

## Abstract

## A community-based study of severe trauma, death and disability, 2018

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Worldwide, unintentional injury is a leading cause of death and a major health problem. The aim of this study was to present the current (2019) status of severe trauma, death and disability by analyzing 2018 community-based severe trauma survey data. This study conducted an all-inclusive survey of all severe traumas, non-traumatic severe injuries and disasters transported by 119 emergency medical services in 2018. The Glasgow Outcome Scale (GOS) was used to grade the severity of trauma. As per the injury mechanism determined by the date on the final medical record, there were 30,034 severe traumas, 12,248 non-traumatic severe injuries, and 6,185 disasters. Of the cases transferred by 119 emergency medical services to primary medical institutions, 5,437 cases were transferred from the emergency room to other hospitals, of which 3,919 cases were closed when the patient medical record surveys were completed between transfers. In addition to case transfers, patient recovery and disability rates were analyzed. The primary finding was that; by incidence, the rate of severe trauma was 62.8 per 100,000 people in 2018; by sex, 69.1% of the trauma occurred in men; and by age, 19.7% occurred in people in their 50s, 17.0% in people in their 60s, and 12.8% in people in their 70s. The study also found that most of the injury mechanisms were either transport accidents (46.7%) or slips and falls (40.3%). Furthermore, the fatality rate of severe trauma patients was 18.4%, and the fatality rate by injury mechanism was the highest in transport accidents at 22.1%. Of the 24,512 survivors of severe trauma, 73.0% recovered to the extent that they could return to daily life, 26.9% had a moderate to severe disability disorder, and 29.6% of the disabled patients were in a vegetative state where daily life became impossible. Community-based severe trauma investigations, such as the one conducted in this study, provide basic data for improving the survival rate of severe trauma by calculating the results for each region and by evaluating the type of emergency medical institution.

**Keywords:** Severe trauma, Mortality, Disability

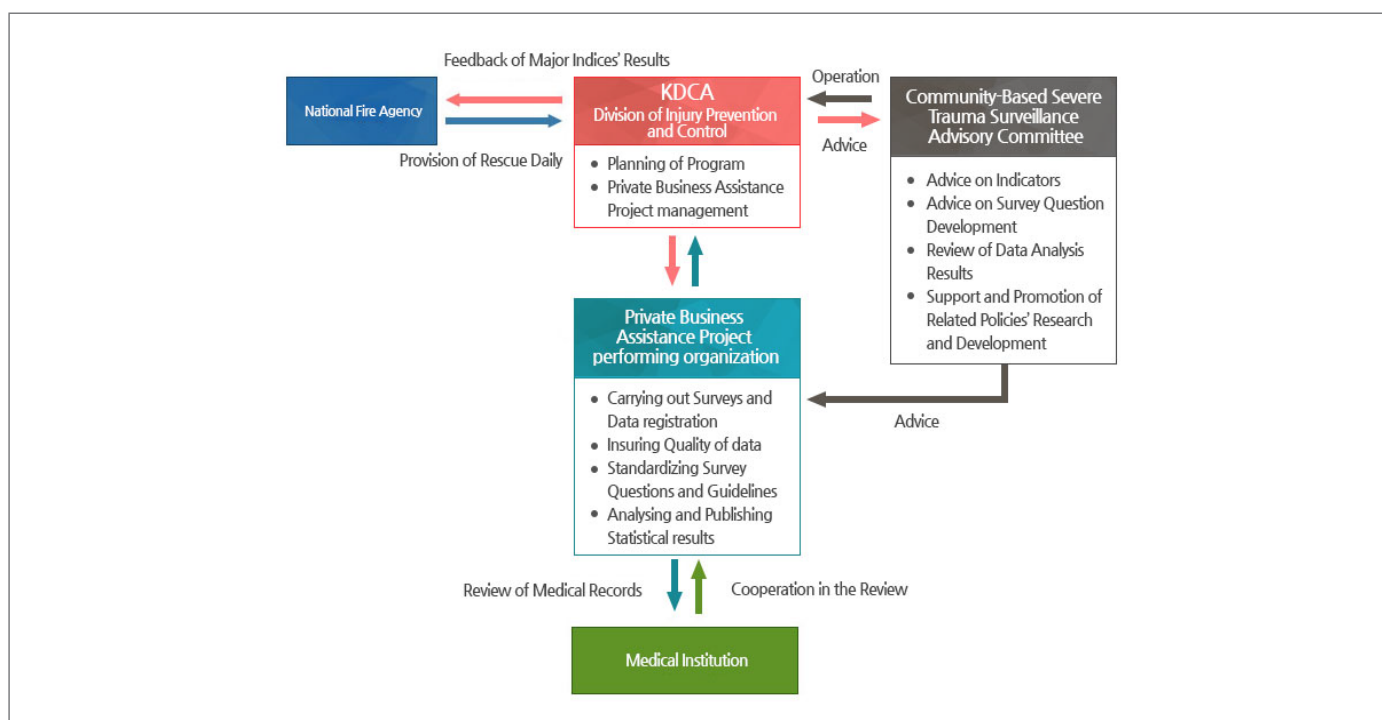


Figure 1. Community-based severe trauma and mass casualty incident survey

Table 1. The occurrence of severe trauma by city and province (2018)

Cities and provinces*	Number of patients	Incidence per 100,000 people**	Cities and provinces*	Number of patients	Incidence per 100,000 people
Total	32,237	62.8	Gyeonggi	5,578	43.4
Seoul	6,488	67.3	Gangwon	1,573	102.6
Pusan	1,612	47.2	Chungbuk	2,022	127.4
Daegu	1,145	46.7	Chungnam	1,947	92.4
Incheon	1,116	38.2	Jeonbuk	1,482	80.8
Gwangju	509	35.0	Jeonnam	1,671	89.0
Daejeon	1,719	115.7	Gyeongbuk	2,028	76.0
Ulsan	601	52.1	Gyeongnam	2,001	59.6
Sejong	153	51.7	Jeju	592	90.2

\* Based on the location of the accident

\*\* 2018 estimated population, Commissioner of Statistics Korea

Table 2. Current status of severe trauma by sex and age

Sex and age		Number of patients	%	Incidence rate per 100,000 people*
Total		32,237	(100.0)	62.8
Sex	Men	22,148	(68.7)	86.5
	Women	10,084	(31.3)	39.2
	Unknown	5	(0.0)	—
Age (yr)	0–9	1,825	(5.7)	41.8
	10–19	1,626	(5.0)	31.2
	20–29	3,162	(9.8)	46.6
	30–39	2,876	(8.9)	39.6
	40–49	3,903	(12.1)	46.0
	50–59	6,284	(19.5)	74.6
	60–69	5,555	(17.2)	97.1
	70–79	4,236	(13.1)	124.6
	80 and over	2,763	(8.6)	168.1
	Unknown	7	(0.0)	—

\* 2018 estimated population, Commissioner of Statistics Korea

Table 3. Injury mechanism of severe trauma

Cities and provinces*	Number of patients**	Traffic		Fall and slip		Blunt		Penetrating		Machine	
		Number of patients	%	Number of patients	%	Number of patients	%	Number of patients	%	Number of patients	%
Total	30,034	14,021	46.7	12,109	40.3	2,031	6.8	1,343	4.5	530	1.8
Seoul	5,438	2,107	38.7	2,769	50.9	318	5.8	209	3.8	35	0.6
Pusan	1,586	562	35.4	796	50.2	116	7.3	98	6.2	14	0.9
Daegu	1,061	449	42.3	442	41.7	93	8.8	65	6.1	12	1.1
Incheon	1,164	396	34.0	560	48.1	102	8.8	79	6.8	27	2.3
Gwangju	498	198	39.8	228	45.8	42	8.4	20	4.0	10	2.0
Daejeon	1,656	719	43.4	776	46.9	99	6.0	54	3.3	—	—
Ulsan	564	290	51.4	196	34.8	34	6.0	26	4.6	18	3.2
Sejong	143	73	51.0	50	35.0	—***	—	10	7.0	—	—
Gyeonggi	5,323	2,450	46.0	2,129	40.0	384	7.2	264	5.0	96	1.8
Gangwon	1,522	739	48.6	579	38.0	104	6.8	60	3.9	40	2.6
Chungbuk	1,851	1,127	60.9	510	27.6	111	6.0	63	3.4	40	2.2
Chungnam	1,847	963	52.1	599	32.4	161	8.7	64	3.5	60	3.2
Jeonbuk	1,397	765	54.8	474	33.9	79	5.7	63	4.5	16	1.1
Jeonnam	1,576	865	54.9	519	32.9	102	6.5	62	3.9	28	1.8
Gyeongbuk	1,985	1,107	55.8	591	29.8	128	6.4	92	4.6	67	3.4
Gyeongnam	1,838	956	52.0	666	36.2	111	6.0	71	3.9	34	1.8
Jeju	585	255	43.6	225	38.5	39	6.7	43	7.4	23	3.9

\* Based on the location of the accident

\*\* Calculation based on the responses of 30,034 people who completed the medical record survey

\*\*\* Less than 10 occurrences not presented

Table 4. Fatality rate<sup>1)</sup> and disability rate<sup>2)</sup> by injury mechanism of severe trauma

Section	Number of patients*		Traffic		Fall and slip		Blunt		Penetrating		Machine	
	Number of patients	%	Number of patients	%	Number of patients	%	Number of patients	%	Number of patients	%	Number of patients	%
Total	30,034	(100.0)	14,021	(100.0)	12,109	(100.0)	2,031	(100.0)	1,343	(100.0)	530	(100.0)
Fatality rate	5,522	(18.4)	3,098	(22.1)	2,033	(16.8)	200	(9.8)	114	(8.5)	77	(14.5)
Disability rate	6,583	(21.9)	3,422	(24.4)	2,550	(21.1)	293	(14.4)	152	(11.3)	166	(31.3)

1) Fatality rate: Percentage of patients who died during severe trauma

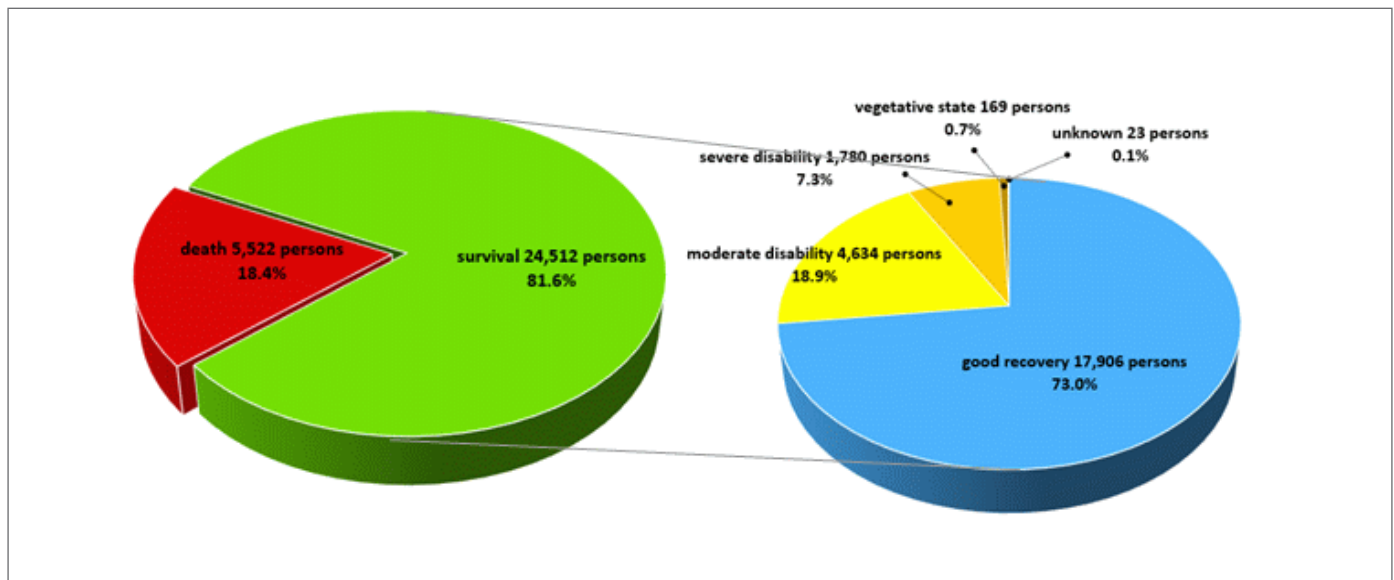
2) Disability rate: The proportion of vegetative state, severe disability and moderately disabled persons based on the Glasgow Outcome Scale (GOS) at discharge

\* Calculation based on the responses of 30,034 people who completed the medical record survey

Table 5. Result of severe trauma treatment by emergency medical type

Class	Number of patients*	Death		Moderate to severe disability		Good recovery	
		Number of patients	%	Number of patients	%	Number of patients	%
Total	30,034	5,522	(18.4)	6,583	(21.9)	17,929	(59.7)
Regional trauma center	6,639	1,124	(16.9)	1,851	(27.9)	3,664	(55.2)
Regional emergency medical center	6,441	1,136	(17.6)	1,604	(24.9)	3,701	(57.5)
Local emergency medical center	12,354	2,105	(17.0)	2,348	(19.0)	7,901	(64.0)
Local emergency treatment center	4,600	1,157	(25.2)	780	(17.0)	2,663	(57.9)

\* Calculation based on the responses of 30,034 people who completed the medical record survey



\* Moderate disability: being able to live independently and unable to return to work or school

Severe disability: being able to follow commands and unable to live independently

Vegetative state: being unable to interact with the environment; unresponsive

Figure 2. The outcome of severe trauma