

Supplementary Table 1. Search strategy ^a

Medical terms in Chinese	<p>“Spinal fractures”, “Cervical fractures”, “Thoracic fractures”, “Lumbar fractures”, “Sacral fractures”, “Spinal cord injury”, “Cervical spine fracture with spinal cord injury”, “Thoracic spine fracture with spinal cord injury”, “Lumbar spine fracture with spinal cord injury”, “Cervical spinal cord injury”, “Thoracic spinal cord injury”, “Lumbar spinal cord injury”, “Cauda equina injury”, “Nerve injury”, “Quadriplegia”, “Paraplegia”, “Incomplete quadriplegia”, “Incomplete paraplegia”</p>
Tenth Revision of the International Classification of Diseases (ICD-10) codes	<p>S12 (Fracture of the neck), S12.0 (Fracture of first cervical vertebra), S12.2 (Fracture of other specified cervical vertebra), S13.0 (Traumatic rupture of cervical intervertebral disk), S13.2 (Dislocation of other and unspecified parts of neck), S13.4 (Sprain and strain of cervical spine), S14 (Injury of nerves and spinal cord at neck level), S14.0 (Concussion and edema of cervical spinal cord), S14.1 (Other and unspecified injuries of cervical spinal cord), S17 (Crushing injury of neck), S19 (Other and unspecified injuries of neck), S22 (Fracture of ribs, sternum and thoracic spine), S22.0 (Fracture of thoracic vertebra), S23.1 (Dislocation of thoracic vertebra), S24 (Injury of nerves and spinal cord at thorax level), S24.0 (Concussion and edema of thoracic spinal cord), S24.1 (Other and unspecified injuries of thoracic spinal cord), S28 (Crushing injury of thorax and traumatic amputation of part of thorax), S29 (Other and unspecified injuries of thorax), S32 (Fracture of lumbar spine and pelvis), S32.0 (Fracture of lumbar vertebra), S33.1 (Dislocation of lumbar vertebra), S34.0 (Concussion and edema of lumbar spinal cord), S34.1 (Other injury of lumbar spinal cord), S34.3 (Injury of cauda equina), S38 (Crushing injury and traumatic amputation of part of abdomen, lower back and pelvis), S39 (Other and unspecified injuries of abdomen, lower back and pelvis), T02.0 (Fractures involving head with neck), T02.1 (Fractures involving thorax with lower back and pelvis), T04.1 (Crushing injuries involving thorax with abdomen, lower back and pelvis), T04.2 (Crushing injuries involving multiple regions of upper limbs), T06.0 (Injuries of brain and cranial nerves with injuries of nerves and spinal cord at neck level), T06.1 (Injuries of nerves and spinal cord involving other multiple body regions), T09.3 (Injury of spinal cord, level unspecified), T09.4 (Injury of unspecified nerve, spinal nerve root and plexus of trunk), T91.1 (Sequelae of fracture of spine), T91.3 (Sequelae of injury of spinal cord), G82 (Paraplegia and tetraplegia), G82.0 (Flaccid paraplegia), G82.1 (Spastic paraplegia), G82.2 (Paraplegia, unspecified), G82.3 (Flaccid tetraplegia), G82.4 (Spastic tetraplegia), G82.5 (Tetraplegia, unspecified), G83.4 (Cauda equina syndrome)</p>

^a We combined medical terms in Chinese and the Tenth Revision of the International Classification of Diseases (ICD-10) codes to retrieve TSCI cases.

Supplementary Table 2. The trends in the number of different age groups

	2013	2014	2015	2016	2017	2018	APC (95% CI)
18-44 years	674	807	707	793	672	721	-0.3 (-5.9, 5.7)
45-64 years	877	1054	1070	1179	1296	1297	7.9 (4.6, 11.4) *
65-84 years	211	261	306	403	422	513	19.2 (15.1, 23.5) *
≥85 years	3	8	12	11	17	20	39.5 (14.3, 70.3) *

* indicates that APC is significantly different from 0, at $\alpha=0.05$ level. APC=Annual Percentage Change.

Supplementary Table 3. The trends in the proportion of number in different age groups

	2013	2014	2015	2016	2017	2018	APC (95% CI)
Total							
18-44 years	674 (38.2)	807 (37.9)	707 (33.7)	793 (33.2)	672 (27.9)	721 (28.3)	-6.7 (-9.5, -3.9) *
45-64 years	877 (49.7)	1054 (49.5)	1070 (51.1)	1179 (49.4)	1296 (53.8)	1297 (50.8)	1.0 (-1.1, 3.0)
65-84 years	211 (12.0)	261 (12.3)	306 (14.6)	403 (16.9)	422 (17.5)	513 (20.1)	11.5 (8.5, 14.6) *
≥ 85 years	3 (0.2)	8 (0.4)	12 (0.6)	11 (0.5)	17 (0.7)	20 (0.8)	30.5 (8.6, 56.9) *
Male							
18-44 years	531 (39.8)	647 (39.4)	561 (34.9)	630 (34.7)	541 (29.8)	562 (29.8)	-6.3 (-8.7, -3.9) *
45-64 years	675 (50.6)	800 (48.8)	830 (51.7)	902 (49.7)	982 (54.0)	984 (52.1)	1.2 (-1.0, 3.4)
65-84 years	126 (9.5)	187 (11.4)	209 (13.0)	276 (15.2)	286 (15.7)	329 (17.4)	12.6 (9.0, 16.2) *
≥ 85 years	1 (0.1)	7 (0.4)	6 (0.4)	7 (0.4)	9 (0.5)	14 (0.7)	34.6 (2.4, 76.9) *
Female							
18-44 years	143 (33.1)	160 (32.7)	146 (29.9)	163 (28.5)	131 (22.2)	159 (24.0)	-7.7 (-12.1, -3.2) *
45-64 years	202 (46.8)	254 (51.9)	240 (49.1)	277 (48.5)	314 (53.3)	313 (47.3)	0.3 (-3.4, 4.2)
65-84 years	85 (19.7)	74 (15.1)	97 (19.8)	127 (22.2)	136 (23.1)	184 (27.8)	9.3 (0.2, 19.2) *
≥ 85 years	2 (0.5)	1 (0.2)	6 (1.2)	4 (0.7)	8 (1.4)	6 (0.9)	26.5 (-16.2, 91.2)

* indicates that APC is significantly different from 0, at $\alpha=0.05$ level. APC = Annual Percentage Change.

Supplementary Table 4. The trends of old-to-young ratio

	Total	2013	2014	2015	2016	2017	2018	APC (95% CI) ^a
Total	0.20	0.14	0.14	0.18	0.21	0.22	0.26	14.1 (9.6, 18.7) *
Sex								
Male	0.17	0.11	0.13	0.15	0.18	0.19	0.22	14.7 (12.0, 17.4) *
Female	0.29	0.25	0.18	0.27	0.30	0.32	0.40	12.7 (1.0, 25.8) *
Occupations								
Farmers	0.19	0.14	0.16	0.17	0.18	0.22	0.26	12.5 (8.5, 16.5) *
Workers	0.07	0.05	0.07	0.06	0.08	0.06	0.09	8.2 (-3.6, 21.5)
Office clerks	0.04	0.01	0.01	0.05	0.08	0.08	0.03	41.7 (-15.8, 138.5)
Self-employed	0.07	0.03	0.05	0.08	0.18	0.05	0.03	2.3 (-38.0, 69.0)
Civil servants	0.58	0.59	0.43	0.95	0.38	0.90	0.08	-22.0 (-56.3, 39.1)
Drivers	0.04	0.04	0.03	0.00	0.04	0.06	0.00	/
Others ^b	0.29	0.20	0.19	0.25	0.33	0.33	0.40	16.7 (9.4, 24.4) *
Missing	0.15	0.12	0.12	0.15	0.11	0.16	0.23	11.5 (-2.5, 27.5)
Etiological groups								
Low falls	0.39	0.33	0.30	0.33	0.40	0.43	0.51	10.4 (4.2, 16.9) *
High falls	0.10	0.07	0.07	0.10	0.10	0.10	0.12	11.4 (4.4, 18.8) *
Traffic accidents	0.15	0.11	0.10	0.14	0.14	0.17	0.19	13.2 (6.4, 20.3) *
Struck by falling objects	0.07	0.02	0.04	0.08	0.10	0.06	0.12	34.6 (3.0, 75.9) *
Sport related injuries	0.40	0.19	0.13	0.38	0.28	0.46	0.79	35.4 (7.9, 69.9) *
Others ^c	0.24	0.13	0.21	0.22	0.25	0.27	0.33	17.1 (8.1, 27.0) *
Missing	0.14	0.06	0.12	0.07	0.20	0.17	0.16	22.1 (-4.2, 55.7)
Segment								
Cervical	0.22	0.15	0.18	0.20	0.23	0.26	0.29	13.8 (12.3, 15.5) *
Thoracic	0.15	0.10	0.08	0.16	0.18	0.18	0.22	20.4 (5.1, 37.8) *
Lumbosacral	0.16	0.14	0.09	0.17	0.17	0.15	0.22	11.4 (-5.2, 31.0)
Multi-site	0.21	0.11	0.29	0.10	0.20	0.43	0.56	33.1 (-5.4, 87.4)
Cauda equina	0.13	0.17	0.00	0.00	0.00	0.33	0.00	/
Missing	0.16	0.20	0.12	0.05	0.23	0.15	0.19	5.7 (-29.6, 58.7)
Severity								
Complete quadriplegia	0.22	0.14	0.19	0.19	0.21	0.25	0.30	14.5 (9.1, 20.1) *
Complete paraplegia	0.13	0.09	0.09	0.13	0.14	0.15	0.16	13.7 (6.7, 21.1) *
Incomplete quadriplegia	0.22	0.15	0.17	0.18	0.24	0.24	0.29	14.1 (9.6, 18.8) *
Incomplete paraplegia	0.21	0.16	0.12	0.22	0.21	0.25	0.28	15.2 (2.0, 30.1) *
Missing	0.16	0.22	0.13	0.08	0.19	0.20	0.18	3.4 (-21.7, 36.4)
AIS grade								
A	0.14	0.10	0.10	0.14	0.16	0.18	0.19	15.7 (9.4, 22.3) *
B	0.17	0.12	0.15	0.19	0.09	0.18	0.27	11.6 (-12.1, 41.8)
C	0.23	0.13	0.20	0.19	0.26	0.27	0.28	15.5 (6.0, 25.9) *
D	0.22	0.17	0.15	0.20	0.24	0.24	0.30	13.5 (6.0, 21.5) *
E	0.13	0.36	0.11	0.09	0.17	0.09	0.10	-16.6 (-39.1, 14.1)

Missing	0.16	0.14	0.09	0.06	0.19	0.38	0.20	23.0 (-16.4, 81.1)
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^a APC indicates trends of Old-to-Young Ratio from 2013 to 2018. * indicates that APC is significantly different from 0, at $\alpha=0.05$ level. ^b “Others” included “teachers”, “students”, “retired”, “unemployed”, “freelances”, and all other unmentioned professions. ^c “Others” included “injuries by others”, “work-related injuries”, “sharp injuries”, “massage injuries”, “electric shock injuries”, “gunshot wounds”, “crush injuries”, “iatrogenic injuries”, and all other unmentioned causes of injury. APC = annual percentage change. AIS grade = American Spinal Injury Association (ASIA) impairment scale.

Supplementary Table 5. Trends in surgery rate and use of high-dose MPSS/MP

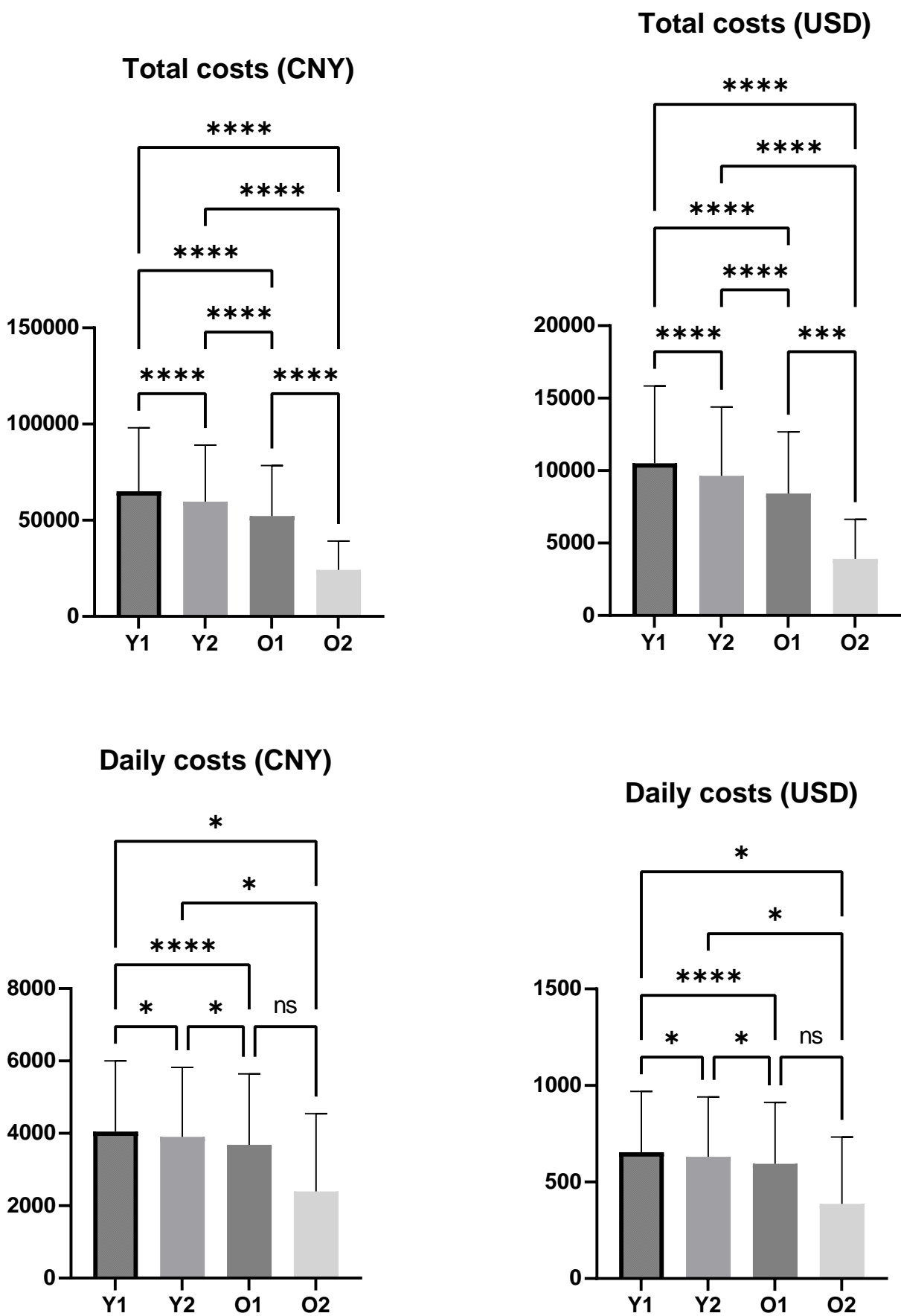
	2013	2014	2015	2016	2017	2018	APC (95% CI)
Surgery rate (%)							
18-44 years	77.0%	73.2%	79.3%	76.5%	78.1%	78.4%	0.7 (-1.1, 2.6)
45-64 years	77.1%	74.0%	75.5%	77.3%	74.5%	75.9%	-0.1 (-1.4, 1.2)
65-84 years	67.3%	62.5%	69.3%	67.0%	69.0%	69.2%	1.2 (-1.3, 3.7)
≥85 years	0.0%	37.5%	50.0%	63.6%	35.3%	45.0%	/
Surgery rate within 24 hours (%)							
18-44 years	3.3%	3.3%	2.3%	1.9%	1.2%	2.5%	-12.4 (-29.6, 9.1)
45-64 years	2.2%	3.1%	2.4%	2.0%	1.8%	1.8%	-7.9 (-17.7, 3.0)
65-84 years	1.4%	0.0%	1.6%	1.2%	1.7%	0.6%	/
≥85 years	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	/
Use rate of high-dose MPSS/MP (%)							
18-44 years	14.7%	16.1%	15.1%	16.6%	10.4%	19.4%	0.5 (-13.8, 17.2)
45-64 years	17.2%	15.2%	15.8%	15.1%	11.3%	17.7%	-2.2 (-12.8, 9.6)
65-84 years	12.8%	13.0%	10.5%	14.1%	9.2%	16.4%	1.4 (-12.9, 18.1)
≥85 years	0.0%	12.5%	8.3%	9.1%	0.0%	5.0%	/
Use rate of high-dose MPSS/MP within 8 hours (%)							
18-44 years	4.6%	5.8%	4.4%	7.2%	3.6%	5.0%	-1.6 (-17.6, 17.6)
45-64 years	5.0%	5.4%	4.0%	5.9%	4.1%	3.5%	-6.4 (-16.8, 5.4)
65-84 years	2.8%	2.7%	3.3%	5.2%	1.9%	3.5%	1.4 (-20.8, 29.8)
≥85 years	0.0%	0.0%	8.3%	0.0%	0.0%	0.0%	/

MPSS = methylprednisolone sodium succinate. MP = methylprednisolone. APC = Annual Percentage Change.

Supplementary Table 6. Trends of medical costs during hospitalization

	2013	2014	2015	2016	2017	2018	APC (95% CI)
Total costs (CNY, thousands, mean)							
18-44 years	87.91	89.76	74.63	74.86	72.61	71.51	-4.6 (-7.9, -1.3) *
45-64 years	79.53	76.28	72.32	69.50	63.63	66.68	-4.1 (-6.1, -2.0) *
65-84 years	64.51	64.69	61.37	59.10	64.65	51.33	-3.3 (-7.8, 1.4)
≥85 years	5.28	68.86	108.48	54.65	18.56	31.50	13.1 (-48.6, 148.8)
Daily costs (CNY, thousands, mean)							
18-44 years	4.49	4.58	4.43	4.33	4.66	4.49	0.1 (-1.8, 2.0)
45-64 years	4.35	4.25	4.35	4.08	4.39	4.59	0.9 (-1.7, 3.6)
65-84 years	3.85	3.95	3.88	3.83	4.29	4.58	3.2 (0.0, 6.5)
≥85 years	1.92	3.57	6.38	4.79	1.72	3.43	1.3 (-30.6, 47.8)
Total costs (USD, thousands, mean)							
18-44 years	14.20	14.49	12.05	12.09	11.72	11.55	-4.6 (-7.9, -1.3) *
45-64 years	12.84	12.32	11.68	11.22	10.27	10.77	-4.1 (-6.1, -2.0) *
65-84 years	10.42	10.45	9.91	9.54	10.44	8.29	-3.3 (-7.8, 1.4)
≥85 years	0.85	11.12	17.52	8.82	3.00	5.09	13.1 (-48.6, 148.8)
Daily costs (USD, thousands, mean)							
18-44 years	0.72	0.74	0.71	0.70	0.75	0.72	0.1 (-1.8, 2.0)
45-64 years	0.70	0.69	0.70	0.66	0.71	0.74	0.9 (-1.7, 3.6)
65-84 years	0.62	0.64	0.63	0.62	0.69	0.74	3.2 (0.0, 6.5)
≥85 years	0.31	0.58	1.03	0.77	0.28	0.55	1.3 (-30.6, 47.8)

* indicates that APC is significantly different from 0, at $\alpha=0.05$ level. APC = Annual Percentage Change. CNY = Chinese Yuan. USD = USA Dollar. SD = standard deviation.



Supplementary Figure. post-hoc tests in 4 age groups of costs

CNY = Chinese Yuan. USD = USA Dollar. ns: no significance. *: $P < 0.05$; **: $P < 0.01$; ***: $P < 0.001$; ****: $P < 0.0001$.