo-interstitial diseases. Renal failure	urinary diseases
61	Urolithiasis	urinary diseases
62	Other diseases of the urinary system	urinary diseases
63	Diseases of male genital organs	urinary diseases
64	Diseases of female pelvic organs	urinary diseases
65	Diseases of upper respiratory tract	respiratory diseases
66	Pneumonia, other acute lower respiratory infections and diseases of pleura	respiratory diseases
67	Chronic obstructive pulmonary disease and chronic bronchitis	respiratory diseases
68	Asthma	respiratory diseases
69	Diabetes mellitus	metabolic diseases
70	Disorders of thyroid gland	metabolic diseases
71	Disorders of other endocrine glands	metabolic diseases
72	Obesity and other hyperalimentation, metabolic disorders	diseases of bloodforming organs
73	Nutritional anaemias	diseases of bloodforming organs
74	Haemolytic anaemias	diseases of bloodforming organs
75	Coagulation defects, purpura and other haemorrhagic conditions	diseases of sense organs
76	Disorders of eyelid, lacrimal system and orbit, conjunctiva, sclera, cornea, iris, ciliary body, choroid and retina.	diseases of sense organs
77	Cataract, disorders of lens	diseases of sense organs
78	Glaucoma	diseases of sense organs
79	Disorders of globe, optical nerve and visual pathways, ocular muscles, accommodation and refraction, and blindness	diseases of sense organs
80	Diseases of external and middle ear	diseases of sense organs
81	Diseases of inner ear	diseases of sense organs
82	Infections of the skin	diseases of skin
83	Bullous disorders, dermatitis and eczema, urticaria and erythema	diseases of skin
84	Intestinal infectious diseases	infectious and parasitic diseases
85	Tuberculosis	infectious and parasitic diseases
86	Bacterial diseases. Erysipelas. Meningitis	infectious and parasitic diseases
87	Sexually transmitted diseases	infectious and parasitic diseases
88	Viral infections	infectious and parasitic diseases
89	Viral hepatitis	infectious and parasitic diseases
90	HIV	infectious and parasitic diseases
91	Protozoal diseases	infectious and parasitic diseases

Table A2 – Descriptive statistics for the estimation sample

	Observations	Mean	SD
L ¹ NMEs (in 100s)	11 032 884	0.090	0.075
L ¹ patents (in 1000s)	11 032 884	0.160	0.243
post	11 032 884	0.403	0.491
post x L ¹ NMEs	11 032 884	0.036	0.065
post x L ¹ patents	11 032 884	0.065	0.173
DD _{idst}	11 032 884	0.200	0.400
DD _{idst} x L ¹ NMEs	11 032 884	0.018	0.049
DD _{idst} x L ¹ patents	11 032 884	0.032	0.126
family disposable income (IHS)	11 032 884	13.150	1.257
individual's disposable income (IHS)	11 032 884	12.539	1.639
partner's disposable income (IHS)	11 032 884	9.094	5.789
individual's wages (IHS)	11 032 884	21.211	19.836
individual's unemployment benefits payments (IHS)	11 032 884	0.231	1.489
individual's capital income (IHS)	11 032 884	-0.210	8.300
adult child's disposable income (IHS)	9 763 843	12.441	1.578
adult child's wages (IHS)	9 763 843	11.334	3.872
adult child's welfare payments (IHS)	9 497 515	3.771	4.745

Note: all absolute economic outcomes were adjusted for inflation with the base year in 2021.



Figure – Development of medical innovations (L^1 NMEs and L^1 patents) in the study period, by disease group

Appendix B

Table – Results of the *F*-test on non-linear pre-trends for family income (IHS) by disease group

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
event year -2	0.027 (0.018)	0.001 (0.017)	-0.006 (0.014)	0.007 (0.005)	-0.014 (0.024)	0.016 (0.013)	-0.001 (0.013)	-0.002 (0.007)	0.023 (0.029)	-0.001 (0.010)	-0.025 (0.015)	-0.004 (0.003)	-0.007 (0.006)
event year 0	0.075 (0.019)	0.015 (0.027)	0.032 (0.016)	0.013 (0.006)	0.036 (0.022)	-0.013 (0.029)	0.006 (0.015)	0.029 (0.008)	0.089 (0.052)	0.032 (0.010)	0.023 (0.011)	0.025 (0.003)	0.024 (0.006)
event year 1	0.074 (0.024)	0.027 (0.024)	0.040 (0.015)	0.034 (0.007)	0.057 (0.029)	-0.004 (0.018)	0.007 (0.018)	0.049 (0.009)	0.066 (0.066)	0.055 (0.012)	0.042 (0.012)	0.045 (0.004)	0.032 (0.007)
DD _{dst} x event year -2	0.008 (0.024)	-0.027 (0.030)	0.007 (0.018)	-0.009 (0.007)	0.035 (0.031)	-0.023 (0.018)	-0.001 (0.018)	0.005 (0.011)	-0.012 (0.034)	0.004 (0.012)	0.042 (0.024)	-0.000 (0.004)	0.007 (0.008)
DD _{dst} x event year 0	-0.871 (0.075)	-3.746 (0.222)	-4.230 (0.133)	-1.400 (0.037)	-8.636 (0.259)	-6.972 (0.281)	-7.162 (0.151)	-4.763 (0.077)	-1.855 (0.372)	-0.653 (0.044)	-1.673 (0.160)	-0.210 (0.010)	-0.370 (0.024)
DD _{dst} x event year 1	-1.882 (0.106)	-7.648 (0.308)	-6.024 (0.178)	-2.185 (0.046)	-9.979 (0.502)	-9.404 (0.449)	-10.571 (0.232)	-6.973 (0.106)	-3.673 (0.514)	-0.978 (0.051)	-2.063 (0.181)	-0.414 (0.013)	-0.894 (0.036)
Constant	13.086 (0.014)	13.152 (0.034)	13.186 (0.020)	13.233 (0.006)	13.115 (0.034)	13.077 (0.039)	13.199 (0.020)	13.133 (0.011)	13.167 (0.065)	13.217 (0.008)	13.285 (0.026)	13.272 (0.002)	13.133 (0.005)
Number of IDs	20,838	6,971	20,886	121,977	5,392	5,009	18,133	65,642	1,489	46,336	7,595	314,974	87,367
R-squared	0.083	0.399	0.333	0.113	0.634	0.546	0.571	0.381	0.193	0.044	0.115	0.015	0.041
Observations	4,249	1,448	4,387	24,891	1,171	1,076	3,900	13,813	306	9,470	1,562	63,588	17,691
<i>F</i> -test: DD _{dst} x event year -2 = 0	0.741	0.367	0.689	0.222	0.264	0.220	0.961	0.622	0.721	0.765	0.0753	0.933	0.363
Standardised difference	0.014	0.025	0.011	0.013	0.077	0.031	0.014	0.013	0.017	0.035	0.037	0.001	0.005
	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
event year -2	0.001 (0.005)	-0.002 (0.004)	-0.008 (0.011)	0.001 (0.008)	-0.007 (0.012)	0.009 (0.008)	-0.024 (0.039)	-0.016 (0.009)	-0.032 (0.022)	0.003 (0.017)	0.000 (0.004)	-0.004 (0.002)	0.010 (0.012)
event year 0	0.020 (0.008)	0.025 (0.006)	0.030 (0.011)	0.049 (0.010)	0.030 (0.017)	0.029 (0.010)	0.040 (0.038)	0.028 (0.012)	0.029 (0.014)	0.044 (0.015)	0.039 (0.004)	0.036 (0.002)	-0.025 (0.037)
event year 1	0.033 (0.010)	0.051 (0.006)	0.051 (0.011)	0.047 (0.012)	0.037 (0.017)	0.038 (0.013)	-0.038 (0.043)	0.030 (0.015)	0.019 (0.022)	0.046 (0.015)	0.051 (0.005)	0.054 (0.002)	0.031 (0.031)
DD _{dst} x event year -2	-0.006 (0.009)	-0.003 (0.007)	0.011 (0.015)	0.010 (0.012)	0.020 (0.018)	-0.002 (0.011)	0.102 (0.067)	0.025 (0.014)	0.036 (0.025)	0.011 (0.022)	0.010 (0.005)	0.008 (0.003)	-0.024 (0.037)
DD _{dst} x event year 0	-0.882 (0.053)	-0.410 (0.023)	-1.935 (0.090)	-0.525 (0.039)	-2.780 (0.120)	-0.549 (0.096)	-0.329 (0.186)	-1.130 (0.075)	-1.148 (0.119)	-1.974 (0.117)	-1.004 (0.025)	-0.025 (0.004)	-0.241 (0.094)
DD _{dst} x event year 1	-2.120 (0.079)	-0.817 (0.030)	-2.614 (0.105)	-0.932 (0.051)	-5.061 (0.165)	-0.450 (0.082)	-0.784 (0.244)	-1.852 (0.094)	-1.902 (0.152)	-3.358 (0.153)	-1.294 (0.028)	-0.027 (0.004)	-0.245 (0.081)
Constant	13.187 (0.010)	13.423 (0.004)	13.231 (0.014)	13.207 (0.007)	13.260 (0.019)	13.260 (0.015)	13.130 (0.034)	13.244 (0.013)	13.236 (0.020)	13.258 (0.020)	13.220 (0.004)	13.292 (0.001)	13.021 (0.015)
Number of IDs	39,213	110,851	27,074	46,275	20,133	7,814	1,653	24,594	10,070	16,168	203,555	632,599	5,169
R-squared	0.110	0.035	0.143	0.040	0.262	0.028	0.039	0.095	0.096	0.174	0.066	0.002	0.010

Observations	7,983	22,369	5,557	9,384	4,196	1,597	339	5,024	2,056	3,328	41,562	127,919	1,065
<i>F-test: DD_{dst} x event year -2 =0</i>	0.483	0.605	0.460	0.365	0.273	0.832	0.128	0.0747	0.158	0.629	0.0574	0.00299	0.512
<i>Standardised difference</i>	0.001	0.015	0.011	0.016	0.015	0.010	0.170	0.004	0.046	0.037	0.005	0.002	0.057
	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)	(37)	(38)	(39)
event year -2	-0.002	-0.001	0.007	-0.007	-0.005	0.000	-0.002	-0.005	0.000	-0.007	-0.005	-0.006	0.000
	(0.006)	(0.002)	(0.007)	(0.010)	(0.009)	(0.003)	(0.003)	(0.007)	(0.003)	(0.009)	(0.007)	(0.009)	(0.006)
event year 0	0.025	0.030	0.040	-0.008	0.032	0.035	0.025	0.019	0.030	0.000	-0.006	-0.011	0.019
	(0.006)	(0.002)	(0.009)	(0.014)	(0.009)	(0.004)	(0.003)	(0.007)	(0.003)	(0.010)	(0.008)	(0.011)	(0.007)
event year 1	0.047	0.043	0.060	-0.008	0.057	0.054	0.043	0.037	0.050	-0.008	-0.012	0.002	0.004
	(0.007)	(0.002)	(0.009)	(0.017)	(0.009)	(0.004)	(0.004)	(0.008)	(0.003)	(0.014)	(0.009)	(0.013)	(0.009)
DD _{dst} x event year -2	-0.005	0.006	-0.004	-0.007	-0.008	0.003	0.005	0.007	0.002	0.010	0.008	-0.002	0.007
	(0.008)	(0.003)	(0.011)	(0.020)	(0.012)	(0.004)	(0.004)	(0.009)	(0.004)	(0.013)	(0.010)	(0.013)	(0.009)
DD _{dst} x event year 0	-0.091	-0.576	-0.673	-0.264	-0.424	-0.320	-1.057	-0.830	-0.096	-0.729	-0.159	-0.113	-0.222
	(0.012)	(0.009)	(0.039)	(0.050)	(0.030)	(0.012)	(0.017)	(0.033)	(0.007)	(0.050)	(0.015)	(0.023)	(0.018)
DD _{dst} x event year 1	-0.113	-0.263	-0.358	-0.167	-0.278	-0.234	-0.431	-0.407	-0.093	-0.854	-0.156	-0.039	-0.123
	(0.013)	(0.006)	(0.027)	(0.043)	(0.024)	(0.010)	(0.010)	(0.021)	(0.006)	(0.054)	(0.016)	(0.022)	(0.015)
Constant	13.148	13.188	13.235	13.302	13.219	13.233	13.180	13.103	13.163	13.117	12.769	12.613	13.121
	(0.002)	(0.001)	(0.006)	(0.008)	(0.005)	(0.002)	(0.002)	(0.005)	(0.001)	(0.008)	(0.003)	(0.004)	(0.003)
Number of IDs	146,581	905,759	58,197	19,913	69,909	353,852	457,710	101,846	403,297	40,674	217,257	77,074	118,220
R-squared	0.001	0.025	0.030	0.008	0.014	0.011	0.056	0.040	0.002	0.043	0.003	0.001	0.006
Observations	29,722	183,512	11,838	4,046	14,178	71,599	93,037	20,744	82,385	8,290	44,544	15,891	24,061
<i>F-test: DD_{dst} x event year -2 =0</i>	0.530	0.0375	0.676	0.712	0.504	0.532	0.234	0.421	0.658	0.448	0.391	0.900	0.396
<i>Standardised difference</i>	0.020	0.008	0.015	0.022	0.017	0.005	0.004	0.027	0.008	0.019	0.070	0.040	0.020
	(40)	(41)	(42)	(43)	(44)	(45)	(46)	(47)	(48)	(49)	(50)	(51)	(52)
event year -2	-0.007	0.078	0.030	0.012	0.004	-0.025	0.005	-0.005	0.006	-0.005	-0.004	-0.001	0.000
	(0.007)	(0.038)	(0.039)	(0.019)	(0.008)	(0.013)	(0.006)	(0.011)	(0.005)	(0.004)	(0.004)	(0.003)	(0.003)
event year 0	0.011	0.016	0.041	0.059	0.012	0.012	0.026	0.085	0.025	0.024	0.035	0.034	0.037
	(0.008)	(0.051)	(0.060)	(0.021)	(0.009)	(0.011)	(0.007)	(0.012)	(0.007)	(0.004)	(0.005)	(0.003)	(0.004)
event year 1	0.020	0.008	0.055	0.091	0.005	0.015	0.049	0.123	0.051	0.039	0.071	0.052	0.059
	(0.009)	(0.056)	(0.060)	(0.021)	(0.017)	(0.013)	(0.007)	(0.013)	(0.007)	(0.005)	(0.005)	(0.003)	(0.004)
DD _{dst} x event year -2	0.004	-0.071	-0.100	0.005	0.003	0.022	-0.003	0.010	-0.009	0.008	-0.003	0.006	0.004
	(0.010)	(0.061)	(0.070)	(0.024)	(0.012)	(0.016)	(0.008)	(0.015)	(0.008)	(0.005)	(0.006)	(0.004)	(0.005)
DD _{dst} x event year 0	-0.184	-0.253	-0.244	-0.509	-0.094	-0.237	-0.060	-0.054	-0.087	-0.117	-0.024	-0.026	-0.087
	(0.017)	(0.102)	(0.117)	(0.072)	(0.035)	(0.031)	(0.014)	(0.019)	(0.016)	(0.009)	(0.008)	(0.005)	(0.008)
DD _{dst} x event year 1	-0.139	-0.108	-0.093	-0.331	-0.046	-0.309	-0.072	-0.062	-0.143	-0.140	-0.033	-0.034	-0.096
	(0.015)	(0.091)	(0.097)	(0.055)	(0.032)	(0.036)	(0.013)	(0.021)	(0.018)	(0.010)	(0.009)	(0.006)	(0.008)
Constant	13.052	12.580	12.470	13.232	13.229	13.018	13.210	13.366	13.171	13.115	13.282	13.160	13.240
	(0.003)	(0.020)	(0.022)	(0.012)	(0.006)	(0.006)	(0.003)	(0.004)	(0.003)	(0.002)	(0.002)	(0.001)	(0.001)
Number of IDs	108,296	5,852	3,279	14,324	15,157	35,867	95,877	38,866	81,078	294,241	199,061	394,345	334,767
R-squared	0.005	0.004	0.004	0.018	0.002	0.012	0.001	0.005	0.002	0.002	0.002	0.001	0.001
Observations	22,265	1,226	672	2,916	3,102	7,378	19,540	7,854	16,578	59,941	40,485	80,213	67,903

<i>F-test: DD_{dst} x event year -2 = 0</i>	0.696	0.247	0.157	0.846	0.809	0.159	0.709	0.496	0.301	0.125	0.651	0.115	0.406
<i>Standardised difference</i>	0.009	0.111	0.102	0.020	0.036	0.060	0.010	0.020	0.008	0.001	0.008	0.010	0.001
	(53)	(54)	(55)	(56)	(57)	(58)	(59)	(60)	(61)	(62)	(63)	(64)	(65)
event year -2	0.010	-0.001	0.002	0.005	-0.000	-0.002	-0.003	-0.002	-0.001	-0.004	0.006	0.002	-0.003
	(0.028)	(0.010)	(0.002)	(0.010)	(0.003)	(0.003)	(0.002)	(0.006)	(0.004)	(0.006)	(0.003)	(0.003)	(0.004)
event year 0	0.038	-0.011	0.033	0.040	0.017	0.038	0.037	0.035	0.040	0.045	0.024	0.044	0.043
	(0.017)	(0.013)	(0.003)	(0.012)	(0.003)	(0.004)	(0.003)	(0.007)	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)
event year 1	0.072	0.003	0.054	0.056	0.020	0.065	0.055	0.047	0.060	0.063	0.038	0.080	0.063
	(0.027)	(0.014)	(0.003)	(0.013)	(0.003)	(0.004)	(0.003)	(0.008)	(0.005)	(0.006)	(0.004)	(0.003)	(0.004)
DD _{dst} x event year -2	0.008	-0.009	0.000	-0.005	0.002	0.004	0.006	0.013	0.004	0.004	-0.005	-0.003	0.005
	(0.033)	(0.015)	(0.003)	(0.015)	(0.004)	(0.004)	(0.003)	(0.008)	(0.006)	(0.007)	(0.004)	(0.004)	(0.005)
DD _{dst} x event year 0	-0.494	-1.750	-0.091	-0.034	-0.038	-0.052	-0.042	-0.174	-0.024	-0.054	-0.040	-0.017	-0.040
	(0.107)	(0.067)	(0.006)	(0.024)	(0.006)	(0.007)	(0.005)	(0.018)	(0.008)	(0.010)	(0.007)	(0.006)	(0.007)
DD _{dst} x event year 1	-0.328	-1.083	-0.115	-0.028	-0.052	-0.065	-0.049	-0.181	-0.042	-0.086	-0.059	-0.020	-0.044
	(0.079)	(0.052)	(0.006)	(0.024)	(0.007)	(0.007)	(0.005)	(0.018)	(0.009)	(0.012)	(0.008)	(0.006)	(0.007)
Constant	13.240	13.089	13.229	13.272	13.136	13.281	13.250	13.190	13.227	13.300	13.208	13.380	13.264
	(0.016)	(0.010)	(0.001)	(0.005)	(0.001)	(0.001)	(0.001)	(0.003)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
Number of IDs	6,095	45,333	575,124	24,219	219,899	277,086	596,224	102,261	197,620	120,582	230,884	288,248	225,181
R-squared	0.020	0.097	0.002	0.001	0.001	0.001	0.001	0.004	0.001	0.001	0.001	0.004	0.001
Observations	1,250	9,346	116,465	4,911	44,426	55,872	121,225	20,832	40,276	24,398	46,599	58,333	45,895
<i>F-test: DD_{dst} x event year -2 = 0</i>	0.807	0.555	0.897	0.739	0.618	0.377	0.0729	0.108	0.474	0.558	0.249	0.408	0.320
<i>Standardised difference</i>	0.105	0.045	0.003	0.002	0.011	0.008	0.004	0.009	0.015	0.011	0.010	0.007	0.015
	(66)	(67)	(68)	(69)	(70)	(71)	(72)	(73)	(74)	(75)	(76)	(77)	(78)
event year -2	0.003	0.000	0.010	-0.003	0.002	0.002	-0.011	-0.006	0.013	0.001	0.002	-0.004	0.011
	(0.004)	(0.008)	(0.006)	(0.006)	(0.005)	(0.017)	(0.009)	(0.010)	(0.018)	(0.014)	(0.005)	(0.008)	(0.006)
event year 0	0.032	0.033	0.025	0.046	0.033	0.043	0.034	0.011	0.021	0.025	0.029	0.013	0.020
	(0.004)	(0.009)	(0.008)	(0.006)	(0.005)	(0.012)	(0.009)	(0.013)	(0.018)	(0.018)	(0.006)	(0.008)	(0.009)
event year 1	0.052	0.037	0.043	0.051	0.049	0.055	0.049	0.035	0.056	0.029	0.060	0.028	0.024
	(0.005)	(0.010)	(0.009)	(0.006)	(0.006)	(0.014)	(0.011)	(0.015)	(0.022)	(0.022)	(0.006)	(0.011)	(0.009)
DD _{dst} x event year -2	-0.003	0.012	-0.007	0.018	0.000	0.006	0.009	-0.005	-0.026	-0.005	-0.007	-0.001	-0.002
	(0.005)	(0.010)	(0.009)	(0.007)	(0.006)	(0.020)	(0.012)	(0.015)	(0.024)	(0.021)	(0.007)	(0.013)	(0.010)
DD _{dst} x event year 0	-0.396	-0.340	-0.148	-0.154	-0.044	-0.126	-0.149	-0.138	-0.640	-0.508	-0.015	0.003	-0.037
	(0.015)	(0.029)	(0.021)	(0.013)	(0.009)	(0.035)	(0.023)	(0.030)	(0.075)	(0.072)	(0.009)	(0.016)	(0.016)
DD _{dst} x event year 1	-0.395	-0.428	-0.160	-0.165	-0.041	-0.150	-0.150	-0.261	-0.712	-0.462	-0.037	-0.056	-0.066
	(0.014)	(0.033)	(0.021)	(0.014)	(0.009)	(0.035)	(0.023)	(0.037)	(0.077)	(0.066)	(0.010)	(0.024)	(0.021)
Constant	13.170	12.990	13.068	13.024	13.212	13.192	13.186	13.051	13.109	13.199	13.238	12.994	13.055
	(0.002)	(0.005)	(0.004)	(0.002)	(0.002)	(0.007)	(0.004)	(0.006)	(0.012)	(0.012)	(0.002)	(0.004)	(0.003)
Number of IDs	276,503	56,026	63,493	177,291	119,112	19,171	49,797	35,400	15,735	13,292	140,473	25,593	28,879
R-squared	0.016	0.017	0.004	0.003	0.001	0.003	0.003	0.006	0.032	0.024	0.001	0.001	0.001
Observations	56,286	11,407	12,991	36,209	24,285	3,912	10,179	7,218	3,223	2,721	28,444	5,192	5,861
<i>F-test: DD_{dst} x event year -2 = 0</i>	0.598	0.234	0.468	0.0120	0.940	0.751	0.462	0.715	0.270	0.807	0.339	0.960	0.839

<i>Standardised difference</i>	<i>0.004</i>	<i>0.021</i>	<i>0.031</i>	<i>0.012</i>	<i>0.004</i>	<i>0.032</i>	<i>0.007</i>	<i>0.010</i>	<i>0.007</i>	<i>0.002</i>	<i>0.007</i>	<i>0.072</i>	<i>0.009</i>
	(79)	(80)	(81)	(82)	(83)	(84)	(85)	(86)	(87)	(88)	(89)	(90)	(91)
event year -2	0.019 (0.008)	0.002 (0.006)	-0.011 (0.005)	-0.000 (0.011)	0.000 (0.007)	-0.006 (0.007)	-0.007 (0.037)	-0.001 (0.006)	0.003 (0.010)	-0.015 (0.011)	0.021 (0.031)	-0.045 (0.074)	-0.006 (0.042)
event year 0	0.031 (0.011)	0.039 (0.006)	0.037 (0.005)	0.048 (0.012)	0.025 (0.008)	0.038 (0.007)	-0.009 (0.040)	0.026 (0.007)	0.017 (0.014)	0.049 (0.013)	0.104 (0.032)	0.041 (0.048)	-0.030 (0.073)
event year 1	0.058 (0.013)	0.057 (0.007)	0.057 (0.006)	0.061 (0.014)	0.028 (0.009)	0.065 (0.008)	0.067 (0.031)	0.046 (0.008)	0.028 (0.016)	0.070 (0.013)	0.176 (0.040)	0.466 (0.400)	0.067 (0.077)
DD _{dst} x event year -2	-0.019 (0.012)	0.003 (0.007)	0.014 (0.007)	0.015 (0.014)	0.006 (0.009)	0.003 (0.009)	0.022 (0.047)	0.003 (0.009)	0.005 (0.016)	0.021 (0.015)	-0.004 (0.039)	0.049 (0.147)	-0.008 (0.114)
DD _{dst} x event year 0	-0.066 (0.023)	-0.033 (0.011)	-0.016 (0.008)	-0.085 (0.022)	-0.017 (0.014)	-0.068 (0.014)	-0.160 (0.091)	-0.314 (0.021)	-0.062 (0.027)	-0.118 (0.027)	-0.185 (0.057)	-3.116 (1.081)	-0.060 (0.134)
DD _{dst} x event year 1	-0.075 (0.024)	-0.061 (0.012)	-0.028 (0.010)	-0.069 (0.024)	-0.031 (0.016)	-0.055 (0.013)	-0.408 (0.107)	-0.163 (0.016)	-0.089 (0.029)	-0.045 (0.022)	-0.213 (0.061)	-1.728 (0.840)	-0.101 (0.138)
Constant	13.218 (0.005)	13.194 (0.002)	13.307 (0.002)	13.109 (0.005)	13.107 (0.003)	13.273 (0.003)	12.919 (0.017)	13.169 (0.003)	13.127 (0.005)	13.272 (0.005)	12.917 (0.012)	12.426 (0.157)	13.059 (0.027)
Number of IDs	29,642	91,623	112,493	47,846	70,343	86,172	5,744	120,563	28,492	36,062	12,708	265	2,334
R-squared	0.001	0.001	0.002	0.001	0.000	0.001	0.009	0.009	0.001	0.002	0.003	0.186	0.001
Observations	6,060	18,738	22,778	9,782	14,427	17,582	1,186	24,499	5,851	7,365	2,621	57	487
<i>F-test: DD_{dst} x event year -2 = 0</i>	<i>0.102</i>	<i>0.672</i>	<i>0.0342</i>	<i>0.298</i>	<i>0.498</i>	<i>0.762</i>	<i>0.636</i>	<i>0.749</i>	<i>0.758</i>	<i>0.164</i>	<i>0.928</i>	<i>0.741</i>	<i>0.945</i>
<i>Standardised difference</i>	<i>0.017</i>	<i>0.004</i>	<i>0.013</i>	<i>0.012</i>	<i>0.010</i>	<i>0.012</i>	<i>0.076</i>	<i>0.002</i>	<i>0.004</i>	<i>0.004</i>	<i>0.022</i>	<i>0.123</i>	<i>0.000</i>

Note: Models are estimated according to Eq.1 by replacing the combined indicator for a health shock with event years, separately by disease group. Event years -3 and -1 are reference categories. Standard errors clustered at a (experimental) individual level are in parentheses.

p<0.01, p<0.05, p<0.1

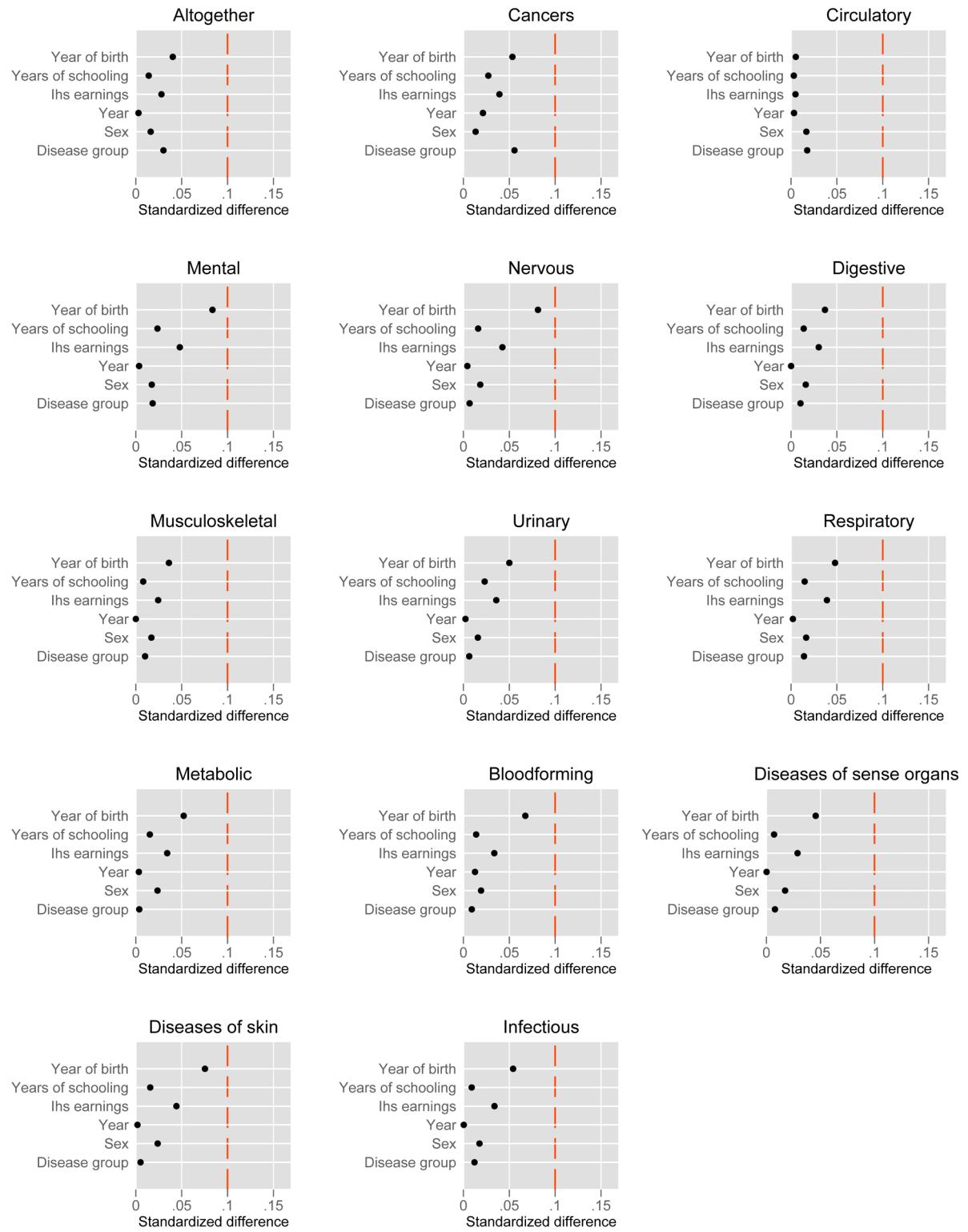


Figure B1 – Results of the balancing test for the estimation sample, in total and by ICD-chapter disease groups

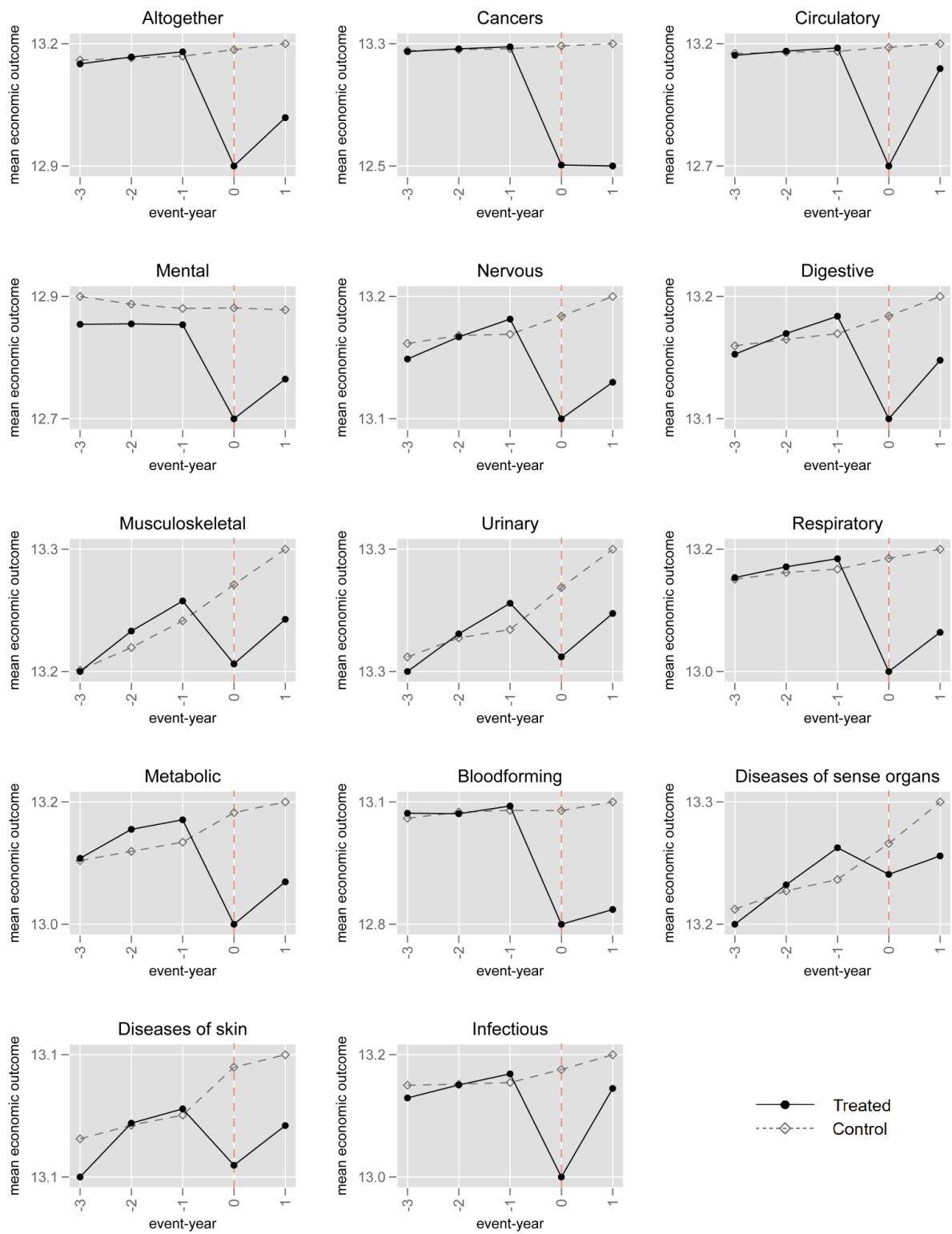


Figure B2 – Development of family income (IHS) by event-years for ever-treated and matched individuals in the estimation sample, in total and by ICD-chapter disease groups

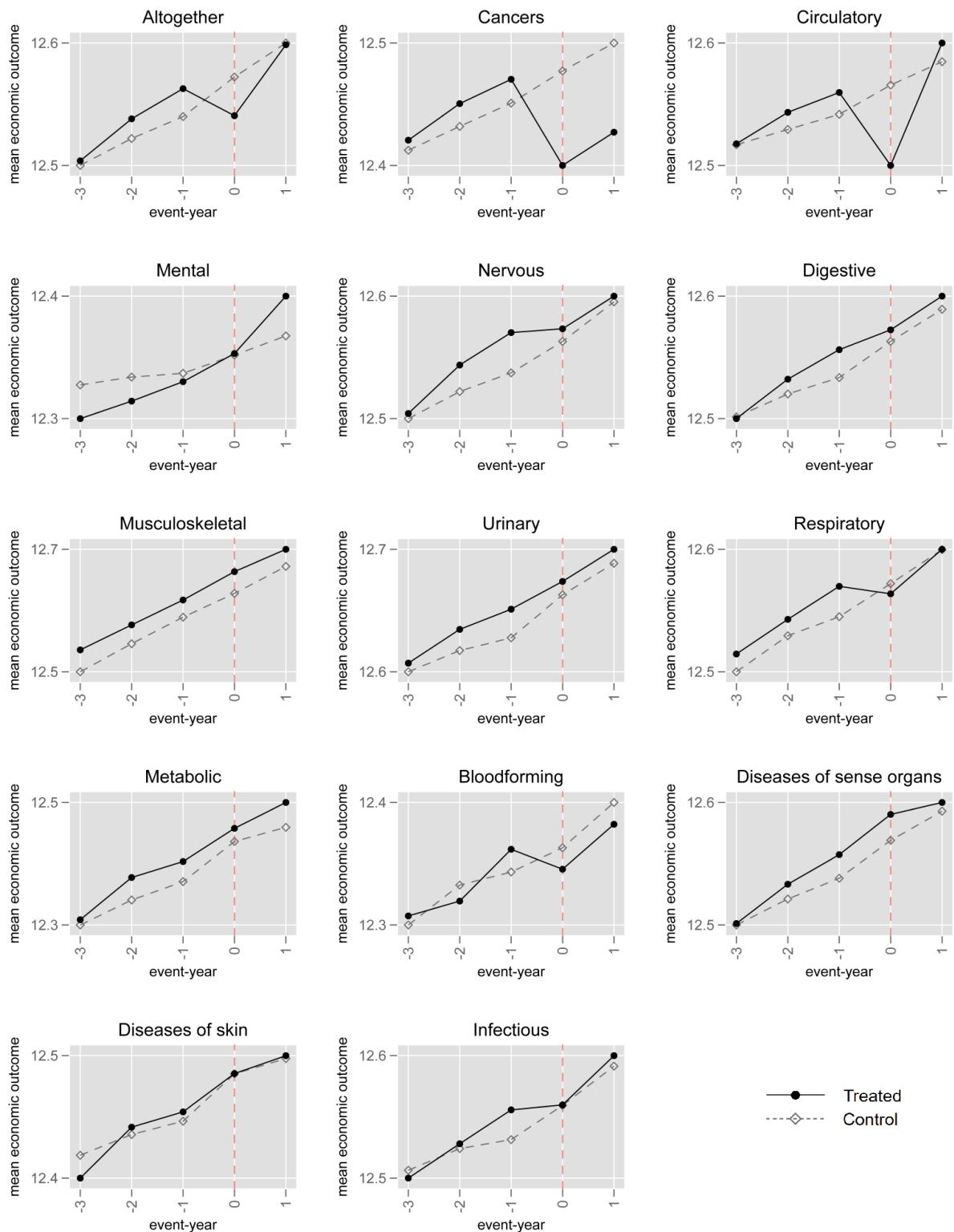


Figure B3 – Development of the individual's own income (IHS) by event-years for ever-treated and matched individuals in the estimation sample, in total and by ICD-chapter disease groups

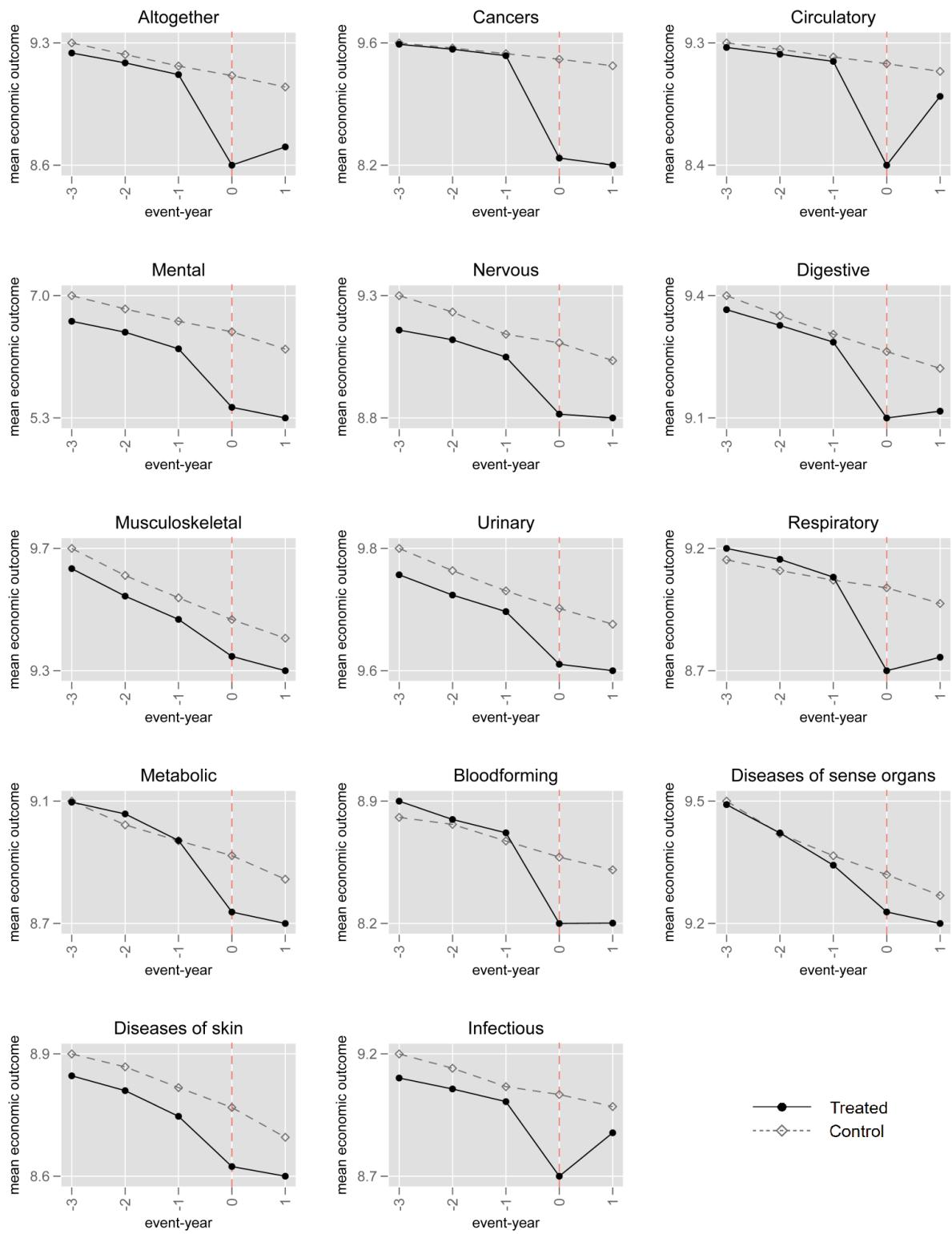


Figure B4 – Development of the **partner's income** (IHS) by event-years for ever-treated and matched individuals in the estimation sample, in total and by ICD-chapter disease groups

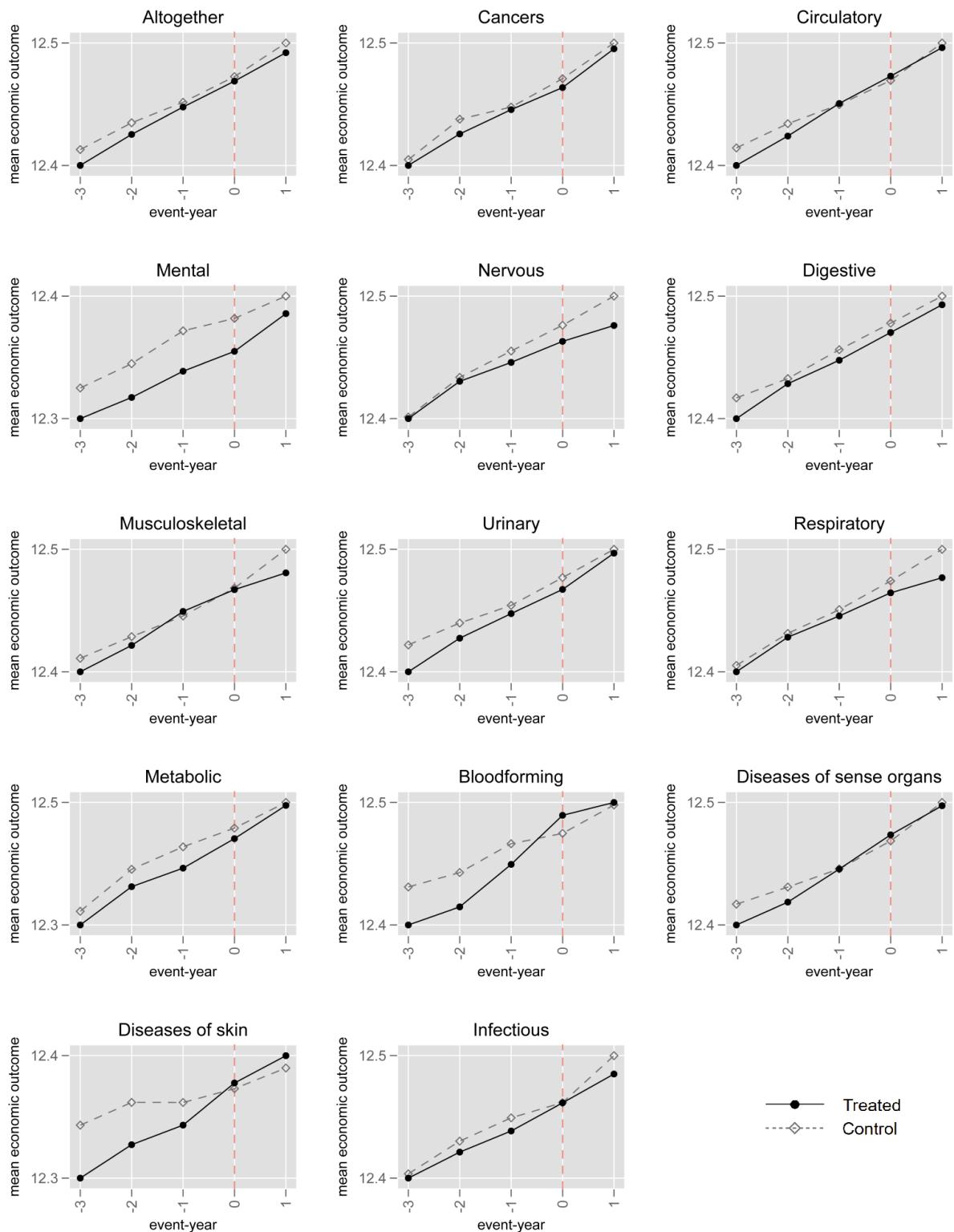


Figure B5 – Development of the adult child's income (IHS) by event-years for ever-treated and matched individuals in the estimation sample, in total and by ICD-chapter disease groups

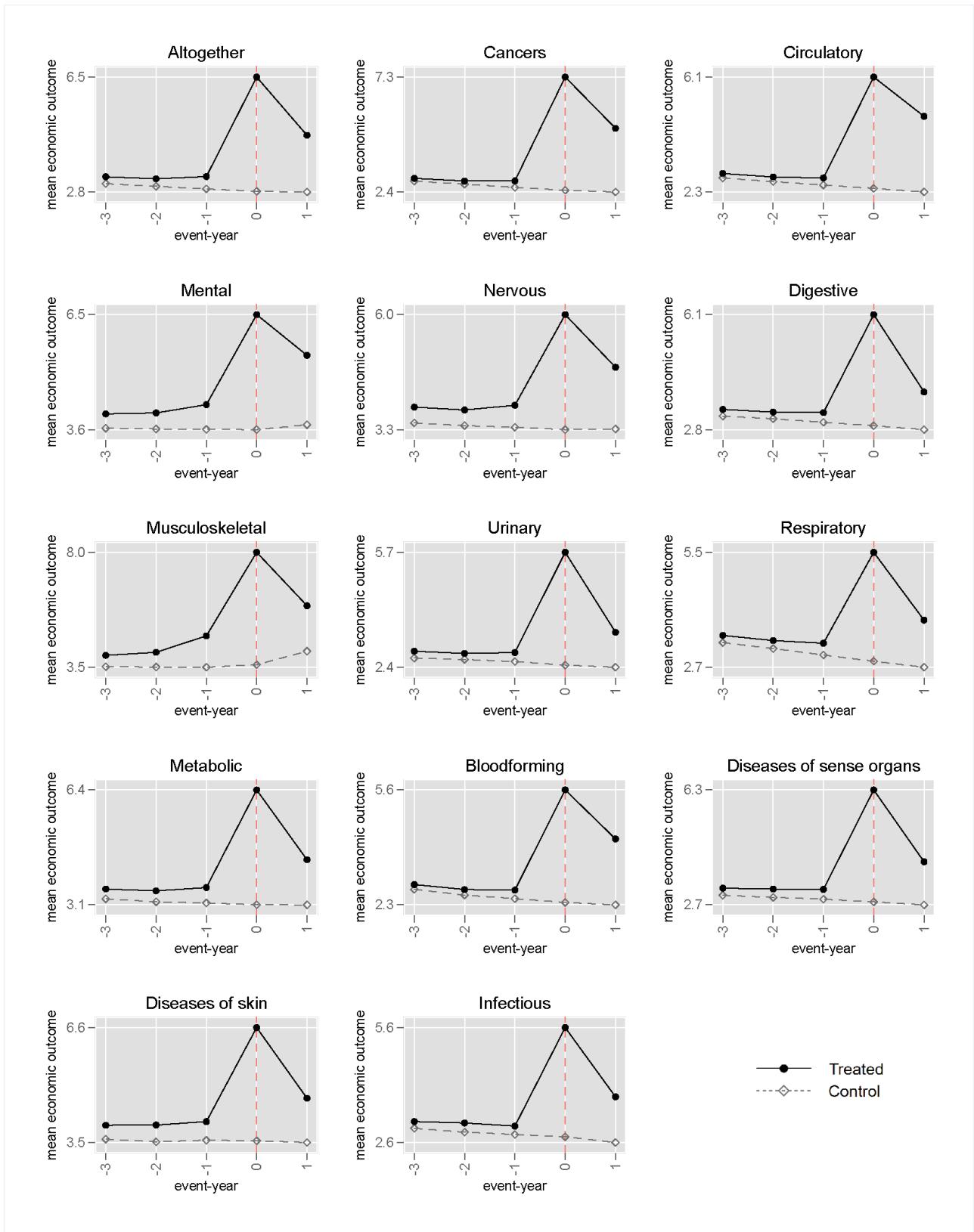


Figure B6 – Development of the individual's sickness absence payments (IHS) by event-years for ever-treated and matched individuals in the estimation sample, in total and by ICD-chapter disease groups

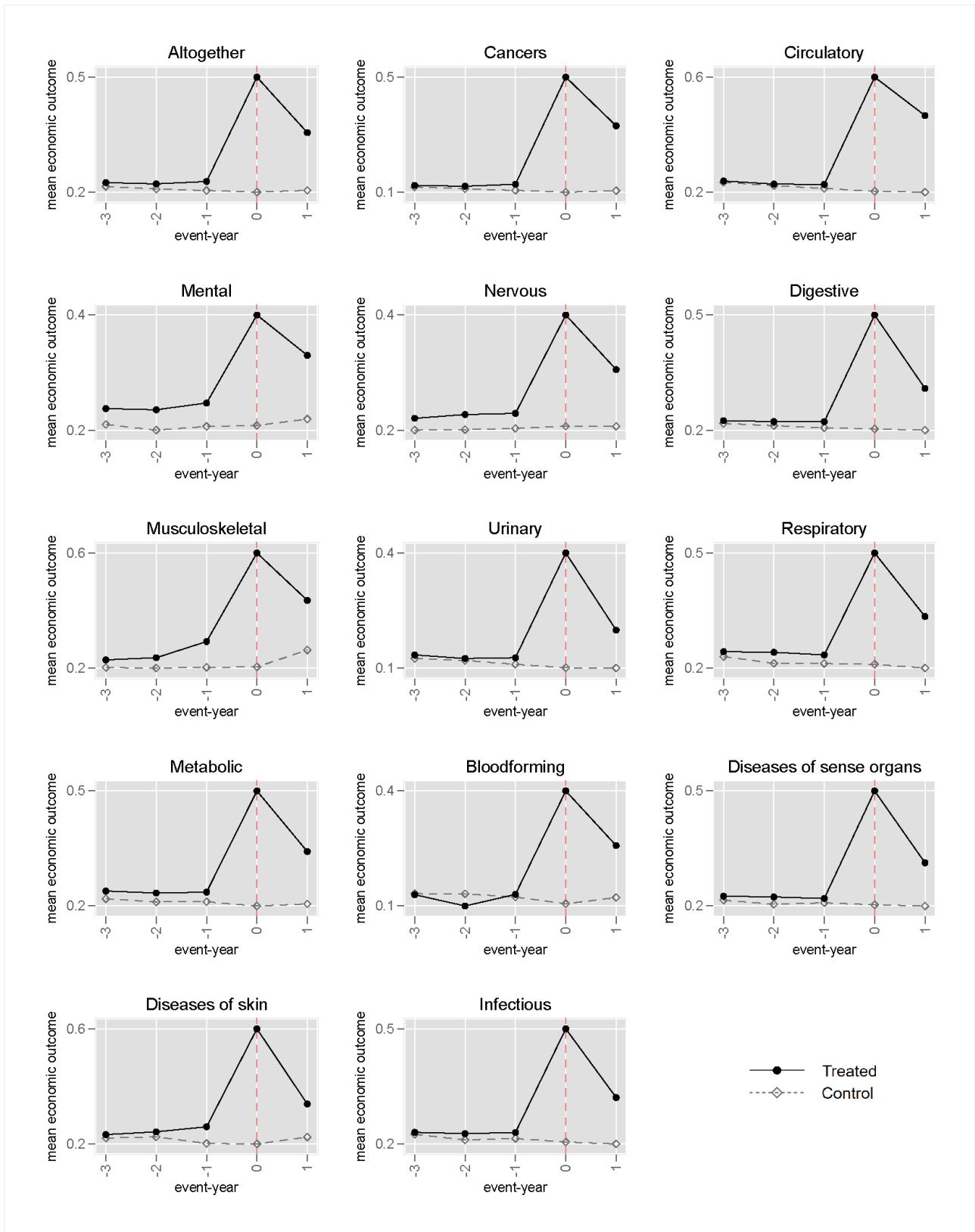


Figure B7 – Development of the individual's unemployment payments (IHS) by event-years for ever-treated and matched individuals in the estimation sample, in total and by ICD-chapter disease groups

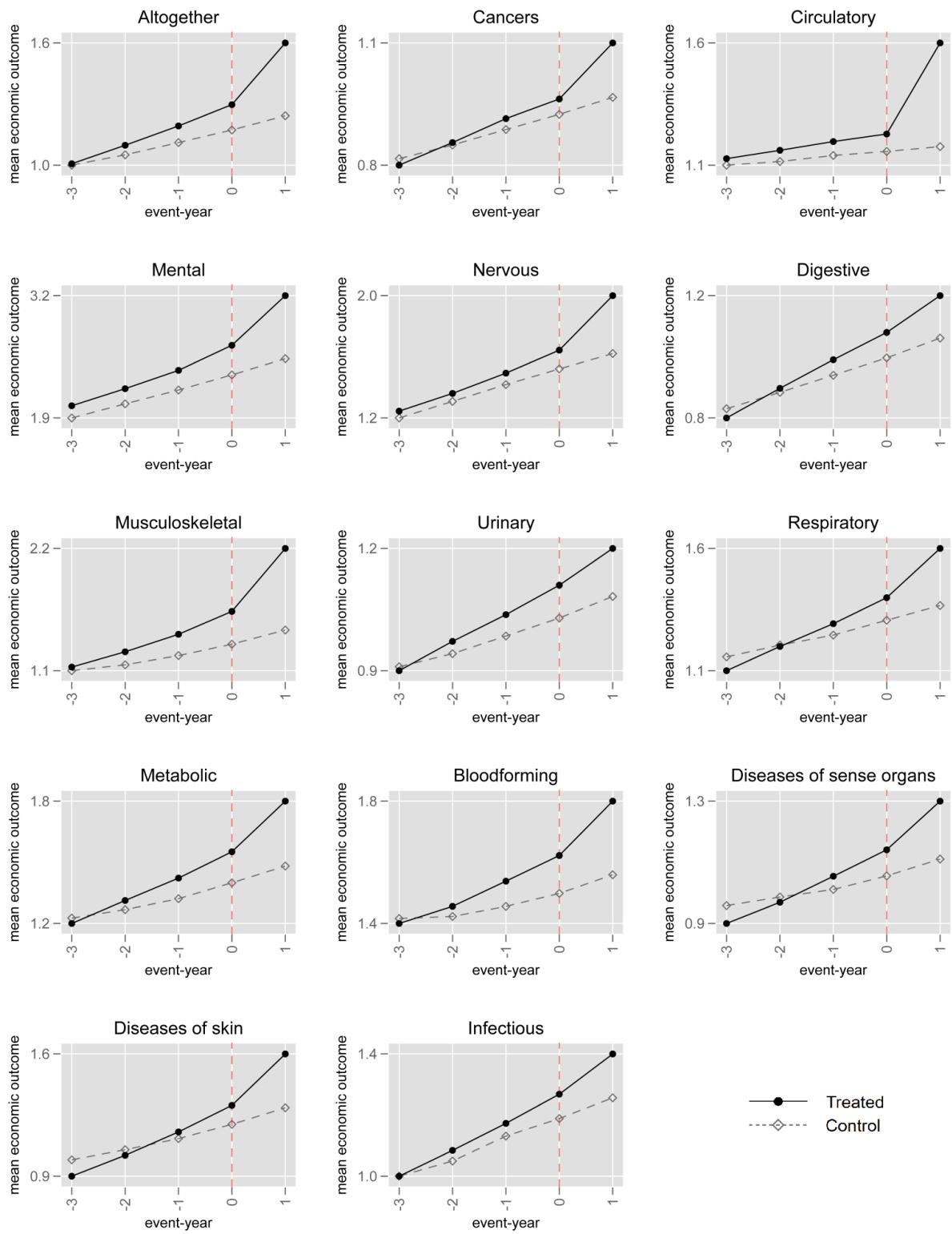


Figure B8 – Development of the individual's disability payments (IHS) by event-years for ever-treated and matched individuals in the estimation sample, in total and by ICD-chapter disease groups

Appendix C

Table C1 – Impact of the health shock on welfare outcomes of the individual by type

	Sickness absence payments (1)	Disability payments (2)
DD _{idt}	2.497 (0.006)	0.176 (0.003)
<i>by event year</i>		
DD _{idst X event year 0}	3.428 (0.006)	0.067 (0.003)
DD _{idst X event year 1}	1.547 (0.007)	0.286 (0.004)
DD _{ids} in 10,000 SEK for DD _{ids} =0	0.825	1.041
Observations	10 665 937	10 665 937
Number of IDs	2 242 971	2 242 971

Note: Models were estimated according to Eq.1. Robust standard errors clustered at individual (experimental) level are in parentheses.

Table C2 – Impact of a health shock on economic outcomes the nuclear family, family members, and adult children, by ICD-chapter disease group

	FAMILY AND FAMILY MEMBERS						WORKING-AGE CHILDREN		
	Family income	Income	Partner's income	Wages	Welfare payments	Capital income	Income	Wages	Welfare payments
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
DD _{dst} X cancers	-0.928 (0.001)	-0.151 (0.003)	-1.311 (0.006)	-0.535 (0.010)	3.646 (0.008)	0.089 (0.012)	-0.000 (0.003)	-0.021 (0.007)	0.049 (0.010)
DD _{dst} X circulatory	-0.399 (0.004)	-0.082 (0.004)	-0.547 (0.009)	-0.449 (0.009)	2.974 (0.012)	0.084 (0.015)	0.006 (0.003)	-0.007 (0.008)	0.033 (0.011)
DD _{dst} X mental	-0.196 (0.007)	0.027 (0.008)	-0.739 (0.021)	-0.472 (0.019)	2.098 (0.025)	0.128 (0.029)	0.008 (0.011)	-0.001 (0.025)	0.065 (0.033)
DD _{dst} X nervous	-0.124 (0.008)	-0.025 (0.009)	-0.186 (0.024)	-0.195 (0.022)	1.771 (0.034)	0.032 (0.044)	-0.015 (0.013)	-0.075 (0.029)	-0.059 (0.042)
DD _{dst} X digestive	-0.115 (0.003)	-0.014 (0.004)	-0.155 (0.009)	-0.041 (0.009)	1.985 (0.013)	-0.011 (0.017)	-0.000 (0.005)	-0.009 (0.011)	0.038 (0.015)
DD _{dst} X musculoskeletal	-0.050 (0.003)	-0.007 (0.004)	-0.056 (0.011)	-0.402 (0.012)	2.526 (0.019)	-0.021 (0.023)	-0.006 (0.006)	-0.009 (0.013)	0.011 (0.018)
DD _{dst} X urinary	-0.053 (0.003)	-0.013 (0.005)	-0.076 (0.012)	0.016 (0.013)	1.976 (0.018)	-0.011 (0.025)	0.004 (0.007)	-0.003 (0.014)	0.049 (0.019)
DD _{dst} X respiratory	-0.241 (0.006)	-0.036 (0.006)	-0.370 (0.017)	-0.091 (0.016)	1.758 (0.023)	-0.020 (0.030)	-0.014 (0.007)	0.017 (0.018)	0.013 (0.026)
DD _{dst} X metabolic	-0.122 (0.007)	-0.005 (0.009)	-0.182 (0.021)	-0.151 (0.020)	2.121 (0.030)	0.005 (0.036)	0.007 (0.010)	-0.029 (0.024)	0.054 (0.035)
DD _{dst} X bloodforming	-0.370 (0.024)	-0.035 (0.023)	-0.511 (0.057)	-0.157 (0.054)	2.483 (0.072)	0.133 (0.087)	0.039 (0.022)	0.024 (0.056)	-0.038 (0.081)
DD _{dst} X sense	-0.035 (0.004)	-0.005 (0.007)	-0.078 (0.018)	-0.029 (0.019)	2.243 (0.027)	-0.046 (0.036)	0.007 (0.010)	-0.014 (0.021)	0.032 (0.029)
DD _{dst} X skin	-0.049 (0.011)	-0.004 (0.016)	-0.079 (0.036)	-0.087 (0.034)	1.857 (0.051)	-0.036 (0.065)	0.045 (0.020)	0.014 (0.045)	-0.080 (0.064)
DD _{dst} X infectious	-0.153 (0.009)	-0.014 (0.010)	-0.212 (0.025)	-0.073 (0.022)	1.874 (0.032)	-0.023 (0.044)	0.008 (0.013)	0.026 (0.028)	0.005 (0.038)
Total observations	11032884	11032884	11032884	11032884	10665937	11032884	9763843	9763843	9497515
Total number of IDs	2243040	2243040	2243040	2243040	2242971	2243040	1282796	1282796	1282609

Note: Models were estimated according to Eq.1 for subsamples of diagnoses causing a health shock aggregated by ICD-chapter groups.
Robust standard errors clustered at individual (experimental) level are in parentheses.

Table C3 – Impact of a health shock on the individual's welfare payments, by type and ICD-chapter disease group

	Sickness absence payments	Unemployment payments	Disability pension payments
	(1)	(2)	(3)
DD _{idst X} cancers	3.651 (0.008)	0.273 (0.002)	0.086 (0.005)
DD _{idst X} circulatory	2.956 (0.012)	0.322 (0.004)	0.219 (0.007)
DD _{idst X} mental	1.921 (0.027)	0.150 (0.008)	0.354 (0.016)
DD _{idst X} nervous	1.732 (0.035)	0.151 (0.010)	0.207 (0.019)
DD _{idst X} digestive	1.937 (0.013)	0.241 (0.004)	0.098 (0.007)
DD _{idst X} musculoskeletal	2.435 (0.019)	0.234 (0.006)	0.388 (0.011)
DD _{idst X} urinary	1.952 (0.018)	0.193 (0.005)	0.077 (0.010)
DD _{idst X} respiratory	1.697 (0.023)	0.191 (0.007)	0.160 (0.013)
DD _{idst X} metabolic	2.027 (0.030)	0.197 (0.009)	0.212 (0.017)
DD _{idst X} bloodforming	2.452 (0.072)	0.235 (0.021)	0.125 (0.042)
DD _{idst X} sense	2.189 (0.027)	0.210 (0.008)	0.115 (0.015)
DD _{idst X} skin	1.734 (0.053)	0.197 (0.017)	0.249 (0.028)
DD _{idst X} infectious	1.839 (0.033)	0.219 (0.010)	0.093 (0.017)
Total observations	10 665 937	11 032 884	10 665 937
Total number of IDs	2 242 971	2 243 040	2 242 971

Note: Models were estimated according to Eq.1 for subsamples of diagnoses causing a health shock aggregated by ICD-chapter groups. Robust standard errors clustered at individual (experimental) level are in parentheses.

Table C4 – Mitigating impact of medical innovations on the individual's welfare payments, by type

	Sickness absence payments		Disability pension payments	
	L ¹ NMEs	L ¹ patents	L ¹ NMEs	L ¹ patents
	(1)	(2)	(5)	(6)
DD _{idst} x med.innovations	0.271 (0.075)	-1.107 (0.023)	0.292 (0.040)	0.113 (0.013)
<i>By event years</i>				
DD _{idst} x med.innovations	0.215 (0.085)	-1.059 (0.026)	0.233 (0.037)	0.108 (0.012)
x event year 0				
DD _{idst} x med.innovations	0.511 (0.090)	-1.122 (0.028)	0.331 (0.049)	0.114 (0.017)
x event year 1				
Observations	10 665 937	10 665 937	10 665 937	10 665 937
Number of IDs	2 242 971	2 242 971	2 242 971	2 242 971

Note: Models are estimated according to Eq.2. Robust standard errors clustered at individual (experimental) level are in parentheses.



Figure C1 – The impact of the health shock on **family income (IHS)** by event-years, by single disease

Note: point estimates and 95% confidence intervals.



Figure C2 – The impact of the health shock on the individual's own income (IHS) by event-years, by single disease

Note: point estimates and 95% confidence intervals.



Figure C3 – The impact of the health shock on the partner's income (IHS) by event-years, by single disease

Note: point estimates and 95% confidence intervals.



Figure C4 – The impact of the health shock on the adult child's income (IHS) by event-years, by single disease

Note: point estimates and 95% confidence intervals.

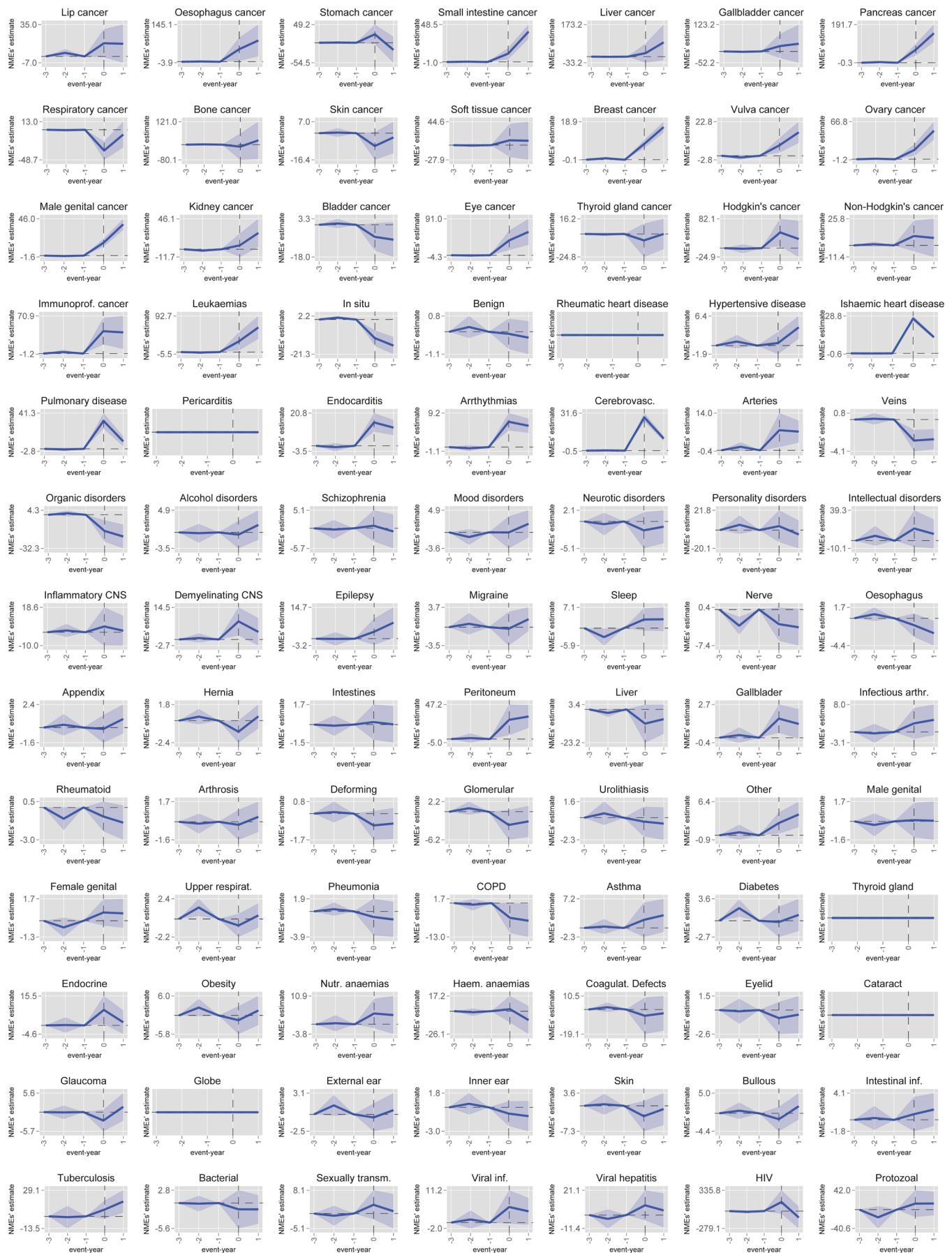


Figure C5 – The impact of NMEs on family income (IHS) by event-years, by single disease

Note: point estimates and 95% confidence intervals.

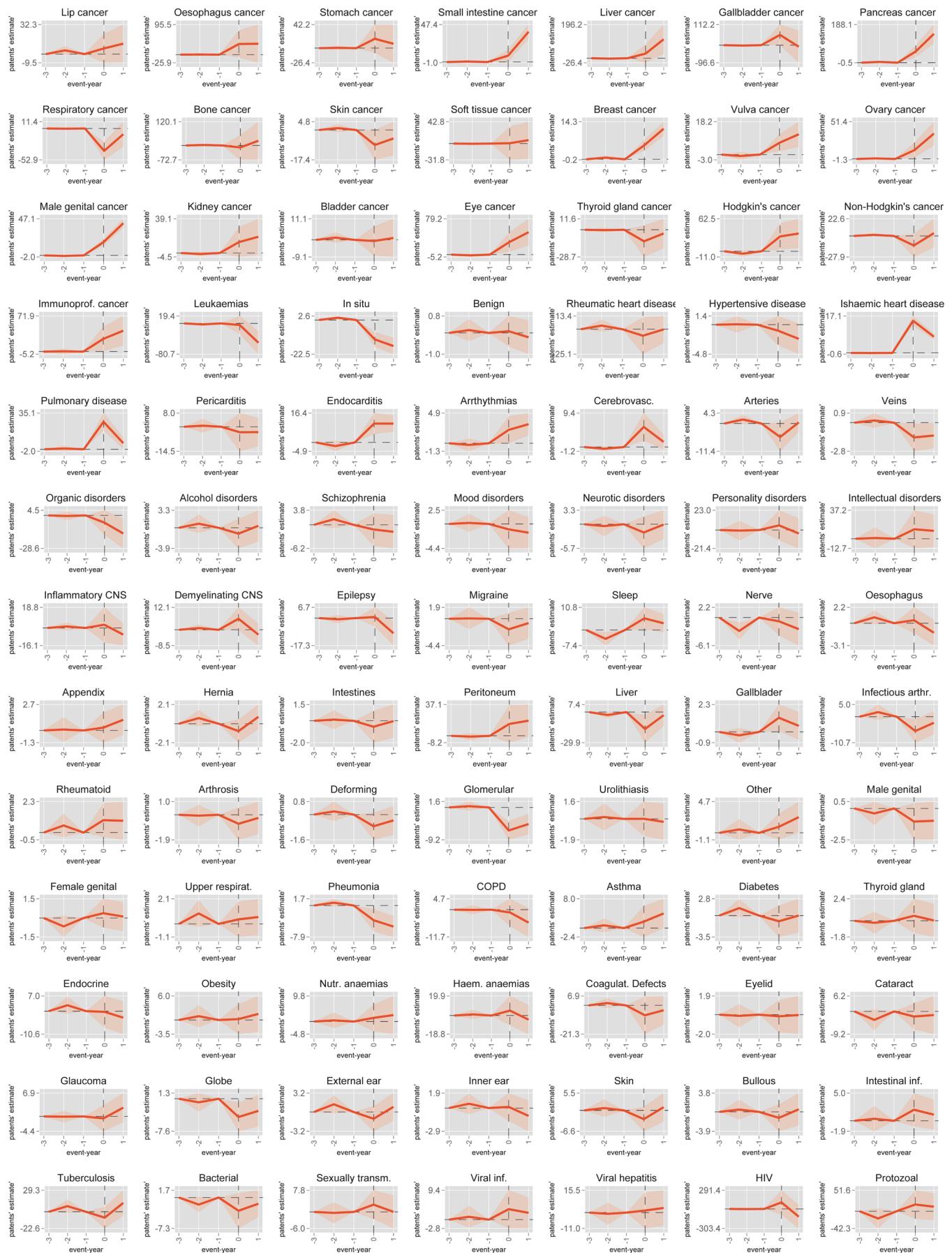


Figure C6 – The impact of patents on family income (IHS) by event-years, by single disease

Note: point estimates and 95% confidence intervals.

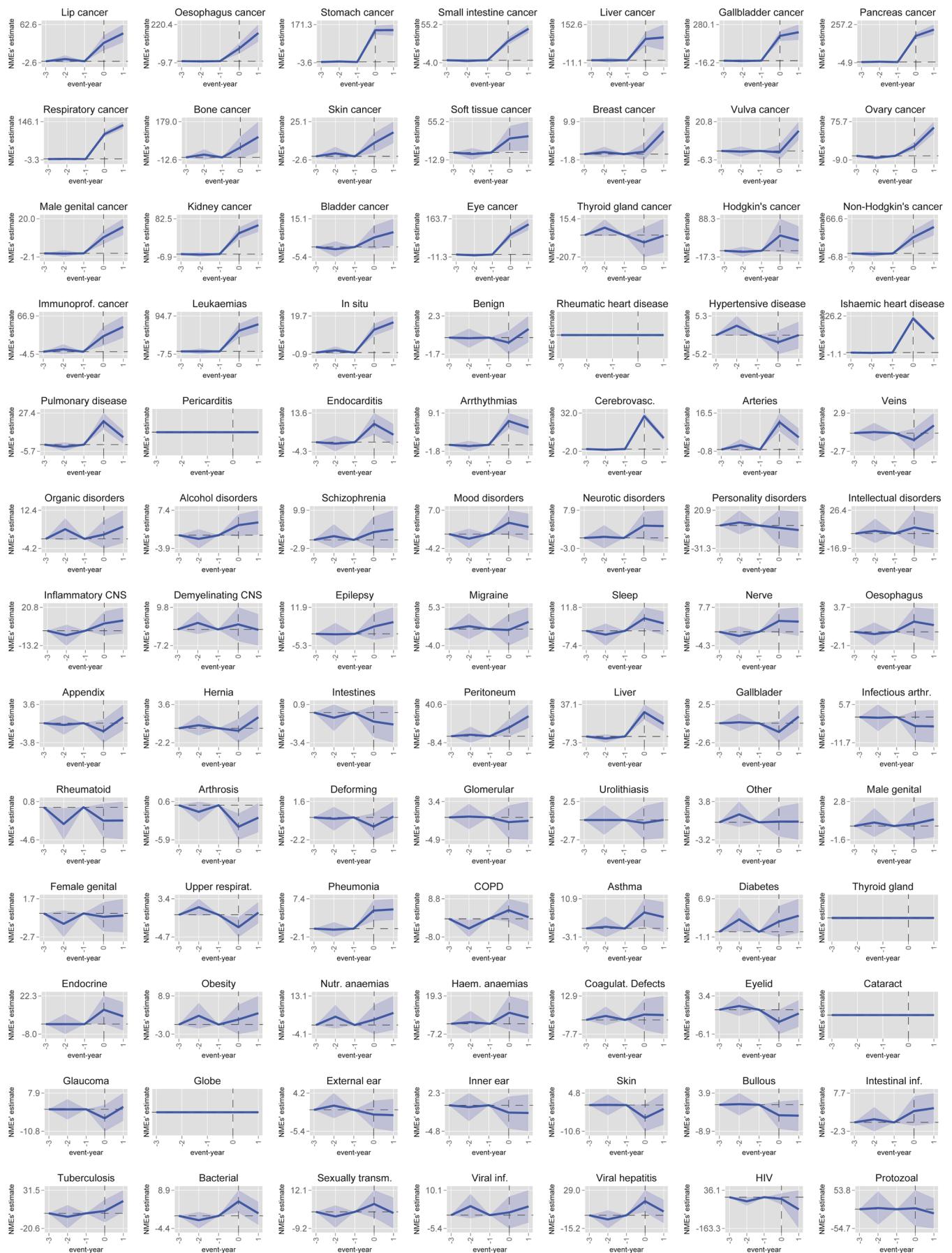


Figure C7 – The impact of NMEs on the individual's own income (IHS) by event-years, by single disease

Note: point estimates and 95% confidence intervals.

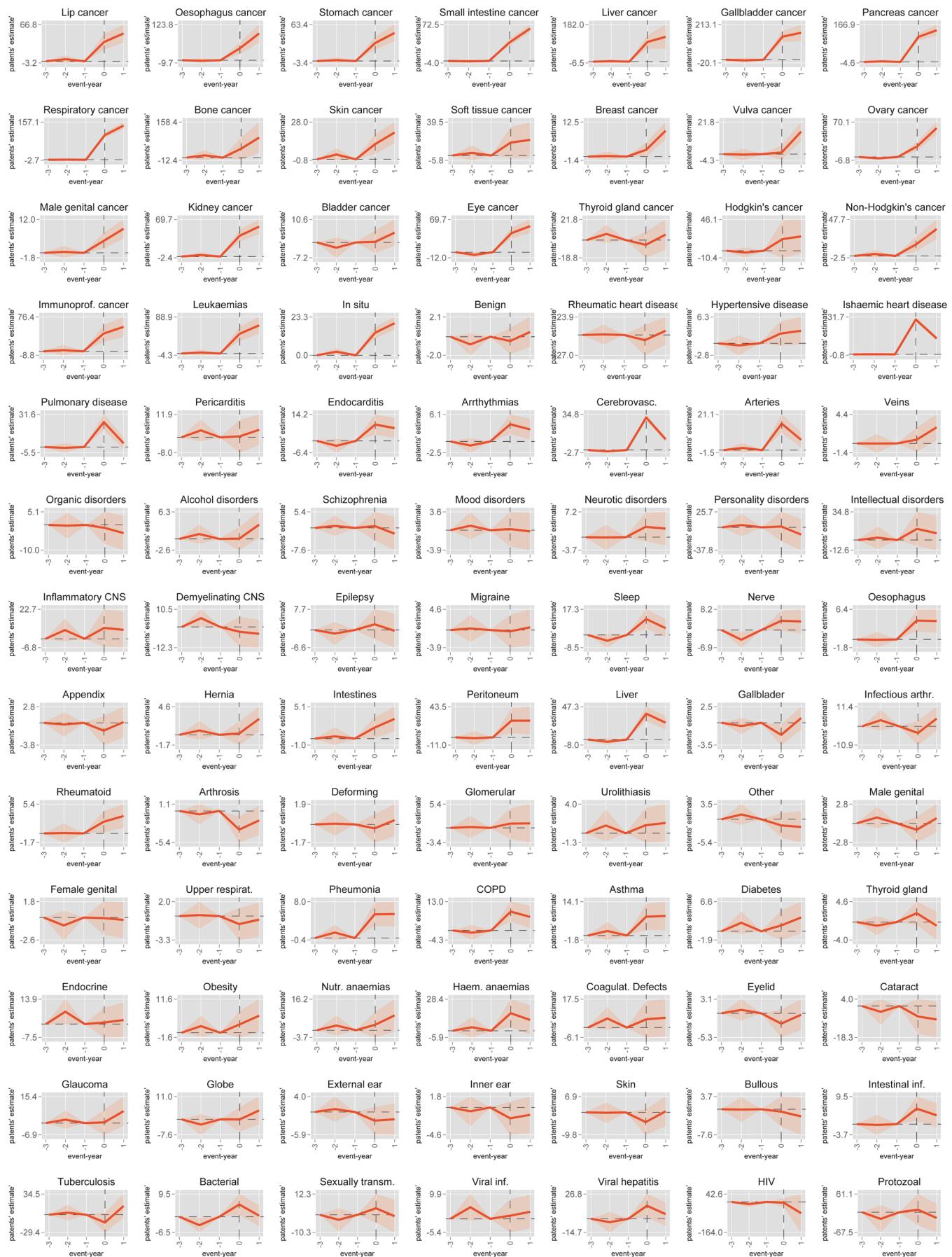


Figure C8 – The impact of patents on the individual's own income (IHS) by event-years, by single disease

Note: point estimates and 95% confidence intervals.

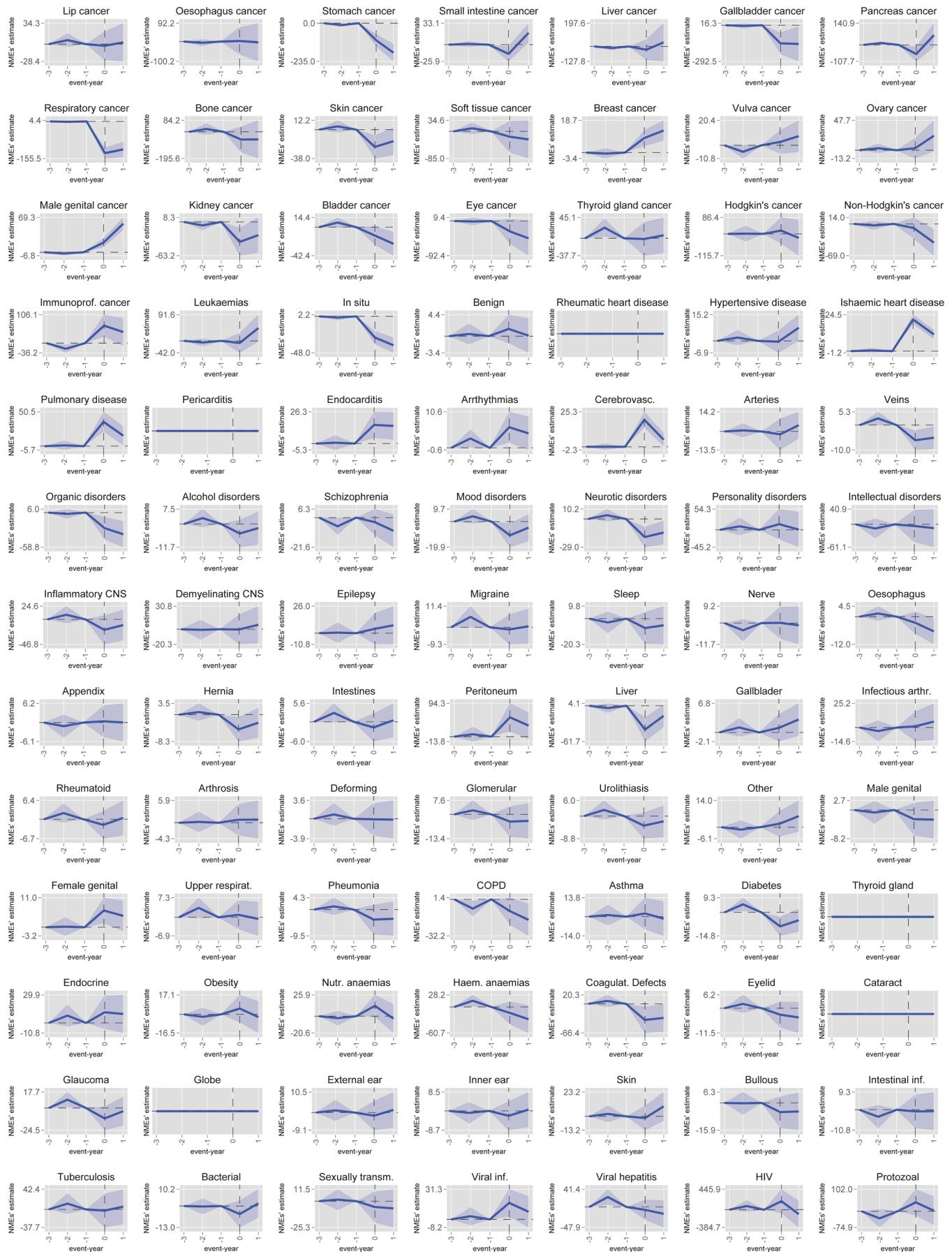


Figure C9 – The impact of NMEs on the partner's income (IHS) by event-years, by single disease

Note: point estimates and 95% confidence intervals.

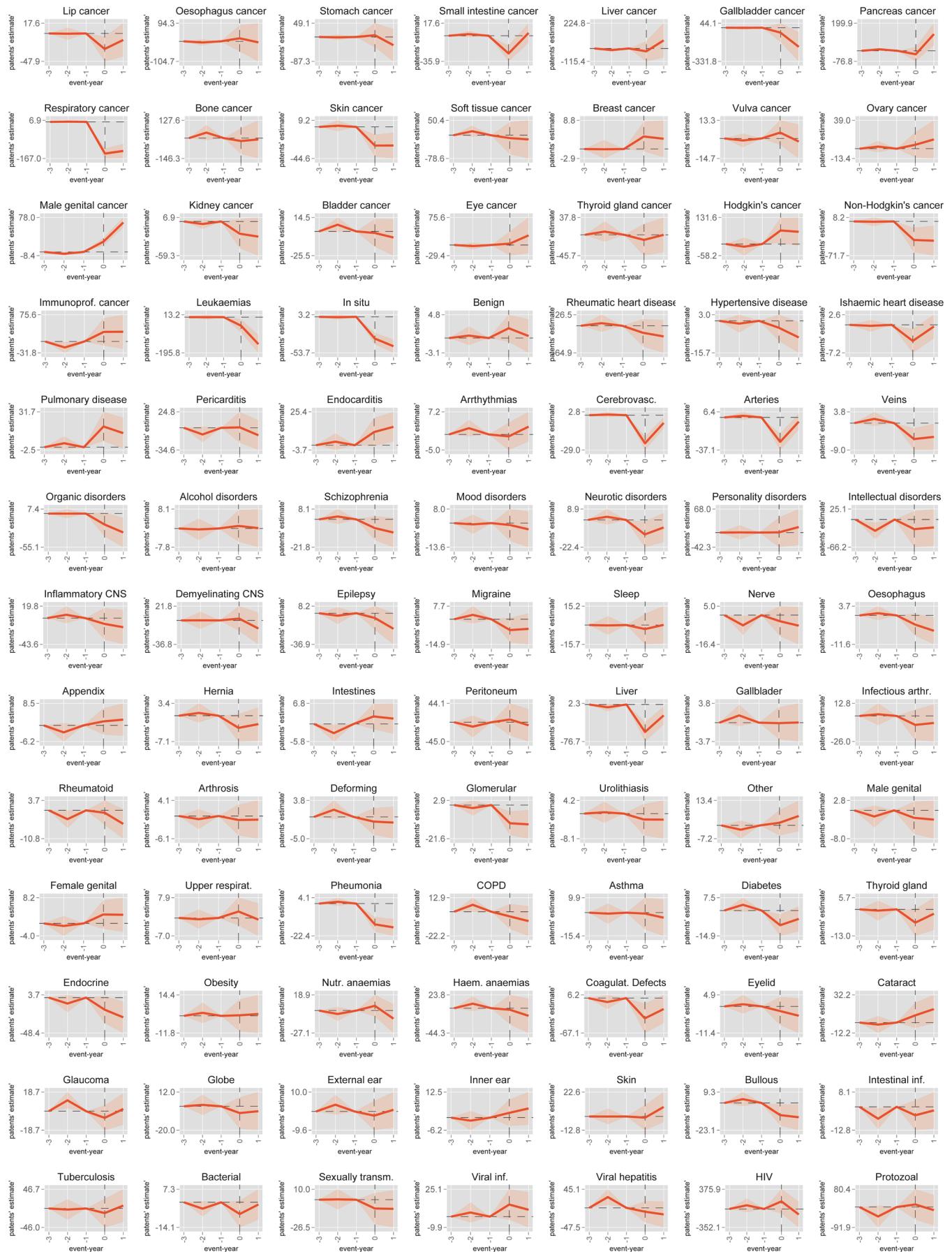


Figure C10 – The impact of patents on the partner's income (IHS) by event-years, by single disease

Note: point estimates and 95% confidence intervals.

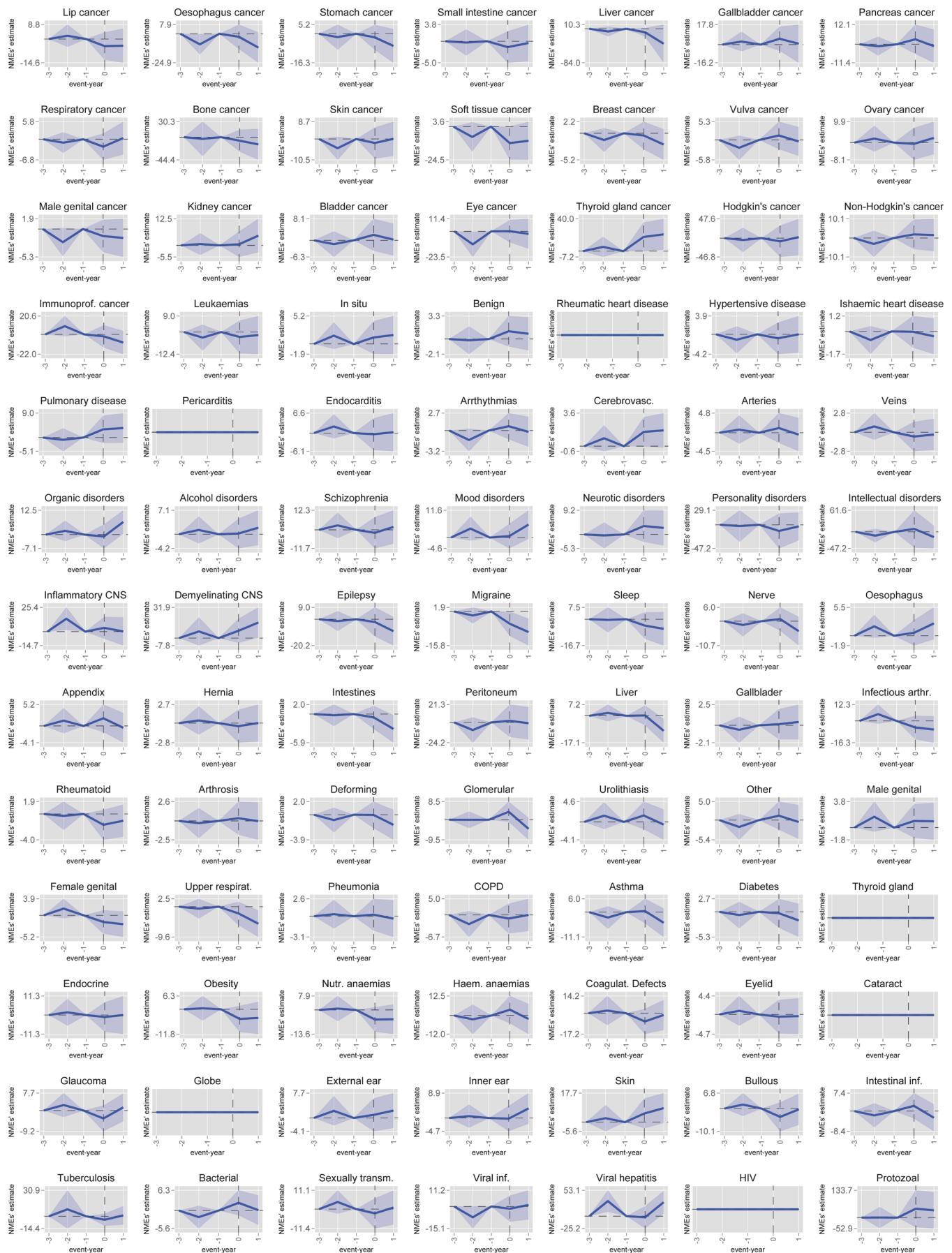


Figure C11 – The impact of NMEs on the adult child's income (IHS) by event-years, by single disease

Note: point estimates and 95% confidence intervals.

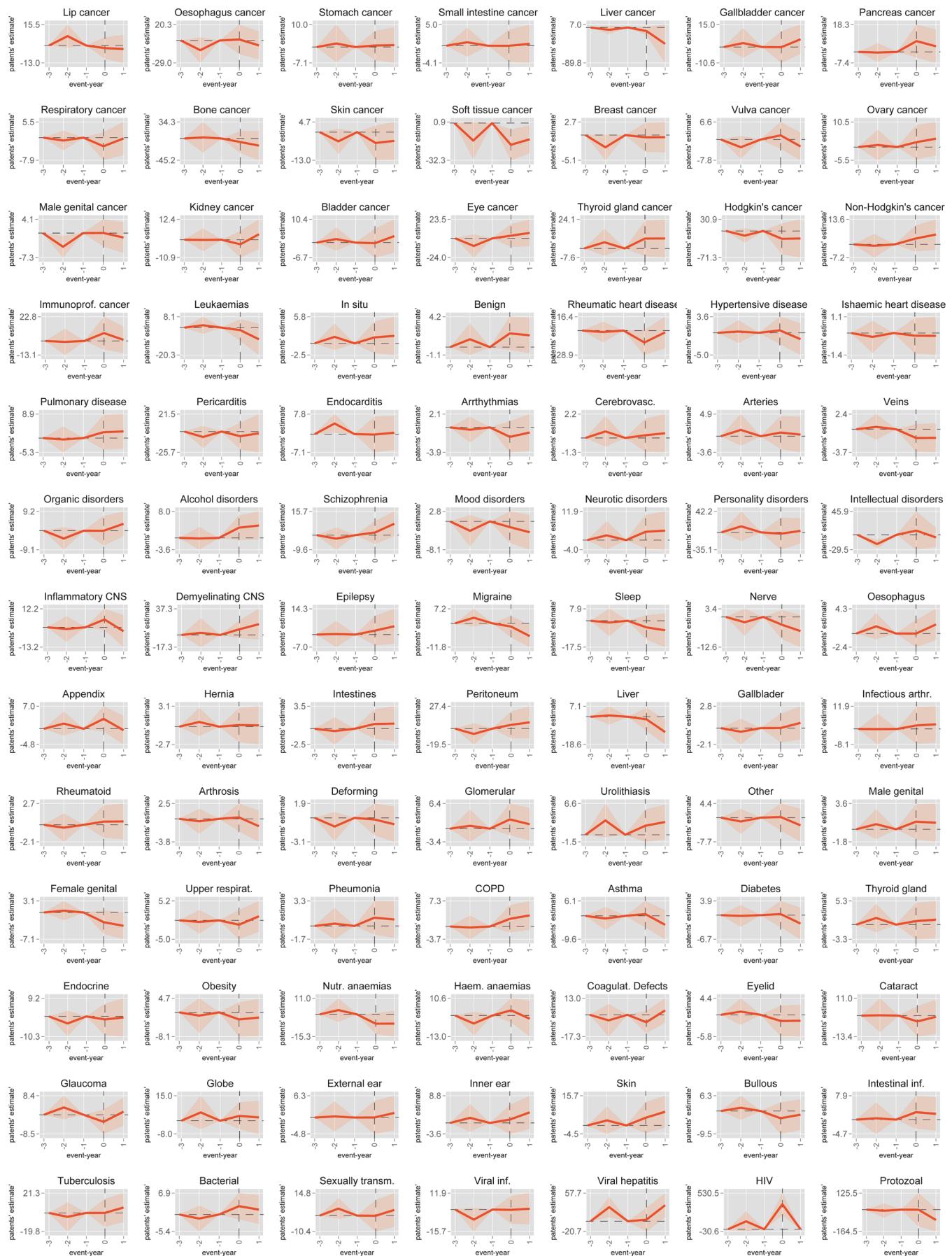


Figure C12 – The impact of patents on the adult child's income (IHS) by event-years, by single disease

Note: point estimates and 95% confidence intervals.

Appendix D

Table – Results from the model-based recursive partitioning

Disease group	Disease group name (short)	The value of the partitioned variable with largest instability	
		L ¹ NMEs	L ¹ patents
1	Lip cancer	1986	2002
2	Oesophagus cancer	1981	1981
3	Stomach cancer	1981	1981
4	Small intestine cancer	1994	1994
5	Liver cancer	1997	1997
6	Gallbladder cancer	2000	2000
7	Pancreas cancer	1995	1995
8	Respiratory organs cancer	1995	1995
9	Bone cancer	1981	1981
10	Skin cancer	1999	2003
11	Soft tissue cancer	No instability	No instability
12	Breast cancer	1983	1983
13	Vulva cancer	2005	1997
14	Ovary cancer	2005	2005
15	Male genital organs cancer	1988	1988
16	Kidney cancer	1996	2002
17	Bladder cancer	1997	1997
18	Eye cancer	1992	1996
19	Thyroid gland cancer	No instability	No instability
20	Hodgkin's cancer	1985	1985
21	Non-Hodgkin's cancer	1995	1995
22	Immunoprof. cancer	1994	1994
23	Leukaemias	1997	1997
24	In situ neoplasms	2002	2002
25	Benign neoplasms	1996	1996
26	Rheumatic heart disease	1996	2001
27	Hypertensive	1982	1982
28	Ischaemic heart disease	No instability	No instability
29	Pulmonary heart disease	1984	1991
30	Pericarditis	1981	1981
31	Endocarditis	1993	1993
32	Arrhythmias	No instability	No instability
33	Cerebrovasc.	2004	2004
34	Arteries	1995	1988
35	Veins	1988	1988
36	Organic disorders	1981	1981
37	Alcohol disorders	1998	No instability
38	Schizophrenia	1981	1981
39	Mood disorders	1982	1984
40	Neurotic disorders	1988	1988
41	Personality disorders	1987	1987
42	Mental retardation	1982	1982
43	Inflammatory CNS disorders	1998	1998
44	Demyelinating disorders	1983	1983
45	Epilepsy	2005	2005
46	Migraine	1993	1990
47	Sleep disorders	1982	1982
48	Nerve disorders	2005	2005
49	Oesophagus	2002	2003
50	Appendix	2002	1987
51	Hernia	1992	2004
52	Intestines	No instability	1989
53	Peritoneum	1983	1983
54	Liver	1995	1988
55	Gallbladder	No instability	No instability
56	Infectious arthr.	1986	1986
57	Rheumatoid	1987	1999

58	Arthrosis	1992	1992
59	Deforming	1982	1982
60	Glomerular	1991	1991
61	Urolithiasis	2005	2005
62	Other urinary	1981	No instability
63	Male genital	No instability	No instability
64	Female genital	1982	1982
65	Upper respirat.	1997	1997
66	Pheumonia	2005	1995
67	COPD	2000	2000
68	Asthma	2005	2005
69	Diabetes	1988	1988
70	Thyroid gland	2004	2004
71	Endocrine	1991	No instability
72	Obesity	No instability	No instability
73	Nutr. anaemias	2001	1982
74	Haem. anaemias	1981	1981
75	Coagulat. Defects	1983	1983
76	Eyelid	1983	1998
77	Cataract	1990	1990
78	Glaucoma	1994	1994
79	Globe	1984	1984
80	External ear	No instability	No instability
81	Inner ear	1989	1989
82	Skin	1982	1982
83	Bullous	1982	1982
84	Intestinal inf.	No instability	No instability
85	Tuberculosis	2001	2001
86	Bacterial	2003	1998
87	Sexually transm.	1994	1994
88	Viral inf.	1984	1984
89	Viral hepatitis	1999	2000
90	HIV	2005	2005
91	Protozoal	2005	2004