Supplementary document

In this supplementary document, we would like to share the data collected from statistics, and the results data from LMDI decomposition.

Figure S1. Total operating costs and income of public hospitals in Japan during 1996–2021
Figure S2. Average operating costs and income of a public hospital in Japan
Table S1: Changes in the number of public hospitals in Japan
Table S2: Total operating costs and income of public hospitals in Japan during 1996–2021
Table S3: Data preparation for LMDI decomposition from the corresponding statistical report
Table S4: Decomposition results of various factors influencing the total operating cost in a public hospital

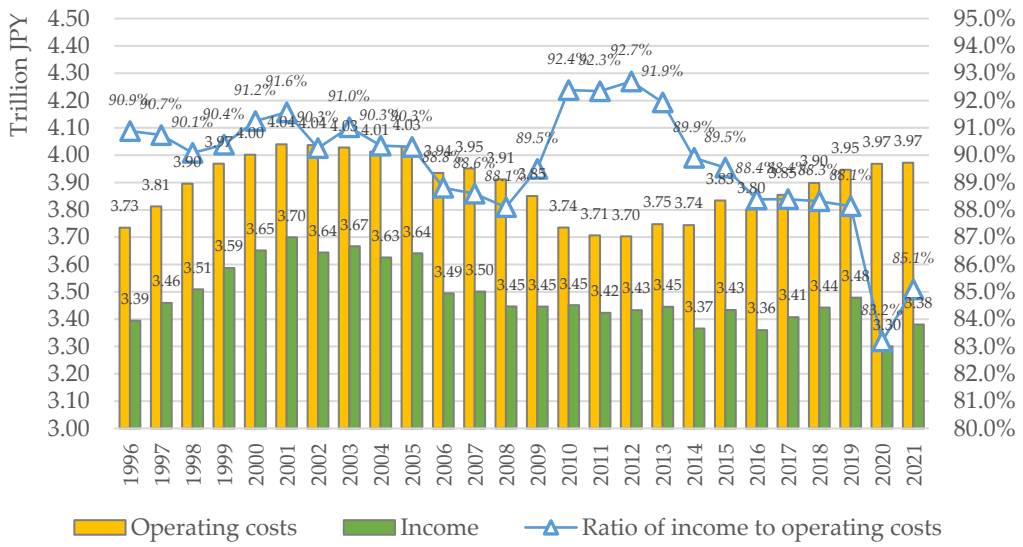


Figure S1. Total operating costs and income of public hospitals in Japan during 1996-2021

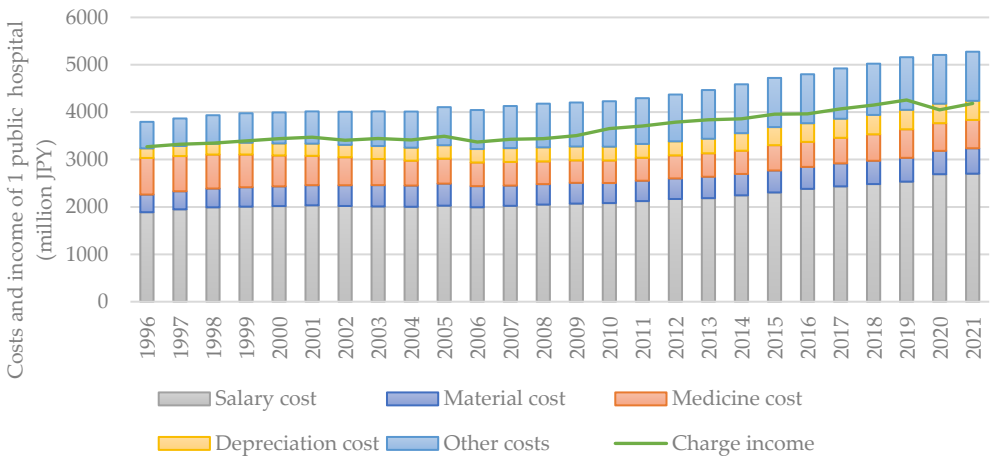


Figure S2. Average operating costs and income of a public hospital in Japan

Table S1 Changes in the number of public hospitals in Japan

Changes in the number of public hospitals in Japan	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Newly established	2	3	10	13	10	11	5	4	1	0	9	5	4
Integrated	-3	-1	-1	-1	-4	-1	-1	-1	0	-4	0	0	-1
Disestablished	-2	0	0	-2	0	0	-1	-2	-1	-2	0	-2	-2
Downgraded to clinics	-2	0	-4	-2	-2	-2	0	-1	-1	-5	-5	-10	-16
Transferred into local incorporated administrative agencies	0	0	0	0	0	0	0	0	0	0	-6	-1	-3
Assigned to private owners	0	0	0	0	0	0	0	0	0	0	-4	-5	-1
Others	-1	0	-1	0	0	-4	-2	-4	-2	-7	-3	-3	-2

2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021*
11	9	9	8	6	2	3	6	4	1	4	1	-
-4	-4	-3	-3	-5	-5	-2	-13	-2	0	0	0	-
-1	-2	-1	0	0	-3	-1	-1	-1	0	0	-2	-
-6	-6	-9	-5	-3	-4	0	-3	-4	-4	-4	-2	-
-7	-22	-11	-7	-2	-10	-4	-5	-2	-2	-7	0	-
-6	-4	-3	-1	-1	-1	0	-2	-1	-1	-2	0	-
-7	-4	-2	-8	-3	-2	0	-2	-3	-1	-2	0	-

*Currently not recorded in the statistics.

Data source:

- MICJ (1996-2021). Yearbook of Local Public Enterprises. Tokyo, Japan, The Ministry of Internal Affairs and Communications (MICJ).

Table S2 Total operating costs and income of public hospitals in Japan during 1996–2021

Total operating costs and income of public hospitals in Japan (trillion JPY)	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Operating costs	3.73	3.81	3.90	3.97	4.00	4.04	4.04	4.03	4.01	4.03	3.94	3.95	3.91
Income	3.39	3.46	3.51	3.59	3.65	3.70	3.64	3.67	3.63	3.64	3.49	3.50	3.45
Ratio of income to operating costs	90.9 %	90.7 %	90.1 %	90.4 %	91.2 %	91.6 %	90.3 %	91.0 %	90.3 %	90.3 %	88.8 %	88.6 %	88.1 %

2009	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
3.85	3.74	3.71	3.70	3.75	3.74	3.83	3.80	3.85	3.90	3.95	3.97	3.97
3.45	3.45	3.42	3.43	3.45	3.37	3.43	3.36	3.41	3.44	3.48	3.30	3.38
89.5%	92.4%	92.3%	92.7%	91.9%	89.9%	89.5%	88.4%	88.4%	88.3%	88.1%	83.2%	85.1%

Data source:

- MICJ (1996–2021). Yearbook of Local Public Enterprises. Tokyo, Japan, The Ministry of Internal Affairs and Communications (MICJ).

Table S3 Data preparation for LMDI decomposition from the corresponding statistical report

Statistics	Mark	Unit	1996	1997	1998	1999	2000	2001	2002	2003	2004
Population	①	million	125.86	126.16	126.47	126.67	126.93	127.32	127.49	127.69	127.79
Number of public hospitals	②	site	984	986	990	998	1002	1006	1007	1003	1000
Annual income	③	trillion JPY	424.02	423.09	413.05	412.18	423.73	409.59	407.15	414.14	422.01
Number of outpatients per day in public hospitals	④	person	535955	535750	545605	560134	568297	571876	535310	511486	496540
Number of inpatients per day in public hospitals	⑤	person	195547	194971	197366	199329	201405	201910	199787	196198	193464
Number of outpatients per day in all hospitals	⑥	person	1784892	1778058	1770556	1790089	1810990	1800133	1736762	1661369	1607849
Number of inpatients per day in all hospitals	⑦	person	1403294	1395304	1393069	1395721	1401399	1402885	1395735	1388723	1384846
Annual gross number of outpatients in public hospitals	⑧	million persons	137.74	137.15	138.58	140.59	142.64	143.54	134.90	129.92	125.13
Annual gross number of inpatients in public hospitals	⑨	million persons	70.79	70.58	71.05	71.56	72.10	72.28	71.72	71.22	70.23
Average visit duration of inpatients in all hospitals	⑩	days	43.70	42.50	40.80	39.80	39.10	38.70	37.50	36.40	36.30
Material costs	⑪	billion JPY	366.81	375.56	392.00	408.51	416.61	427.63	440.49	452.00	447.91
Medicine costs	⑫	billion JPY	759.50	732.94	710.23	689.47	654.32	623.51	595.49	553.30	525.13
Salary costs	⑬	billion JPY	1858.51	1922.31	1972.51	2001.86	2021.96	2045.91	2034.00	2015.51	2002.96
Depreciation costs	⑭	billion JPY	199.11	209.11	226.06	247.80	253.48	257.98	262.79	274.10	273.75
Other costs	⑮	billion JPY	550.84	572.73	594.85	621.21	655.67	685.20	704.46	733.36	763.04

2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
127.77	127.90	128.03	128.08	128.03	128.06	127.83	127.59	127.41	127.24	127.10	127.04	126.92	126.75	126.56	126.15	125.50
982	973	957	936	916	883	863	847	839	816	812	792	783	776	765	762	753
422.63	428.76	428.45	396.83	383.54	396.29	389.57	390.02	404.92	413.93	433.15	432.54	441.12	443.64	442.80	418.66	441.03
471014	440440	420413	396132	384092	366883	357791	349003	344578	329291	329195	313547	307338	304499	300493	267525	275482
189123	179080	173259	165358	159497	154206	150003	146083	143231	136917	136019	132326	131201	128954	126779	112783	110181
1579640	1525185	1481322	1431316	1416845	1412245	1401669	1397864	1389983	1372114	1366693	1355757	1346627	1334097	1324829	1193205	1243000
1382190	1358965	1332655	1318020	1308219	1313421	1299322	1287181	1275347	1261181	1255404	1250769	1252295	1246867	1234144	1165389	1142570
119.64	111.94	106.32	99.90	96.14	91.98	89.39	87.77	86.01	82.66	81.90	78.50	77.38	76.42	74.37	66.94	68.66
68.84	65.06	62.75	60.05	57.72	55.84	54.10	52.58	51.47	49.51	49.00	47.71	47.59	46.78	46.06	41.08	40.16
35.70	34.70	34.10	33.80	33.20	33.20	32.50	32.00	31.20	30.60	29.10	28.50	28.20	27.80	27.30	28.3	27.5
457.30	433.55	409.18	404.17	400.51	373.83	370.70	367.34	378.96	368.14	376.22	366.94	379.90	381.43	384.18	375.51	403.98
517.16	486.07	478.00	448.89	435.55	420.57	418.82	412.44	415.76	400.49	433.89	418.75	422.55	433.87	461.16	445.32	450.44
1990.12	1939.21	1935.99	1918.23	1896.46	1837.70	1832.29	1835.79	1833.30	1831.83	1872.29	1885.84	1905.85	1926.34	1938.39	2050.34	2034.17
277.71	276.19	278.60	277.37	267.57	256.54	251.32	250.58	256.93	301.95	309.99	311.47	314.56	316.79	313.45	312.63	303.56
789.65	800.29	849.90	863.26	850.59	846.82	833.55	837.07	862.74	841.57	842.19	818.44	832.05	839.62	849.86	784.46	780.59

Data source:

- MICJ (1996–2021). Yearbook of Local Public Enterprises. Tokyo, Japan, The Ministry of Internal Affairs and Communications (MICJ).
- MHLWJ (1996–2021). Survey of Medical Institutions. Tokyo, Japan, The Ministry of Health, Labor, and Welfare of Japan (MHLWJ).
- MOF (2022). Trade Statistics of Japan. Tokyo, Japan, Ministry of Finance (MOF).

Table S4 Decomposition results of various factors influencing the total operating cost in a public hospital

Contribution of each influencing factor (million JPY)	1997	1998	1999	2000	2001	2002	2003	2004
Population	9.06	9.73	6.09	8.14	12.29	5.35	6.54	2.92
Annual income per capita	-17.48	-103.41	-14.47	102.04	-148.23	-29.38	61.76	72.72
Consultation rate by annual income	-20.42	59.12	7.00	-72.23	128.53	-104.05	-170.24	-199.54
Coverage of one public hospital in terms of yearly medical consultations	5.98	61.04	27.37	4.32	16.94	-120.47	-29.55	-13.28
Visit duration for a single consultation at a public hospital including inpatients and outpatients	0.41	-6.68	-10.61	-9.80	-5.41	69.71	39.52	32.11
Cost for one patient during his/her one-day stay in a public hospital	93.75	48.41	26.41	-15.22	17.96	171.88	99.01	101.65
Net changes of medical expense at one public hospital	71.30	68.21	41.80	17.25	22.08	-6.96	7.05	-3.41

2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
-0.60	4.24	4.22	1.65	-1.70	0.82	-7.43	-8.18	-6.20	-6.29	-5.20	-1.99	-4.71	-6.67	-7.80	-16.78	-26.83
6.54	54.46	-7.22	-320.13	-141.06	137.09	-65.45	13.17	171.81	105.95	216.47	-4.73	101.31	43.16	4.40	-289.76	299.68
-47.91	-176.64	-131.93	196.98	81.58	-144.22	24.02	-0.06	-220.02	-127.28	-260.15	-17.23	-97.99	-74.34	-101.89	-63.23	-155.46
-63.80	-112.95	-5.74	-42.81	-8.11	-24.47	26.26	-3.07	9.07	-24.46	32.78	-55.08	-10.87	21.13	43.13	-160.49	75.95
34.04	12.30	21.16	26.23	-3.06	16.81	-6.55	-16.81	-3.74	-0.44	-6.30	24.64	19.52	-9.82	19.13	-12.62	-92.51
164.78	157.26	204.24	188.24	96.75	40.59	93.83	92.00	143.79	173.88	156.60	131.76	116.21	126.54	179.29	591.04	-32.64
93.04	-61.32	84.71	50.17	24.40	26.63	64.67	77.05	94.70	121.37	134.20	77.38	123.47	100.00	136.26	48.16	68.19