Childhood Injuries and Injury Surveillance in Hong Kong

CB Chow

Hon. Clinical Professor, Community Child Health Unit, Department of Paediatrics and Adolescent Medicine, The University of Hong Kong

Hon. Professor, Department of Community Medicine, The University of Hong Kong

Hon. Fellow, Centre of Suicide Research and Prevention, The University of Hong Kong

Acknowledgement

Patrick Ip
Wilfred Wong
Sophia Li
Ivy Chiu
Frederick Ho
Leung Ming

Summary

- Childhood Injuries
  - Mortality
  - Hospitalization
  - Accident & Emergency attendances
  - Total direct medical costs
  - Disability adjusted life years loss
  - Geographical distribution in relation to districts and socio-economic gradients
  - “Avoidable” injuries
- Injury surveillance system

Injury is a major public health problem

We have data, we have expertise, we have infrastructure….

WHAT WE NEED IS LEADERSHIP AND COMMITMENT *FROM ?*

Hong Kong

[9] Comparison of age-specific death rates

Age Group & Year / Country / Place	Age: 0		Age: 1-4		Age: 5-9		Age: 10-14		Age: 15-19	
	2006	2007	2006	2007	2006	2007	2006	2007	2006	2007
Australia	4.7	4.4	0.2	0.2	0.1	0.1	0.1	0.1	0.4	0.4
Canada	5.0*	5.1*	0.2	0.2	0.1	0.1	0.1	0.1	0.5	0.4
Japan	2.6*	2.6*	–	–	0.1	0.1	0.1	0.1	0.3	0.3
UK	5.1	4.9	0.2	0.2	0.1	0.1	0.1	0.1	0.4	0.3
USA	6.9	6.8	0.3	0.3	0.1	0.1	0.2	0.2	0.6	0.6

Notes:

Unless otherwise specified, death rate refers to the number of deaths per 1,000 population.

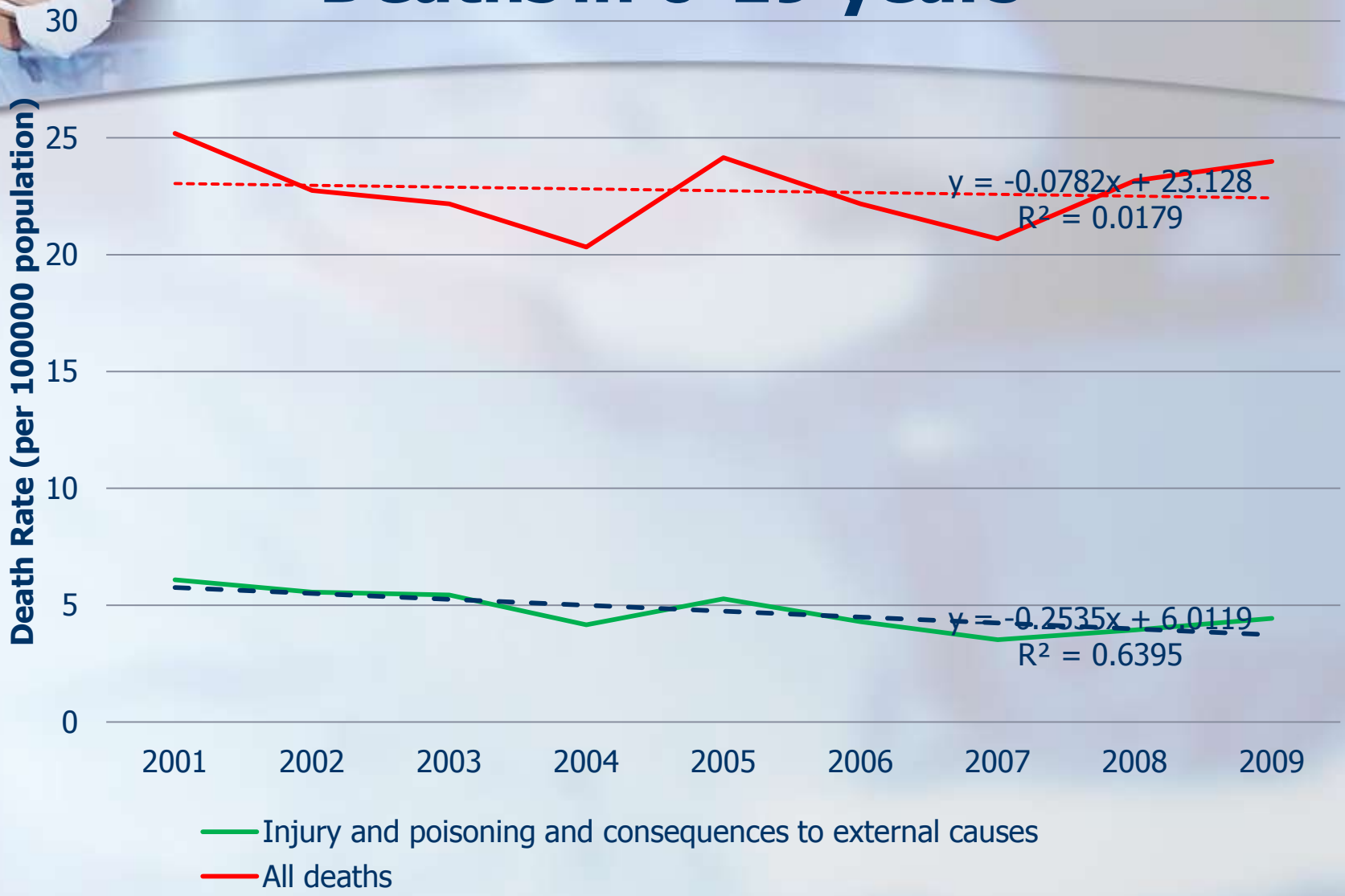
* Infant deaths per 1,000 live births.

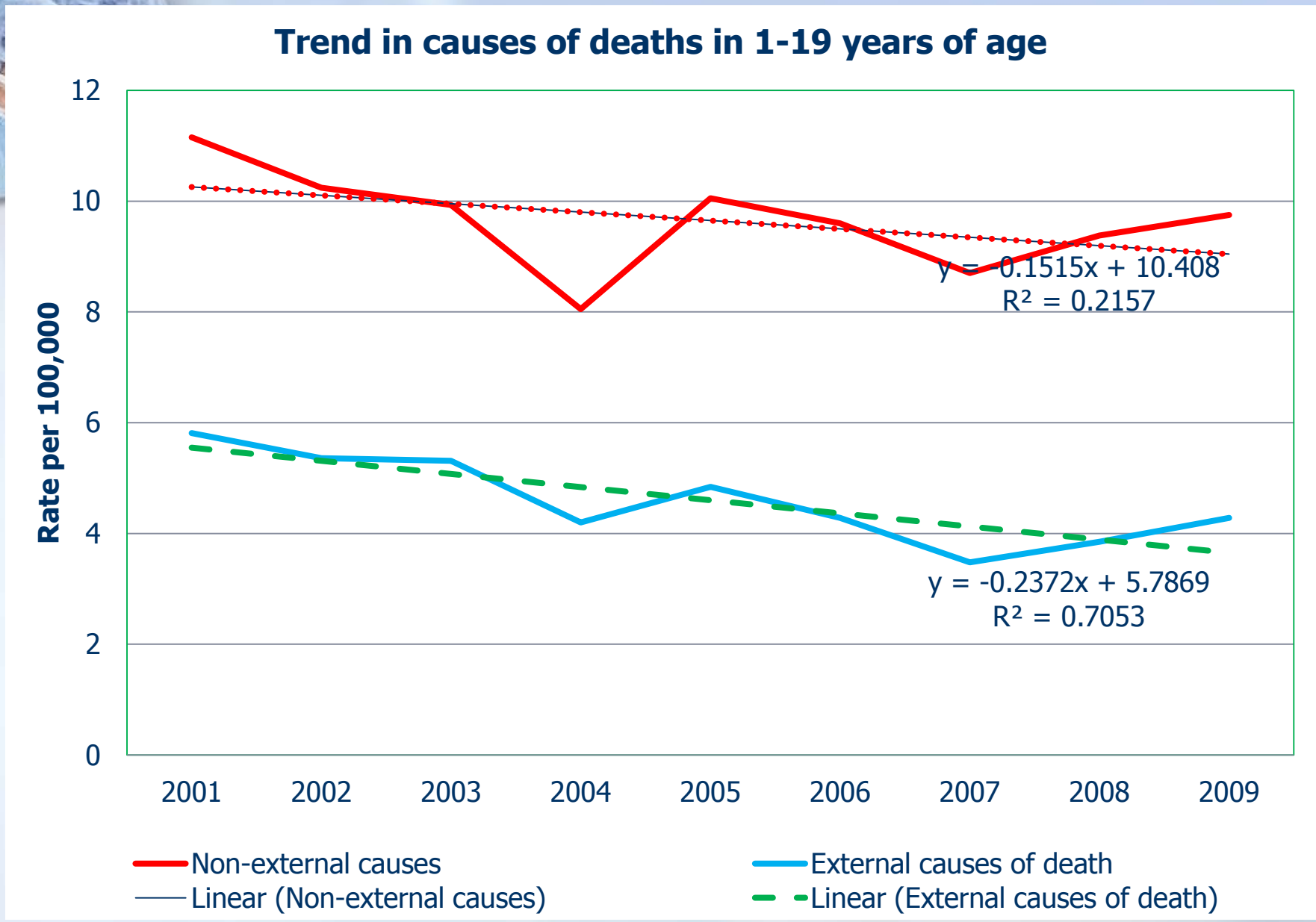
MORTALITIES DUE TO INJURIES

Causes of deaths 2001-2009

	Age Group					Total
	below 1 year	1 - 4 years	5 - 9 years	10 - 14 years	15 - 19 years	
All causes of deaths	1132	341	295	391	745	2904
Ext causes of deaths	36	52	67	110	345	610
Percent due to external causes	3.2%	15.2%	22.7%	28.1%	46.3%	21.0%

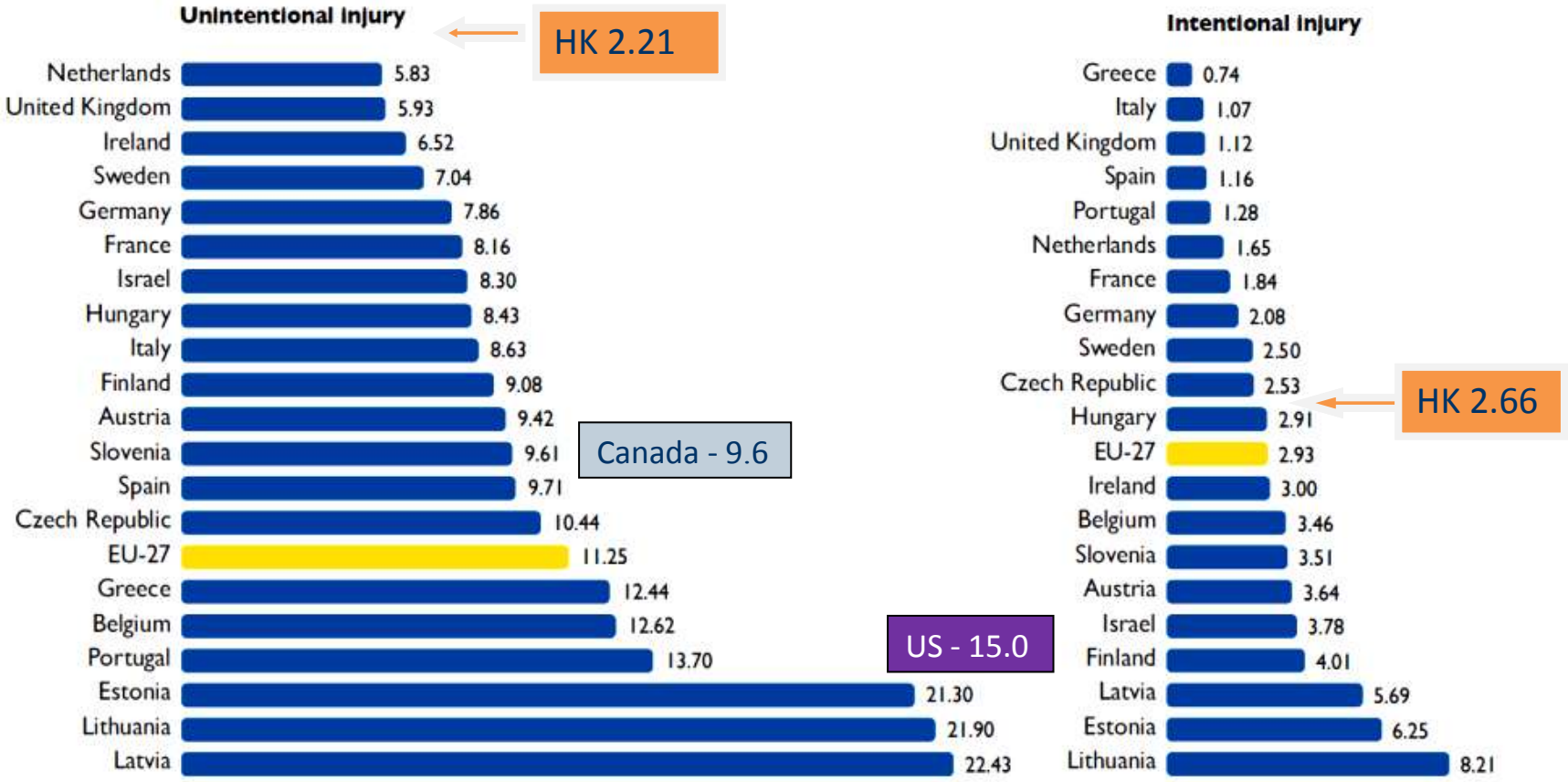
Deaths in 0-19 years




Trend in causes of deaths in 1-19 years of age
Rate per 100,000
12
10
8
6
4
2
0
2001
2002
2003
2004
2005
2006
2007
2008
2009
y = -0.1515x + 10.408
R² = 0.2157
y = -0.2372x + 5.7869
R² = 0.7053
Non-external causes
Linear (Non-external causes)
External causes of death
Linear (External causes of death)

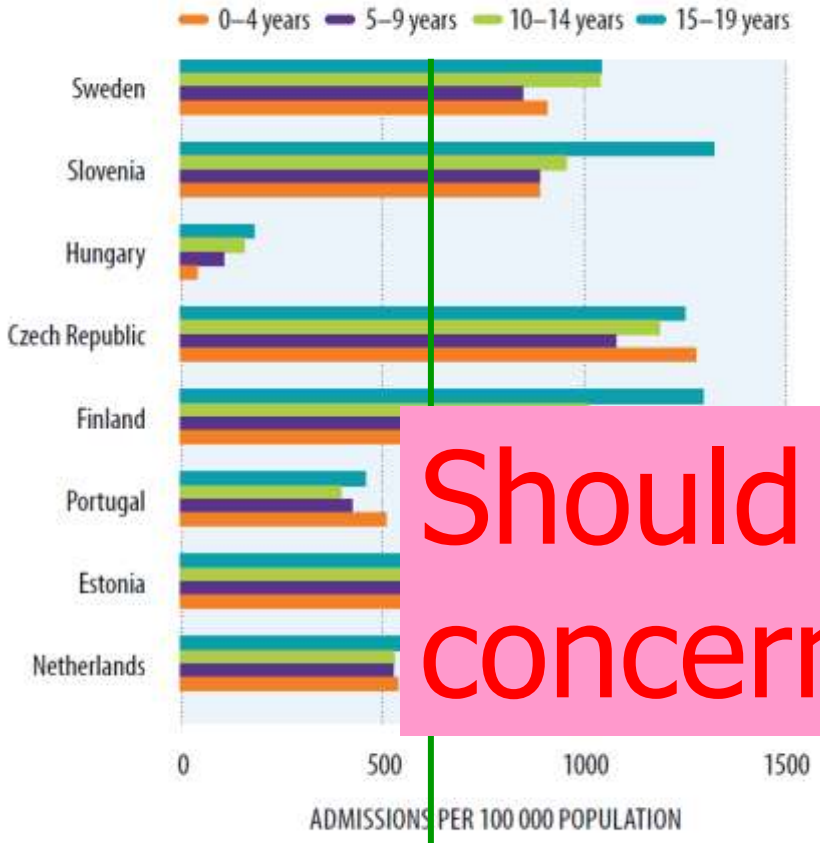
Unintentional and intentional injury deaths for children and adolescents

(rate per 100 000 population 0-19 years in 20 CSAP countries and EU27)



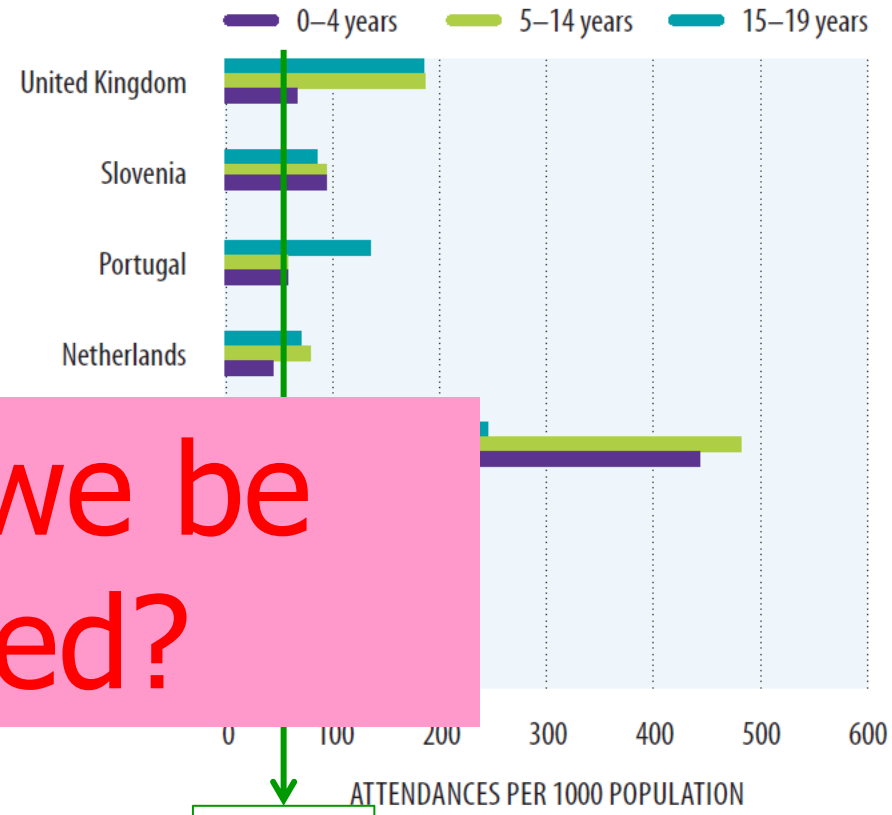
Source: WHO Mortality database as averages for 3 years for 2003-2005 or most recent three years of data; Cyprus and Iceland excluded due to small populations and data for the constituent countries of the United Kingdom (England, Northern Ireland, Scotland and Wales) were not available so they are presented together as the United Kingdom.

Hospitalization rates for children with unintentional injuries by age category for selected European countries, 2004



Source: APOLLO Hospital Discharge Databas

Emergency department attendance rate for home and leisure injuries per 1000 population per year by age for selected European countries, 2000–2004



Should we be concerned?

HK 0-14 yr

HK 0-14 yr

The clinical pyramid for injuries in children

INJURY DEATHS BY CAUSES

External causes of death in Hong Kong 0-19 years of age

Number of Deaths	External Cause of Death								Row Total
	Transport accidents	Falls	Accidental drowning and submersion	Exposure to smoke, fire and flames	Accidental poisoning by and exposure to noxious substances	Intentional self-harm	Assault	All other external causes	
2001	17	7	8	3	3	35	9	12	**94**
2002	13	5	6	2	3	26	19	10	**84**
2003	15	5	2	2	3	27	20	6	**80**
2004	4	3	5	0	5	37	2	4	**60**
2005	14	2	6	0	3	27	14	8	**74**
2006	8	3	8	0	2	28	6	4	**59**
2007	14	2	4	0	1	22	1	4	**48**
2008	9	3	2	0	2	23	5	9	**53**
2009	7	1	2	1	1	24	14	8	**58**
Column Total	**101**	**31**	**43**	**8**	**23**	**249**	**90**	**65**	**610**

External causes of death by age groups for 2001-2009

Number of Deaths	External Cause of Death								Row Total
	Transport accidents	Falls	Accidental drowning and submersion	Exposure to smoke, fire and flames	Accidental poisoning by and exposure to noxious substances	Intentional self-harm	Assault	All other external causes	
below 1 year	2	1	0	2	3	0	17	11	**36**
1 - 4 years	5	10	3	2	3	0	18	11	**52**
5 - 9 years	15	8	11	1	0	3	22	7	**67**
10 - 14 years	28	4	9	0	2	40	15	12	**110**
15 - 19 years	51	8	20	3	15	206	18	24	**345**
Total	**101**	**31**	**43**	**8**	**23**	**249**	**90**	**65**	**610**
Percent	**16.6%**	**5.1%**	**7.0%**	**1.3%**	**3.8%**	**40.8%**	**14.8%**	**10.7%**	

Potential year life loss

YLL	below 1 year	1 - 4 years	5 - 9 years	10 - 14 years	15 - 19 years	YLL 75	YLL 85
2001	7	7	10	21	49	5881	6821
2002	5	10	11	20	38	5317	6157
2003	4	10	11	11	44	5023	5823
2004	1	1	7	9	42	3627	4227
2005	8	8	8	7	43	4663	5403
2006	2	1	7	8	41	3581	4171
2007	2	2	3	14	27	2948	3428
2008	3	3	8	8	31	3290	3820
2009	4	10	2	12	30	3662	4242
Total	**36**	**52**	**67**	**110**	**345**	37992	44092
Average	4.0	5.8	7.4	12.2	38.3	4221	4899

Year life loss by age groups

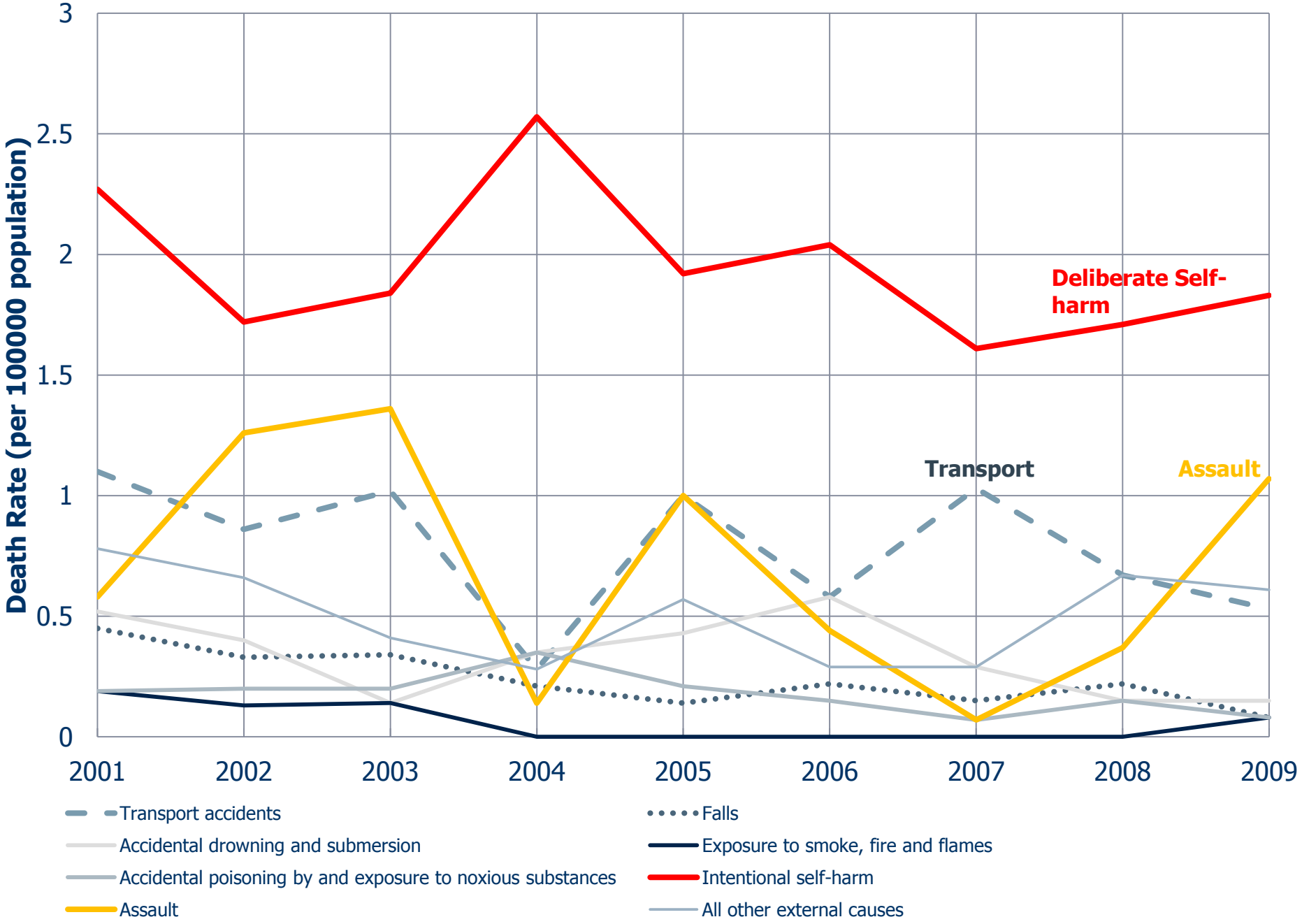
YLL by age groups	below 1 year	1 - 4 years	5 - 9 years	10 - 14 years	15 - 19 years	YLL 75
2001	525	511	680	1323	2842	5881
2002	375	730	748	1260	2204	5317
2003	300	730	748	693	2552	5023
2004	75	73	476	567	2436	3627
2005	600	584	544	441	2494	4663
2006	150	73	476	504	2378	3581
2007	150	146	204	882	1566	2948
2008	225	219	544	504	1798	3290
2009	300	730	136	756	1740	3662
Total	2700	3796	4556	6930	20010	37992
Average	300.0	421.8	506.2	770.0	2223.3	4221.3

Potential Life years loss by district 0-19 years 2001-2009

YLL by districts	0 - 4 years	5 - 9 years	10 - 14 years	15 - 19 years	YLL (75)	YLL (85)
Central & Western	3	1	0	13	1041	1211
Eastern (HK)	5	3	9	18	2180	2530
Southern (HK)	2	2	3	9	993	1153
Wan Chai	2	0	4	8	862	1002
Kowloon City	4	1	3	13	1303	1513
Kwun Tong	5	5	10	29	3017	3507
Sham Shui Po	10	1	1	15	1731	2001
Wong Tai Sin	1	5	7	20	2014	2344
Yau Tsim Mong	4	1	1	10	1003	1163
Islands	2	1	3	6	751	871
Kwai Tsing	2	3	9	25	2367	2757
North	7	4	7	24	2616	3036
Sai Kung	2	5	9	20	2213	2573
Sha Tin	2	5	8	35	3020	3520
Tai Po	5	0	7	24	2198	2558
Tsuen Wan	3	2	2	4	713	823
Tuen Mun	13	9	9	30	3868	4478
Yuen Long	9	15	17	31	4546	5266
Marine	0	0	0	0	0	0
Outside Hong Kong	1	2	0	1	267	307
Unknown	6	2	1	10	1217	1407
Total	**88**	**67**	**110**	**345**	**37920**	**44020**

Death Rate (per 100000 population	External Cause of Death for 0 – 19 years of age								All Shown External Cause of Death
	Transport accidents	Falls	Accidental drowning and submersion	Exposure to smoke, fire and flames	Accidental poisoning by and exposure to noxious substances	Intentional self-harm	Assault	All other external causes	
2001	1.10	0.45	0.52	0.19	0.19	2.27	0.58	0.78	**6.09**
2002	0.86	0.33	0.40	0.13	0.20	1.72	1.26	0.66	**5.56**
2003	1.02	0.34	0.14	0.14	0.20	1.84	1.36	0.41	**5.44**
2004	0.28	0.21	0.35	0.00	0.35	2.57	0.14	0.28	**4.16**
2005	1.00	0.14	0.43	0.00	0.21	1.92	1.00	0.57	**5.27**
2006	0.58	0.22	0.58	0.00	0.15	2.04	0.44	0.29	**4.29**
2007	1.03	0.15	0.29	0.00	0.07	1.61	0.07	0.29	**3.52**
2008	0.67	0.22	0.15	0.00	0.15	1.71	0.37	0.67	**3.94**
2009	0.53	0.08	0.15	0.08	0.08	1.83	1.07	0.61	**4.43**
Average per Year of Death Registration	**0.79**	**0.24**	**0.34**	**0.06**	**0.18**	**1.95**	**0.71**	**0.51**	**4.78**

Trend in external causes of death



ARE THEY PREVENTABLE?

Review Panel of the Pilot Project on Child Fatality Review

Final Report

December 2010

Deaths in under 18 for year 2006 and 2007

www.swd.gov.hk/doc/whatsnew/201101/PPCFRFR.pdf

External Cause of Drowning Death

Number of Deaths	Drowning and submersion, undetermined intent	Drowning and submersion while in bath-tub	Drowning and submersion following fall into bath-tub	Drowning and submersion while in swimming-pool	Drowning and submersion following fall into swimming-pool	Drowning and submersion while in natural water	Drowning and submersion following fall into natural water	Other specified drowning and submersion	Unspecified drowning and submersion	Row Total
0 - 4 years	1	0	0	0	0	0	1	1	1	**4**
5 - 9 years	0	0	0	4	0	4	1	2	0	**11**
10 - 14 years	0	0	0	3	0	4	2	0	0	**9**
15 - 19 years	3	0	0	0	0	16	3	1	0	**23**

Deaths due to falls 2001 to 2009 by age groups

Number of Deaths	Fall on same level from slipping, tripping and stumbling	Fall while being carried or supported by other persons	Fall on and from stairs and steps	Fall from, out of or through building or structure	Fall from cliff	Other fall from one level to another	Unspecified fall	Row Total
0 - 4	0	1	0	8	0	1	1	**11**
5 - 9	1	0	0	6	0	0	1	**8**
10 - 14	0	0	1	2	1	0	0	**4**
15 - 19	0	0	0	6	0	1	1	**8**
Total	**1**	**1**	**1**	**22**	**1**	**2**	**3**	**31**
Incidence per 100,000	**0.01**	**0.01**	**0.01**	**0.17**	**0.01**	**0.02**	**0.02**	**0.24**

Review Panel of the Pilot Project on Child Fatality Review

Final Report

December 2010

During review on the accident cases, the Review Panel has the following observations:

(1) Seven out of the 18 "traffic accident" cases occurred because of carelessness of pedestrians and / or undesirable conduct of drivers; **39%**

(2) Five out of the six cycling accidents occurred on roads with running traffic; **83%**

(3) Five out of the seven "fall accident" cases could have been avoided if proper home safety design or devices were in place; **71%**

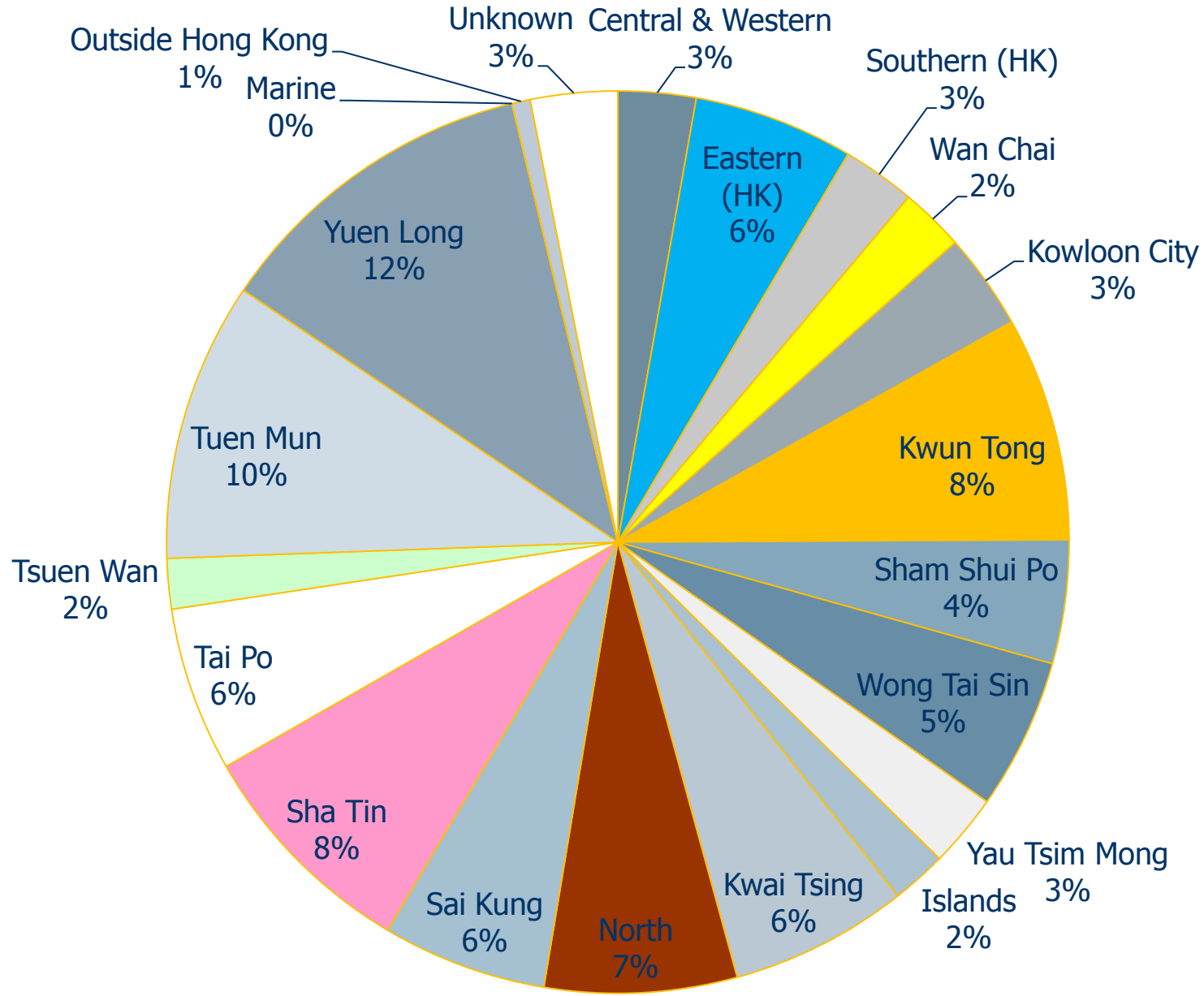
(4) Five out of the seven "fall accident" cases and seven out of the eighteen "traffic accident" cases reviewed occurred when the children, either left alone or with peers, lacked close or proper parental care or supervision; and

(5) Two out of three drowning cases occurred because the deceased children swam in places not suitable for swimming and had over-estimated their swimming ability. **67%**

40-80% of "fatal accidents" can be prevented

INJURY DEATHS BY DISTRICTS

Total external causes death for 2001-2009

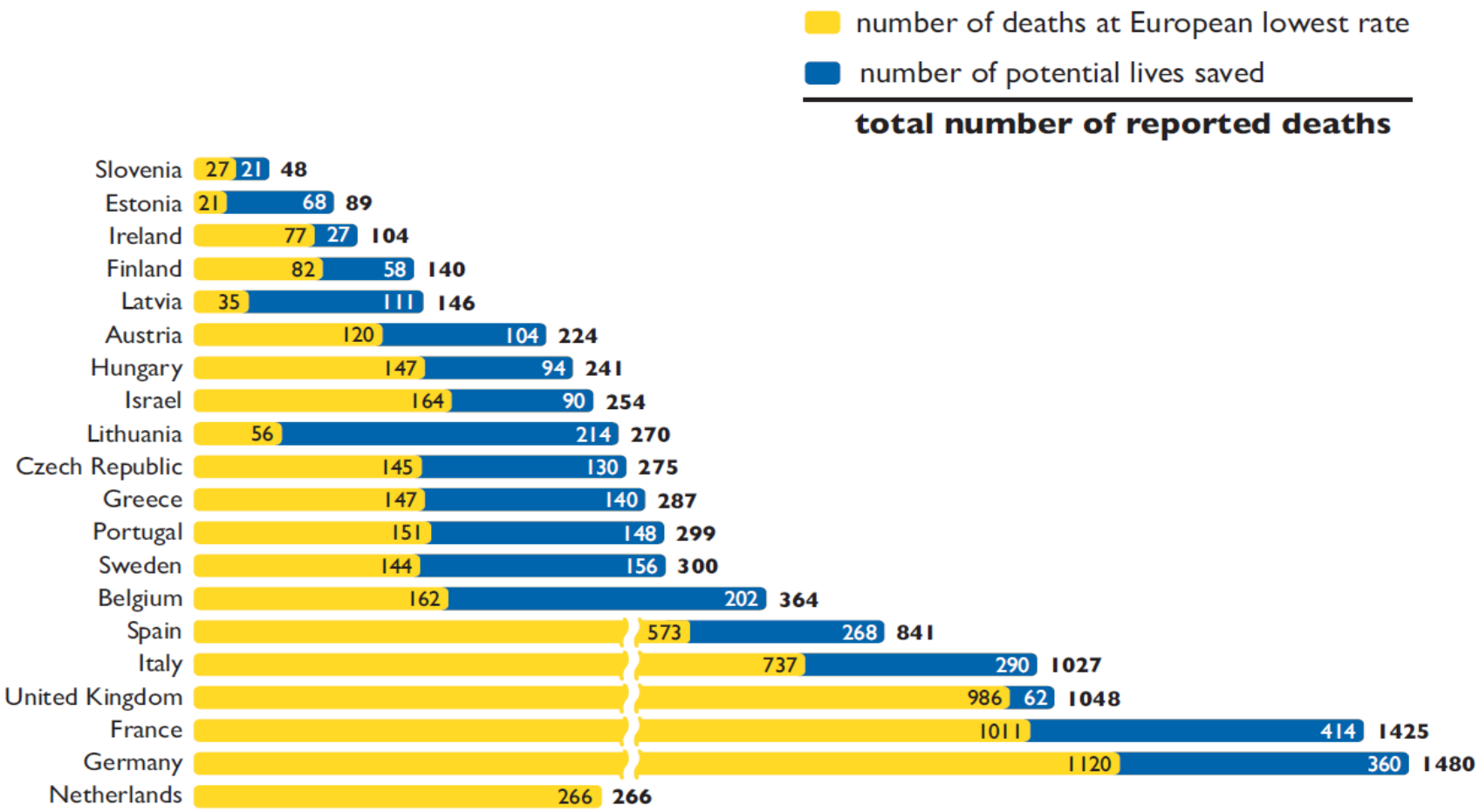


Total external causes death for 2001-2009

	Residential District																				
	中西區 Central & Western	東區 Eastern (HK)	南區 Southern (HK)	灣仔 Wan Chai	九龍城 Kowloon City	觀塘 Kwun Tong	沙田 Sham Shui Po	黃大仙 Wong Tai Sin	油尖旺 Yau Tsim Mong	離島 Islands	葵青 Kwai Tsing	北區 North	西貢 Sai Kung	沙田 Sha Tin	大埔 Tai Po	荃灣 Tsuen Wan	屯門 Tuen Mun	元朗 Yuen Long	Marine	Outside Hong Kong	Unknown	Total
2001	1	10	1	5	6	5	4	5	3	0	7	4	5	13	1	1	9	4	0	1	9	**94**
2002	2	3	0	2	5	9	4	4	4	0	3	7	8	4	6	1	7	15	0	0	0	**84**
2003	0	2	1	1	1	8	5	7	1	1	5	2	7	4	7	1	14	11	0	1	1	**80**
2004	1	3	1	3	2	4	3	3	2	1	2	4	3	7	4	0	8	8	0	0	1	**60**
2005	4	4	9	0	2	5	4	3	2	2	3	7	2	2	7	1	8	6	0	1	2	**74**
2006	4	3	0	2	2	2	2	2	4	4	2	3	2	4	5	2	3	11	0	1	1	**59**
2007	2	3	3	1	1	3	2	2	0	2	4	9	4	3	1	1	2	3	0	0	2	**48**
2008	2	3	1	0	1	8	2	3	0	0	5	3	4	6	2	2	5	5	0	0	1	**53**
2009	1	4	0	0	1	5	1	4	0	2	8	3	1	7	3	2	5	9	0	0	2	**58**
Total	17	35	16	14	21	49	27	33	16	12	39	42	36	50	36	11	61	72	0	4	19	610

Potential for life saving in children and adolescents in participating CSAP countries

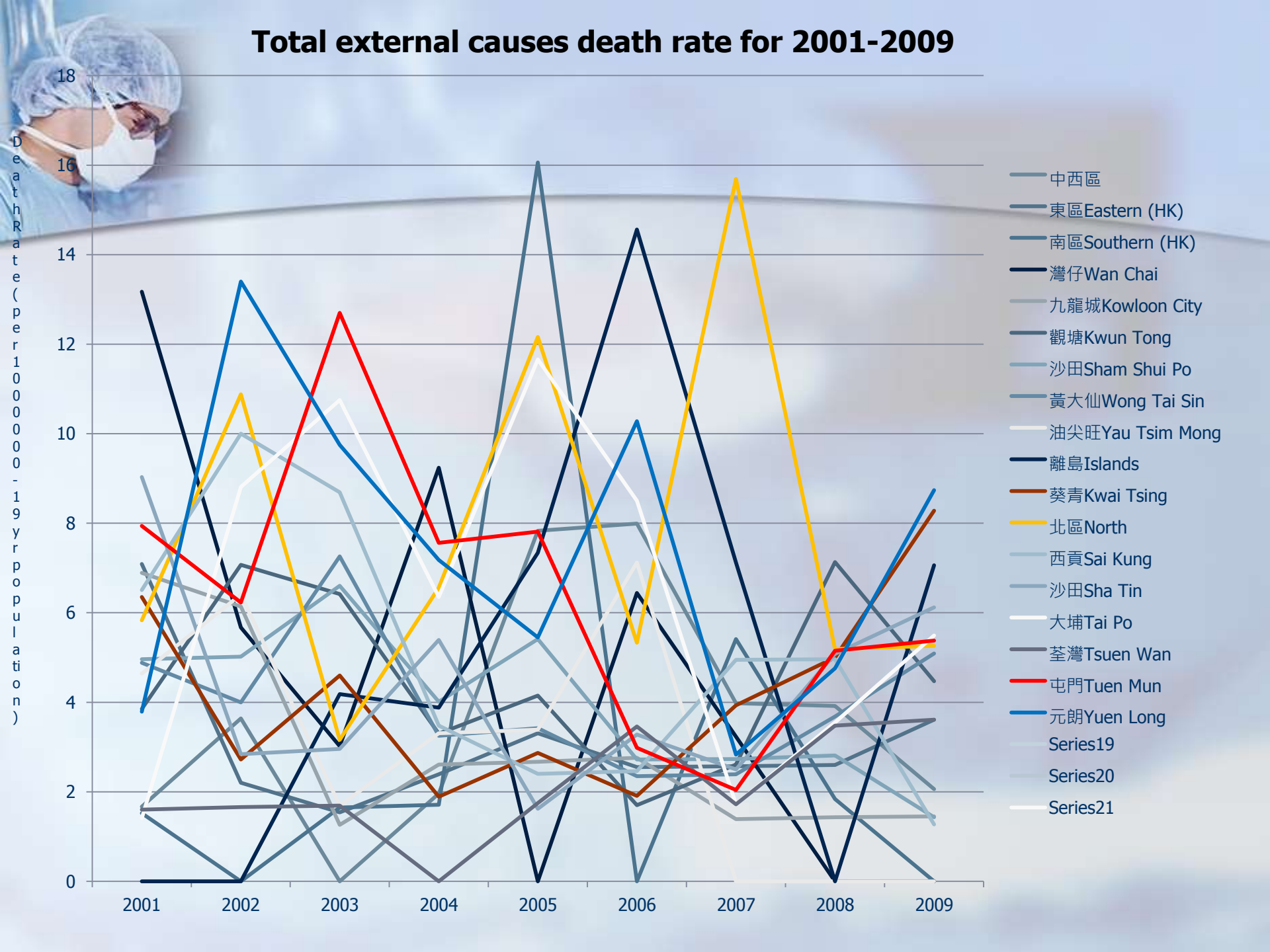
(number of deaths using the European country with lowest rate [the Netherlands] as reference[2])



Source: WHO Mortality database; 2005 or most recent year available; Cyprus and Iceland excluded due to small populations; data for the constituent countries of the United Kingdom presented together.

If all countries in the Region had the same injury mortality rates among children as the countries with the lowest rates, this would avoid an estimated 75% of these deaths. The experience accumulated by several European countries shows that sustained and systematic approaches that address the underlying causes of injuries, such as their socioeconomic and environmental determinants, can make all countries in the Region among the safest in the world.

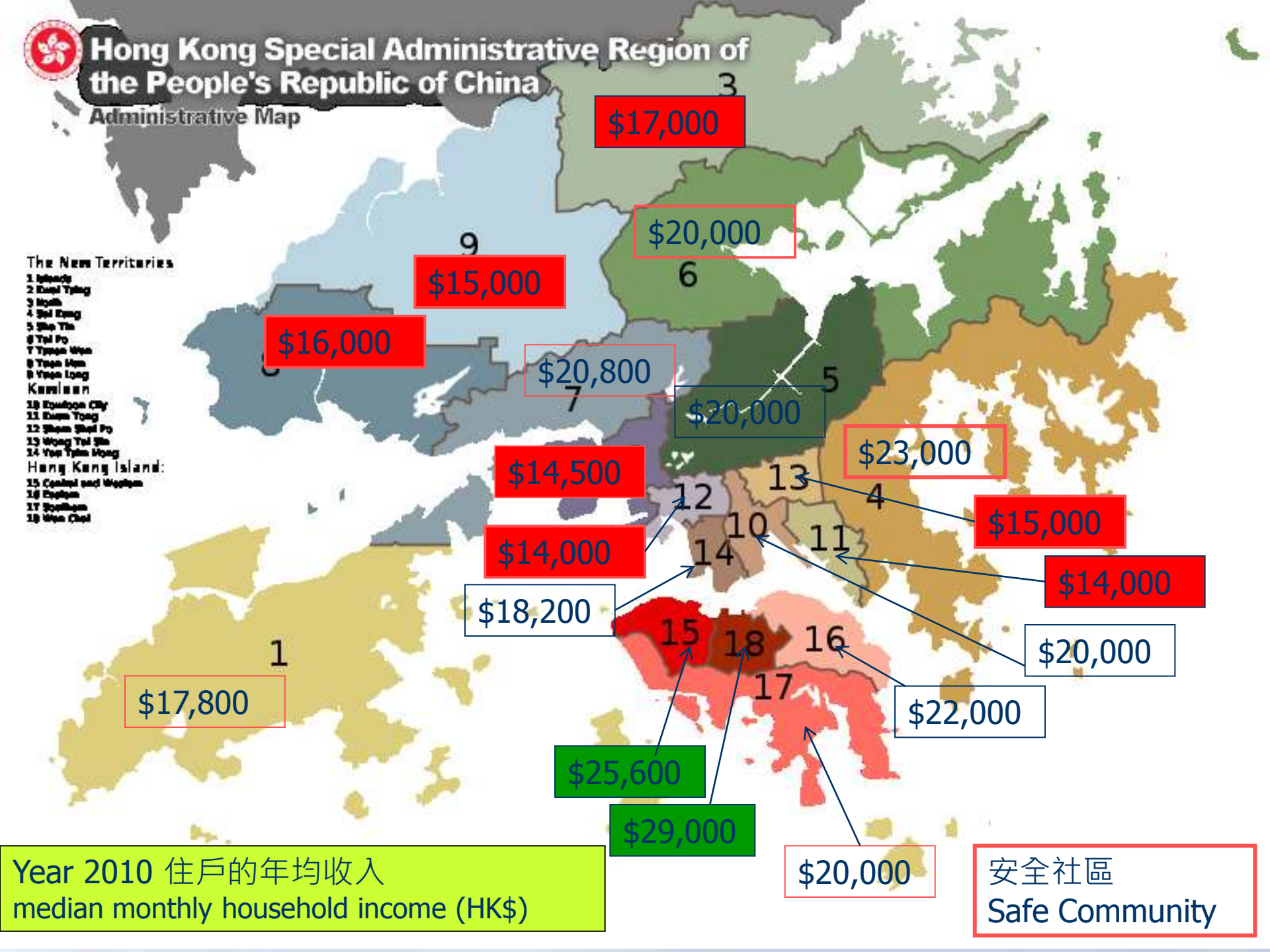
Total external causes death rate for 2001-2009



Total external causes death rate for 2001-2009

Death Rate (per 100000 0-19 yr population)	Residential District																	All Shown Residential District
	中西區 Central & Western	東區 Eastern (HK)	南區 Southern (HK)	灣仔 Wan Chai	九龍城 Kowloon City	觀塘 Kwun Tong	沙田 Sham Shui Po	黃大仙 Wong Tai Sin	油尖旺 Yau Tsim Mong	離島 Islands	葵青 Kwai Tsing	北區 North	西貢 Sai Kung	沙田 Sha Tin	大埔 Tai Po	荃灣 Tsuen Wan	屯門 Tuen Mun	元朗 Yuen Long	
2001	1.67	7.09	1.52	13.17	6.89	3.85	4.96	4.88	4.64	0.00	6.35	5.83	6.51	9.03	1.41	1.60	7.94	3.79	**6.09**
2002	3.64	2.20	0.00	5.67	6.14	7.07	5.02	4.00	6.41	0.00	2.72	10.88	10.00	2.84	8.81	1.66	6.23	13.40	**5.56**
2003	0.00	1.54	1.65	3.02	1.26	6.42	6.60	7.26	1.69	4.18	4.60	3.16	8.69	2.96	10.75	1.69	12.70	9.75	**5.44**
2004	1.96	2.39	1.71	9.24	2.61	3.30	4.01	3.25	3.31	3.88	1.89	6.56	3.48	5.39	6.35	0.00	7.56	7.18	**4.16**
2005	7.83	3.31	16.06	0.00	2.67	4.15	5.41	3.42	3.39	7.34	2.87	12.16	2.40	1.62	11.66	1.75	7.81	5.45	**5.27**
2006	7.99	2.55	0.00	6.44	2.76	1.70	2.72	2.35	7.12	14.56	1.91	5.33	2.46	3.28	8.50	3.46	2.98	10.28	**4.29**
2007	3.98	2.57	5.41	3.23	1.39	2.61	2.73	2.39	0.00	7.12	3.93	15.69	4.95	2.50	1.72	1.72	2.04	2.83	**3.52**
2008	3.92	2.60	1.84	0.00	1.43	7.13	2.81	3.68	0.00	0.00	5.00	5.19	4.96	5.08	3.55	3.48	5.15	4.76	**3.94**
2009	2.06	3.61	0.00	0.00	1.45	4.47	1.43	5.09	0.00	7.06	8.28	5.26	1.27	6.12	5.49	3.61	5.38	8.74	**4.43**
Average per Year of Death Registration	**3.63**	**3.14**	**3.07**	**4.76**	**3.08**	**4.54**	**4.01**	**4.08**	**3.01**	**5.12**	**4.14**	**7.73**	**4.94**	**4.36**	**6.48**	**2.09**	**6.54**	**7.40**	**4.78**
OR	1.7	1.5	1.5	2.3	1.5	2.2	1.9	2.0	1.4	2.4	2.0	3.7	2.4	2.1	3.1	1.0	3.1	3.5	2.3

75% of deaths can be avoided if all districts have the lowest death rate

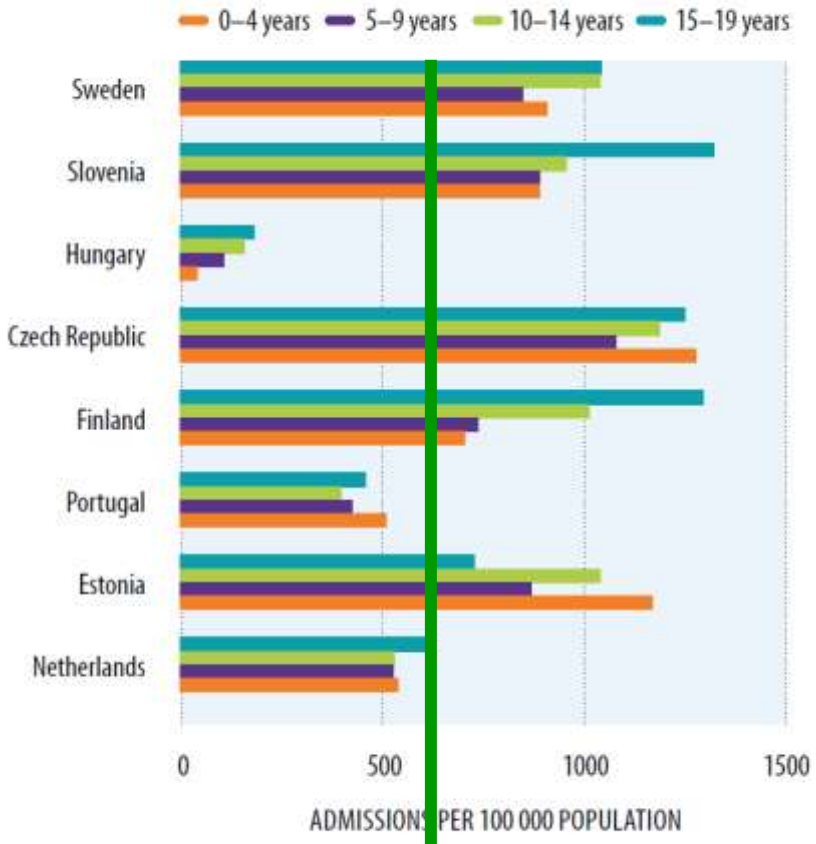

Hong Kong Special Administrative Region of the People's Republic of China
Administrative Map
The New Territories
Kowloon
Hong Kong Island:
3
$17,000
9
$15,000
6
$20,000
$16,000
8
$20,800
7
$20,000
5
$23,000
$14,500
12
13
4
$15,000
10
$14,000
14
11
$14,000
$18,200
15
18
16
$20,000
1
$17,800
17
$22,000
$25,600
$29,000
$20,000
Year 2010 住戶的年均收入
median monthly household income (HK$)
安全社區
Safe Community

HOSPITAL ADMISSIONS FOR EXTERNAL CAUSES

Hospital injury admissions

- From 2001 to 2009, there were a total of 98,895 admissions with external cause of injury codes in people aged 0-19. (~11,000 per year)
- During the same period, there were a total of 68,885 injury related AED injury (7,700 per year)
- So around 30,000 admissions were not direct from AED (3,300 per year)

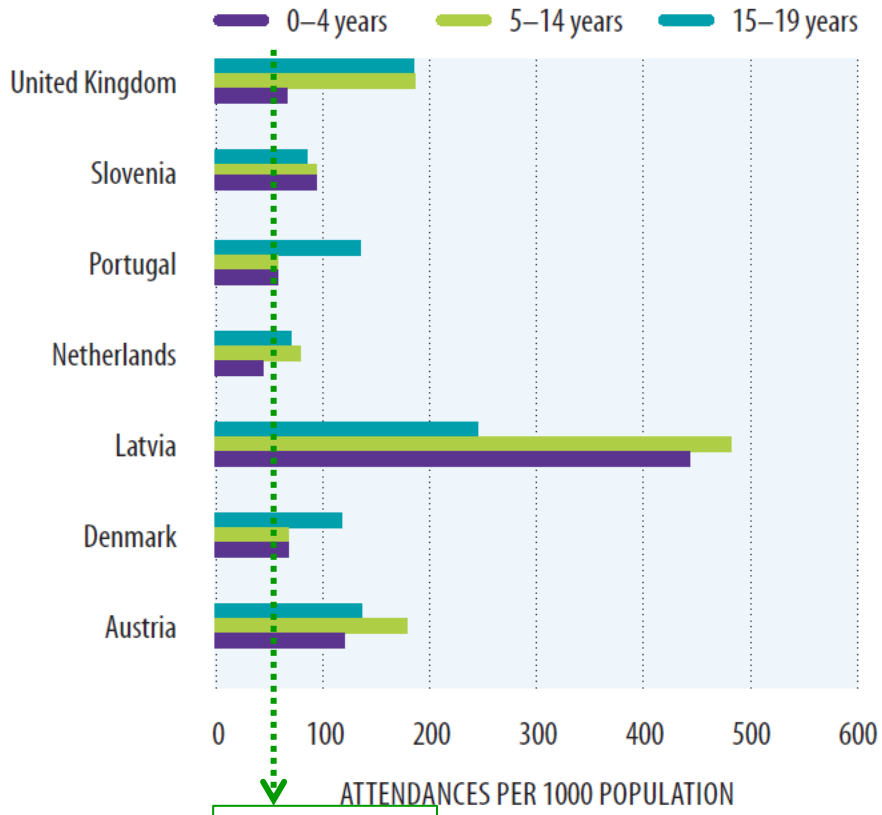
Hospitalization rates for children with unintentional injuries by age category for selected European countries, 2004



Source: APOLLO Hospital Discharge Databas

HK
0-14 yr

Emergency department attendance rate for home and leisure injuries per 1000 population per year by age for selected European countries, 2000–2004



HK
0-14 yr

The clinical pyramid for injuries in children

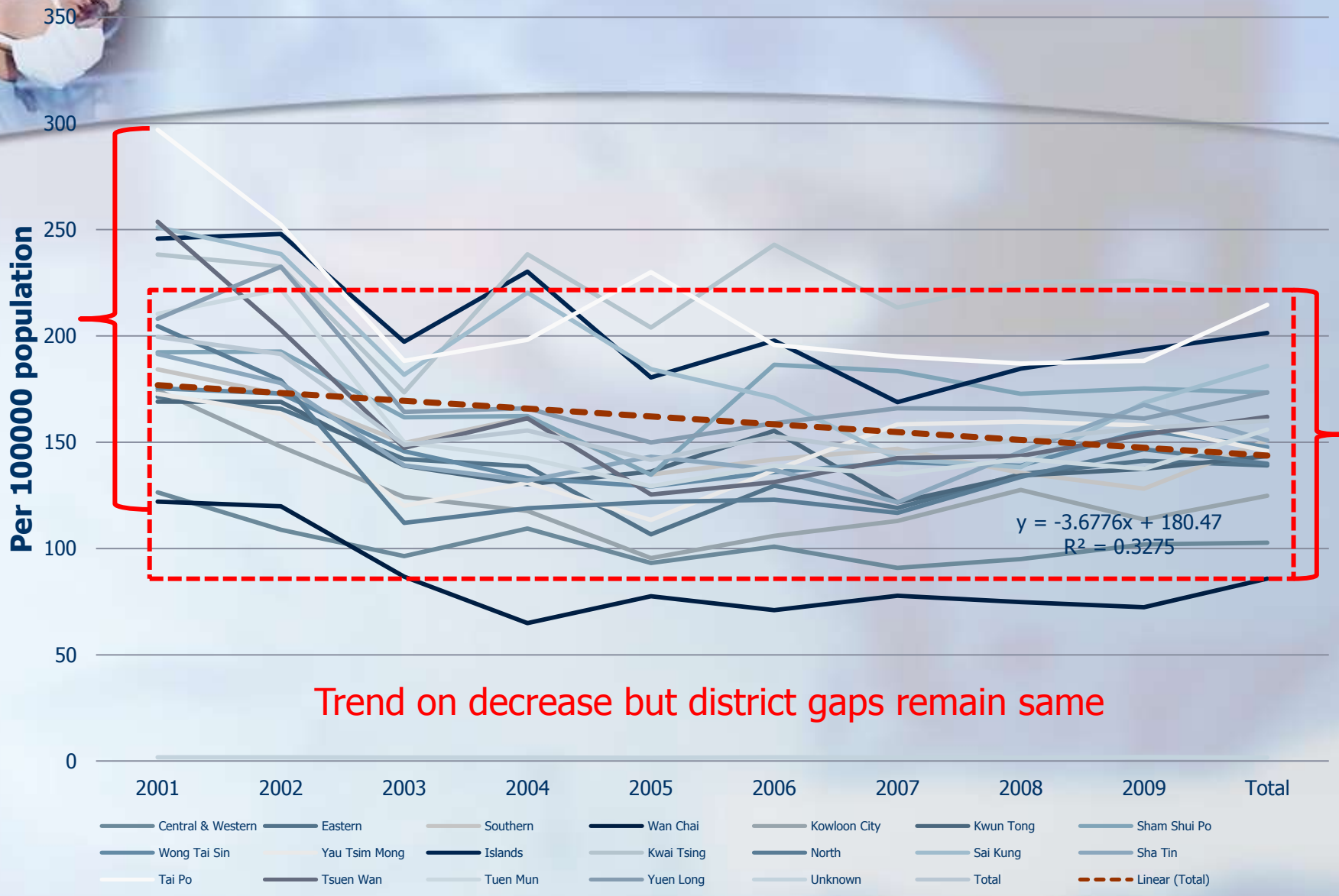
AED injury admissions for 0-19 2001-2009 by districts

District	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total
Central & Western	331	271	228	260	220	252	228	238	257	2285
Eastern	1056	1004	846	817	619	760	697	791	822	7412
Southern	535	493	421	452	376	390	406	374	353	3800
Wan Chai	204	190	130	96	112	110	121	116	112	1191
Kowloon City	665	553	455	429	343	383	410	462	413	4113
Kwun Tong	951	959	796	747	799	912	713	796	842	7515
Sham Shui Po	680	683	575	582	511	684	682	645	659	5701
Wong Tai Sin	780	770	650	585	558	576	597	592	661	5769
Yau Tsim Mong	487	458	335	378	335	383	456	470	472	3774
Islands	213	245	219	289	239	271	245	271	287	2279
Kwai Tsing	1137	1139	870	1215	1048	1266	1114	1182	1180	10151
North	611	533	332	350	356	345	339	393	446	3705
Sai Kung	823	833	674	874	744	694	587	575	712	6516
Sha Tin	1204	1118	875	823	889	832	743	902	1055	8441
Tai Po	923	774	570	599	690	574	563	557	565	5815
Tsuen Wan	699	555	400	436	343	378	418	424	452	4105
Tuen Mun	1028	1105	760	718	668	697	676	723	697	7072
Yuen Long	934	1134	864	884	808	848	899	918	908	8197
Unknown	120	119	113	107	106	120	119	118	132	1054
Total	13381	12936	10113	10641	9764	10475	10013	10547	11025	98895

AED Injury admission rate per 100,000 population by district for 0-19, 2001-2009

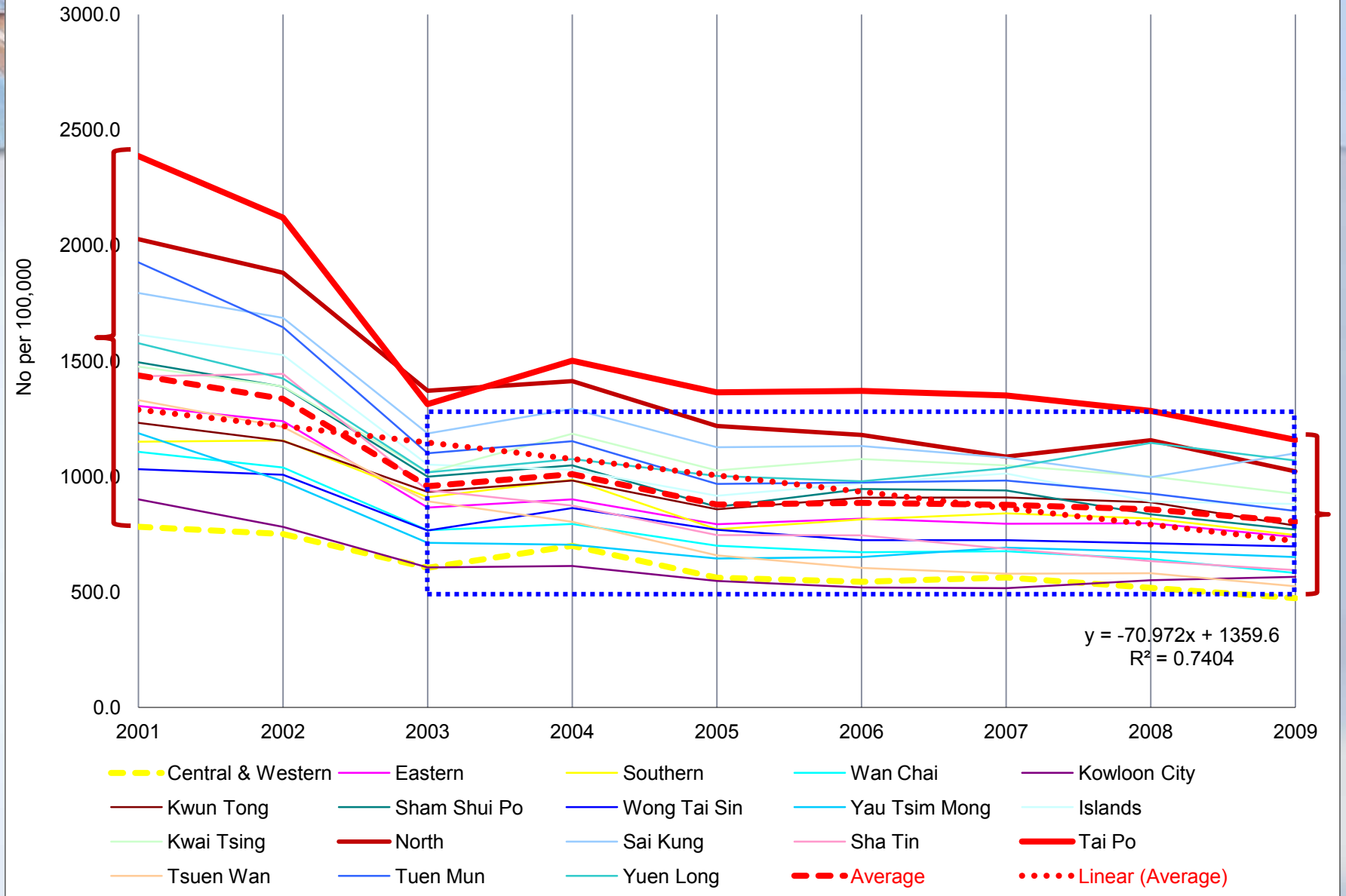
District	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total
Central & Western	126.4	108.8	96.4	109.4	93.2	100.9	90.9	95.0	101.9	102.7
Eastern	171.4	165.7	142.1	138.6	106.6	129.5	119.0	135.0	141.2	139.1
Southern	184.3	172.5	149.6	161.7	134.8	141.9	146.9	135.6	128.1	150.9
Wan Chai	122.0	119.9	86.7	64.9	77.5	71.0	77.8	74.8	72.4	85.8
Kowloon City	174.4	147.9	124.2	117.7	95.5	105.9	113.0	127.6	113.6	124.8
Kwun Tong	169.1	169.0	139.0	130.2	136.2	155.4	121.7	134.3	137.5	143.4
Sham Shui Po	192.3	192.6	161.7	162.3	134.7	186.4	183.4	172.7	175.3	173.3
Wong Tai Sin	175.4	172.9	145.7	133.1	129.2	136.0	140.5	139.0	155.6	147.7
Yau Tsim Mong	172.7	163.3	120.1	130.9	113.4	136.8	158.4	159.7	157.9	145.9
Islands	245.8	247.9	197.3	230.3	180.5	197.8	168.8	184.6	193.5	201.4
Kwai Tsing	238.3	232.7	173.4	238.4	203.9	242.9	213.3	225.4	226.0	221.5
North	204.6	179.1	112.0	118.9	121.8	123.0	116.8	133.6	146.7	139.9
Sai Kung	251.2	238.5	181.7	220.4	184.4	170.9	142.2	138.2	168.5	185.9
Sha Tin	191.5	177.8	139.1	131.9	143.2	137.0	121.7	145.5	167.6	150.8
Tai Po	296.9	252.3	188.3	198.2	230.0	195.8	190.3	187.0	188.3	214.6
Tsuen Wan	253.7	202.9	147.3	161.3	125.4	131.2	142.5	143.6	153.7	161.9
Tuen Mun	210.3	222.0	150.0	142.5	129.3	138.9	134.9	142.2	137.4	156.0
Yuen Long	208.0	232.5	164.2	166.0	149.9	158.9	166.0	165.6	161.1	173.4
Unknown	1.8	1.8	1.7	1.6	1.5	1.8	1.7	1.7	1.9	1.7
Total	199.5	191.5	148.7	155.5	141.7	152.7	144.8	151.2	156.7	160.1

Childhood Injuries rate admitted via AED in HA 2001-2009

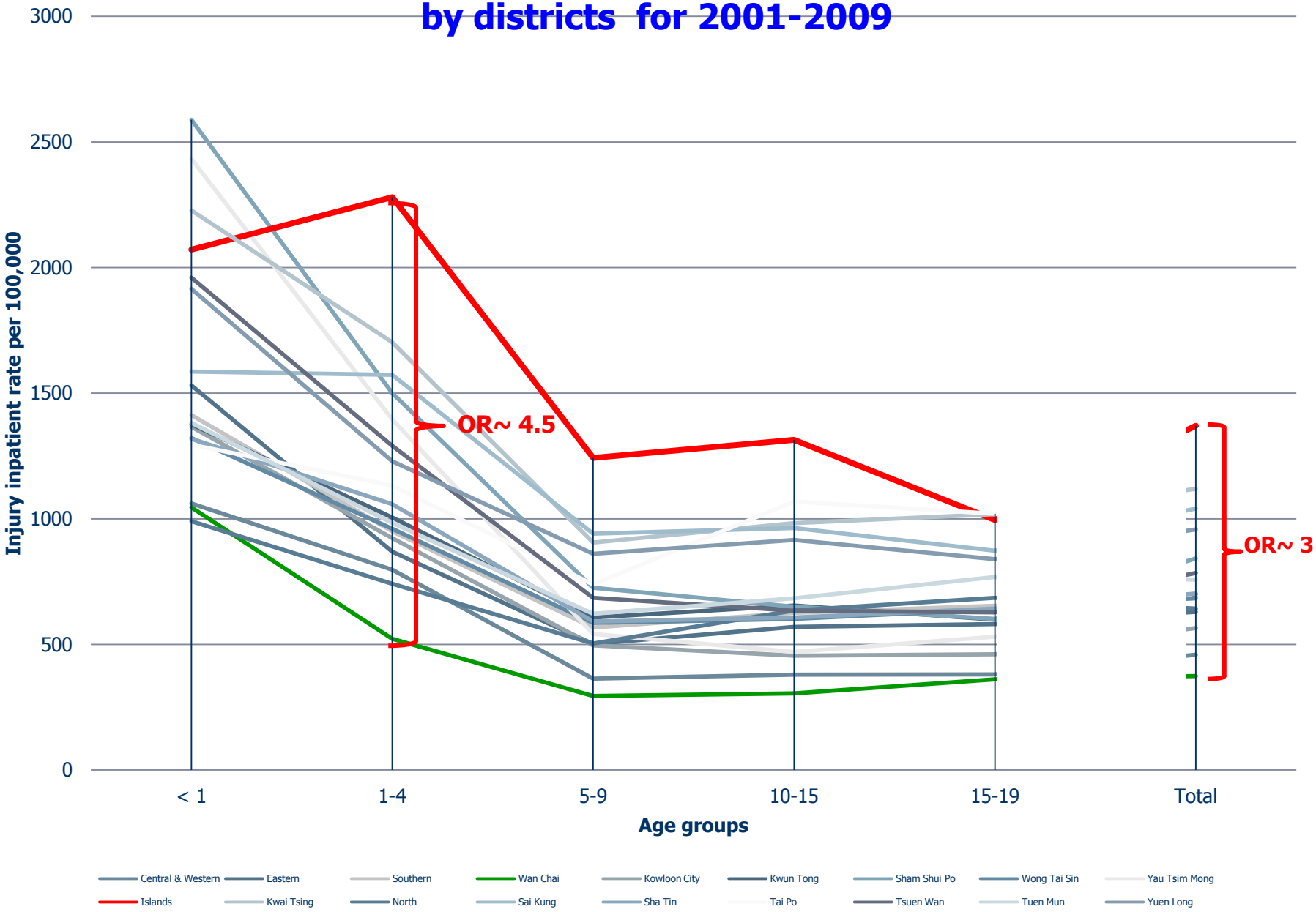


Trend on decrease but district gaps remain same

Childhood Injuries HA inpatient (episode) rate 2001-2009



Total inpatient (episodes) rate due to external causes by districts for 2001-2009

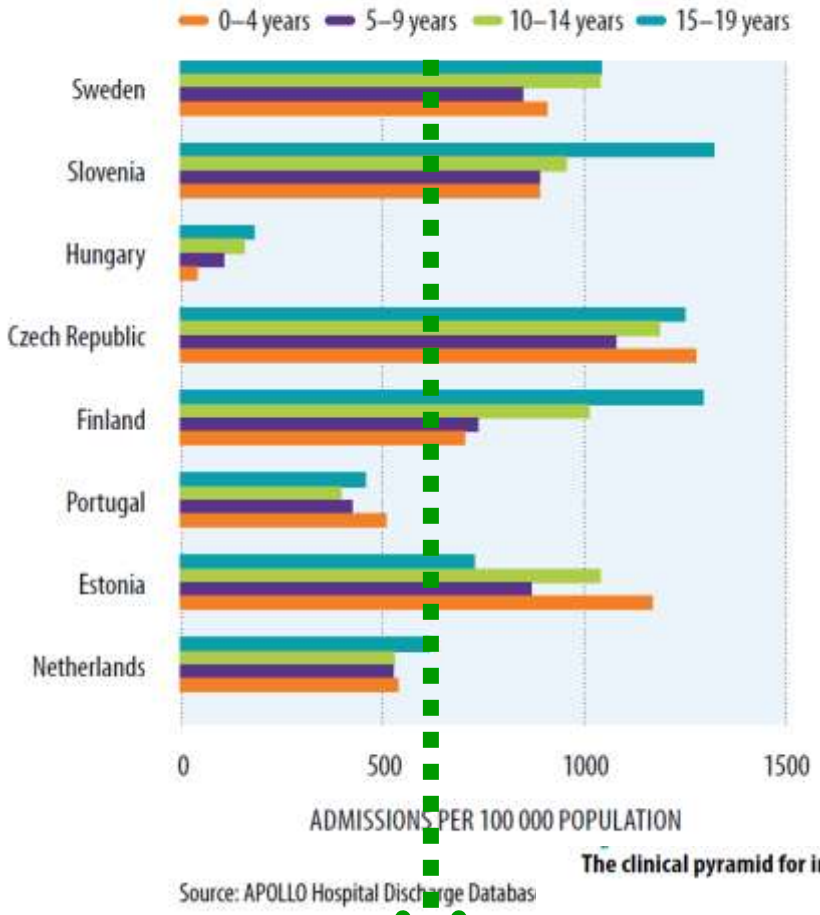


Operations due to external causes

	below 1 years		1 - 4 years		5 - 9 years		10 - 14 years		15 - 19 years		Total	
District	F	M	F	M	F	M	F	M	F	M	F	M
Central & Western	10	8	48	56	59	85	50	99	41	114	208	362
Eastern	24	25	105	156	119	257	106	388	122	459	476	1285
Southern	11	14	72	77	70	133	54	212	60	232	267	668
Wan Chai	3	13	22	25	18	37	18	63	22	83	83	221
Kowloon City	13	17	75	95	84	161	56	162	53	237	281	672
Kwun Tong	15	24	151	180	168	261	121	417	121	512	576	1394
Sham Shui Po	15	30	112	133	79	214	60	280	48	256	314	913
Wong Tai Sin	13	14	100	129	130	229	95	296	106	414	444	1082
Yau Tsim Mong	20	23	79	110	66	128	52	157	56	184	273	602
Islands	1	7	49	86	46	114	43	145	29	116	168	468
Kwai Tsing	17	35	158	225	168	293	134	493	129	580	606	1626
North	2	16	67	93	95	196	78	343	72	394	314	1042
Sai Kung	13	12	143	156	144	268	105	373	89	444	494	1253
Sha Tin	12	23	100	129	111	236	76	313	105	479	404	1180
Tai Po	9	14	56	77	56	140	74	277	78	400	273	908
Tsuen Wan	4	15	59	68	48	96	34	110	42	130	187	419
Tuen Mun	15	25	103	118	109	232	90	359	123	462	440	1196
Yuen Long	25	36	141	173	152	345	111	447	122	500	551	1501
Unknown	7	9	21	32	20	43	29	67	34	94	111	245
Total	229	360	1661	2118	1742	3468	1386	5001	1452	6090	6470	17037

AED ATTENDANCES DUE TO INJURIES

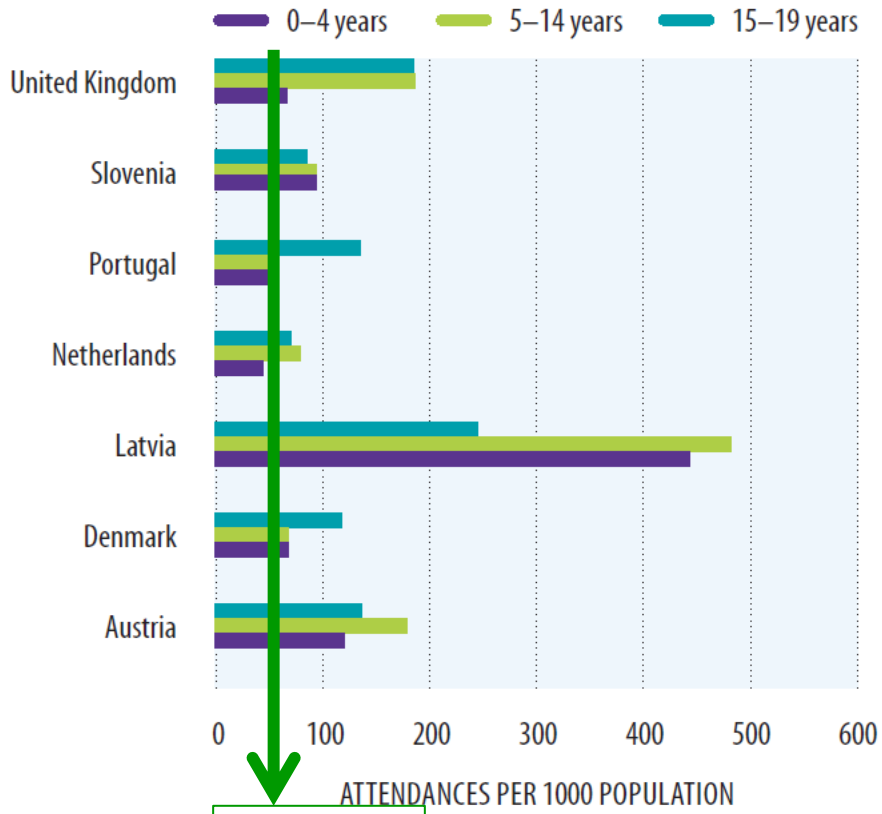
Hospitalization rates for children with unintentional injuries by age category for selected European countries, 2004



Source: APOLLO Hospital Discharge Databas

HK
0-14 yr

Emergency department attendance rate for home and leisure injuries per 1000 population per year by age for selected European countries, 2000–2004



HK
0-14 yr

The clinical pyramid for injuries in children

AED Injury attendances from 2001 to 2009

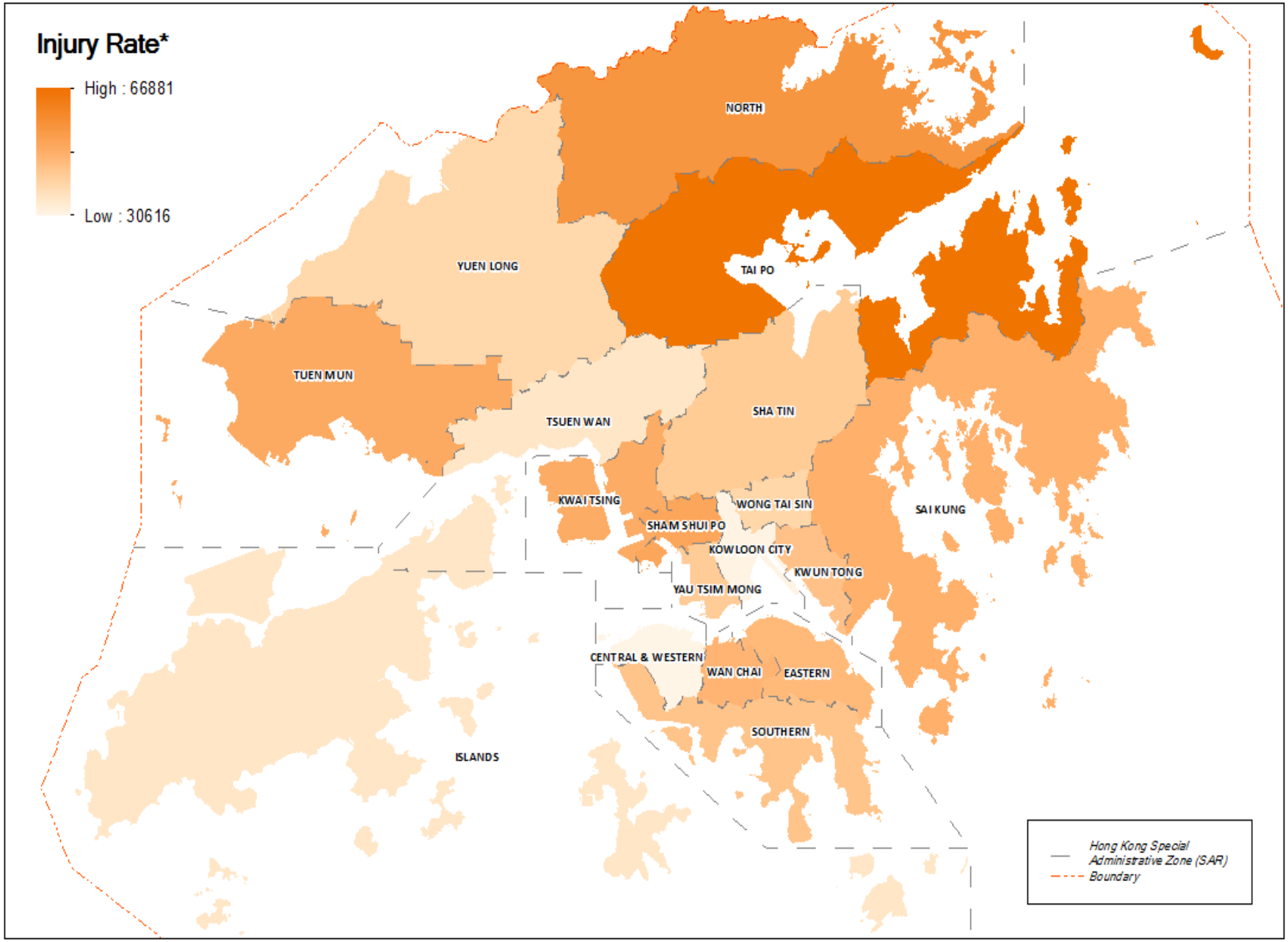
	below 1 years		1 - 4 years		5 - 9 years		10 - 14 years		15 - 19 years		Total		BOTH
District	F	M	F	M	F	M	F	M	F	M	F	M	SEXES
Central & Western	224	236	1199	1701	1010	1867	1067	2368	1204	2714	4704	8886	13590
Eastern	642	797	3878	5708	3763	6566	3638	8932	4365	10750	16286	32753	49039
Southern	300	385	1798	2551	1612	2985	1705	4020	2198	5431	7613	15372	22985
Wan Chai	141	176	940	1357	947	1559	852	1860	944	2044	3824	6996	10820
Kowloon City	321	422	1764	2599	1493	2909	1478	3544	1783	4262	6839	13736	20575
Kwun Tong	773	925	4235	6077	3806	6896	3380	8548	4222	11359	16416	33805	50221
Sham Shui Po	552	610	3042	4332	2572	4914	2238	5731	2788	7015	11192	22602	33794
Wong Tai Sin	420	455	2287	3504	2193	4280	2258	5530	3108	7705	10266	21474	31740
Yau Tsim Mong	367	472	2010	2873	1528	2756	1194	3034	1642	3888	6741	13023	19764
Islands	143	165	1051	1665	972	1884	841	2197	772	2302	3779	8213	11992
Kwai Tsing	779	852	4243	6032	3592	6709	3412	8952	4519	12323	16545	34868	51413
North	518	606	2847	4031	2509	4531	2511	6488	3216	9160	11601	24816	36417
Sai Kung	665	794	3888	5575	3372	5935	3011	7601	3409	9444	14345	29349	43694
Sha Tin	726	794	3797	5469	3745	6328	3545	8706	4860	12511	16673	33808	50481
Tai Po	525	586	2964	4058	2662	4864	3129	7801	4070	11185	13350	28494	41844
Tsuen Wan	377	444	2026	2712	1669	2847	1368	3308	1501	3826	6941	13137	20078
Tuen Mun	770	857	4310	6019	3744	6702	3624	9337	4735	12720	17183	35635	52818
Yuen Long	878	998	4670	6887	3938	7598	3552	9424	4052	11732	17090	36639	53729
Unknown	56	58	338	492	328	589	284	651	397	954	1403	2744	4147
Total	9177	10632	51287	73642	45455	82719	43087	108032	53785	141325	202791	416350	619141
	19,809		124,929		128,174		151,119		195,110		619,141		

Injury rates (per 100,000 children) by age groups and causes, 2001-2009

	Age Group in Years				
	Less than 1	1 to 4	5 to 9	10 to 14	15 to 19
Common assault	160	309	714	2,875	4,610
Indecent assault	18	40	45	61	105
Abuse	251	274	273	234	108
Traffic	880	1,709	2,100	1,698	2,098
Industrial	68	106	46	57	5,994
Domestic	36,572	45,669	18,445	10,125	8,415
Sports	36	1,823	4,442	10,135	12,493
Self-harm	228	517	329	318	567
Unclassified	12040	21,687	14,529	11,012	10,031

AED injury attendances per 100,000 0-19 population by districts

District	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total
Central & Western	782.0	750.6	604.9	699.6	561.4	543.5	562.4	517.6	472.4	611.1
Eastern	1305.7	1239.1	865.4	900.3	793.4	816.7	795.6	797.5	737.5	920.3
Southern	1150.4	1155.6	910.1	985.3	771.3	814.1	840.4	818.7	746.4	912.6
Wan Chai	1106.2	1039.0	767.2	794.5	699.7	671.4	675.9	642.6	582.0	779.4
Kowloon City	900.7	781.8	606.5	612.5	547.2	519.3	516.1	550.2	565.6	624.4
Kwun Tong	1231.8	1153.7	932.8	982.0	858.3	908.3	908.8	888.3	786.7	958.3
Sham Shui Po	1494.3	1388.4	999.4	1048.5	868.8	945.2	939.5	836.1	769.9	1027.2
Wong Tai Sin	1031.6	1007.2	766.2	863.1	769.1	724.6	723.7	710.7	697.5	812.5
Yau Tsim Mong	1186.8	979.1	712.8	704.2	644.9	651.1	691.6	674.1	651.4	764.1
Islands	1613.1	1525.8	1051.4	1029.5	916.9	970.1	1013.1	891.0	880.6	1059.7
Kwai Tsing	1475.4	1390.1	1017.7	1184.6	1026.1	1074.8	1048.3	1000.6	924.7	1122.1
North	2027.4	1882.5	1371.5	1413.4	1218.2	1180.0	1085.4	1157.0	1022.0	1375.0
Sai Kung	1794.4	1686.3	1185.8	1293.1	1126.7	1131.5	1081.2	996.6	1100.4	1246.5
Sha Tin	1433.6	1443.8	940.2	873.9	746.1	745.5	686.9	633.8	595.0	901.8
Tai Po	2387.4	2121.0	1312.9	1501.3	1364.3	1370.7	1350.2	1283.4	1158.3	1544.4
Tsuen Wan	1330.2	1214.2	892.4	803.2	658.5	603.7	579.3	580.6	525.0	792.0
Tuen Mun	1927.3	1645.7	1099.9	1152.9	967.3	973.5	982.8	925.5	850.4	1165.4
Yuen Long	1577.5	1424.1	1018.2	1075.3	1002.0	979.4	1035.8	1145.3	1069.4	1136.4
Unknown	8.9	7.1	5.3	6.1	5.6	6.9	6.8	7.7	6.1	6.7
Total	1437.49	1336.29	957.69	1009.58	878.61	885.21	876.78	856.97	803.95	1002.14

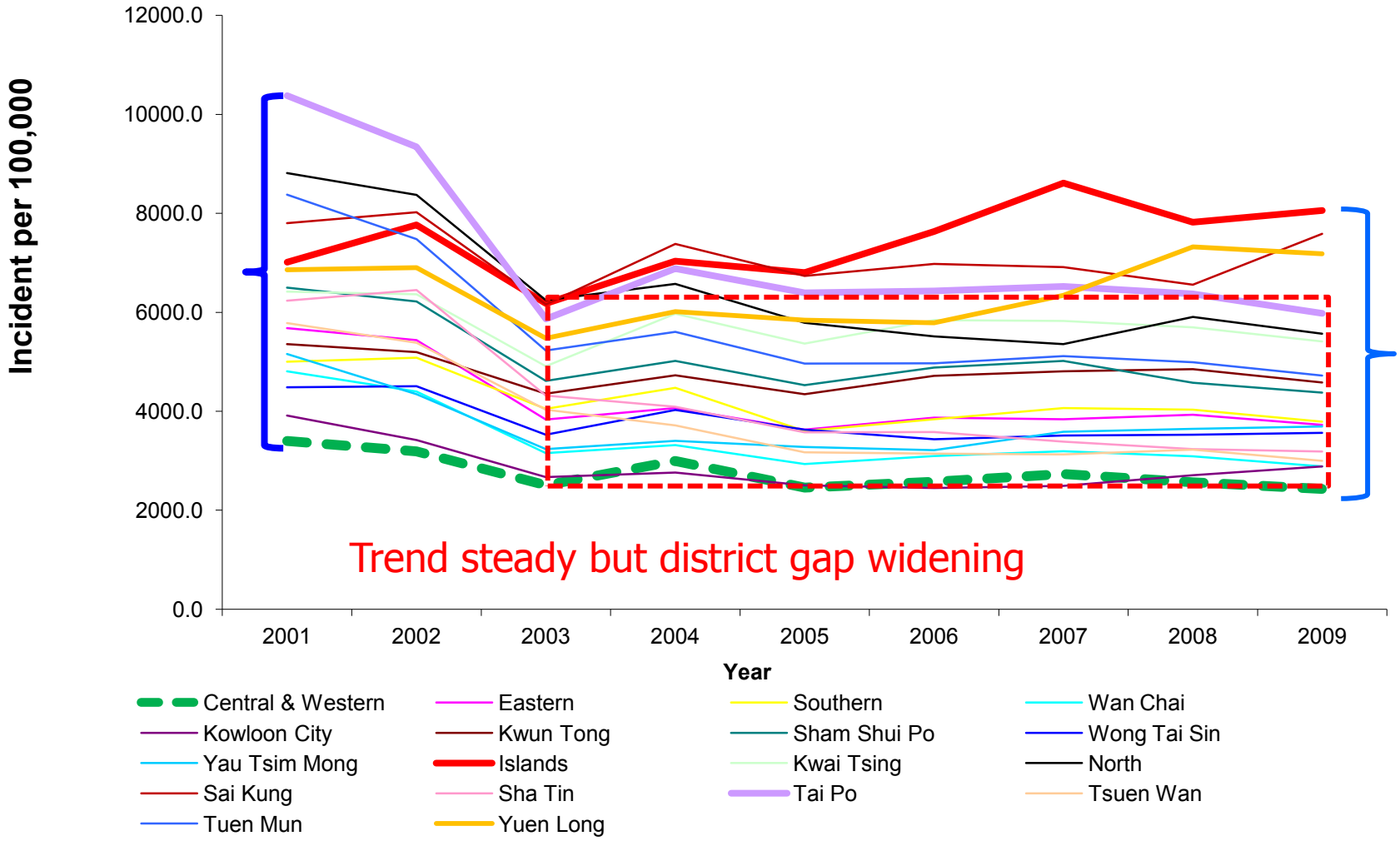


Map 1: All Injury Rates among Children 0-19 Years Old, by District, Hong Kong, 2001-2009

* A&E Attendance Rate per 100,000 Population

Data Source: CDARS, Hospital Authority

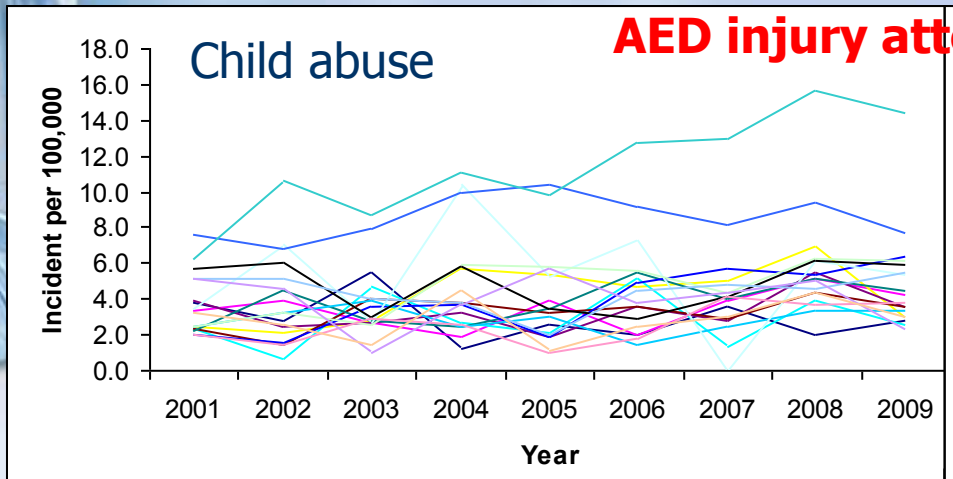
AED injury attendances per 100,000 population by districts

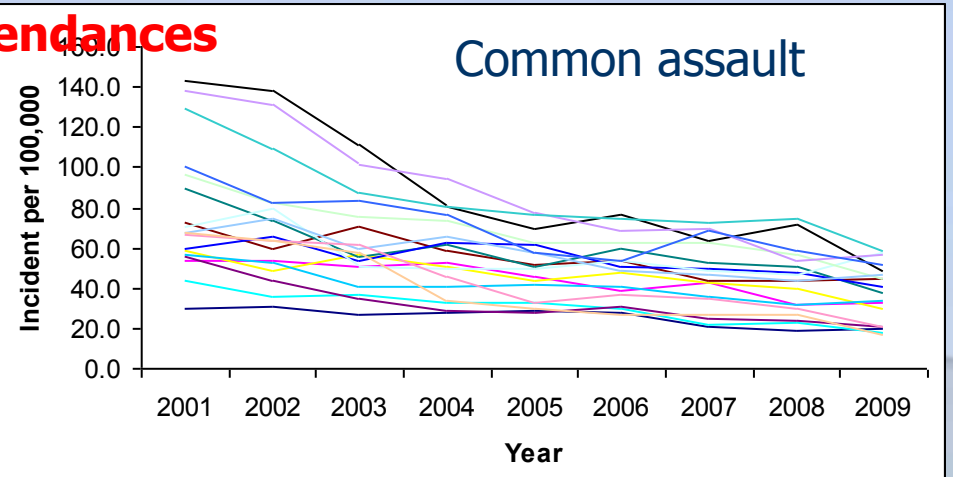


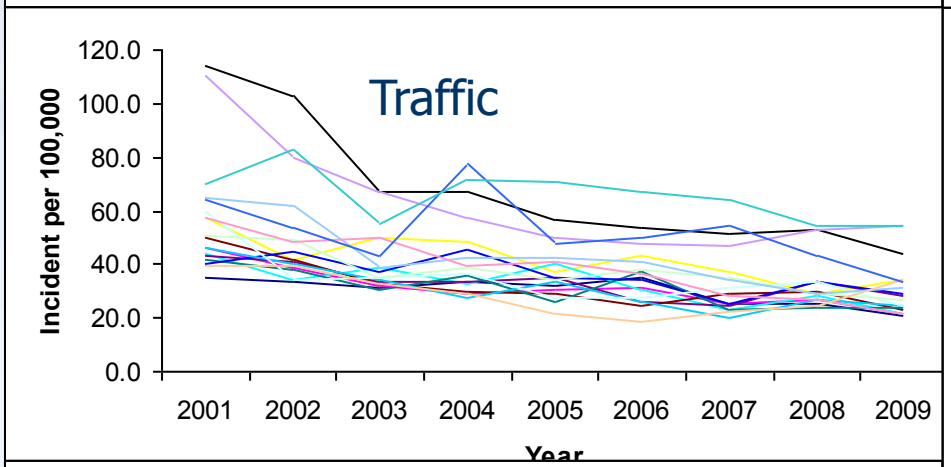
CAN WE CLOSE THE GAPS?

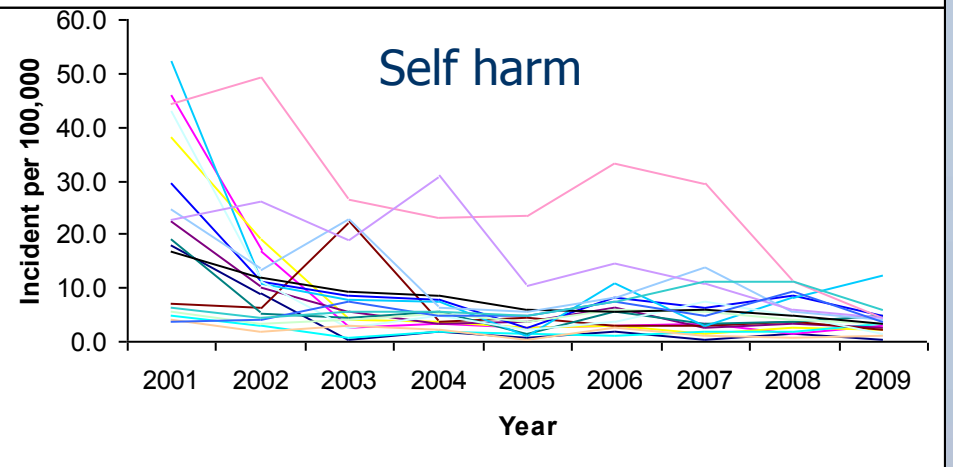
HOW TO MEASURE AVOIDABLE INJURIES?

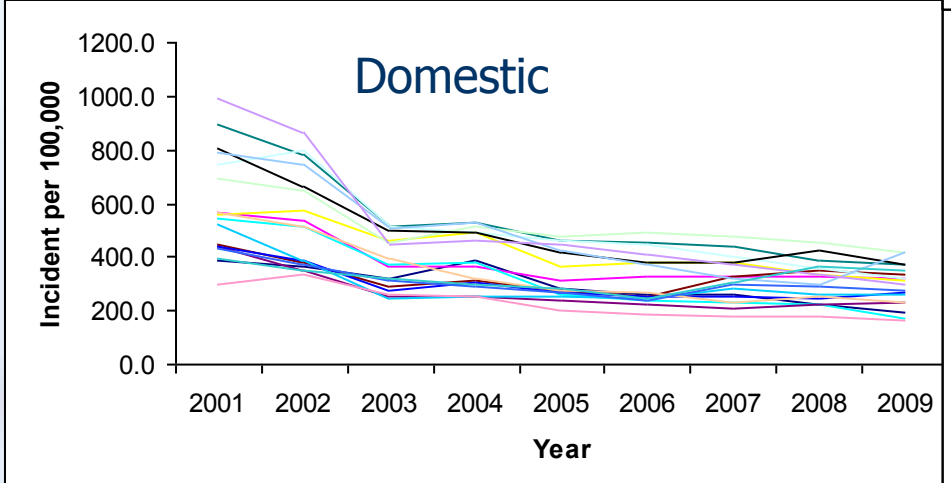
AED injury attendances

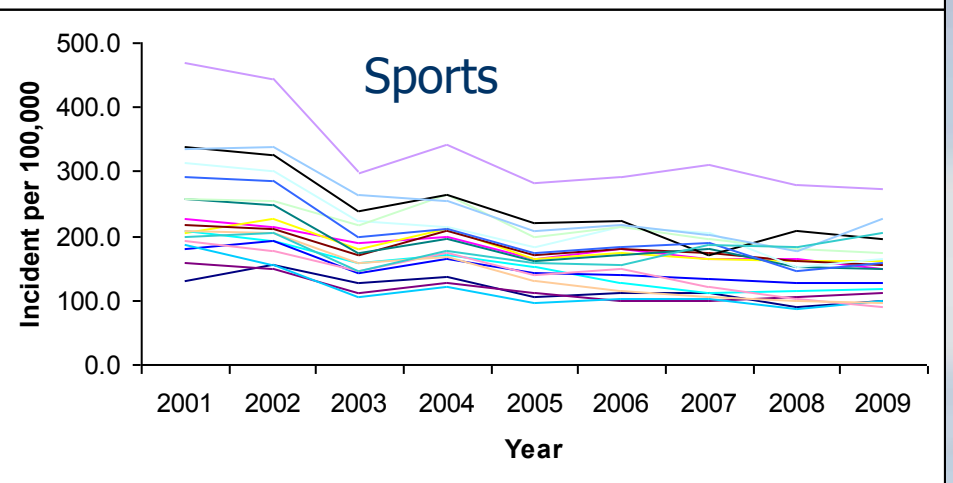




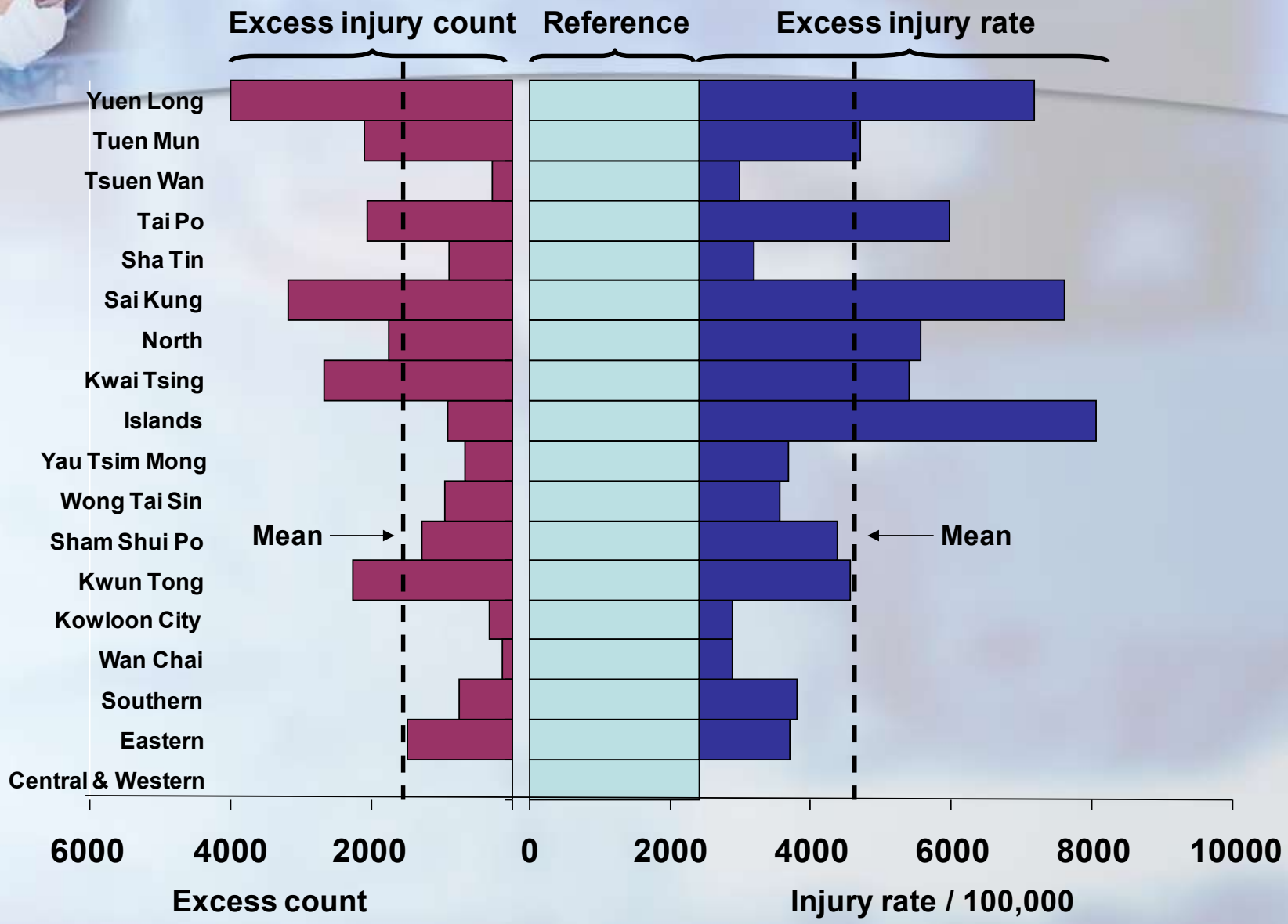




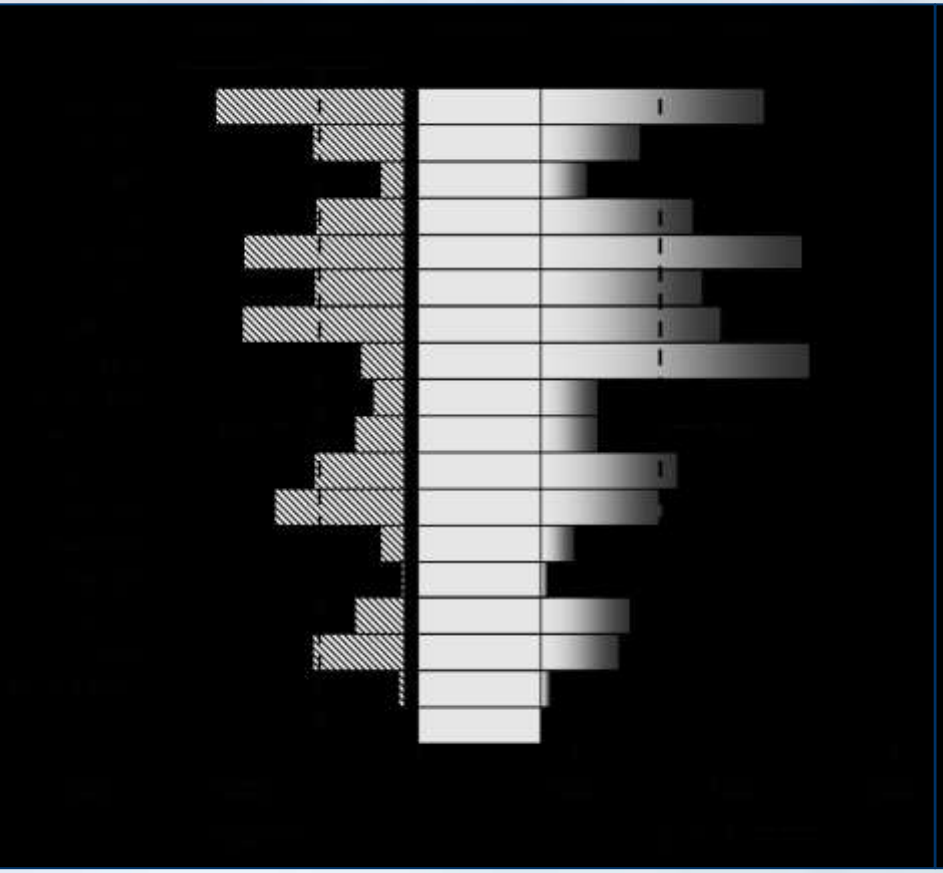




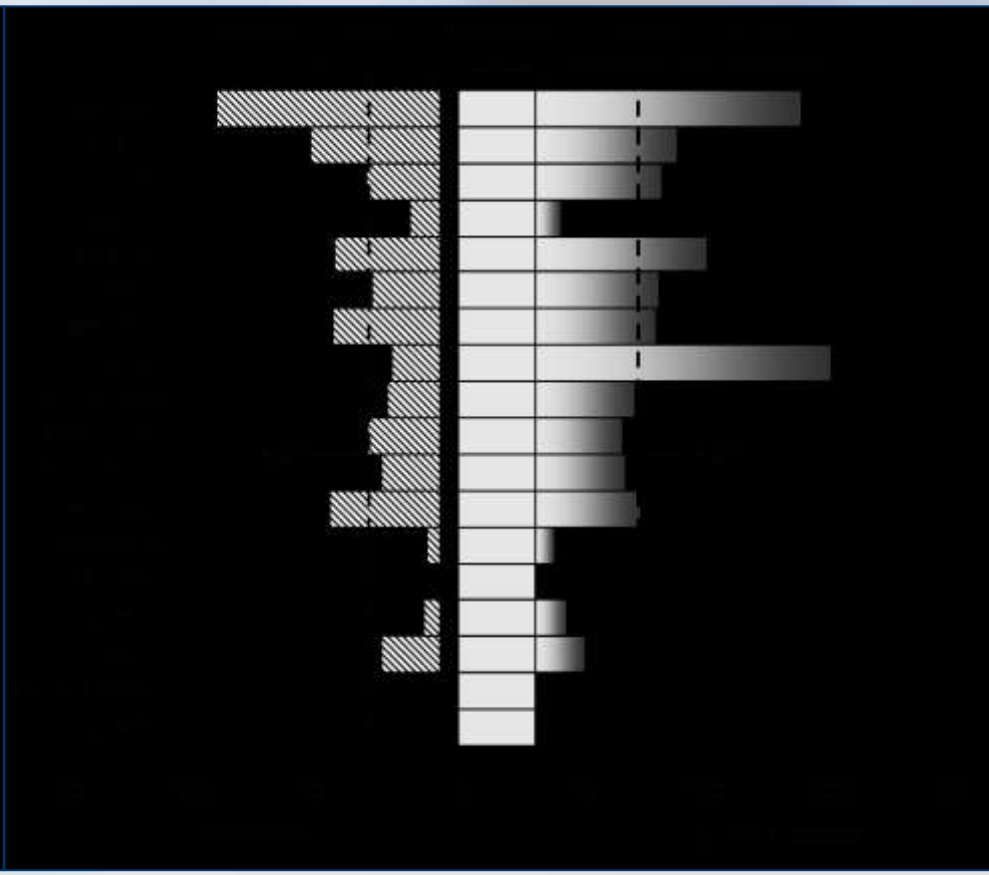
Overall Injury related AED attendance comparison among districts in 2009



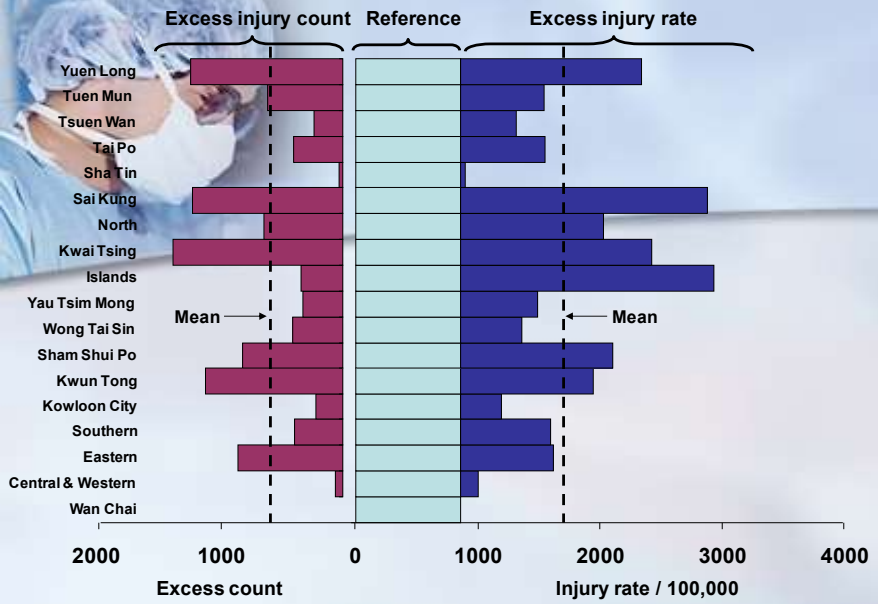
Unintentional Injury related AED attendance comparison among districts in 2009



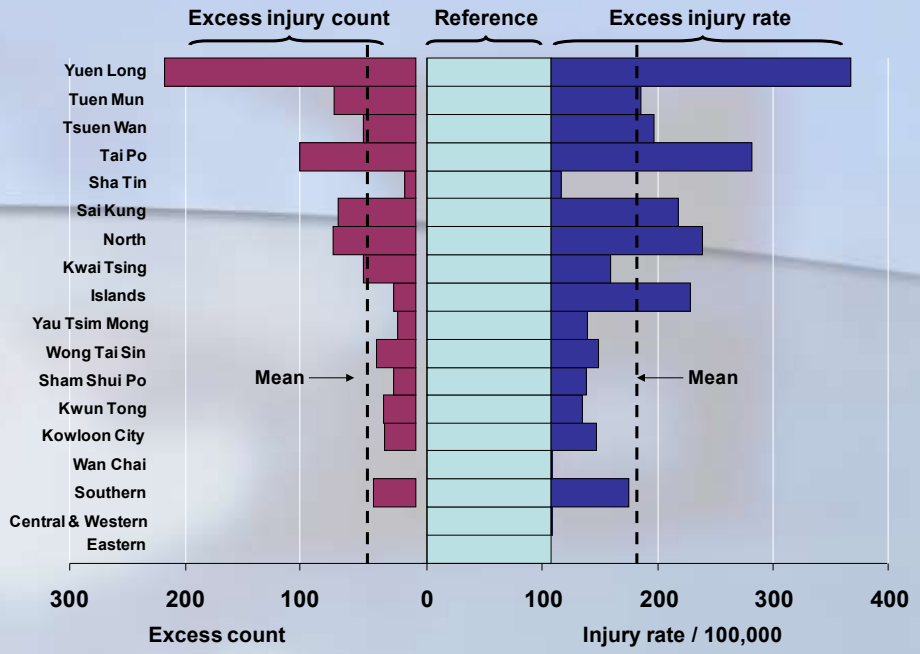
Intentional Injury related AED attendance comparison among districts in 2009



Domestic injuries

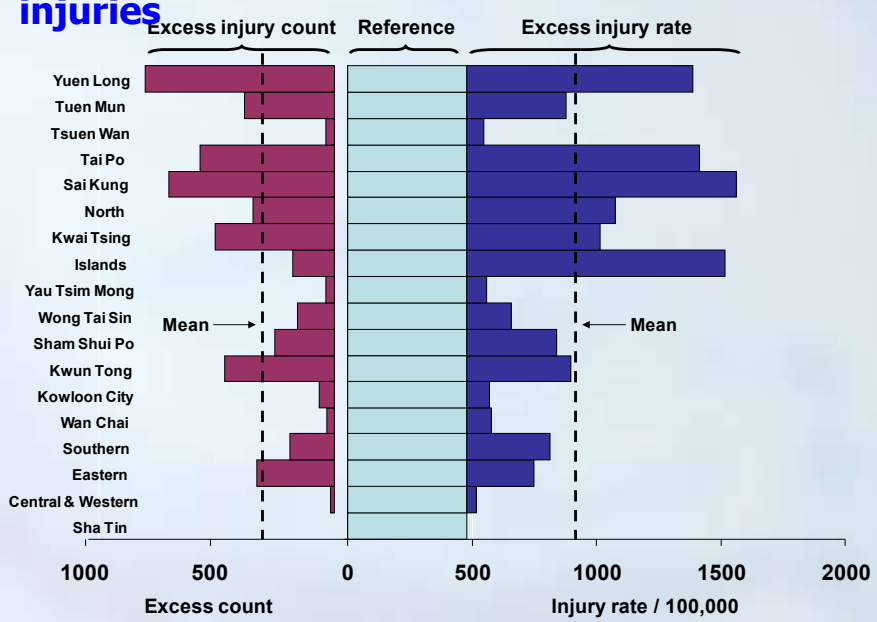


Traffic injuries

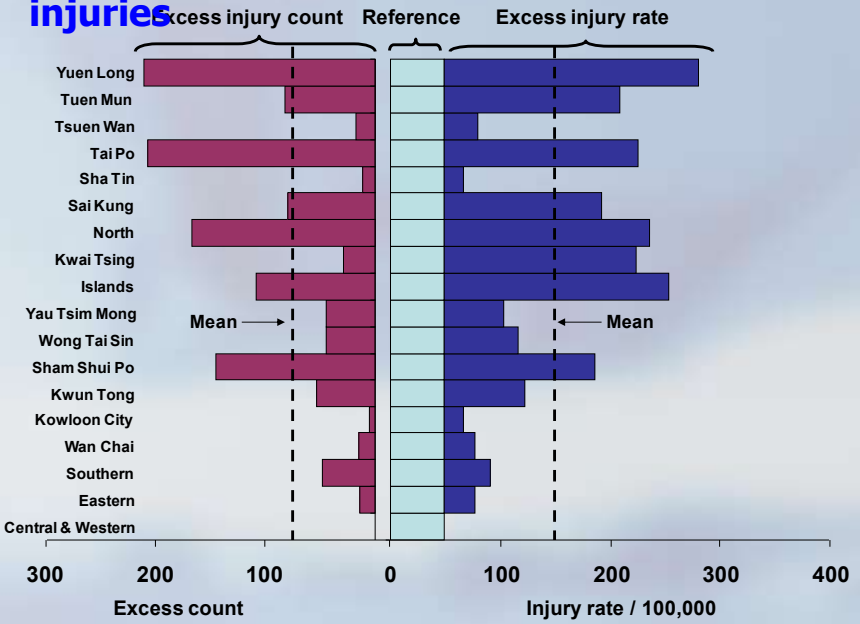


2009

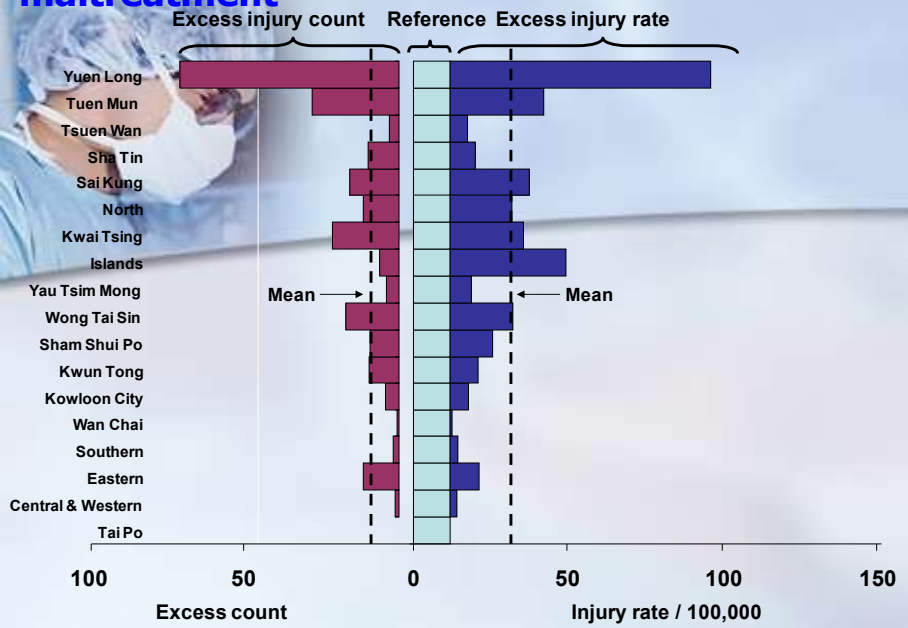
Sports injuries



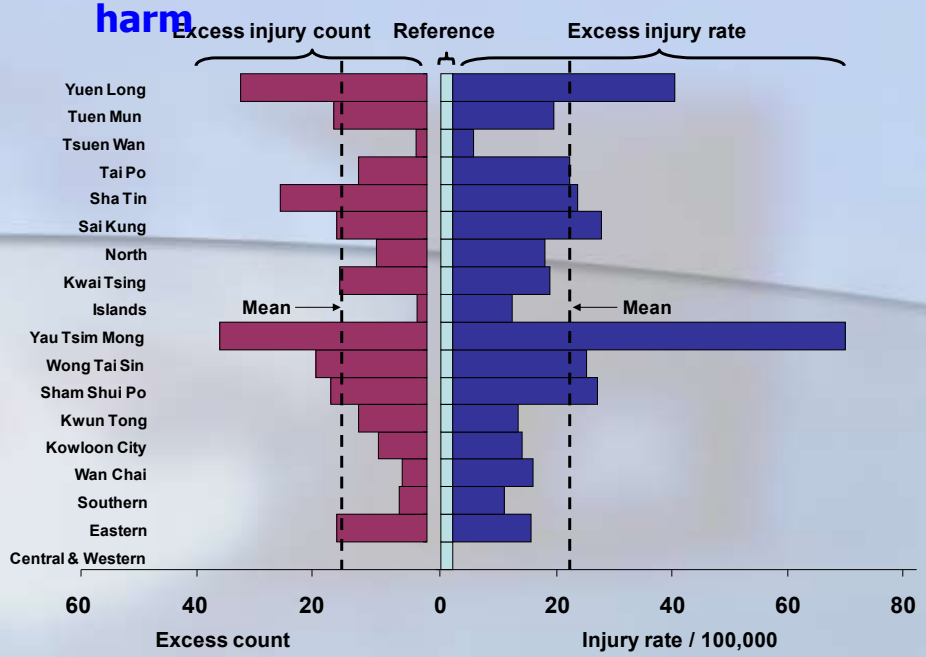
Industrial injuries



Child maltreatment

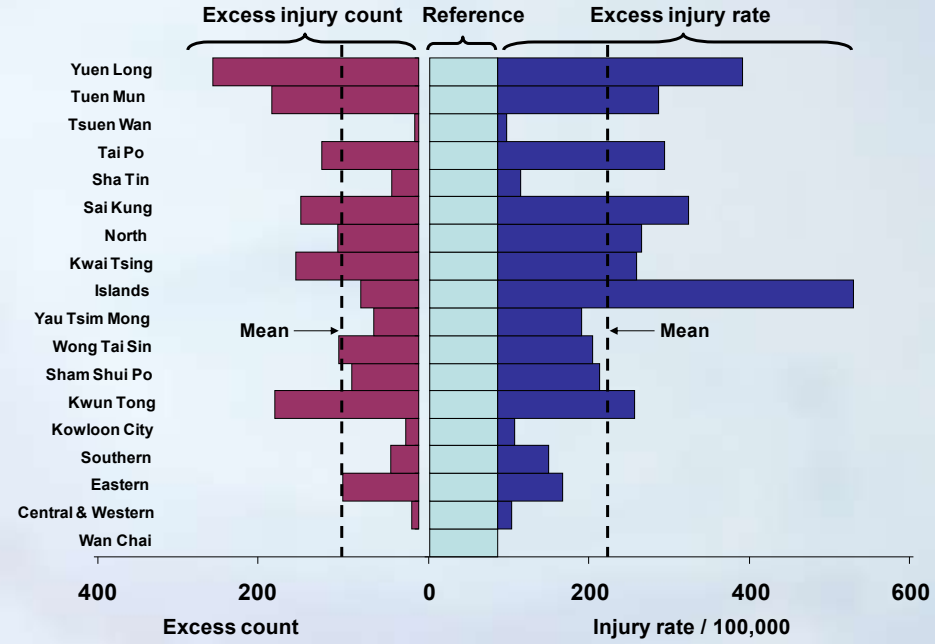


Deliberate self-harm

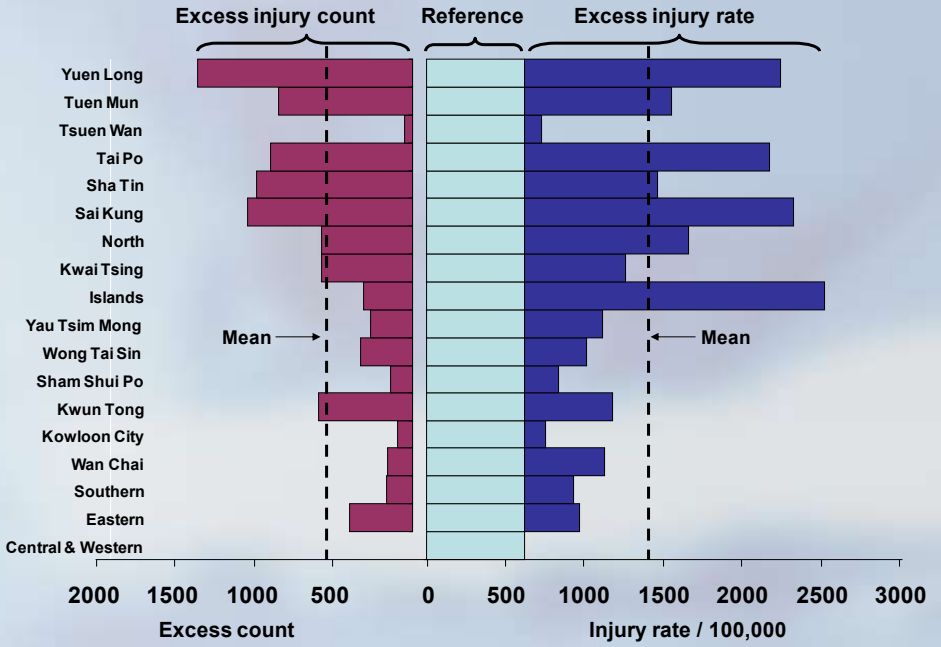


Common assaults

2009



Unclassified



WHAT IS THE BURDEN?

Direct medical costs

In-direct cost ~ usually 3X that of direct medical cost

Total in-patient admissions by districts and age groups

District	0 - 1	>1 - 4	>4 - 9	>9 - 14	>14 - 19	Total
CENTRAL & WESTERN	409	450	500	589	608	2556
EASTERN	1261	1136	1676	2067	2232	8372
ISLANDS	305	443	592	695	567	2602
KOWLOON CITY	751	730	1018	1038	1064	4601
KWAI TSING	1558	1734	2349	2764	2982	11387
KWUN TONG	1056	1259	1842	2190	2134	8481
NORTH	458	478	843	1120	1259	4158
SAI KUNG	861	1161	1644	1886	1768	7320
SHAM SHUI PO	1267	1113	1445	1421	1371	6617
SHATIN	1235	1444	1978	2250	2460	9367
SOUTHERN	559	596	868	1080	1143	4246
TAI PO	630	748	1205	1887	1896	6366
TSUEN WAN	743	740	1001	1028	1056	4568
TUEN MUN	986	1021	1608	1928	2318	7861
WANCHAI	221	181	258	296	368	1324
WONG TAI SIN	853	914	1370	1568	1767	6472
YAU TSIM MONG	951	809	848	787	917	4312
YUEN LONG	1170	1156	2082	2473	2413	9294
OTHERS	188	157	214	271	453	1283
Total	15462	16270	23341	27338	28776	109904
Annual average	1546	1627	2334	2734	2878	10990

2001-2009	below 1 years				1 - 4 years				5 - 9 years				10 - 14 years				15 - 19 years					
HA	Female		Male		Female		Male		Female		Male		Female		Male		Female		Male			Medical Cost
District	Num	Los	Num	Los	Num	Los	Num	Los	Num	Los	Num	Los	Num	Los	Num	Los	Num	Los	Num	Los	Total patient day	
Central & Western	65	18	92	20.2	188	3.2	333	4.1	154	4.6	260	4.2	163	5.3	314	4.1	163	5.3	314	4.1	11098.3	36,624,390
Eastern	209	10	295	12.7	541	3.6	777	3.3	491	4.2	858	4.7	435	4.5	1252	3.1	435	4.5	1252	3.1	28120.4	92,797,320
Southern	75	7.9	144	10.9	288	3.1	385	3.4	255	3.5	468	5.2	258	5.4	615	3.6	258	5.4	615	3.6	14904.4	49,184,520
Wan Chai	38	7.8	55	7.8	97	6.6	121	3.6	94	5.6	125	3.2	79	6.9	162	4.6	79	6.9	162	4.6	5308.2	17,517,060
Kowloon City	122	10.5	155	23.5	353	2.8	511	3.6	301	5.7	531	4.2	273	5.7	541	3.3	273	5.7	541	3.3	18380.2	60,654,660
Kwun Tong	178	19.8	244	8.3	609	4	795	2.9	604	4.3	881	3.3	483	5.7	1259	3.6	483	5.7	1259	3.6	30366.6	100,209,780
Sham Shui Po	213	10.3	275	9.4	544	3	770	3.1	365	3.4	741	3.2	303	4.7	788	6.3	303	4.7	788	6.3	25187.1	83,117,430
Wong Tai Sin	151	11.6	162	9.6	434	4.5	617	2.6	423	3.9	723	3.3	364	5	899	3.3	364	5	899	3.3	20473	67,560,900
Yau Tsim Mong	155	9.7	199	21.1	401	2.5	537	2.6	249	4.2	411	2.8	186	6.6	439	4.1	186	6.6	439	4.1	16352.7	53,963,910
Islands	40	8.4	55	11.6	191	2.4	305	2.9	152	3.2	316	2.8	154	6.3	375	3.3	154	6.3	375	3.3	8103.5	26,741,550
Kwai Tsing	**253**	**6**	**318**	**6.8**	**832**	**2.4**	**1133**	**2.6**	**678**	**3.3**	**1142**	**4**	**603**	**6.7**	**1592**	**3.2**	**603**	**6.7**	**1592**	**3.2**	**33697.4**	**111,201,420**
North	52	7.1	100	14.9	210	3.5	338	3.6	240	3.9	431	3.8	241	6.5	676	4.9	241	6.5	676	4.9	16142.6	53,270,580
Sai Kung	120	10.6	163	8.5	612	2.4	702	2.6	512	3	857	2.7	401	5.2	1120	4	401	5.2	1120	4	22931.8	75,674,940
Sha Tin	176	10.4	256	5.6	703	2.9	948	2.8	590	3.5	1042	3	495	5.5	1333	5.3	495	5.5	1333	5.3	32722.9	107,985,570
Tai Po	73	7.6	137	30.2	361	2.8	506	2.7	330	3.5	675	3.2	382	3.9	1239	3.3	382	3.9	1239	3.3	21541.2	71,085,960
Tsuen Wan	117	5.4	167	10.7	386	2.2	492	3	286	2.2	540	3.1	252	4.8	577	3.3	252	4.8	577	3.3	13274.5	43,805,850
Tuen Mun	137	7.5	219	10.8	513	3.1	685	3.4	494	4.4	860	3.2	474	4.4	1118	3.5	474	4.4	1118	3.5	24234.8	79,974,840
Yuen Long	209	13.5	245	10.8	570	3.5	799	3.1	580	7.9	1125	3.8	574	4.5	1351	4.1	574	4.5	1351	4.1	35040.6	115,633,980
Unknown	30	18.5	41	14.5	74	19.6	92	13.7	66	8.1	95	9.6	75	14	116	24.2	75	14	116	24.2	13021.3	42,970,290
																						1,289,974,950

Inpatient cost will be HK$140 million per year

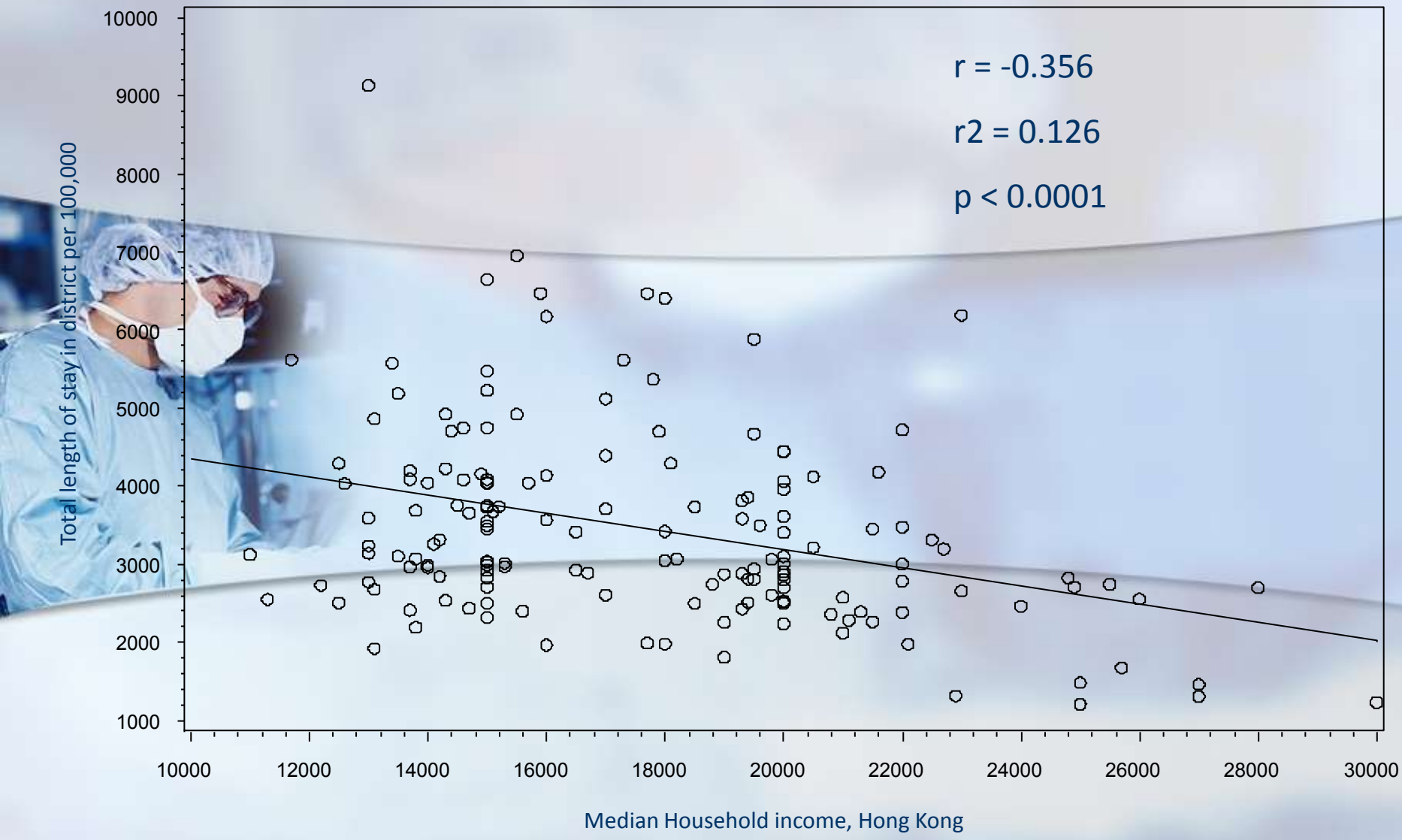
Injury attendances at AED from 2001 to 2009 by districts

District	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total	Avg Cost per year
Central & Western	2048	1870	1430	1663	1325	1357	1410	1296	1191	13590	1,057,000
Eastern	8046	7506	5152	5308	4608	4794	4659	4674	4292	49039	3,814,144
Southern	3339	3303	2561	2754	2152	2238	2323	2258	2057	22985	1,787,722
Wan Chai	1849	1647	1150	1175	1011	1040	1051	996	901	10820	841,556
Kowloon City	3435	2922	2221	2232	1965	1879	1872	1993	2056	20575	1,600,278
Kwun Tong	6928	6548	5342	5634	5035	5329	5324	5264	4817	50221	3,906,078
Sham Shui Po	5283	4923	3554	3759	3297	3468	3494	3122	2894	33794	2,628,422
Wong Tai Sin	4587	4486	3419	3794	3321	3068	3075	3027	2963	31740	2,468,667
Yau Tsim Mong	3347	2746	1988	2033	1905	1823	1991	1984	1947	19764	1,537,200
Islands	1398	1508	1167	1292	1214	1329	1470	1308	1306	11992	932,711
Kwai Tsing	7039	6803	5106	6038	5275	5603	5474	5246	4829	51413	3,998,789
North	6055	5601	4065	4161	3562	3310	3151	3404	3108	36417	2,832,433
Sai Kung	5880	5890	4398	5127	4545	4595	4462	4148	4649	43694	3,398,422
Sha Tin	9012	9079	5914	5452	4632	4526	4192	3928	3746	50481	3,926,300
Tai Po	7422	6507	3974	4537	4093	4019	3994	3822	3476	41844	3,254,533
Tsuen Wan	3665	3321	2423	2171	1801	1740	1699	1714	1544	20078	1,561,622
Tuen Mun	9421	8190	5571	5807	4999	4884	4924	4707	4315	52818	4,108,067
Yuen Long	7084	6945	5359	5727	5402	5226	5610	6347	6029	53729	4,178,922
Unknown	595	482	360	417	385	472	467	538	431	4147	322,544
Total	96433	90277	65154	69081	60527	60700	60642	59776	56551	619141	48,155,411

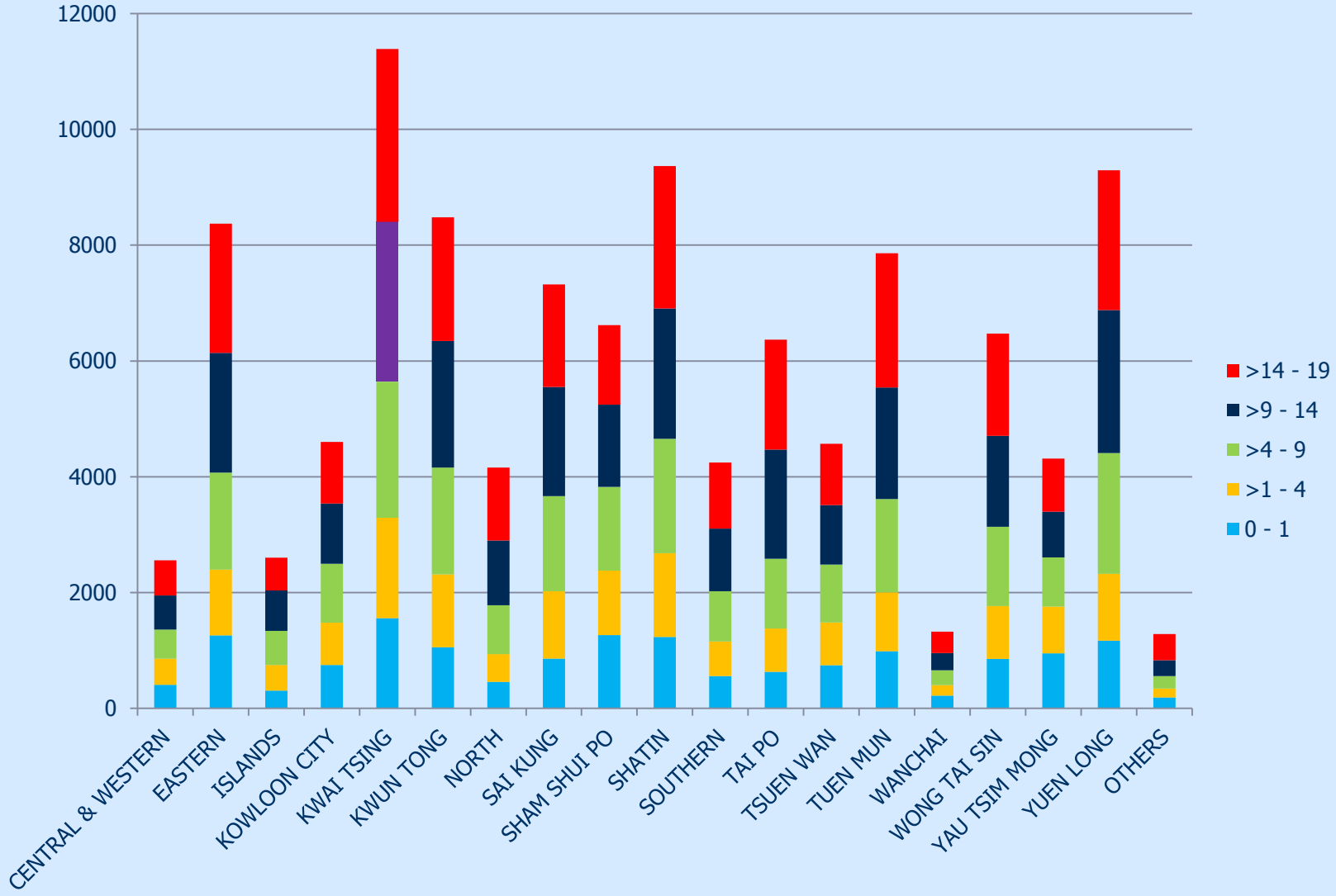
Direct medical cost for AED 48 Million per year.

Total AED+inpatient 188 Million per year

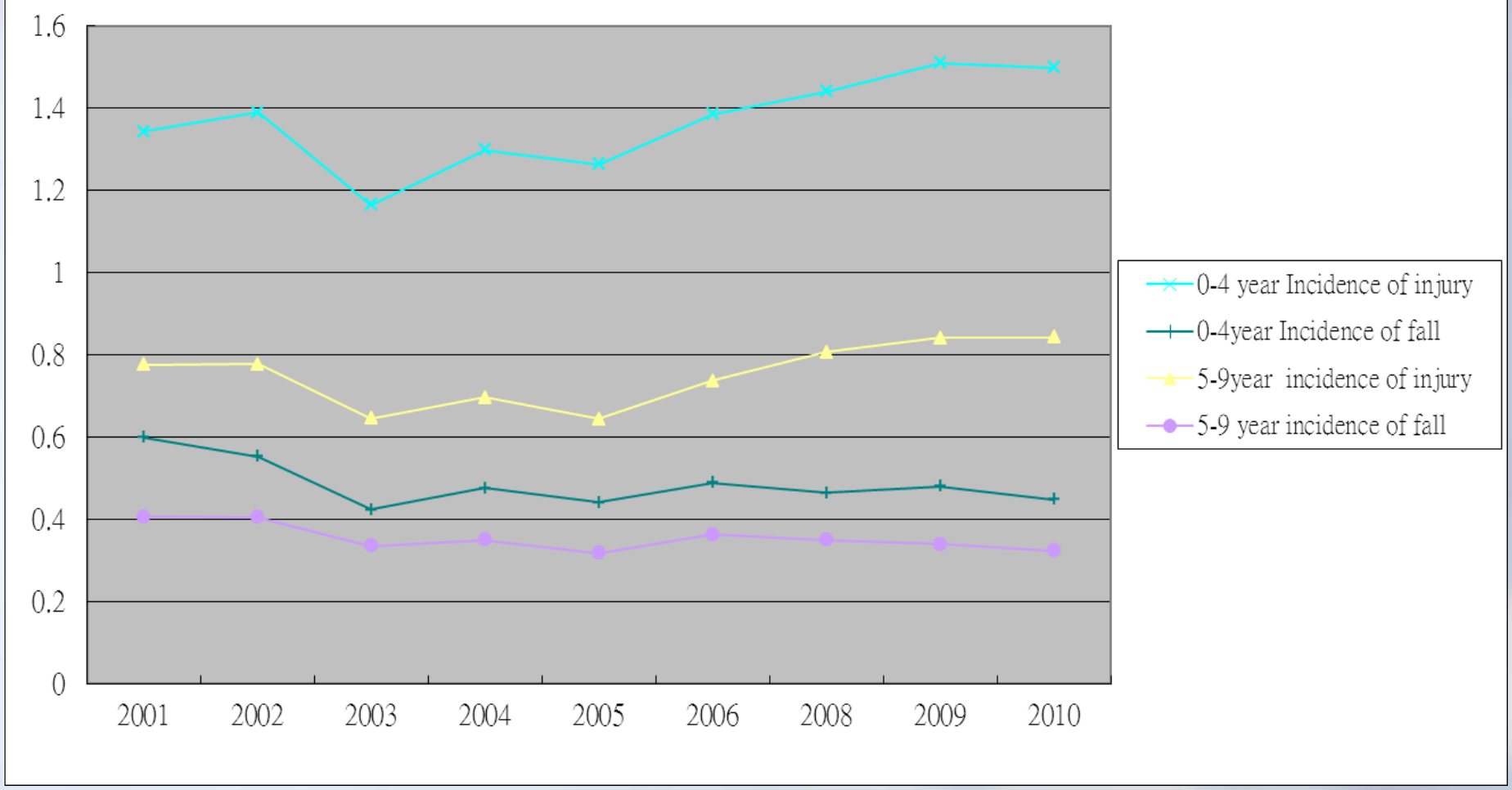
Total length of stay in different district for children age 0 – 19 years against district household income (2001 to 2009)

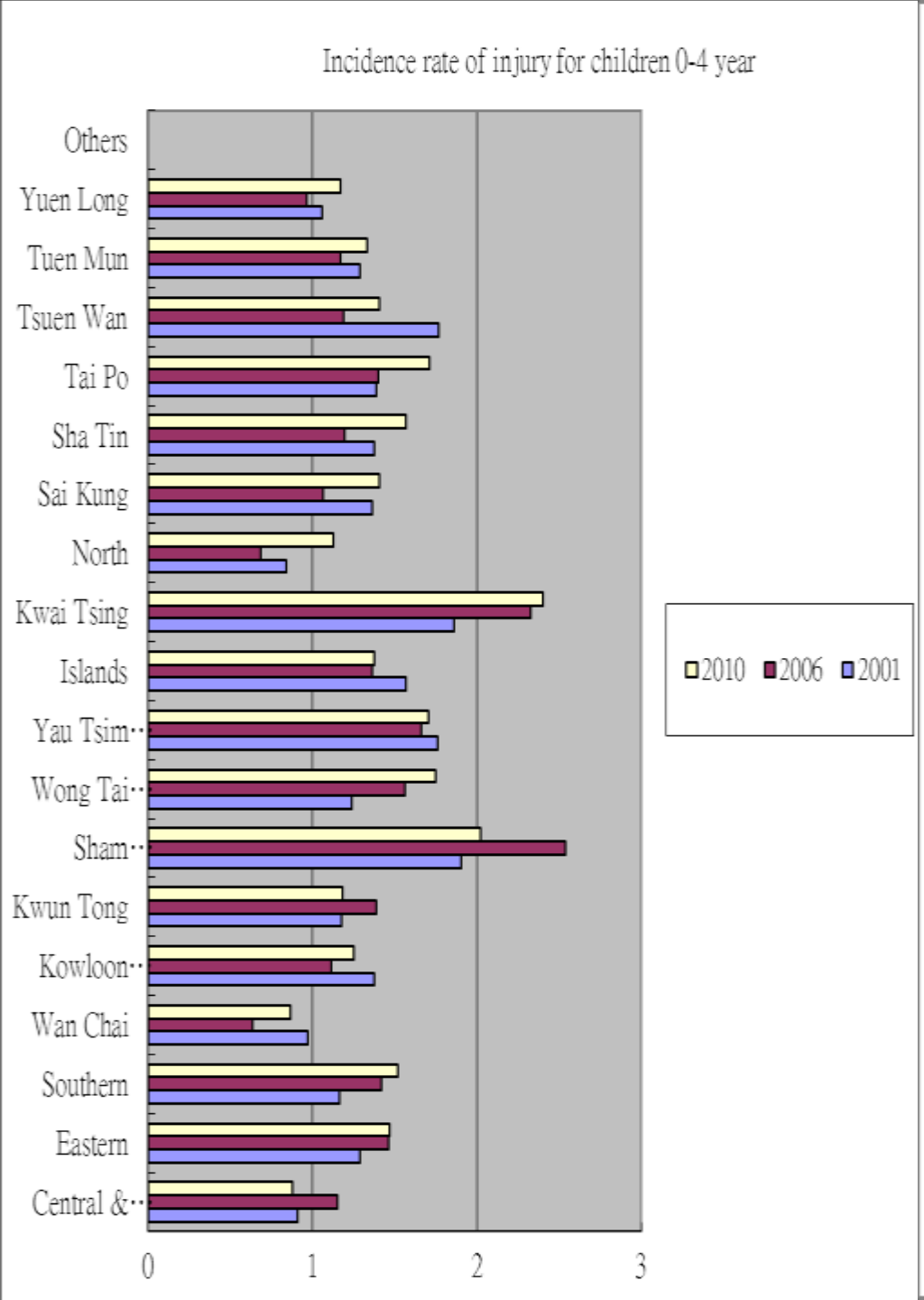


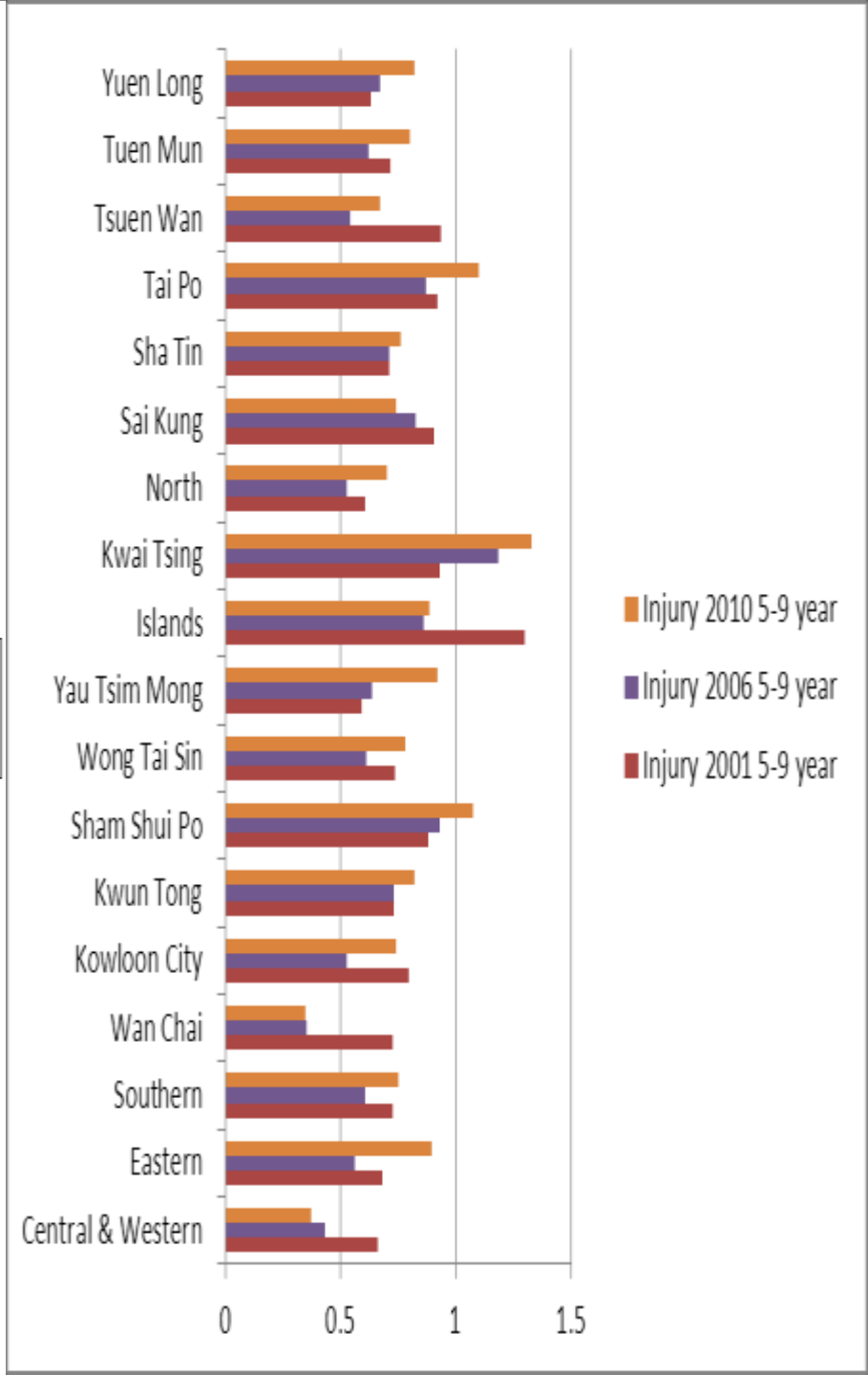
Number of HA inpatient Attendance by age groups 2001-2010



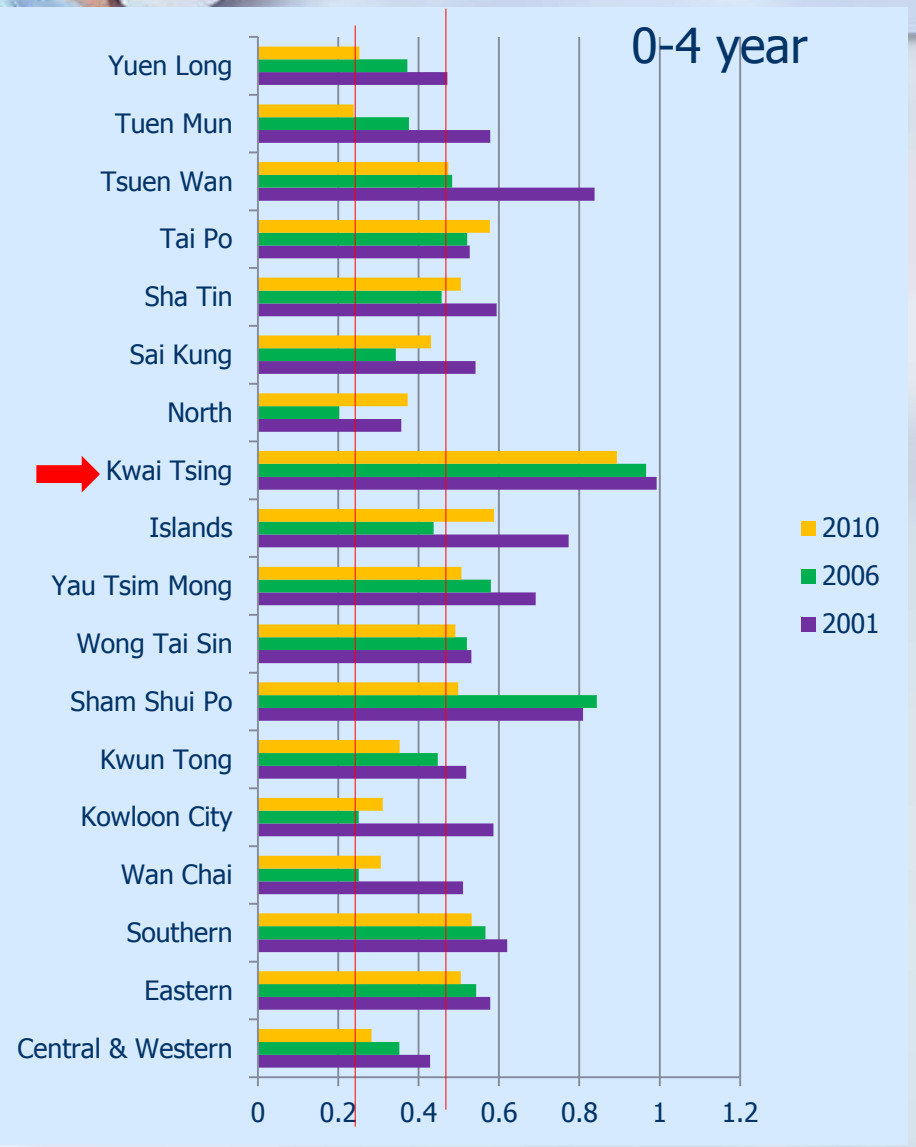
Incidence of hospitalization due to injury and falls

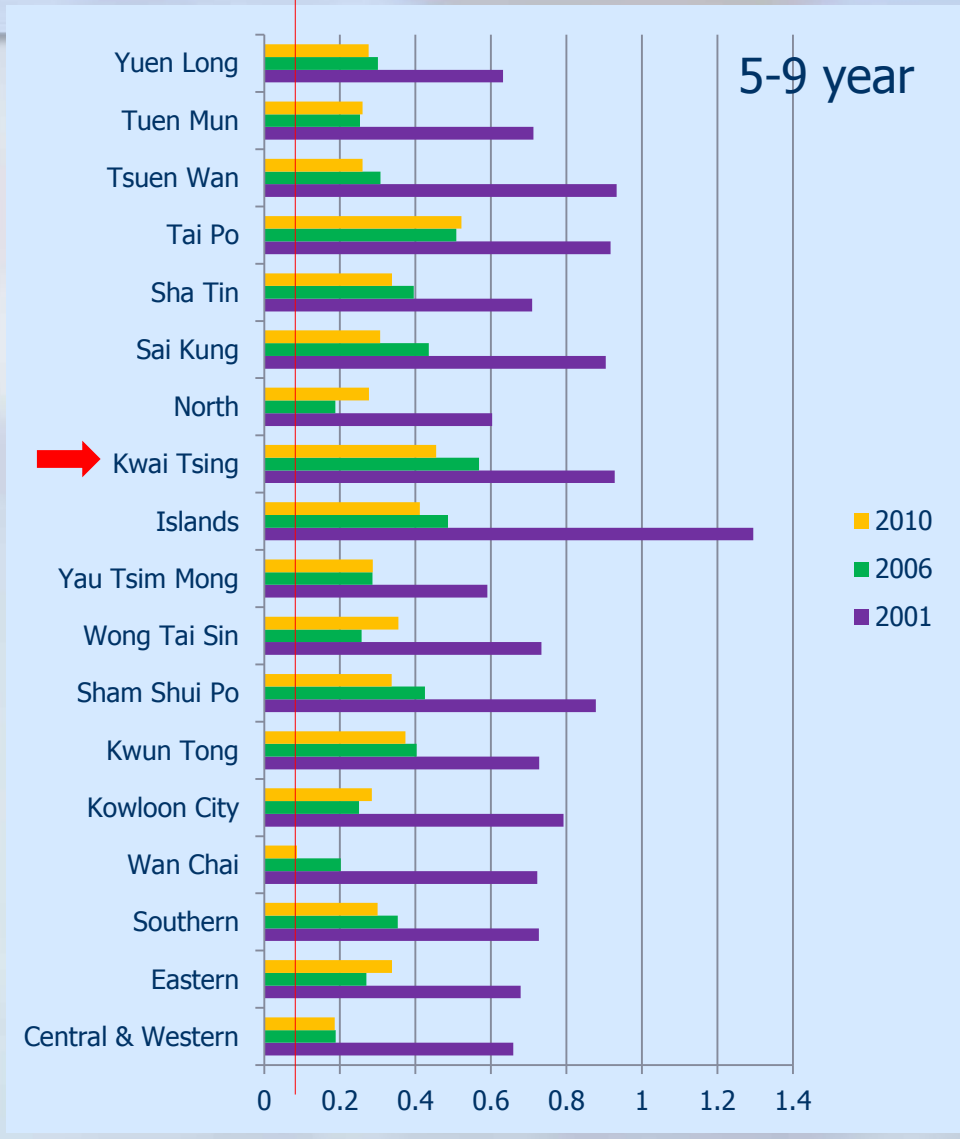



Incidence rate of injury for children 0-4 year
Others
Yuen Long
Tuen Mun
Tsuen Wan
Tai Po
Sha Tin
Sai Kung
North
Kwai Tsing
Islands
Yau Tsim··
Wong Tai··
Sham··
Kwun Tong
Kowloon··
Wan Chai
Southern
Eastern
Central &··
0
1
2
3
2010
2006
2001


Yuen Long
Tuen Mun
Tsuen Wan
Tai Po
Sha Tin
Sai Kung
North
Kwai Tsing
Islands
Yau Tsim Mong
Wong Tai Sin
Sham Shui Po
Kwun Tong
Kowloon City
Wan Chai
Southern
Eastern
Central & Western
0
0.5
1
1.5
Injury 2010 5-9 year
Injury 2006 5-9 year
Injury 2001 5-9 year

Incidence of hospital admission due to Fall among children





WHO Burden of Injuries methodology

In-patient External coding from 2001 to 2010

	Type of injury	Number (n=111187)	(%)	<1 year n=7425	1-4 year n=24307	5-9 year n=23341	10-14 year n=27338	15-19 year n=28776
1	brain injury	2356	2.1	277 (3.73%)	694 (2.86%)	451 (1.93%)	391 (1.43%)	543 (1.89%)
2	other skull-brain injury	15438	13.9	2364 (31.84%)	4643 (19.1%)	2822 (12.09%)	2399 (8.78%)	3210 (11.16%)
3	soft tissue head injuries	422	0.4	8 (0.11%)	91 (0.37%)	71 (0.3%)	77 (0.28%)	175 (0.61%)
4	eye injury	450	0.4	13 (0.18%)	146 (0.6%)	79 (0.34%)	75 (0.27%)	137 (0.48%)
5	fracture facial bones	1249	1.1	2 (0.03%)	40 (0.16%)	76 (0.33%)	288 (1.05%)	843 (2.93%)
6	open wound face	1990	1.8	42 (0.57%)	885 (3.64%)	439 (1.88%)	259 (0.95%)	365 (1.27%)
7	factures/dislocations/sprain/strain	316	0.3	0 (0%)	13 (0.05%)	32 (0.14%)	67 (0.25%)	204 (0.71%)
8	whiplash/neck	321	0.3	3 (0.04%)	20 (0.08%)	63 (0.27%)	81 (0.3%)	154 (0.54%)
9	spinal cord injury	73	0.1	0 (0%)	0 (0%)	2 (0.01%)	9 (0.03%)	62 (0.22%)
10	internal organ injuries	366	0.3	8 (0.11%)	33 (0.14%)	68 (0.29%)	104 (0.38%)	153 (0.53%)
11	facture rib/sternum	82	0.1	9 (0.12%)	6 (0.02%)	10 (0.04%)	27 (0.1%)	30 (0.1%)
12	facture of clavicle/scapula	553	0.5	58 (0.78%)	105 (0.43%)	75 (0.32%)	153 (0.56%)	162 (0.56%)
13	facutre of upper arm	1321	1.2	53 (0.71%)	170 (0.7%)	394 (1.69%)	488 (1.79%)	216 (0.75%)
14	facture of elbow/forearm	13778	12.4	67 (0.9%)	3334 (13.72%)	5356 (22.95%)	3821 (13.98%)	1200 (4.17%)
15	fracture of wrist	9160	8.2	11 (0.15%)	310 (1.28%)	2046 (8.77%)	4780 (17.48%)	2013 (7.00%)
16	fracture of hand/fingers	3993	3.6	5 (0.07%)	196 (0.81%)	439 (1.88%)	1478 (5.41%)	1875 (6.52%)
17	dislocation/sprian	774	0.7	33 (0.44%)	165 (0.68%)	133 (0.57%)	181 (0.66%)	262 (0.91%)
18	dislocation fingers	455	0.4	0 (0%)	20 (0.08%)	21 (0.09%)	125 (0.46%)	289 (1%)
19	injury of nerves	341	0.3	2 (0.03%)	31 (0.13%)	49 (0.21%)	82 (0.3%)	177 (0.62%)
20	complex soft tissue injury	2255	2.0	26 (0.35%)	361 (1.49%)	267 (1.14%)	367 (1.34%)	1229 (4.27%)
21	fracture of pelvis	304	0.3	0 (0%)	7 (0.03%)	26 (0.11%)	90 (0.33%)	181 (0.63%)
22	fracture of hip	168	0.2	2 (0.03%)	21 (0.09%)	23 (0.1%)	62 (0.23%)	60 (0.21%)
23	fracture of femur shaft	636	0.6	52 (0.7%)	144 (0.59%)	148 (0.63%)	138 (0.5%)	154 (0.54%)
24	fracture of knee/lower leg	3561	3.2	22 (0.3%)	577 (2.37%)	737 (3.16%)	1372 (5.02%)	853 (2.96%)
25	fracture of ankle	1636	1.5	0 (0%)	17 (0.07%)	99 (0.42%)	713 (2.61%)	807 (2.80%)
26	fracture of foot	1323	1.2	1 (0.01%)	128 (0.53%)	216 (0.93%)	431 (1.58%)	547 (1.9%)
27	dislocation/knee	2338	2.1	3 (0.04%)	29 (0.12%)	55 (0.24%)	609 (2.23%)	1642 (5.71%)
28	dislocation foot	868	0.8	0 (0%)	56 (0.23%)	137 (0.59%)	241 (0.88%)	434 (1.51%)
29	dislocation hip	151	0.1	1 (0.01%)	22 (0.09%)	40 (0.17%)	56 (0.2%)	32 (0.11%)
30	injury of nerves	23	0.0	0 (0%)	1 (0%)	2 (0.01%)	8 (0.03%)	12 (0.04%)
31	complex soft tissue injury	391	0.4	1 (0.01%)	64 (0.26%)	86 (0.37%)	96 (0.35%)	144 (0.5%)
32	superficial inury	4049	3.6	98 (1.32%)	813 (3.34%)	938 (4.02%)	1027 (3.76%)	1173 (4.08%)
33	open wounds	5984	5.4	76 (1.02%)	1160 (4.77%)	1050 (4.5%)	1258 (4.6%)	2440 (8.48%)
34	burns	3134	2.8	497 (6.69%)	1611 (6.63%)	533 (2.28%)	243 (0.89%)	250 (0.87%)
35	poisoning	4643	4.2	129 (1.74%)	1012 (4.16%)	193 (0.83%)	569 (2.08%)	2740 (9.52%)
36	multi trauma	4830	4.3	114 (1.54%)	592 (2.44%)	810 (3.47%)	1277 (4.67%)	2037 (7.08%)
37	foreign body	6971	6.3	266 (3.58%)	2795 (11.5%)	1882 (8.06%)	1076 (3.94%)	952 (3.31%)
38	no injury afterexamination	14613	14.5	2646 (35.64%)	3182 (13.09%)	2300 (9.85%)	2669 (9.76%)	3816 (13.26%)
39	other and uspecified injury	10352	9.3	777 (10.46%)	2062 (8.48%)	2891 (12.39%)	2899 (10.6%)	1723 (5.99%)

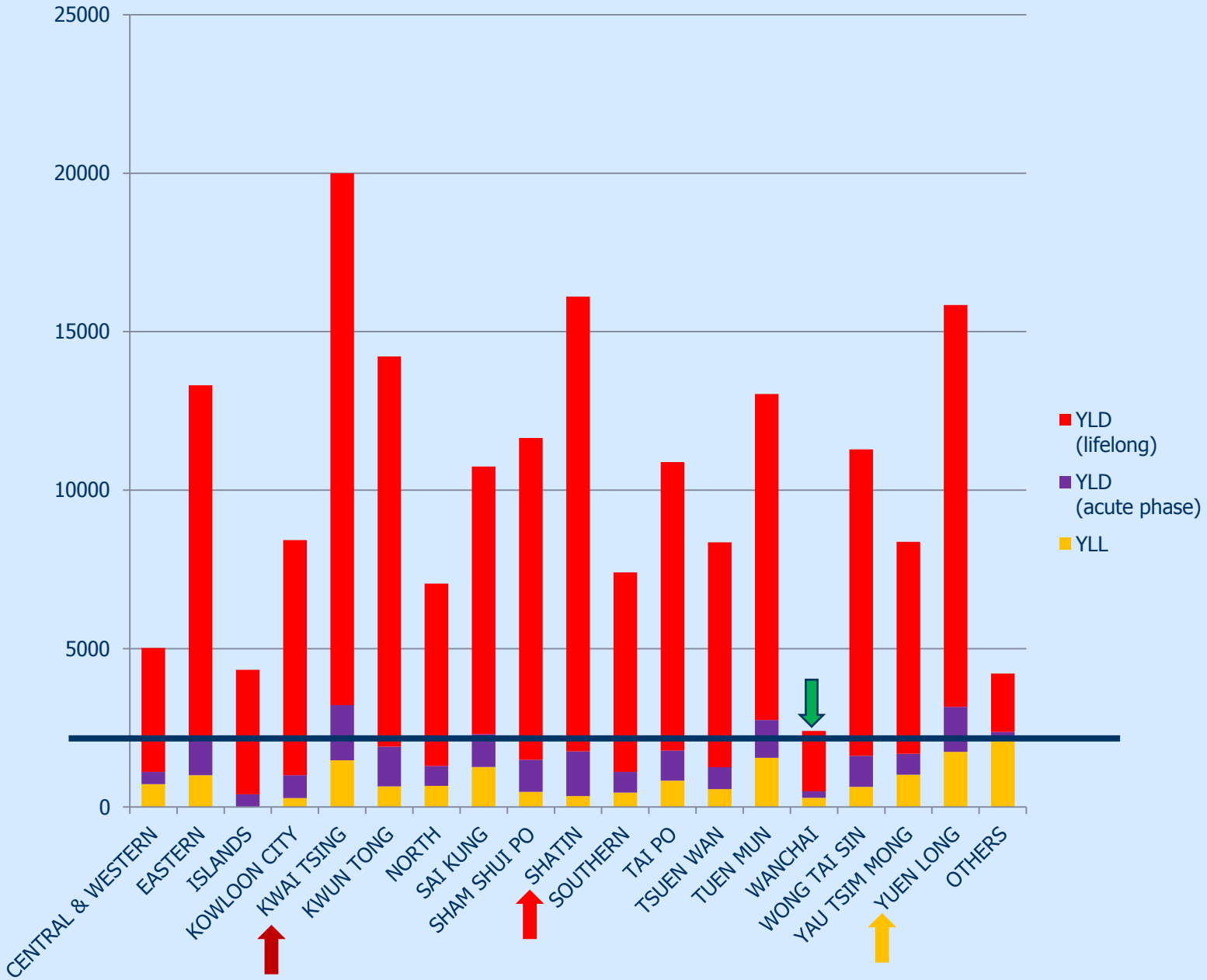
In-patient External coding from 2001 to 2010

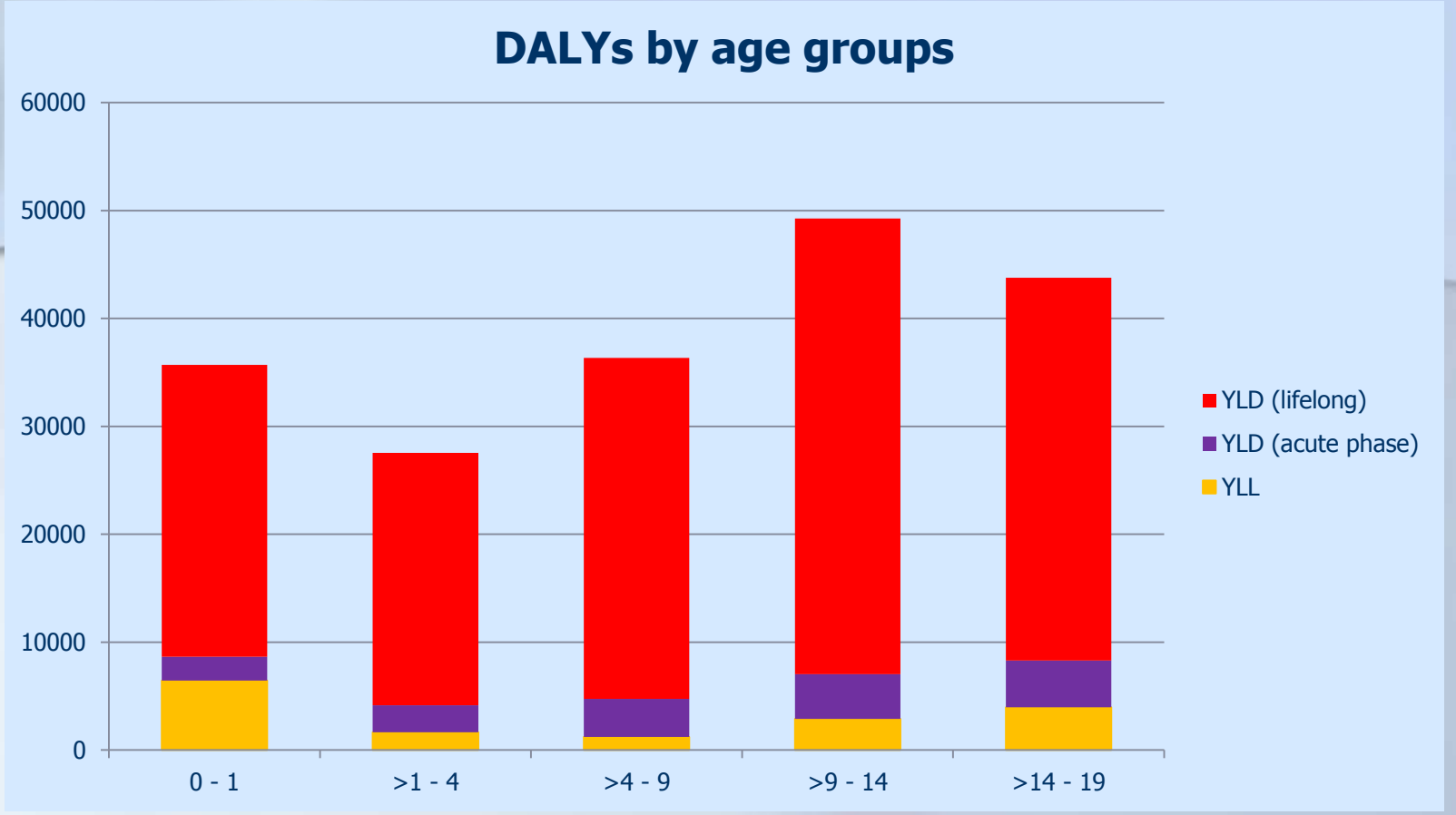
	Type of injury	Number (n=111187)	(%)	Mean (day)	Std (day)	Min (day)	Max (day)	TOTAL LOS pat-days	AE
1	brain injury (concussion)	2356	2.1	1.7	7.8	1	338	3958	
2	other skull-brain injury	15438	13.9	2.8	13.3	1	714	43535	
3	soft tissue head injuries	422	0.4	3.9	8.7	1	111	1642	
4	eye injury	450	0.4	3.2	5.7	1	72	1422	
5	fracture facial bones	1249	1.1	3.1	6.6	1	93	3847	
6	open wound face	1990	1.8	3.1	27.6	1	1171	6129	
7	factures/dislocations/sprain/strain	316	0.3	11.8	24.2	1	238	3729	
8	whiplash/neck	321	0.3	2.5	3.2	1	35	793	
9	spinal cord injury	73	0.1	60.9	120.6	1	810	4446	
10	internal organ injuries	366	0.3	13.8	22.6	1	183	5051	
11	facture rib/sternum	82	0.1	18.7	51.8	1	406	1533	
12	facture of clavicle/scapula	553	0.5	4.3	11.3	1	137	2356	
13	facutre of upper arm	1321	1.2	4.8	25.4	1	818	6341	
14	facture of elbow/forearm	13778	12.4	2.1	5.5	1	394	29072	
15	fracture of wrist	9160	8.2	1.8	3.1	1	154	16396	
16	fracture of hand/fingers	3993	3.6	2.2	3.4	1	93	8825	
17	dislocation/sprian sholder/elbow	774	0.7	2.8	6.4	1	111	2198	
18	dislocation/sprain wrist/fingers	455	0.4	2.3	4.0	1	71	1033	
19	injury of nerves arm/hand	341	0.3	3.3	6.0	1	71	1136	
20	complex soft tissue injury	2255	2.0	2.4	4.7	1	75	5502	
21	fracture of pelvis	304	0.3	13.5	29.0	1	379	4107	
22	fracture of hip	168	0.2	26.2	66.5	1	721	4402	
23	fracture of femur shaft	636	0.6	24.8	72.7	1	1646	15773	
24	fracture of knee/lower leg	3561	3.2	7.1	15.1	1	373	25247	
25	fracture of ankle	1636	1.5	6.2	7.1	1	93	10143	
26	fracture of foot	1323	1.2	4.4	9.7	1	117	5861	
27	dislocation/sprain knee	2338	2.1	4.6	6.8	1	121	10638	
28	dislocation /sprain ankle/foot	868	0.8	3.4	5.9	1	85	2908	
29	dislocation hip	151	0.1	8.5	24.8	1	255	1280	
30	injury of nerves leg/foot	23	0.0	15.0	21.3	1	83	345	
31	complex soft tissue injury	391	0.4	7.5	18.0	1	183	2948	
32	superficial inury	4049	3.6	2.7	6.6	1	183	10892	
33	open wounds	5984	5.4	3.2	7.6	1	183	19029	
34	burns	3134	2.8	8.6	17.9	1	716	27046	
35	poisoning	4643	4.2	3.2	15.6	1	716	14811	
36	multi trauma	4830	4.3	7.2	20.2	1	716	34776	
37	foreign body	6971	6.3	1.5	4.9	1	181	10387	
38	no injury after examination	14613	14.5	11.6	53.5	1	2030	169511	
39	other and uspecified injury	10352	9.3	5.6	12.6	1	672	58178	
								577225	
							Annual	57723	
							Annual cost	HK$190,484,260	

DALYs by districts (2001-2010)

District	No. cases	YLL	YLD (acute phase)	YLD (lifelong)	DALYs	DALYs/case	Annual average DALYs
CENTRAL & WESTERN	2556	721	383	3919	5024	1.9654	502
EASTERN	8372	1008	1203	11100	13311	1.5899	1331
ISLANDS	2602	0	405	3929	4334	1.6656	433
KOWLOON CITY	4601	288	716	7419	8423	1.8306	842
KWAI TSING	11387	1475	1740	16783	19998	1.7562	2000
KWUN TONG	8481	654	1251	12311	14216	1.6762	1422
NORTH	4158	670	624	5760	7054	1.6965	705
SAI KUNG	7320	1268	1029	8444	10742	1.4675	1074
SHAM SHUI PO	6617	477	1016	10152	11645	1.7599	1165
SHATIN	9367	345	1413	14348	16106	1.7194	1611
SOUTHERN	4246	454	652	6297	7403	1.7435	740
TAI PO	6366	832	947	9104	10883	1.7095	1088
TSUEN WAN	4568	566	690	7092	8349	1.8276	835
TUEN MUN	7861	1552	1192	10290	13034	1.6581	1303
WANCHAI	1324	289	206	1907	2402	1.8144	240
WONG TAI SIN	6472	641	978	9668	11287	1.7440	1129
YAU TSIM MONG	4312	1020	659	6690	8369	1.9408	837
YUEN LONG	9294	1746	1420	12678	15843	1.7047	1584
OTHERS	1283	2185	189	1838	4212	3.2828	421
Total	111187	16191	16713	159730	192634	1.7325	19263
Annual average	11119	1619	1671	15973	19263		

DALYs by districts





Age Group	cases	YLL	YLD (acute phase)	YLD (lifelong)	DALYs	DALYs/case
0 - 1	15462	6435	2217	27045	35697	2.3087
>1 - 4	16270	1661	2486	23405	27552	1.6934
>4 - 9	23341	1230	3527	31601	36358	1.5577
>9 - 14	27338	2886	4161	42221	49267	1.8022
>14 - 19	28776	3979	4323	35458	43760	1.5207
Total	111187	16191	16714	159729	192634	1.7325
Annual average	11119	1619	1671	15973	19263	

Injury Survey 2008

Table 3.1.4 Number of times injured in the 12 months before enumeration in injured persons by age group

Number of times injured	0 – 4		5 – 14		15 – 24		25 – 34		35 – 44	
	No. of persons ('000)	%	No. of persons ('000)	%	No. of persons ('000)	%	No. of persons ('000)	%	No. of persons ('000)	%
Once	3.3	58.3	35.2	91.8	46.6	87.7	49.1	93.5	67.0	90.6
Twice	1.7	29.4	2.4	6.2	3.3	6.2	3.4	6.5	5.1	6.9
Three times or more	0.7	12.4	0.8	2.0	3.2	6.1	*	*	1.8	2.5
Total	5.7	100.0	38.3	100.0	53.2	100.0	52.5	100.0	74.0	100.0

Number of times injured	45 – 54		55 – 64		65 – 74		75 and above		Total	
	No. of persons ('000)	%	No. of persons ('000)	%	No. of persons ('000)	%	No. of persons ('000)	%	No. of persons ('000)	%
Once	80.7	92.0	45.6	96.5	22.6	94.1	29.7	91.9	380.0	91.5
Twice	5.0	5.7	1.1	2.3	1.4	5.9	2.2	6.7	25.6	6.2
Three times or more	2.0	2.3	0.6	1.2	*	*	0.5	1.4	9.6	2.3
Total	87.8	100.0	47.3	100.0	24.0	100.0	32.4	100.0	415.2	100.0

Base: Respondents who sustained injury episode(s) in the 12 months before enumeration

Among the 460 000 injury episodes which took place in the 12 months before enumeration, 11.1% (or 51 100) of them were childhood injury episodes (Table 4.2.3.1).

Table 4.2.3.1 Proportion of childhood injury episodes sustained in the 12 months before enumeration

Whether the injury episode was sustained by children aged 14 and below	No. of episodes ('000)	%
Yes	51.1	11.1
No	408.9	88.9
Total	460.0	100.0

Base: Injury episodes (up to three most serious ones) sustained by the respondents in the 12 months before enumeration

2008 –
888,800 children < 14 yr
51,100 childhood injury episodes. (~47,115 AED)
11.1% of total injuries

Table 4.2.3.1.2 Proportion of population aged 14 and below sustained injury episodes in the 12 months before enumeration by age group

Whether sustained injury episodes	0 – 4		5 – 9		10 – 14		Total	
	No. of persons ('000)	%	No. of persons ('000)	%	No. of persons ('000)	%	No. of persons ('000)	%
Yes	5.7	2.6	9.5	3.4	28.9	7.4	44.1	5.0
No	214.1	97.4	268.6	96.6	361.9	92.6	844.7	95.0
Total	219.8	100.0	278.1	100.0	390.8	100.0	888.8	100.0

Base: Respondents aged 14 and below

Prevalence of sustained injuries needing medical advice or treatment in past 12 months preceding the survey

Age (year)	0-1	2-5	6-10	11-14	Total
Prevalence per 100,000	2.9	6.0	6.7	22.9	38.5
Percentage	4.2	3.3	2.1	7.3	4.4%

Percent with reduction in physical activity after injuries

Age (year)	Girls	Boys	Total
0-1 yr	9.0	28.0	21.1
2-5	26.4	10.5	17.6
6-10	31.0	30.7	30.8
11-14	34.5	34.7	34.6
All 0-14	30.5	30.1	30.3

Table 5.1.6.1 Total medical expenses per episode incurred in injury episodes sustained in the 12 months before enumeration by age group

Total medical expenses (HK$)	0 – 14		15 – 64		65 and above		Total	
	No. of episodes ('000)	%	No. of episodes ('000)	%	No. of episodes ('000)	%	No. of episodes ('000)	%
0	1.2	2.4	13.7	3.9	1.1	1.9	16.1	3.5
1 – 50	13.9	27.2	66.4	19.1	5.5	9.0	85.8	18.6
51 – 100	5.9	11.5	47.0	13.5	7.1	11.7	60.0	13.1
101 – 250	8.7	17.1	32.3	9.3	5.5	9.0	46.5	10.1
251 – 500	6.7	13.0	44.3	12.7	8.4	13.7	59.3	12.9
501 – 1,000	4.2	8.3	59.8	17.2	7.9	12.9	71.9	15.6
1,001 – 2,500	3.4	6.6	33.5	9.6	4.7	7.7	41.5	9.0
2,501 – 5,000	1.7	3.2	19.2	5.5	9.1	15.0	30.0	6.5
5,001 – 10,000	0.9	1.7	8.8	2.5	2.8	4.6	12.5	2.7
More than 10,000	*	*	9.4	2.7	1.8	2.9	11.2	2.4
Refusal	*	*	*	*	0.4	0.7	0.4	0.1
Unknown / missing	4.5	8.9	13.6	3.9	6.7	10.9	24.8	5.4
Total	51.1	100.0	348.0	100.0	60.9	100.0	460.0	100.0
Median (HK$)	150		300		500		300	
Mean (HK$)	572.7		1,767.9		4,104.3		1,929.0	
Standard error of mean (HK$)	150.693		428.348		2,193.736		430.094	

Base: Injury episodes (up to three most serious ones) sustained by the respondents in the 12 months before enumeration

Annual medical expenses for 0-14 ~ HK$29,264,970

Table 4.2.3.3.1 Place of occurrence of childhood injury episodes sustained in the 12 months before enumeration by age group

Place of occurrence of childhood injury episodes	0 – 4		5 – 9		10 – 14		Total	
	No. of episodes ('000)	%	No. of episodes ('000)	%	No. of episodes ('000)	%	No. of episodes ('000)	%
School or educational area	*	*	2.2	23.0	16.0	48.8	18.2	35.6
Home	7.3	82.5	2.4	25.2	3.0	9.2	12.7	24.8
Recreational area, cultural area, or public building	1.5	17.5	3.4	35.8	2.3	7.1	7.3	14.2
Transport area: public highway, street or road	*	*	1.0	10.2	4.1	12.6	5.1	10.0
Sports or athletics area	*	*	*	*	4.1	12.4	4.1	7.9
Countryside	*	*	*	*	1.4	4.3	1.4	2.7
Transport area: others (e.g. bus terminal, MTR station, car park)	*	*	*	*	0.9	2.8	0.9	1.8
Other specified place of occurrence	*	*	0.5	5.8	1.0	2.9	1.5	2.9
Total	8.8	100.0	9.5	100.0	32.8	100.0	51.1	100.0

Base: Childhood injury episodes (up to three most serious injury episodes) sustained by respondents aged 14 and below in the 12 months before enumeration

Epidemiology of poisoning in Hong Kong 2005-2008

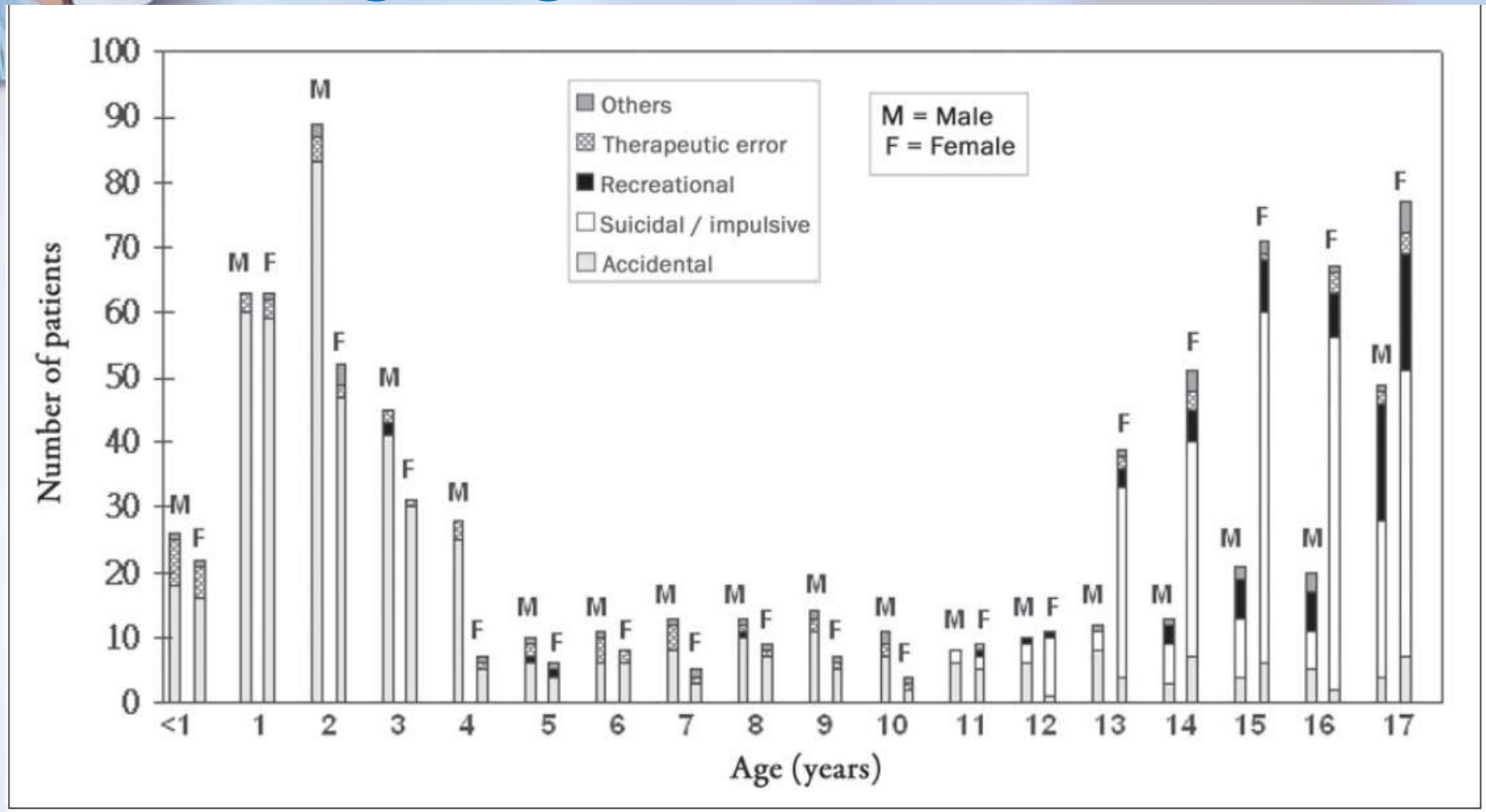
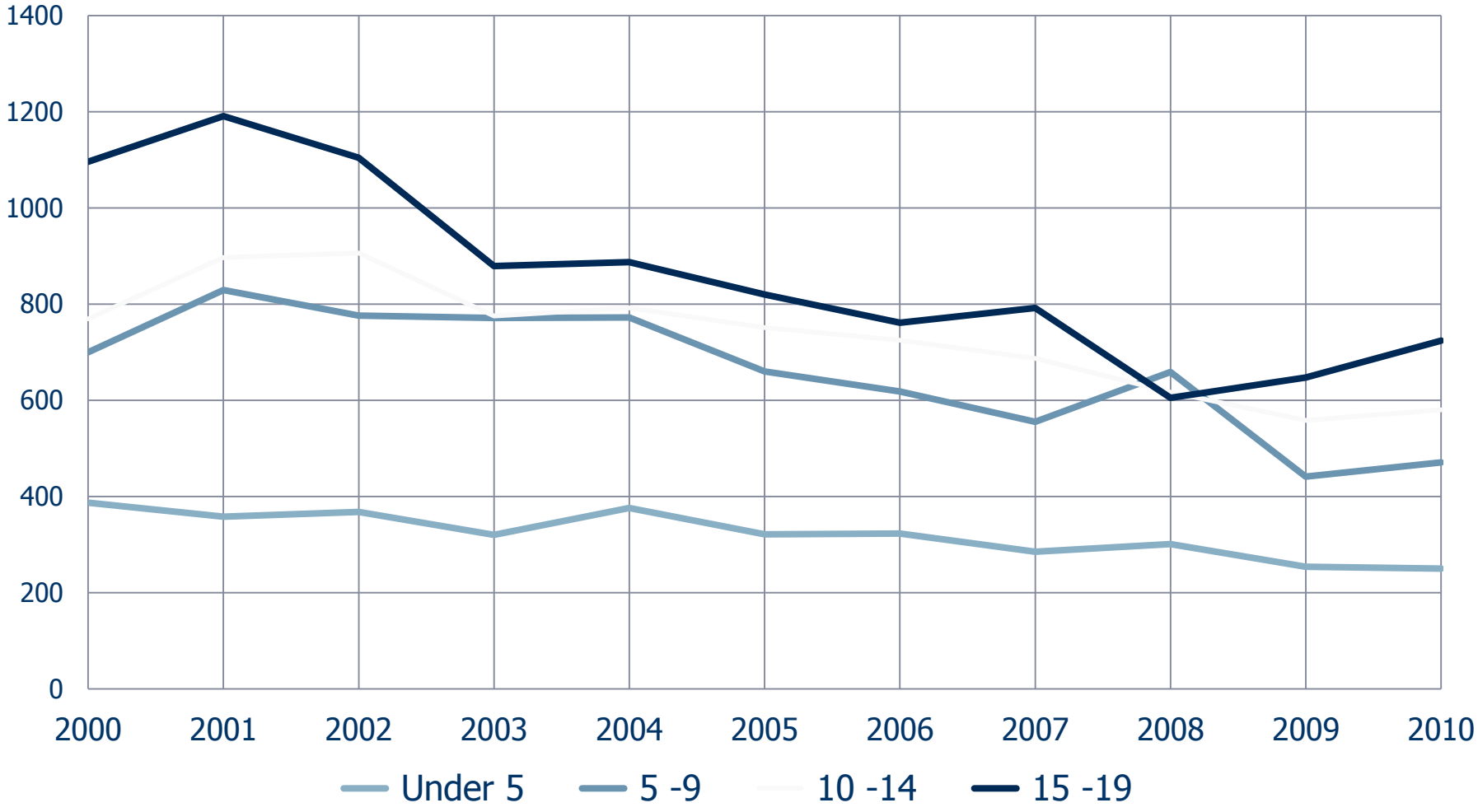


Figure 1 Age and sex distribution of paediatric poisoning cases in Hong Kong.

Traffic casualties

Transport Department



Road traffic casualties by age and class of road user (2000 - 2010)

Age/ Class of road user	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Under 20											
Pedestrian	1 203	1 312	1 189	1 046	994	889	888	757	640	592	632
Passenger	1 172	1 277	1 278	1 017	1 068	1 018	905	967	1 005	804	826
Driver	577	686	687	682	765	645	634	595	537	504	567
Sub-total	*2 952*	*3 275*	*3 154*	*2 745*	*2 827*	*2 552*	*2 427*	*2 319*	*2 182*	*1 900*	*2 025*
20 - 39											
Pedestrian	1 311	1 409	1 384	1 336	1 369	1 260	1 168	1 086	1 041	939	1 079
Passenger	3 202	3 301	3 433	2 678	2 830	2 746	2 717	2 627	2 441	2 367	2 328
Driver	4 829	5 047	4 996	4 507	4 513	4 454	4 554	4 606	4 086	4 032	3 940
Sub-total	*9 342*	*9 757*	*9 813*	*8 521*	*8 712*	*8 460*	*8 439*	*8 319*	*7 568*	*7 338*	*7 347*
40 - 59											
Pedestrian	1 085	1 224	1 182	1 127	1 209	1 264	1 242	1 261	1 202	1 097	1 173
Passenger	1 478	1 788	1 886	1 597	1 926	1 861	1 821	2 093	1 971	1 891	2 083
Driver	2 047	2 169	2 399	2 297	2 575	2 888	2 875	3 330	3 358	3 337	3 648
Sub-total	*4 610*	*5 181*	*5 467*	*5 021*	*5 710*	*6 013*	*5 938*	*6 684*	*6 531*	*6 325*	*6 904*
60 & over											
Pedestrian	1 013	1 018	1 031	986	960	980	917	945	870	871	914
Passenger	809	825	827	748	848	926	853	930	981	979	1 065
Driver	190	191	234	201	243	269	263	344	395	503	565
Sub-total	*2 012*	*2 034*	*2 092*	*1 935*	*2 051*	*2 175*	*2 033*	*2 219*	*2 246*	*2 353*	*2 544*
Unknown age											
Pedestrian	173	15	19	22	45	11	18	29	70	84	100
Passenger	309	53	53	64	51	6	16	47	81	130	194
Driver	31	3	2	2	6	3	2	8	6	8	10
Sub-total	*513*	*71*	*74*	*88*	*102*	*20*	*36*	*84*	*157*	*222*	*304*
All ages											
Pedestrian	4 785	4 978	4 805	4 517	4 577	4 404	4 233	4 078	3 823	3 583	3 898
Passenger	6 970	7 244	7 477	6 104	6 723	6 557	6 312	6 664	6 479	6 171	6 496
Driver	7 674	8 096	8 318	7 689	8 102	8 259	8 328	8 883	8 382	8 384	8 730
Total	19 429	20 318	20 600	18 310	19 402	19 220	18 873	19 625	18 684	18 138	19 124

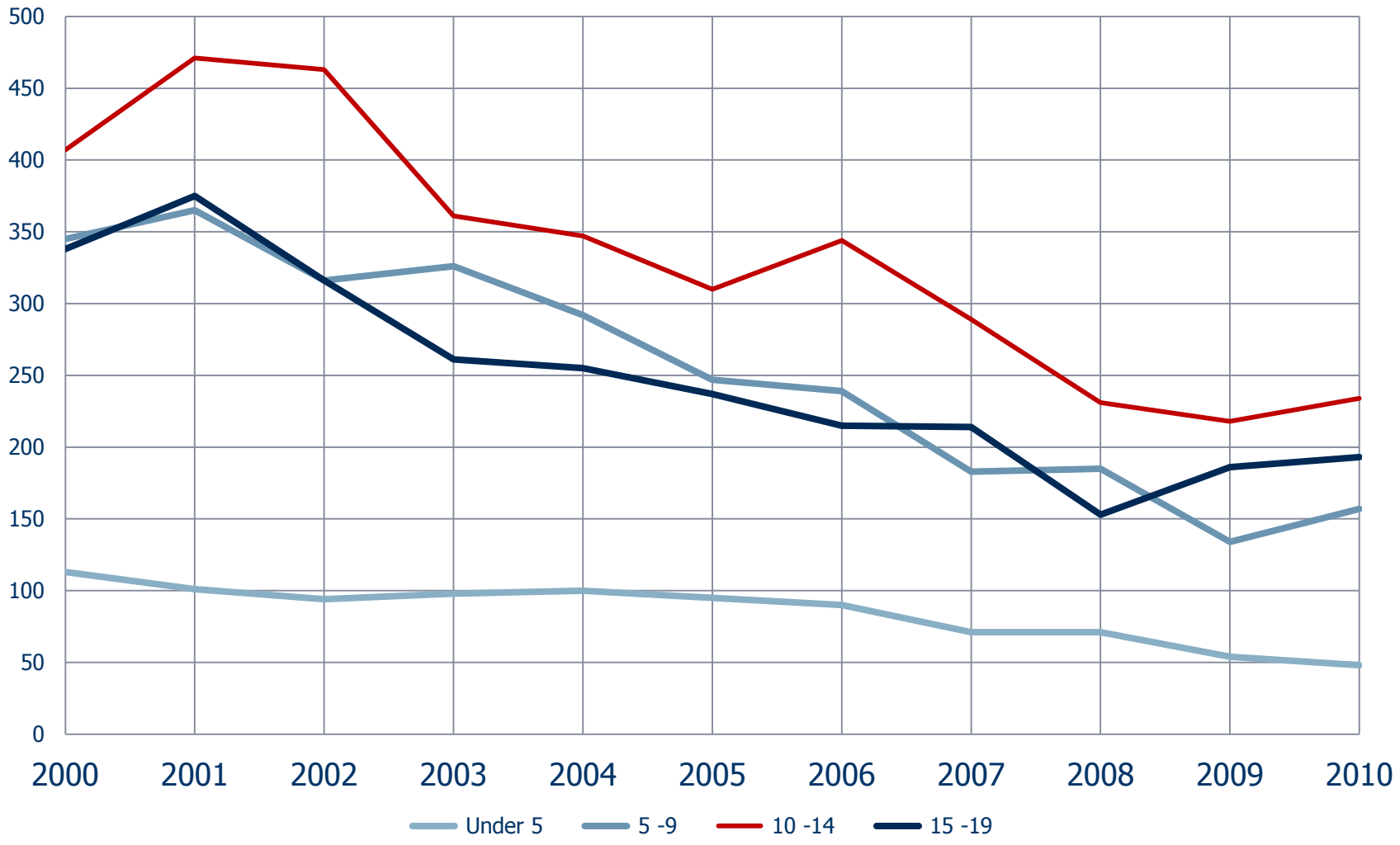
Pedestrian casualties by year

Transport Department

Age	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Under 5	113	101	94	98	100	95	90	71	71	54	48
5 -9	345	365	316	326	292	247	239	183	185	134	157
10 -14	407	471	463	361	347	310	344	289	231	218	234
Sub-total	*865*	*937*	*873*	*785*	*739*	*652*	*673*	*543*	*487*	*406*	*439*
15 -19	338	375	316	261	255	237	215	214	153	186	193

Pedestians injuries

Transport Department



Age-specific incidence

Other data source

- Census and Statistical Department
- Child Fatality Review
- Coroner's Report
- Traffic data from Transport Department and Police
- Central Protection Registry from Social Welfare Department
- Domestic Violence Registry
- Police report on violence
- Town planning .....

We are not short of data or information BUT how can we integrate them into useful information that can inform policy, planning, services delivery and interventions...

*The **Asian Pacific ICT 2009 Award** in Melbourne - Merit Award in E Health*

*Silver Award of the **HKICT 2009** in the Category of Best Public Service*

Implementation of Surveillance System in an Emergency Department for Injury Prevention and Public Health Surveillance

傷害監察系統在預防傷害及公共衛生的應用

CB Chow, Leung Ming, Adela Lai, YH Chow

Centre for Safety Promotion and Injury Prevention

Kwai Tsing Safe Community and Healthy City

Princess Margaret Hospital

Injury, Int. J. Care Injured 43 (2012) 739–748

Contents lists available at ScienceDirect

Injury

journal homepage: www.elsevier.com/locate/injury

Development of an electronic emergency department-based geo-information injury surveillance system in Hong Kong

C.B. Chow [a,b,*], M. Leung [b,c], Adela Lai [b,c], Y.H. Chow [b], Joanne Chung [b], K.M. Tong [d], Albert Lit [c]

[a] Department of Paediatrics and Adolescent Medicine, The University of Hong Kong, Hong Kong
[b] Kwai Tsing Safe Community and Healthy City Association, Hong Kong
[c] Accident and Emergency Department, Princess Margaret Hospital, Hong Kong
[d] Information Technology Department, Princess Margaret Hospital, Hong Kong

ARTICLE INFO

Article history:
Accepted 10 August 2011

Keywords:
Injury surveillance
Injury prevention
Safe community
Geo-spatial

ABSTRACT

Objectives: To describe the experience in the development of an electronic emergency department (ED)-based injury surveillance (IS) system in Hong Kong using data-mining and geo-spatial information technology (IT) for a Safe Community setup.

Methods: This paper described the phased development of an emergency department-based IS system based on World Health Organization (WHO) injury surveillance Guideline to support safety promotion and injury prevention in a Safe Community in Hong Kong starting 2002.

Results: The initial ED data-based only collected data on name, sex, age, address, eight general categories of injury types (traffic, domestic, common assault, indecent assault, batter, industrial, self-harm and sports) and disposal from ED. Phase 1 – manual data collection on International Classification of External Causes of Injury pre-event data; Phase 2 – manual form was converted to electronic format using web-based data mining technology with built in data quality monitoring mechanism; Phase 3 – integration of injury surveillance-data with in-patient hospital information; and Phase 4 – geo-spatial information and body mapping were introduced to geo-code exact place of injury in an electronic map and site of injury on body map.

Conclusion: It was feasible to develop a geo-spatial IS system at busy ED to collect valuable information for safety promotion and injury prevention at Safe Community setting. The keys for successful development and implementation involves engagement of all stakeholders at design and implementation of the system with injury prevention as ultimate goal, detail workflow planning at front end, support from the management, building on exiting system and appropriate utilisation of modern technology.

以系統為主的預防傷害及暴力個案

Source: Violence and INjury Control through Education, Networking and Training On the World Wide Web (VINCENT WEB)

安全社區是預防傷害有效的模式
傷害監察系統是量度安全社區的指標

WHO Collaborating Centre on Community Safety Promotion

Safe community is a proven intervention model to reduce injury in the community by ***engaging local community*** using ***local data***

Target high-risk groups and environments
Promote safety for vulnerable groups
Document the frequency and causes of injuries
Evaluation measures

It could be achieved by **Injury Surveillance**

WORLD HEALTH ORGANIZATION
Regional Office for the Western Pacific

Regional Framework for Action on Injury Prevention 2008-2013

The first core task of health sector recommended by WHO: **Injury Surveillance**

Purposes of an Injury Surveillance System:
傷害監察系統的目的

Information to support injury prevention & control

- Support planning and policy-making
- Guide targeting and priority-setting

•Risk population
•Risk mechanism
•Risk environment
•Risk behaviour

- **Measuring and monitoring injury, its consequences, injury risk-factors and exposure to them**
- (Contributing to) **evaluation of interventions**

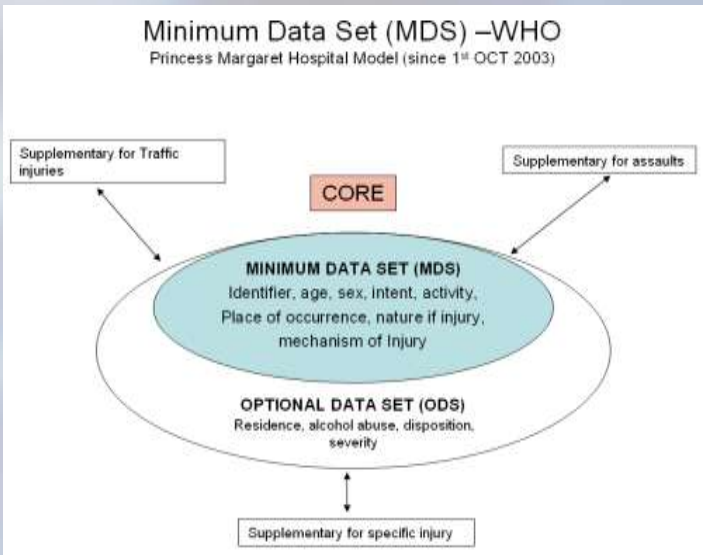
•Epidemiology - incidence
•Pattern – type, place, time
•Demographics

•Mortality
•Morbidity
•Disability
•**COST**

…especially those not directly observable

Injury Surveillance System 傷害監察系統

- Piloted in AED of PMH **in 2003**
- Analyzed 2000 cases
- Funded by OSHC, collaborated with HK Poly U,
- An Injury Surveillance System was designed
- To integrate existing system with coding of data
- All injured cases were assessed by triage nurse
- Injury data input – paper form → web form
- Injury databases – ICD-9 CM, AIS and ISS



AEIS – demographics, 8 categories, triage priorities for treatment, sick leave, outcome/disposal, XR

ICECI – intent, place, activity, mechanism, nature, type, severity score, drugs, TRAFFIC, ASSUALT …linked to CMS/CDARS - cost

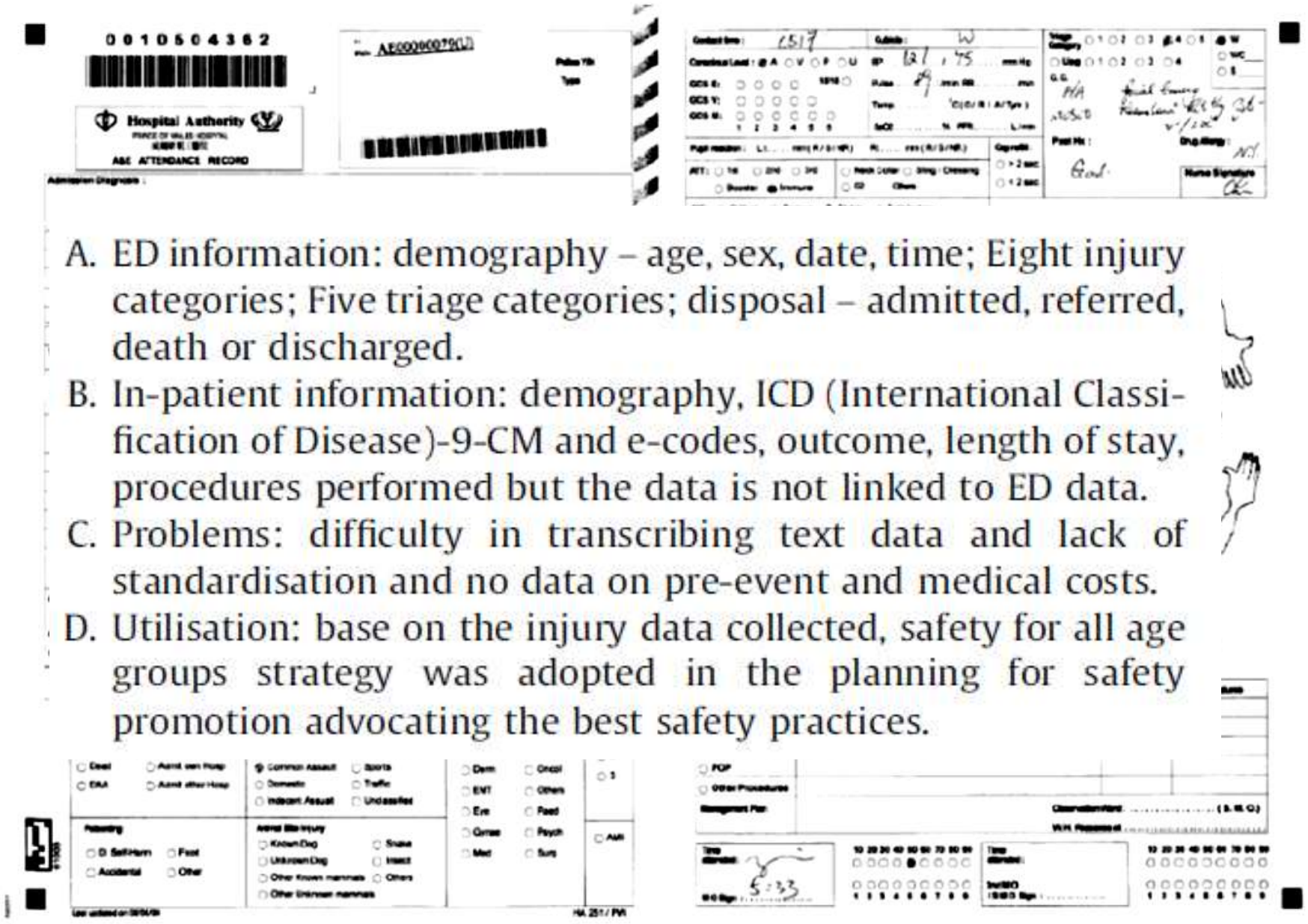
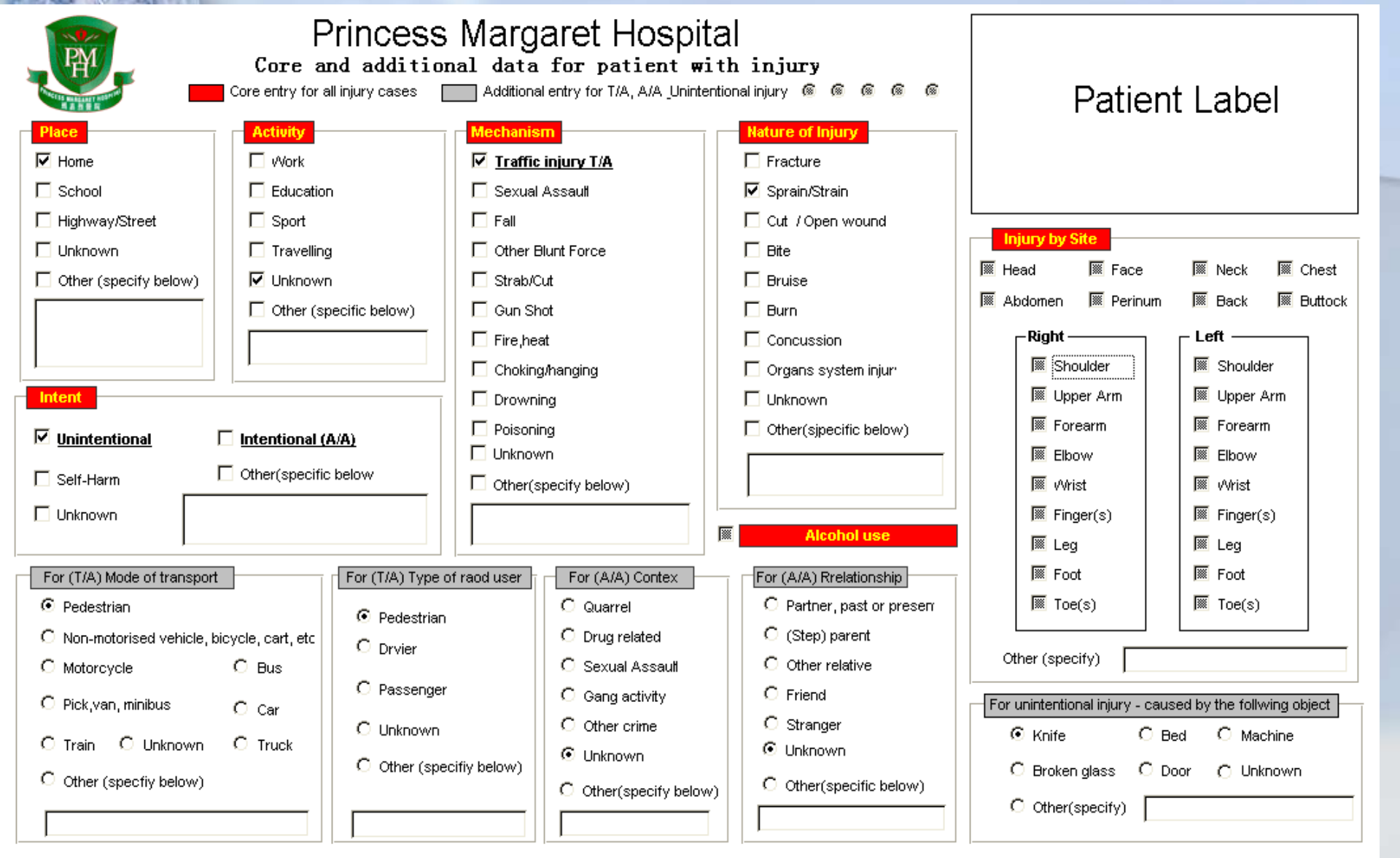


Fig. 1. Sample of accidental and emergency information system record form.



Princess Margaret Hospital

Core and additional data for patient with injury

Core entry for all injury cases Additional entry for T/A, A/A ,Unintentional injury

Patient Label

Place
- [x] Home
- [ ] School
- [ ] Highway/Street
- [ ] Unknown
- [ ] Other (specify below)

Activity
- [ ] Work
- [ ] Education
- [ ] Sport
- [ ] Travelling
- [x] Unknown
- [ ] Other (specific below)

Mechanism
- [x] **Traffic injury T/A**
- [ ] Sexual Assault
- [ ] Fall
- [ ] Other Blunt Force
- [ ] Strab/Cut
- [ ] Gun Shot
- [ ] Fire,heat
- [ ] Choking/hanging
- [ ] Drowning
- [ ] Poisoning
- [ ] Unknown
- [ ] Other(specify below)

Nature of Injury
- [ ] Fracture
- [x] Sprain/Strain
- [ ] Cut / Open wound
- [ ] Bite
- [ ] Bruise
- [ ] Burn
- [ ] Concussion
- [ ] Organs system injur
- [ ] Unknown
- [ ] Other(sjpecific below)

Injury by Site

Head Face Neck Chest
Abdomen Perinum Back Buttock

Right	Left
Shoulder	Shoulder
Upper Arm	Upper Arm
Forearm	Forearm
Elbow	Elbow
Wrist	Wrist
Finger(s)	Finger(s)
Leg	Leg
Foot	Foot
Toe(s)	Toe(s)

Other (specify)

Intent
- [x] **Unintentional**
- [ ] **Intentional (A/A)**
- [ ] Self-Harm
- [ ] Other(specific below
- [ ] Unknown

Alcohol use

For (T/A) Mode of transport
- (•) Pedestrian
- ( ) Non-motorised vehicle, bicycle, cart, etc
- ( ) Motorcycle ( ) Bus
- ( ) Pick,van, minibus ( ) Car
- ( ) Train ( ) Unknown ( ) Truck
- ( ) Other (specfiy below)

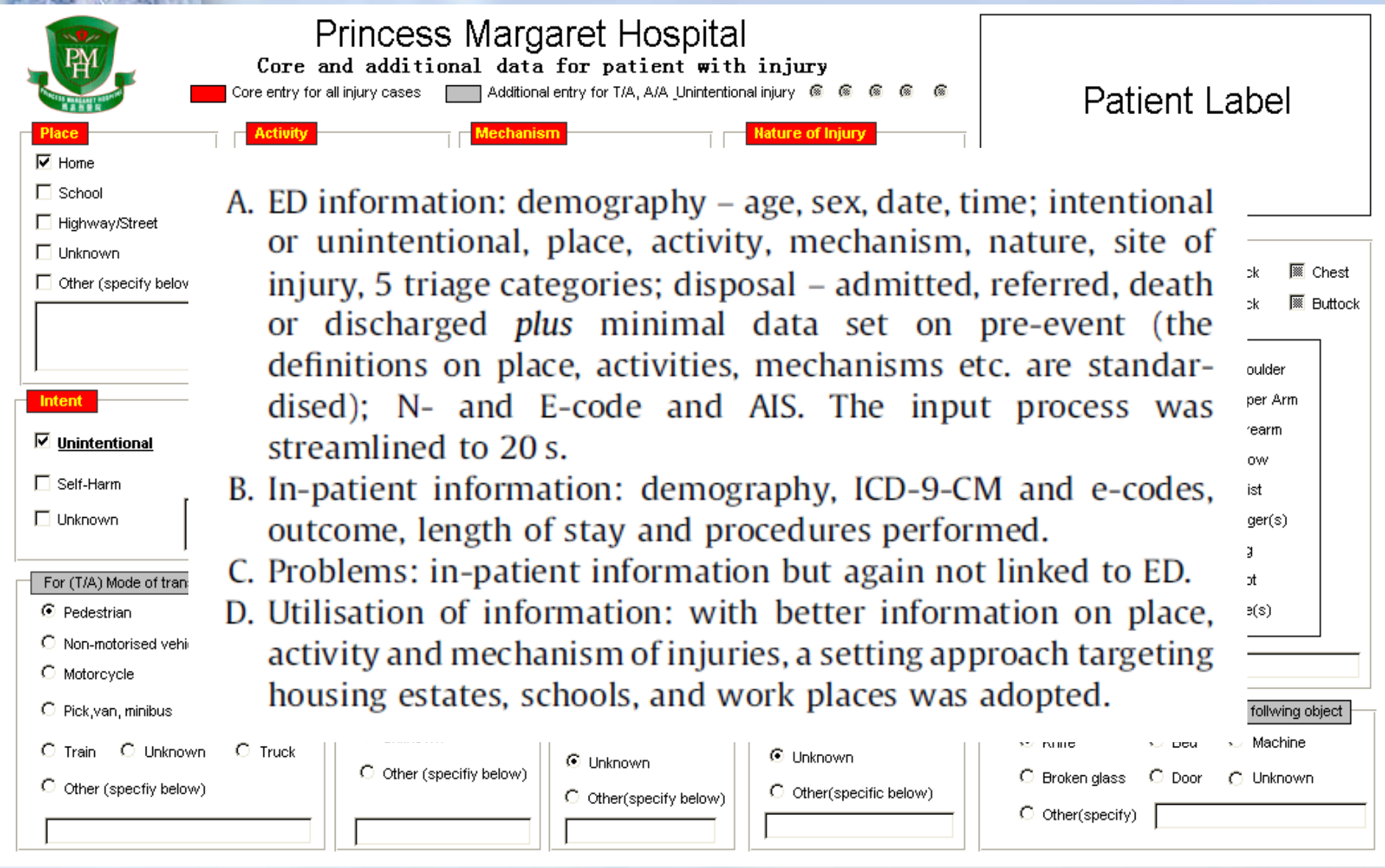
For (T/A) Type of raod user
- (•) Pedestrian
- ( ) Drvier
- ( ) Passenger
- ( ) Unknown
- ( ) Other (specifiy below)

For (A/A) Contex
- ( ) Quarrel
- ( ) Drug related
- ( ) Sexual Assault
- ( ) Gang activity
- ( ) Other crime
- (•) Unknown
- ( ) Other(specify below)

For (A/A) Rrelationship
- ( ) Partner, past or presen
- ( ) (Step) parent
- ( ) Other relative
- ( ) Friend
- ( ) Stranger
- (•) Unknown
- ( ) Other(specific below)

For unintentional injury - caused by the follwing object
- (•) Knife ( ) Bed ( ) Machine
- ( ) Broken glass ( ) Door ( ) Unknown
- ( ) Other(specify)

Paper entry form before the web-based input system



A. ED information: demography – age, sex, date, time; intentional or unintentional, place, activity, mechanism, nature, site of injury, 5 triage categories; disposal – admitted, referred, death or discharged *plus* minimal data set on pre-event (the definitions on place, activities, mechanisms etc. are standardised); N- and E-code and AIS. The input process was streamlined to 20 s.

B. In-patient information: demography, ICD-9-CM and e-codes, outcome, length of stay and procedures performed.

C. Problems: in-patient information but again not linked to ED.

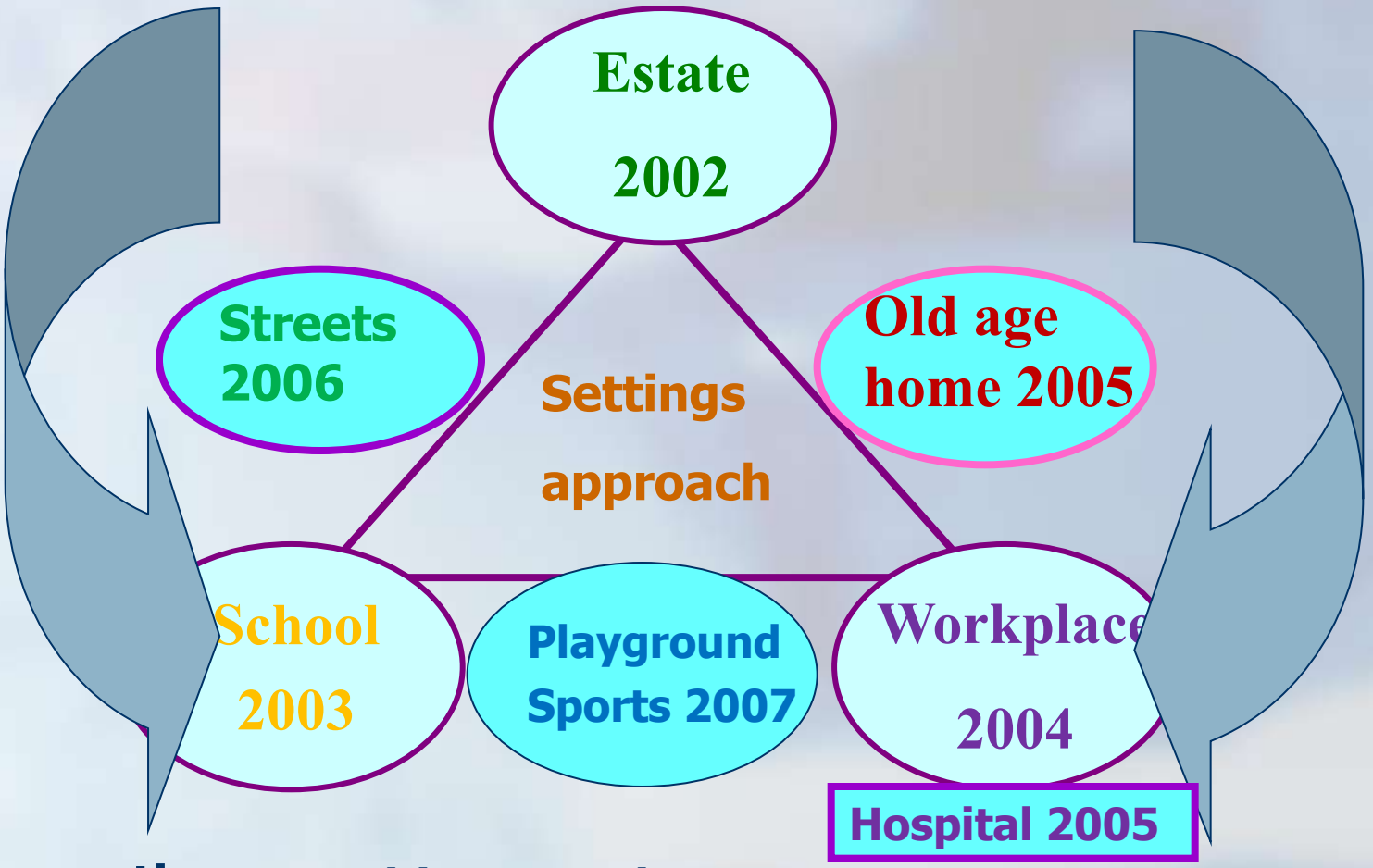
D. Utilisation of information: with better information on place, activity and mechanism of injuries, a setting approach targeting housing estates, schools, and work places was adopted.

Paper entry form before the web-based input system

Phase I - 全人安健 -Safety for ALL - 2000

Child	Youth	Adult	Elderly	Home	Road	Crime	Fire

Safe & Healthy 2002



<u>Community promotion</u> – Nutrition, Exercise, Infection, Fall, Mental health, Emergency response

Safe homes

Phase II - SETTING APPROACH 設施模式

Safe & Healthy Estate

Safe and Healthy Community

Safe and Healthy Workplaces

Safe and Healthy Elderly homes

Safe Schools

Kwai Tsing experience

發展地區資源網絡　　動員地區人力資源

Partnership 建立伙伴

- Safe and Health Estate
- Partnership for learning – Safe and Health Schools
- Partnership for RCHE – Safe and Health Elderly Homes
- Partnership for patient care – Safe and Healthy Hospital
- Safety & healthy charter
- 3 high & DM retinopathy screening

Community engagement 社區參與

- Road safety
- Fire safety
- Food safety & environmental hygiene
- Home safety
- Violence – deliberate self harm and IPV
- Clean Hong Kong
- Universal CPR training
- QK Blog – comprehensive student health programme

Collaborative Assessment Activity

Take about 5 minutes to complete the tool according to directions on the previous page.

Priority (H, M, L)	Less Developed 1 2	3	4 More Developed 5	Effectiveness (1-5)
	Clarity of mission/Strength of vision			
	Collaborative members lack a clear understanding of the collaborative's mission/vision	⇒	All collaborative members have a clear understanding of the collaborative's mission/vision	
	The collaborative takes actions that are not related to the mission	⇒	The collaborative bases its actions on a focused mission	
	The collaborative has defined the mission narrowly to carry out one activity	⇒	Our mission is comprehensive and looks at the big picture	
	Communication/Link to others			
	The collaborative works largely in isolation of the community	⇒	The collaborative's work is effectively integrated with the community, including meaningful participation by the constituency we serve	
	The collaborative's efforts do not translate into meaningful influence in the larger community	⇒	The collaborative influences key decision-makers, government agencies, and other organizations	
	The collaborative is seen largely as self-serving or irrelevant	⇒	The collaborative has successfully maintained or increased its credibility	
	The Collaborative Environment			
	Members of the collaborative are unmotivated and lack inspiration	⇒	Members of the collaborative are motivated and inspired	
	Members distrust one another and/or the collaborative leadership	⇒	The collaborative has an honest and open environment, and lines of communication are always open	
	The collaborative allows conflicts to go unresolved	⇒	The collaborative effectively addresses and resolve conflicts	
	Building Membership Capacity			
	Members are recruited haphazardly	⇒	Members are recruited based on the goals of the collaborative	
	The collaborative seems to be controlled by just a few people	⇒	The collaborative encourages inclusion and participation by all members by working to empower them	
	New members are uncertain about how to integrate themselves into the group	⇒	New members are welcomed and effectively oriented to the group	
	The collaborative does not draw on the specific abilities, capacity, and perspectives of members	⇒	The collaborative develops specific roles and responsibilities for members based on their resources and skills	
	Management			
	The administrative structure of the collaborative is not clear	⇒	The collaborative maintains clear roles, responsibilities, and procedures	
	Deadlines are rarely met and staffing is insufficient to meet goals		Activities, staffing and deadlines are effectively coordinated to meet goals	
	Meetings are perceived as unproductive	⇒	Meetings have clear objectives that meet the group's needs	

合作程度評估

不合格
Failed

Main strategies

- Development of local networking and coalition **Not enough**
- Mobilizing local community to local networking, arranging personal appointments and discussing aims & objectives of the programme and thereby securing commitment of cooperation. **need further improvement**
  - The sectors covered are: Existing Health system, Public Administration, other relevant Govt. Departments like Police (including village police, Elected public representatives, Municipal Chairman, UP Chairmen, Various Association leaders
  - "Local elite", Local NGO's
- **Need more targeted injury surveillance system**

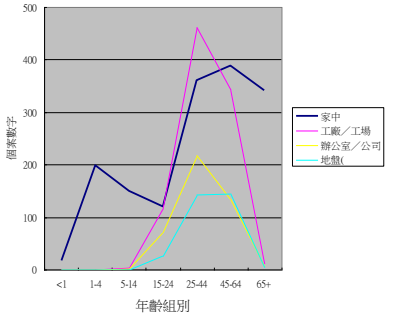
Phase III - Purposeful Community Engagement

Targeted Partnership Approach for risk groups in specific setting

- Community
  - Physical, social, political, economic, and institutional/organizational dimensions
  - Integration, collaboration, and coordination among the various aspects of community relative to resident well-being
- Data
  - Community structural indicators (e.g., from census)
  - Individual level data (e.g., from household survey)
  - Hot spots or high risk zones - GIS

The Way Ahead – new injury surveillance system

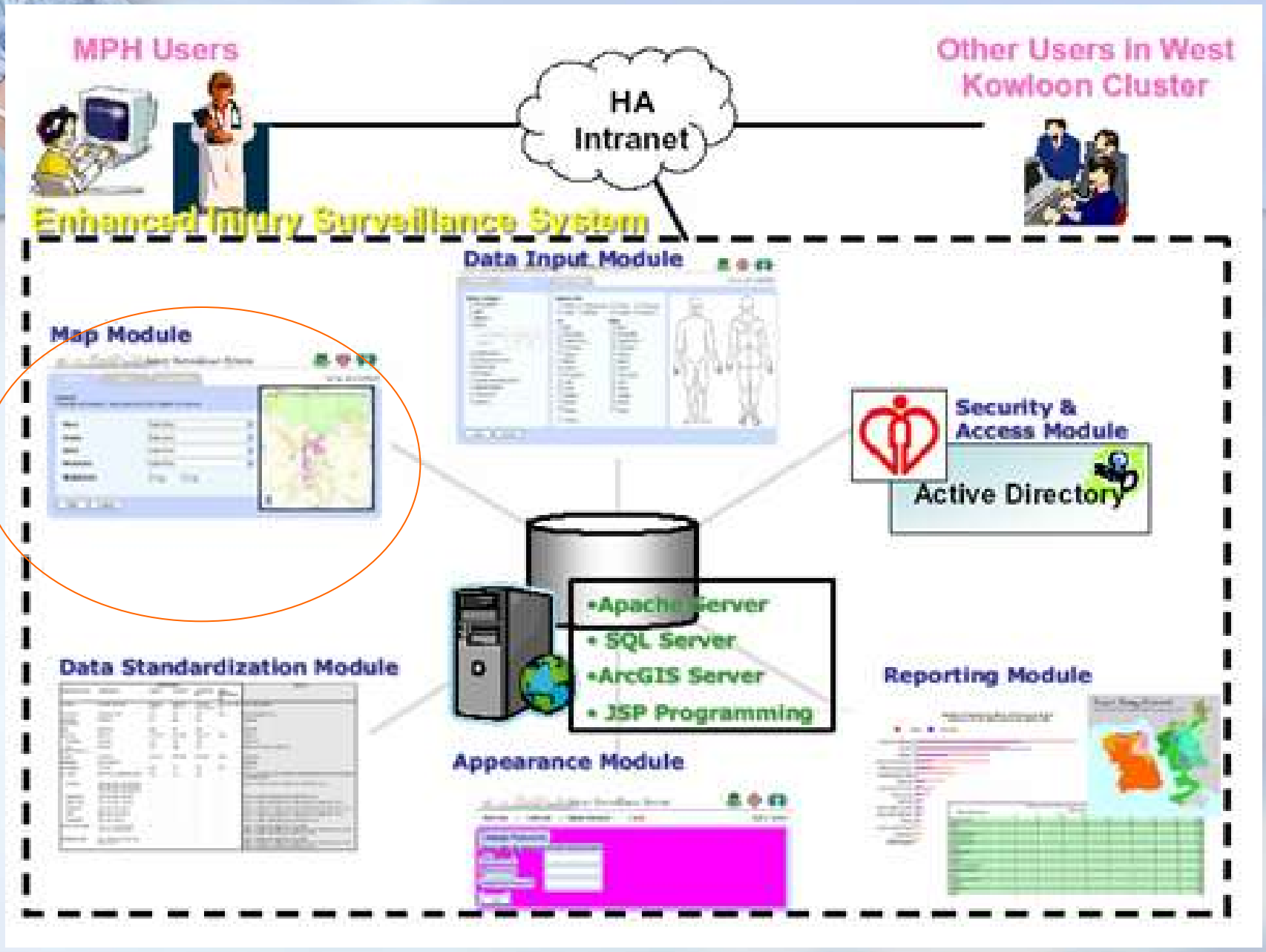
- New GIS injury prevention system
  - Prioritized by volume and severity
  - Identified high risk group by injury map
  - Analysis of the mechanism, activity, place of injury of the identified group by experts
- Recruited stake holders
  - Targeted for a regionalize surveillance system
  - OSH injuries from Labor department
  - Intentional and traffic injuries from police
  - Fire related injuries from Fire department

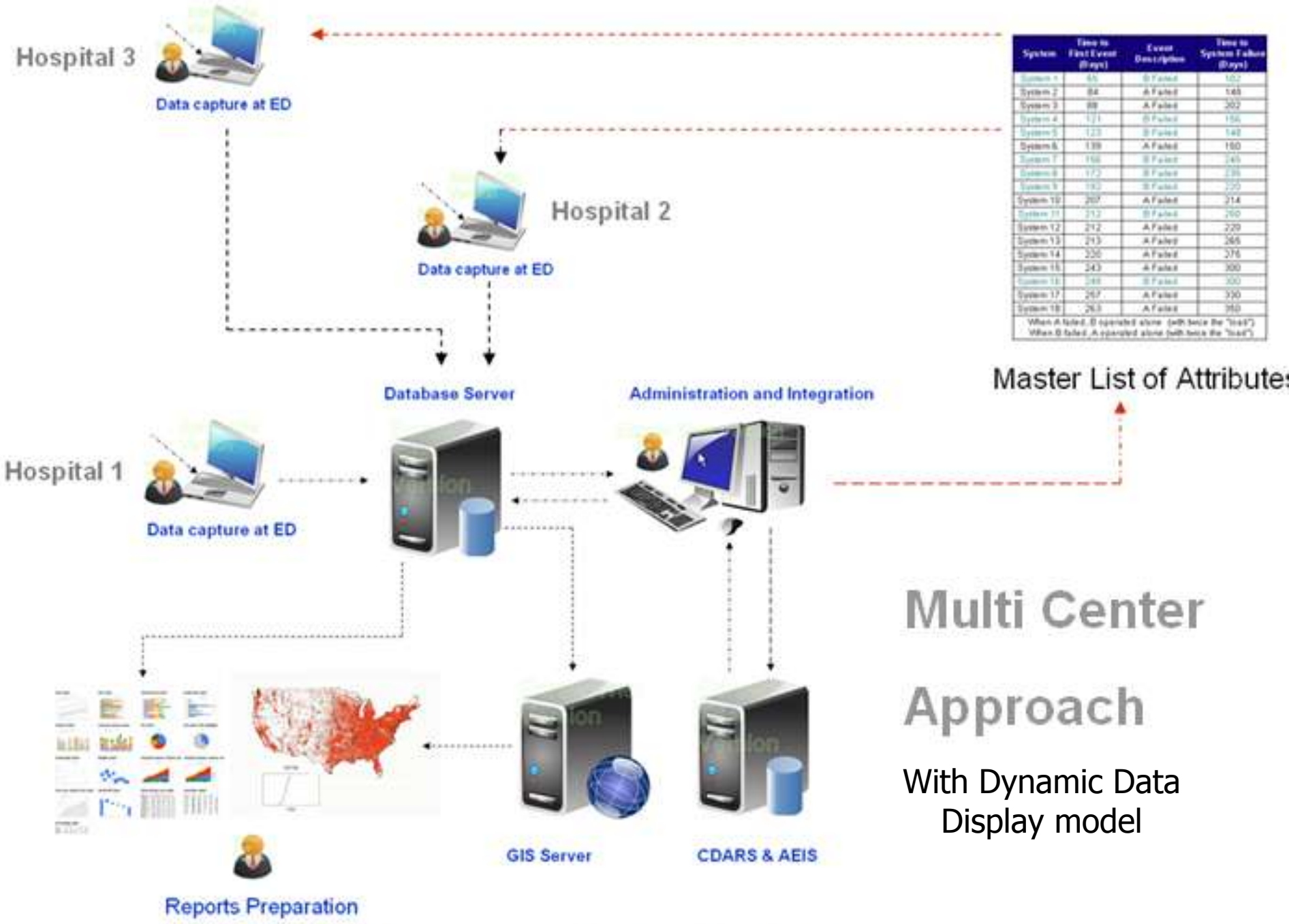


- System enhancement for Data integration and report generation
  - To prepare for data upload/download from various stakeholders
  - Design process of data integration
  - Report plan in the future; aim at epidemiological monitoring
- Sharing of data to the public and stakeholders
  - Identify source of data distribution e.g. web / journal
  - Educational activities
- Linking data to action
- Evidence-based intervention

Definition: Geographic Information Systems (GIS)
地域空間的資訊系統

- The *common ground* between information processing and the many fields using spatial analysis techniques. (Tomlinson, 1972)
- A powerful *set of tools* for collecting, storing, retrieving, transforming, and displaying spatial data from the real world. (Burroughs, 1986)
- A *decision support system* involving the *integration* of spatially referenced data in a problem solving environment. (Cowen, 1988)
- **整合數據以提供更完善的決策模式**


MPH Users
HA Intranet
Other Users in West Kowloon Cluster
Enhanced Injury Surveillance System
Data Input Module
Map Module
Security & Access Module
Active Directory
•Apache Server
• SQL Server
•ArcGIS Server
• JSP Programming
Data Standardization Module
Reporting Module
Appearance Module


Hospital 3
Data capture at ED
Hospital 2
Data capture at ED
Master List of Attributes
Database Server
Administration and Integration
Hospital 1
Data capture at ED
Multi Center
Approach
With Dynamic Data
Display model
GIS Server
CDARS & AEIS
Reports Preparation

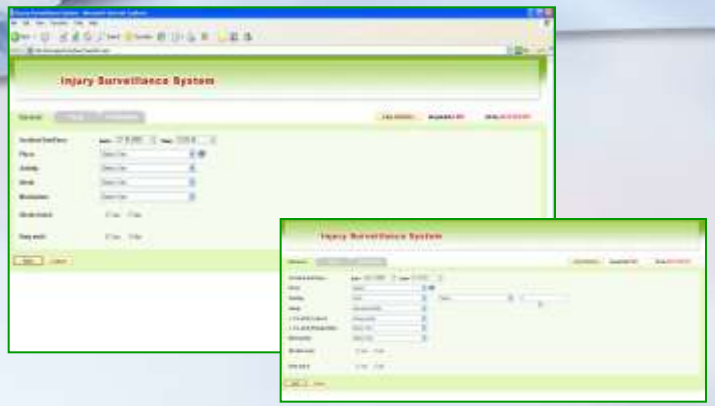
Data capture at the Triage Station of AED

Triage station and Computer System for data input

分流站及電腦系統 – **integrated into work flow**

The 3rd version system with GIS and Body Mapping

Simple & Non-distracted user interface



Customizable data field

Minimal stages for data entry

Fit the actual situation of ED triage process

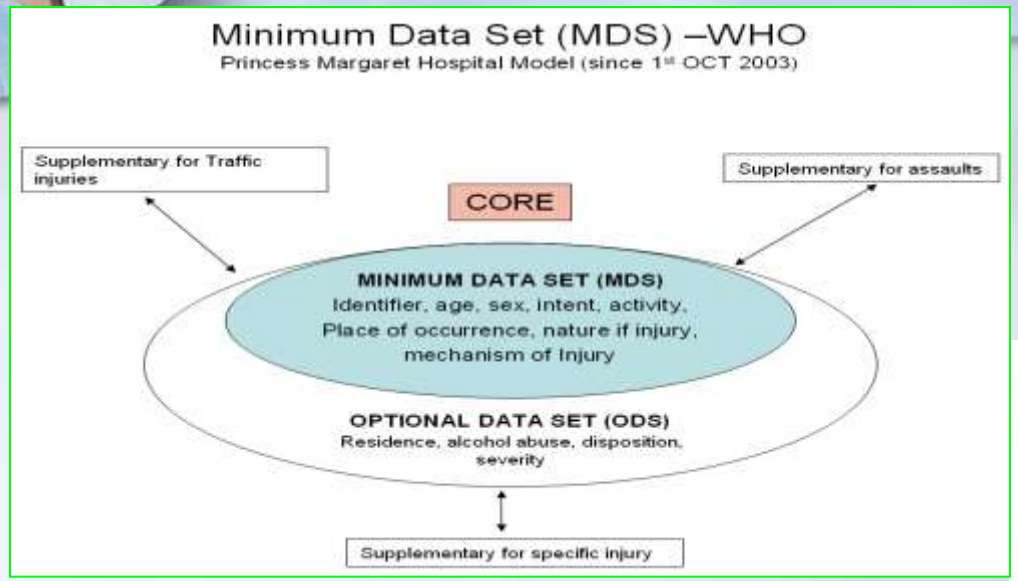
Simple and efficiency

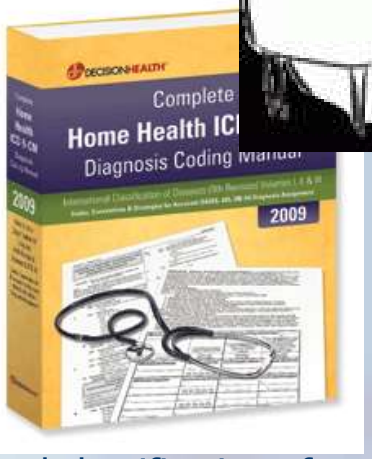
Time needed: 25 seconds

簡單易用的介面 – 只需25秒

Facilitated input of data

Automatic mapping to ICECI
國際受傷分類系統及代碼自動化





- Place
- Activities
- Intent
- Mechanism
- Nature of Injury
- Site of Injury

Standardization of injury definitions

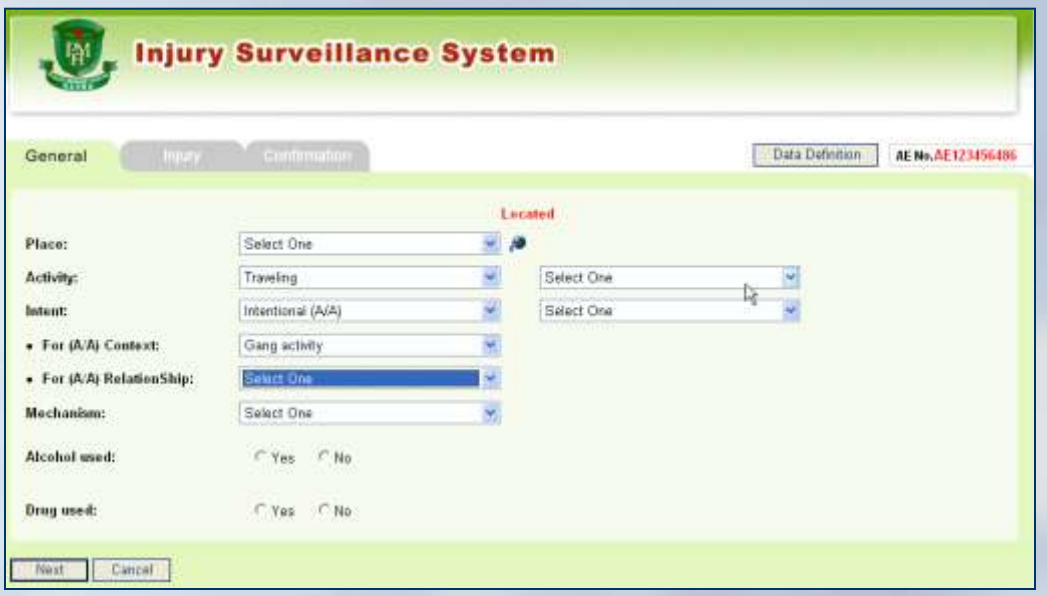
ICECI – international classification of external cause of injury

Automatic mapping to ICECI

Time saving of 15 mins per case in average

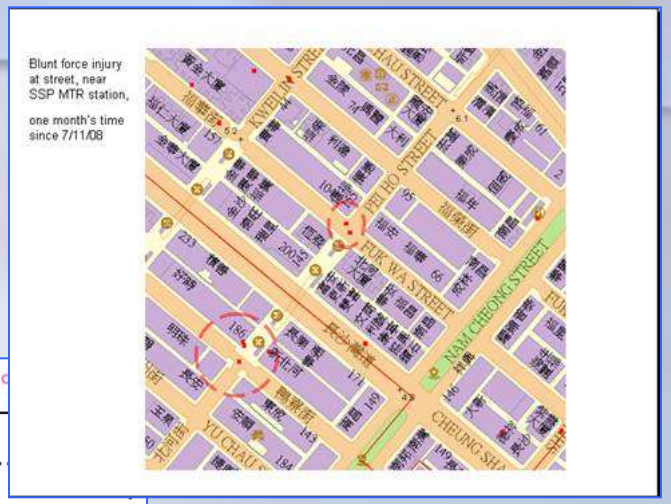
損傷情況
高危因素
區域和地點

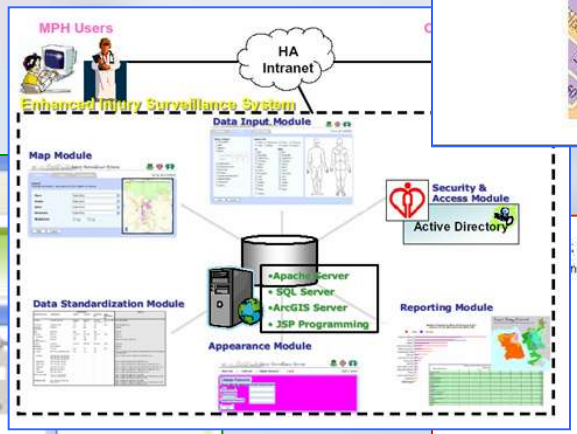
GIS for identifying location injury event

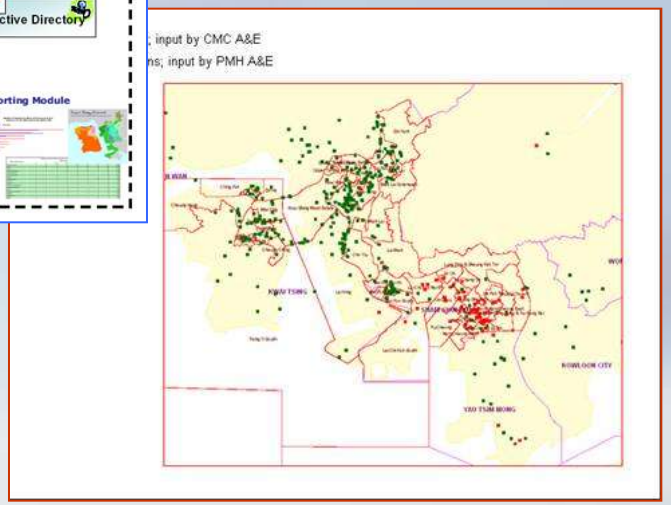


GIS interface for event location

- **Outdoor injuries** as a major portion 33.41%
- **Traffic Injury/ Falls Injury** is the Leading cause.

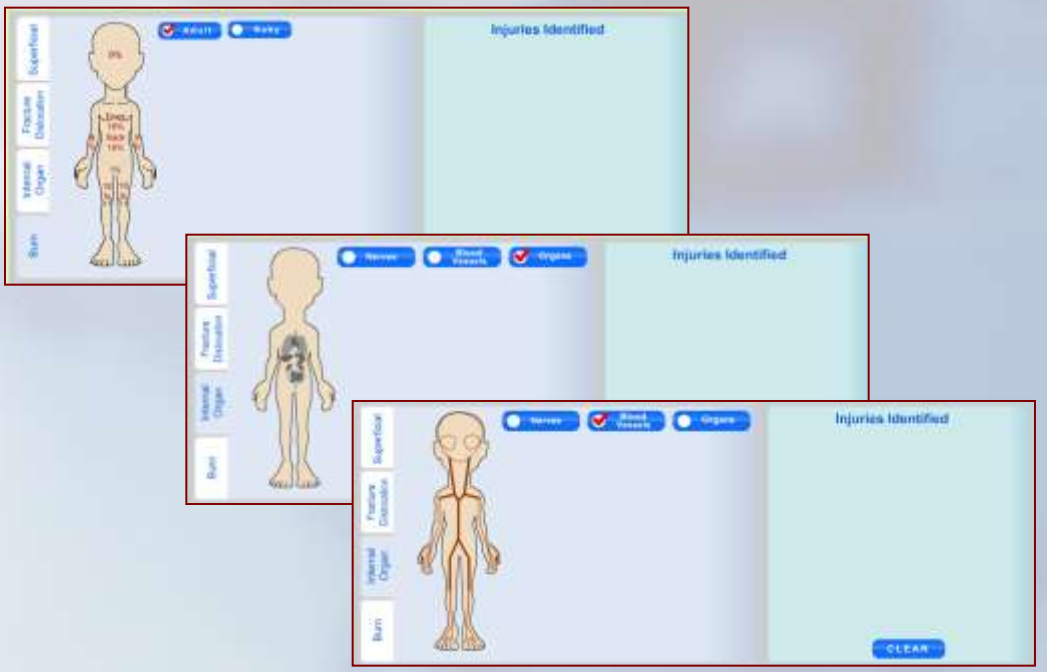






Interactive body mapping for injury coding 身體圖像受傷部位輸入

International Disease Coding – ICD 10 & AIS 05

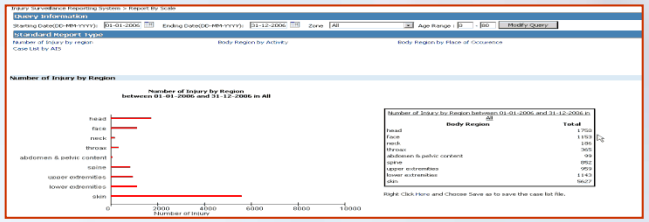


Support real time diagnosis coding

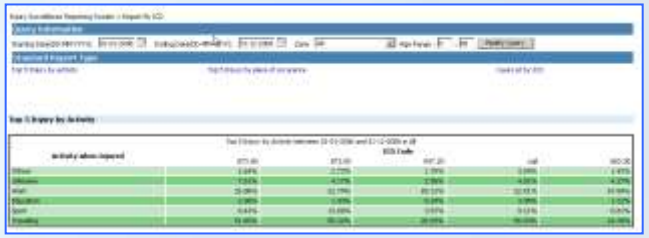
Time saving of 8 mins per case in average

User Oriented Reporting Modules – Trend Monitoring, Spatial Clustering and Scenario Based Search Functionalities

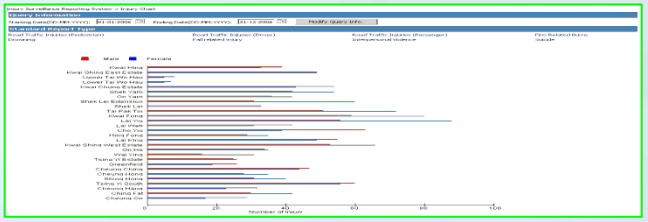
Standard reporting – preset format



Reporting by ICD injury coding



Reporting by AIS scale



Injury charts

Geo-spatial ISS

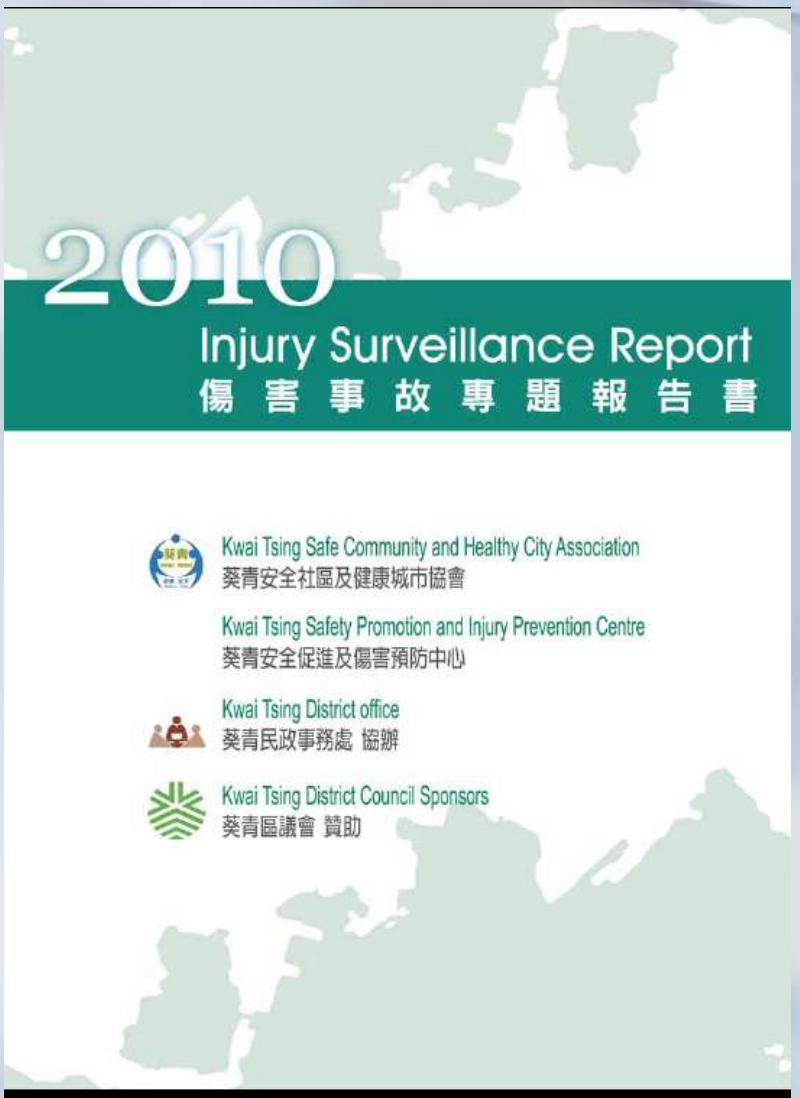
A. ED information: demography – age, sex, date, time; eight injury categories; five triage categories; disposal – admitted, referred, death or discharged, minimal data set on pre-event (the definitions on place, activities, mechanisms etc. are standardised); N- and E-code and AIS plus injury map based on residential address.
B. In-patient information: demography, ICD-9-CM and E-codes, outcome, length of stay and procedures performed.
C. Problems: ED data is now integrated with in-patient information. The site where the injury was sustained and recorded.
D. Utilisation of IS information: with additional GIS information on exact location where the injury occurred, "hot zone" or high risk areas were identified and further analysed using GIS technology. The injury data could be studied in relation to socio-economic status, weather conditions etc., giving better under-

Table 1
Incremental safety promotion and injury prevention strategies.

	Data available	Strategy	Intervention
Phase 0: ED clinical injury data	Demographic, 8 category of trauma, triage priority, disposal, sick leaves, X Ray	Safety for all	General public education Targeted at age or mechanism Best practices approach
Phases 1 and 2: ED-IS + ICECI[a] Manual then web-based	Place, activity, mechanism, nature, type, outcome, E and N code + ISS	Setting	Targeted high risk group and/or mechanism or medical costs, e.g. elderly fall at home or street, sports injuries
Phase 3: Integrated with CMS[b] + residential address	Integrated with inpatient clinical information + residential address	Targeted	Setting approach targeting high incidence places – estate, school, workplace
Phase 4: Geo-spatial	Site of injury	Geo-spatial	High risk locations/sites, e.g. hot zones on roads, playgrounds, malls, stations, etc.

[a] International Classification of External Causes of Injury.
[b] Centers for Medicare and Medicaid Services.

Injury surveillance report



Year of potential life lost

2010 傷害事故專題報告書

2010

Analyses by Crude Rate

★ 4.48 Crude rate is the number of events over the population per year. Analyzed the crude rate by mechanism, the rate for fall was particular high (75.0%) and traffic injury (12.5%) that were higher than those of last year (74.1% and 8.2% respectively).

★ 4.49 Analyzed by places of injury, the crude rates were higher for home (52.8%), highway/street (16.7%), and old aged home (8.3%). It is worth noting that the percentage for old aged home of this year is lower than last year (14.1%).

★ 4.50 Analyzed by activities, the crude rates were higher for vital activity (30.6%) and travel (26.4%), lower than those of last year (35.3% and 40.0 respectively).

★ 4.51 Analyzed by traumatic types, the crude rates were higher for domestics (59.6%) and traffic (17.3%), higher than those of last year (58.2% and 10.4% respectively).

Analyses by Years of Potential Life Lost (YPLL)

★ 4.52 Years of Potential Life Lost (YPLL) measures for a group of individuals the total number of years these people would have additionally lived up to some point in the future, would they not have died from a particular cause of death.[4]

★ 4.53 Measured with mechanism, the YPLL were longer for fall (210 years) and traffic injury (119 years) that were lower than those of the last year (278 years and 171 years respectively).

★ 4.54 Analyzed by places of injury, YPLL were longer for home (112 years) and highway/street (110 years) injuries, that were lower than those of the last year (181 years and 142 years respectively).

★ 4.55 Analyzed by activities, YPLL were longer for travel (129 years) and vital activity (62 years) that were lower than those of the last year (167 years and 194 years respectively).

★ 4.56 Analyzed by traumatic type, YPLL were longer for self-harm (150 years) and traffic (90 years) which was lower than that of last year (171 years).

2009

4.10 Analysis by crude rate

★ 4.10.1 Crude rate is the number of events over the population per year. Analyzed the crude rate by mechanism, the rate for fall was particular high (74.1%) and traffic injury (8.2%) which was much lower came next.

★ 4.10.2 Analyzed by places of injury, the crude rates were higher for home (54.1%), highway/street (15.3%) and old aged home (14.1%).

★ 4.10.3 Analyzed by activities, the crude rates were higher for travel (35.3%) and vital activity (40.0%).

★ 4.10.4 Analyzed by traumatic types, the crude rates were higher for domestics (58.2%) and traffic (10.4%).

4.11 Analysis by YPLL

★ 4.11.1 Years of Potential Life Lost (YPLL) measures for a group of individuals the total number of years these people would have additionally lived up to some point in the future, would they not have died from a particular cause of death.[6]

★ 4.11.2 Measured with mechanism, the YPLL were longer for fall (278.0 years) and traffic injury (171.0 years).

★ 4.11.3 Analyzed by places of injury, YPLL were longer for home (181.0 years) and highway/street (142.0 years).

★ 4.11.4 Analyzed by activities, YPLL were longer for vital activity (194.0 years) and travel (167.0 years).

★ 4.11.5 Analyzed by traumatic type, YPLL were longer for traffic (171.0 years) and domestics (68.0 years).

★ 4.11.6 Among 86 mortality cases out of 18,595 cases, the YPLL was 507 years.

Administrative districts for each District Councilor ~20,000 population

Direct inpat medical cost = LOS in ICU & general wards

Table 33 : Total cost of general wards and intensive wards by location
表三十三：按地點比較普通病房及加護病房的總收費

地點 Location	個案數目 Cases	收費（港元） Total cost (HKD)			
		最多 Maximum	平均值 Mean	標準差 Standard Deviation	總收費（平均 x 個案） Total cost (mean*Cases)
大白田 Tai Pak Tin	260	1,043,500	10,727	66,175	2,789,000
安蔭 On Yam	204	155,800	10,131	25,621	2,066,700
石籬 Shek Lei	229	211,900	9,303	23,388	2,130,400
長康 Cheung Hong	114	188,800	8,776	28,463	1,000,500
新石籬 Shek Lei Extension	155	175,600	8,386	22,649	1,299,800
葵盛東邨 Kwai Shing East Estate	204	162,400	8,271	21,750	1,687,200
上大窩口 * Upper Tai Wo Hau*	27	126,100	8,033	25,534	216,900
石蔭 Shek Yam	216	228,400	7,911	22,726	1,708,800
青發 Ching Fat	144	188,800	7,781	23,383	1,120,500
荔華 Lai Wah	146	172,300	7,436	23,447	1,085,600
長青 Cheung Ching	176	116,200	7,206	19,964	1,268,300

Pediatric and Adolescent
(Age 0-18)

Injury Report

Data Source: Injury Surveillance from PMH

Jan – Dec 2009

Methodology

- Point-of-care recording system; injury surveillance at ED
- Based on WHO MDS model and local classification of injury; follow ICECI
- Integration with hospital data for medical related variables
- Location of injury is captured with GIS interface at ED
- Automatic Geo coding of the event locations
- Descriptive statistic and Geo processing is performed
- Summary statistics and spatial pattern of 1 year data for sharing

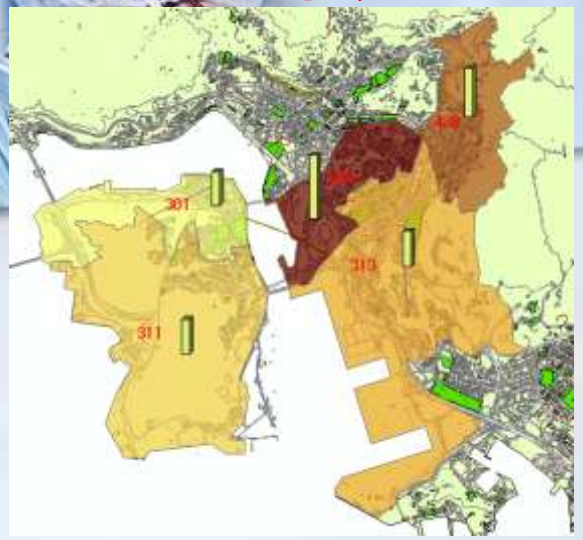
Content

- Overview of the Injury Surveillance System – a multi centered and geospatial recording system at the point-of-care
- 1 Year Findings
  - Overview of Incidence
  - Fall Injuries
  - Sport related Injuries
  - Cycle Path related injuries
- Summary of findings
- Conclusion

Summary of Findings

- The were were 3,229 cases were captured; 83**.2 % were unintentional**, 44.8% were fall related.
- There were no distinct difference on the number of case along the weekdays
- There were 40.8% (n=1,319) occurred at **home,** 15.6% (n=505) occurred at **school**
- 27.6% (n= 892) of the cases involved in **vital activities**; 18.1%(n=584) were **sport related injury**
- Most of the cases suffered from **extremities injury (upper: 16.7%; n= 538 , lower 11.7 % n= 378)**
- **584 sport related injured** were identified, (48.6%; n= 284 occurred at playground, 26.2%; n= 153 were occurred at school)
- **1,445 fall related injuries** were identified, floor: 73.4%;n= 1,060 and bed: 5.8% n= 84 were the main causative agent
- **28 bicycle related injured** were identified, 32.1% of the cases occurred **on Friday.**

Self harm and SES
自殘和社經水平



Cluster of severe falls
跌倒

Chart 23: Distribution of fall injuries of infants in Kwai Tsing
圖二十三： 葵青區嬰兒跌傷意外分佈

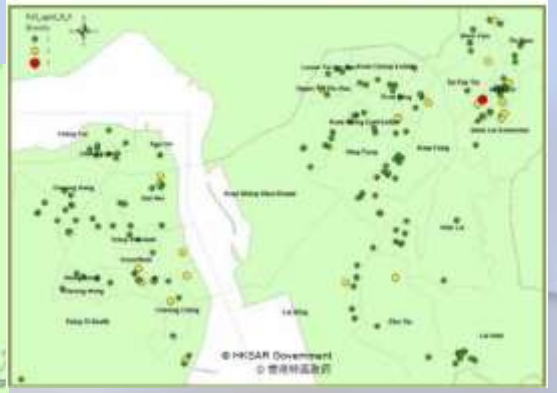
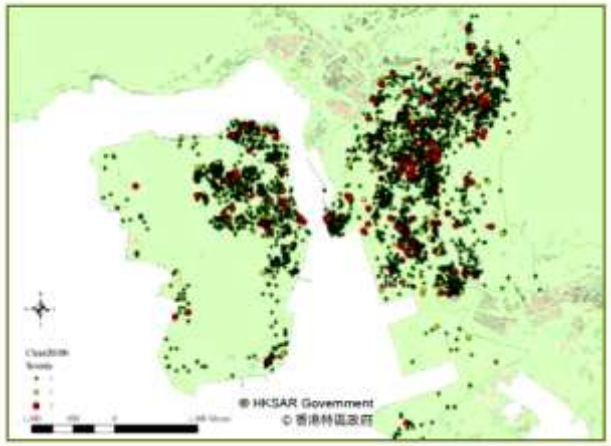


Chart 18: Distribution of injuries by severity in Kwai Tsing
圖十八：嚴重程度的受傷個案分佈

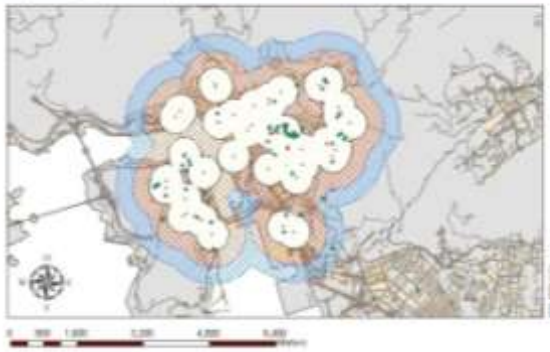


Playground & sports 運動

Figure 1: Distribution of selected playgrounds in Kwai Tsing district

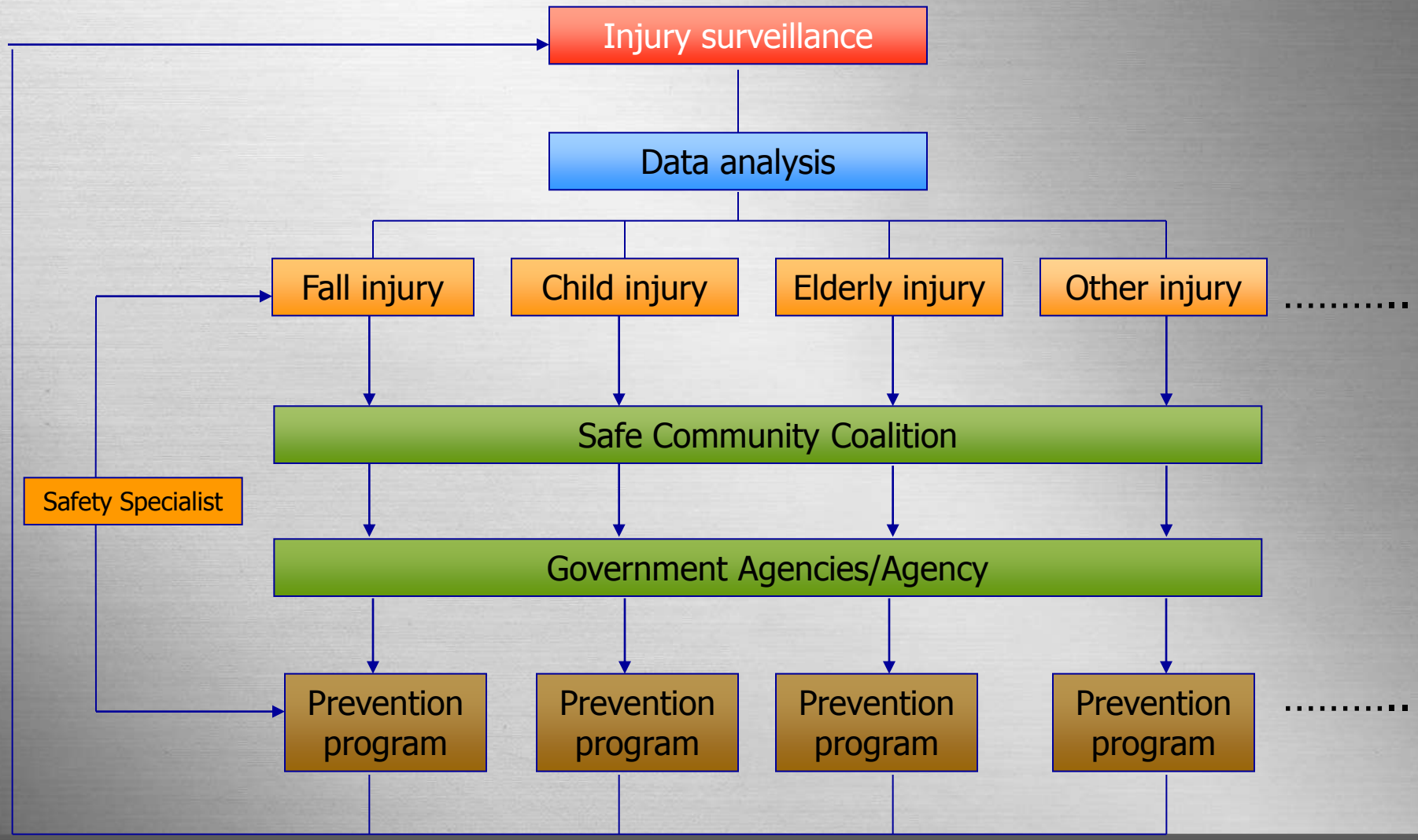
Interpersonal violence-abuses 暴力

Multiple Ring Buffer Analysis of Child Abuse Cases Vs Child Service Centers



Hot zones for traffic injuries 交通意外

Collaboration model of Targeted Injury Prevention & Control



傷害預防及監測的協作模式

Traffic Injury 因交通意外受傷個案

Leading cause of death for aged 10-24 years.

Each year nearly 400 000 people under 25 die on the world's roads – on average more than 1000 a day.

(WHO 2008)


联合国

大会

大会决议

64/255. 加强全球道路安全

The Decade of Action for Road Safety 2011-2020 was officially proclaimed by the United Nations General Assembly in March 2010. It is scheduled to commence formally on 11 May 2011.

2011年5月11日起動

GLOBAL STATUS REPORT ON ROAD SAFETY

TIME FOR ACTION

World Health Organization

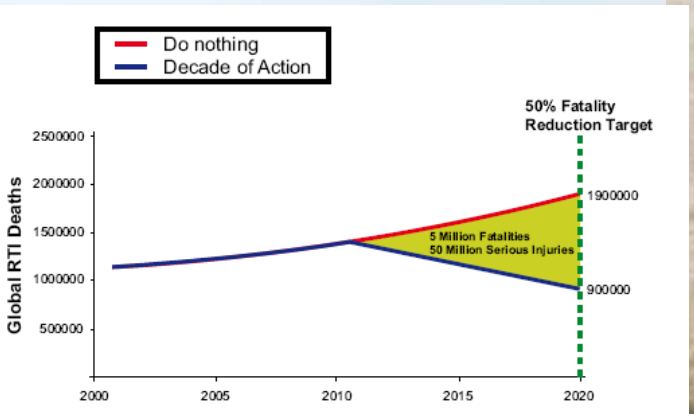
2009

西太 ROAD SAFETY IN THE WESTERN PACIFIC REGION

CALL FOR ACTION

MAKE ROADS SAFE

The Campaign for Global Road Safety

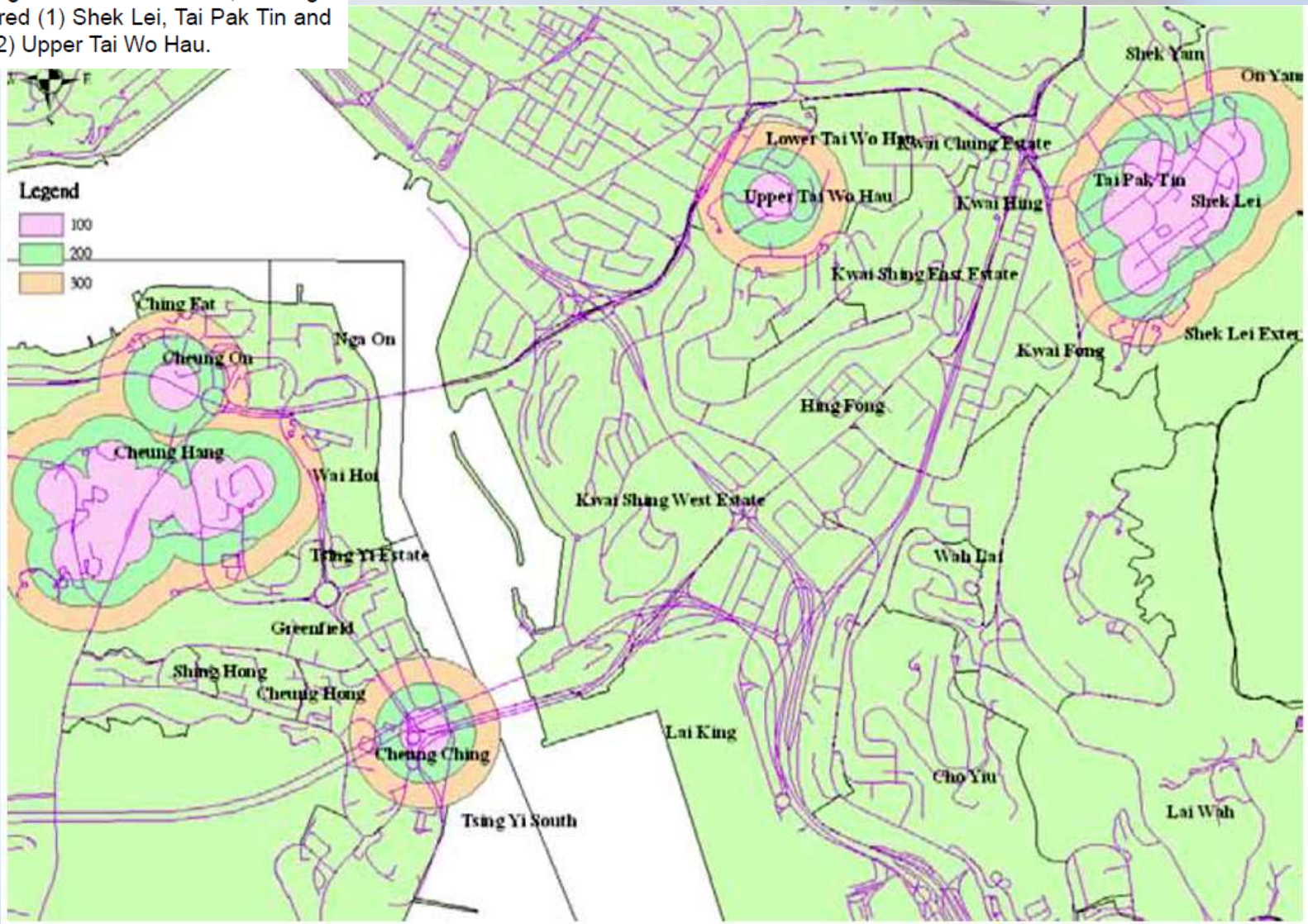


ENSURING THE DECADE *IS* ACTION

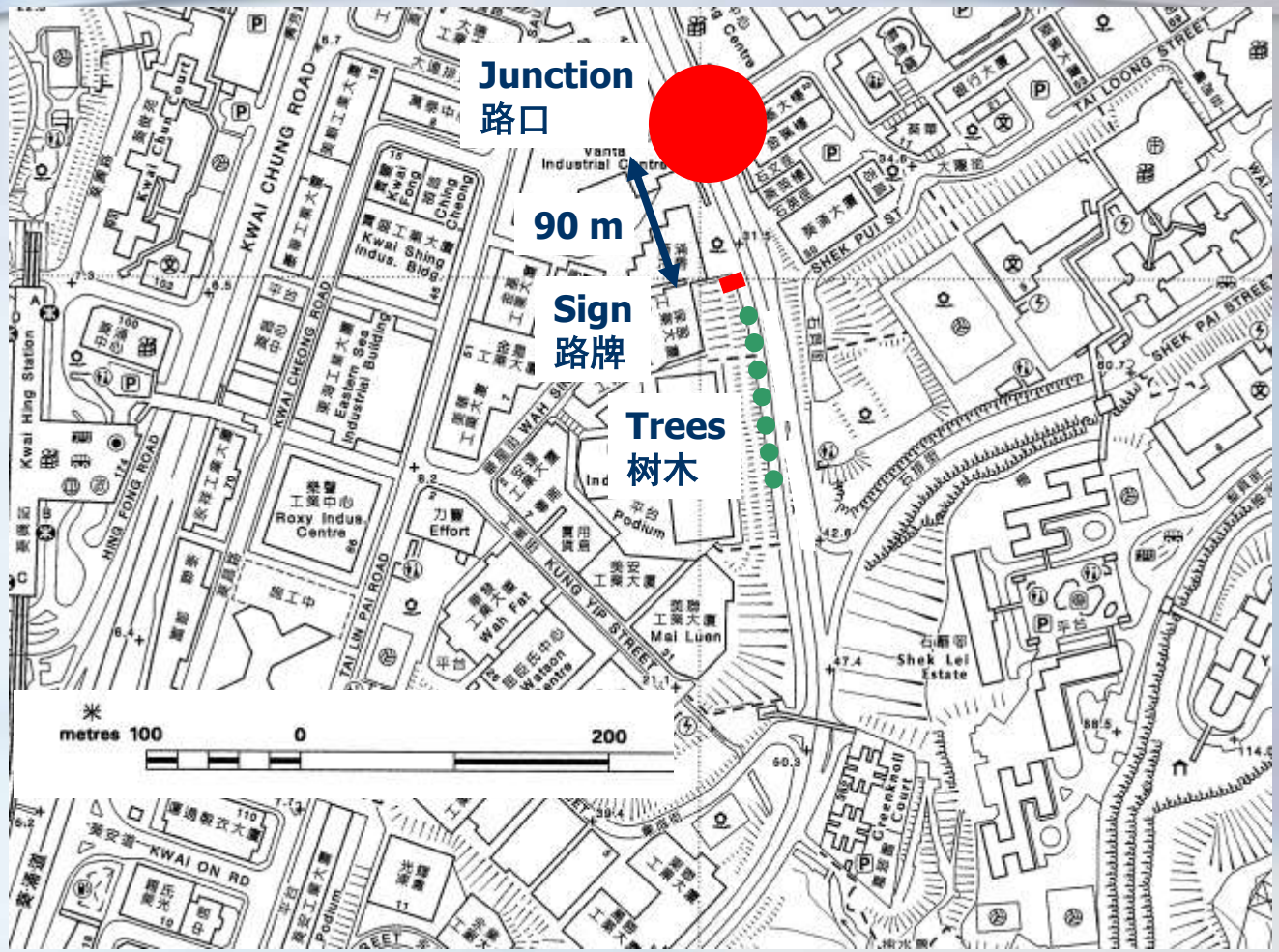
UN Decade of Action for Road Safety 2011-2020

Further Analysis on Traffic Injuries

★ 7.6 Based on the hot spots which have Z scores of 2 or above, the spatial clusters of 100 meters, 200 meters and 300 meters rings were compiled as the map shown below. The large cluster on Tsing Yi Island covered Cheung Hang, Cheung On, Wai Ying and Tsing Yi Estate. It is worth noting that severe cases occurred in the entrance of south bridge. On the other hand, the large clusters on territory covered (1) Shek Lei, Tai Pak Tin and Shek Lei Extention and (2) Upper Tai Wo Hau.



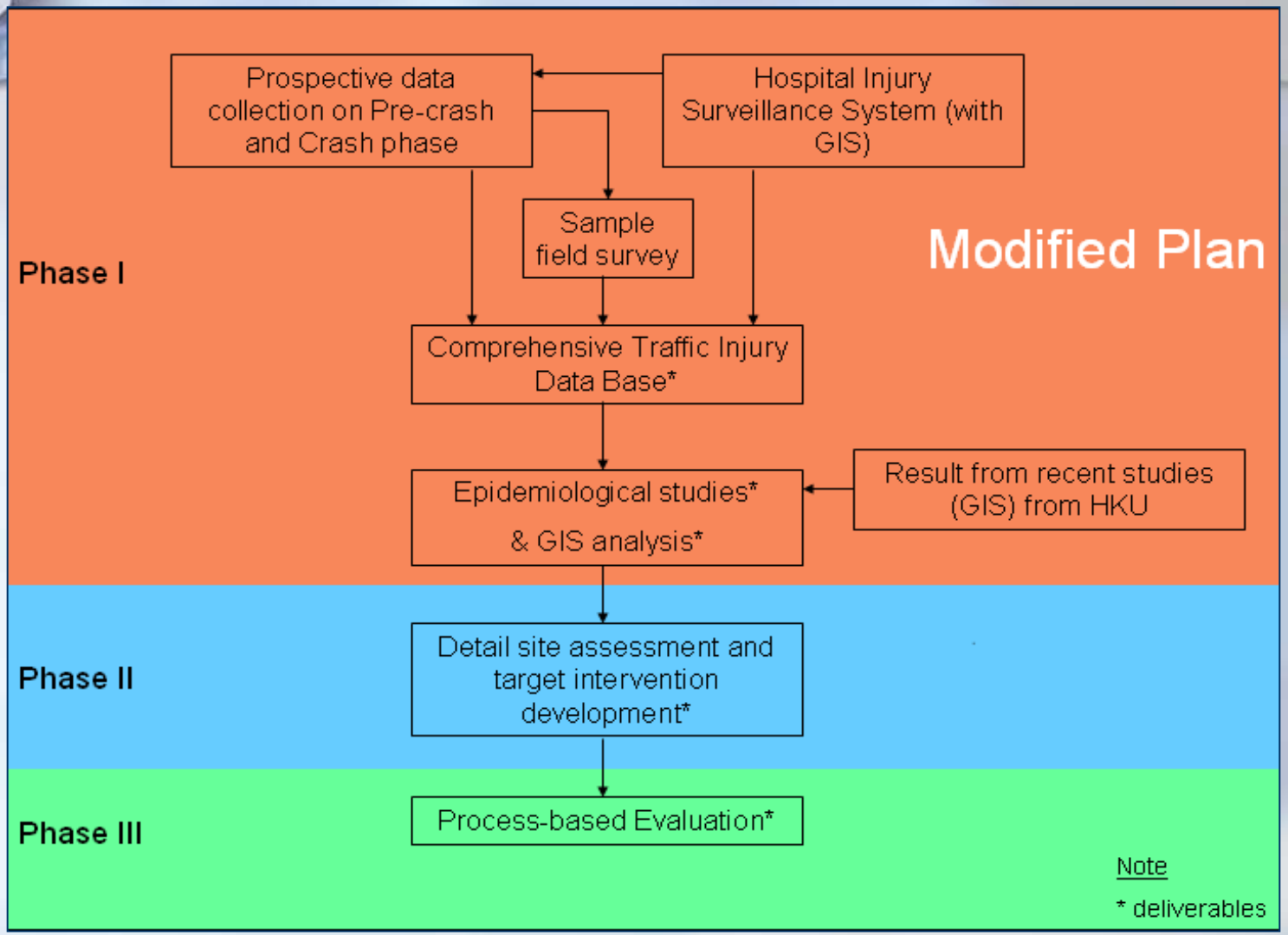
Kwai Tsing Traffic Injury Study
葵青交通伤害研究



模式明顯及可整治性較高的8個熱區

	事故多發路段類別			車禍數目	有效車禍數目	事故模式	事故形態	共通因素	可整治性
	嚴重	多傷患	行人						
昌榮路/和宜合路		Y		33	33	+++	追撞,交叉口,行人	縱坡和車速,切換車道	2
青康路	Y		Y	16	16	+++	行人	橫過道路往公交車站	2
興寧路		Y	Y	59	56	+++	行人	沿道路均有過路行人	2
青葵公路	Y			71	38 (最少)	+++	追撞	引入隧道路段,繁忙交通,高比例的重型車,路線縱坡變化	2
青綠街			Y	13	13	+++	行人	行人沿路段各處分散橫過寬闊的雙車道道路	3
荃青交匯處與荃灣路	Y	Y		36	35	+++	追撞	快速公路出口下坡連接環島t	3
和宜合道			Y	19	17	+++	行人	行人沿路段各處分散橫過寬闊的雙車道道路, 與公交車站有關連	3
和宜合道/青山公路		Y		29	28	+++	追撞, 行人	流暢車流沿大下坡路段引入信號燈控制交叉口,交叉口過路處行人等候區狹窄,大隴街交叉口與主交叉口距離短	2

Road Safety Project 道路安全研究



Road Safety Project

Pedestrian

Severe

Multiple

7 July 2010

Accepted for publication

Multi-disciplinary efforts toward sustained road safety benefits: Integrating place-based and people-based safety analyses

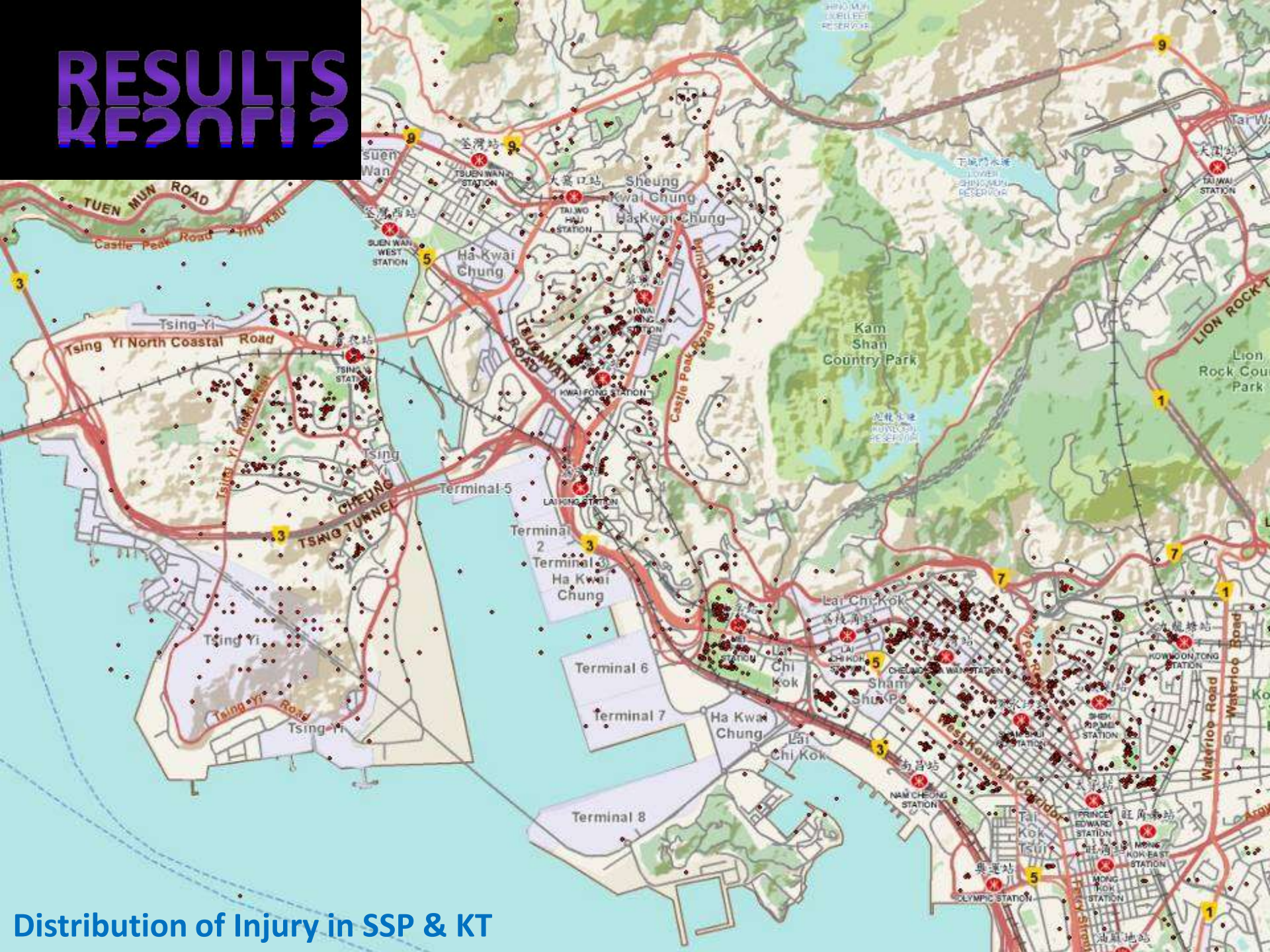
Journal:	*Injury Prevention*
Manuscript ID:	injuryprev-2012-040400.R1
Article Type:	Programme report
Date Submitted by the Author:	n/a
Complete List of Authors:	Loo, Becky; The University of Hong Kong, Geography Chow, CB; Princess Margaret Hospital, Paediatrics Leung, M; Princess Margaret Hospital, Accidents and Emergency Kwong, THJ; Community for Road Safety, Lai, SFA; Princess Margaret Hospital, Chau, YH; Kwai Tsing Safe Community and Health City Association,
Keywords:	Safe Community < Interventions, Geographical / Spatial analysis < Methodology, Surveillance < Methodology, Mixed methods < Methodology, Process/impact evaluation < Methodology, Program evaluation < Methodology

GIS distribution of Playground injury and identification of high risk park

Funded by Health Care Promotion Fund

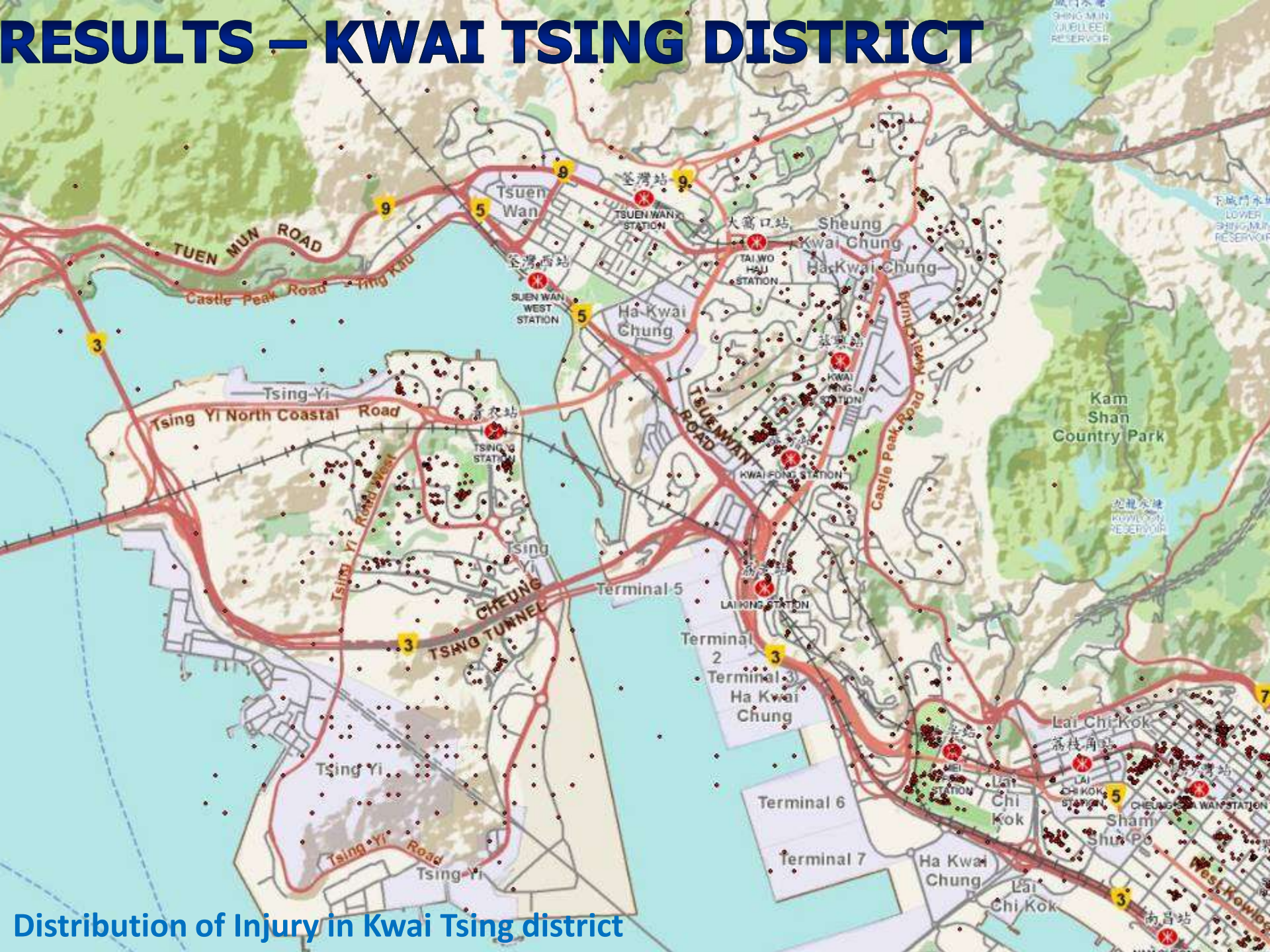
在遊樂場或運動場發生的傷害 – 找出高危地點

RESULTS



Distribution of Injury in SSP & KT

RESULTS – KWAI TSING DISTRICT



Distribution of Injury in Kwai Tsing district

RESULTS – KWAI TSING DISTRICT

Table 1: Injury incidents in selected playground areas of Kwai Tsing district

Playground	Kwai Chung Sports Ground (n=264)	Hing Fong Road Playground (n=264)	Tsing Yi Sports Ground (n=76)	Lai King Hill Road Playground (n=45)	Wo Yip Hop Road Sports Ground (n=47)	Tai Loong Street Playground (n=28)
Area name (Code[1])	Hing Fong (S15)	Hing Fong (S15)	Wai Ying (S19)	Cho Yiu (S14)	Shek Yam (S06)	Tai Pak Tin (S10)
Population	20,231	20,231	19,853	16,584	21,136	21,492
No. of injuries among aged 0-15 (%)	68 (25.76)	68 (25.76)	22 (28.95)	11 (24.44)	10 (21.28)	16 (57.14)
No. of hospital admission	9	9	1	0	2	3
Day(s) of hospitalization	1-18	1-18	1	-	1-2	1-3

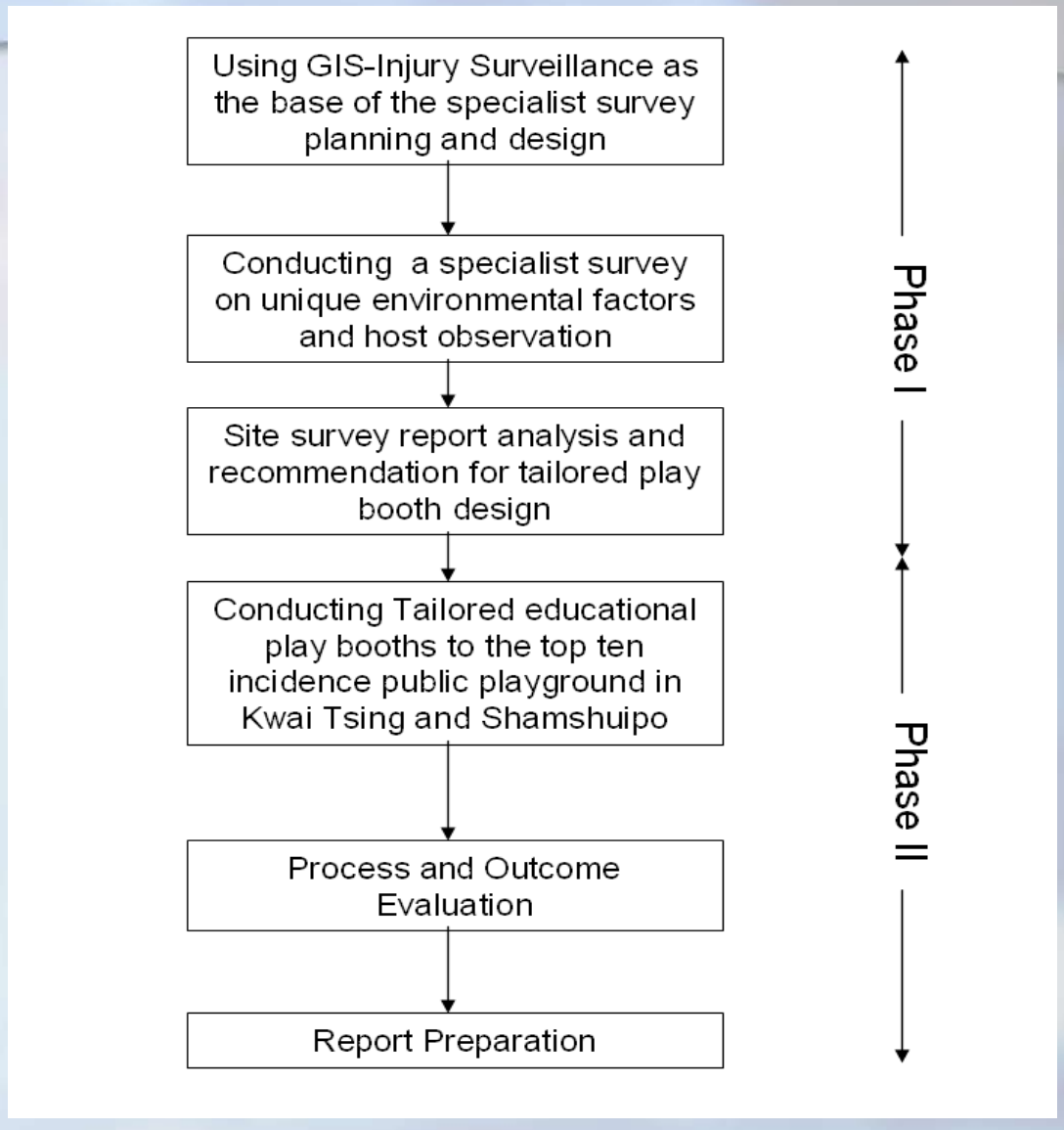
[1]Area code and population are based on the categorization of the Electoral Affairs Commission, Hong Kong: version 2007 used in this table and version 2010 for GIS mapping.

RESULTS – SHAM SHUI PO DISTRICT

Selected Playgrounds :

- **Shek Kip Mei Park**
- **Fa Hui Park**
- **Po On Road Playground**
- **Sham Shui Po Park**
- **Lai chi Kok Park**
- Cheung Sha Wan Sports Ground (backup)

PROJECT PHASES OUTLINE



10 risk behaviours

- Improper dressing
  - Slippers
  - Wearing of strings or necklace
  - School bags
- Improper way of playing
  - Climbing
  - Running
  - Jumping
- Improper supervision
- Access to nearby car parks
- Improper equipments – for elderly
- Improper age – 2 to 12 years

Collaborative Multiplier Approach for intervention

	Expertise	Desired outcomes	Strategies
District Council			
Health			
Police			
Social			
Playground specialist			
Housing Authority			
Engineers			
Community leaders			
Others			

We are not short of data but……

WHAT SHOULD BE THE WAY FORWARD?

Child and adolescent injury prevention: A WHO plan of action 2006–2015

WHO plan of action for child and adolescent injury prevention

1. **Data and measurement**
   - Magnitude and burden
   - Risk factors
   - Health impacts
2. **Research**
   - Key research needs
   - Promotion of intervention trials
3. **Prevention**
   - Stronger prevention programmes
   - National strategies and planning programmes
4. **Services**
   - Services for persons affected by injury and violence
5. **Capacity development**
   - Research effort and capacity
6. **Advocacy**
   - Raising awareness
   - Promoting and supporting action
   - International, multisectoral cooperation

Injury prevention strategies

Legislation, regulation and enforcement. Laws and other forms of regulation have proved to be among the more powerful mechanisms for preventing injury. For example, there is strong evidence to suggest that the introduction of child safety seat laws has led to increased levels of restraint use and reduced road traffic injury rates (*20*).

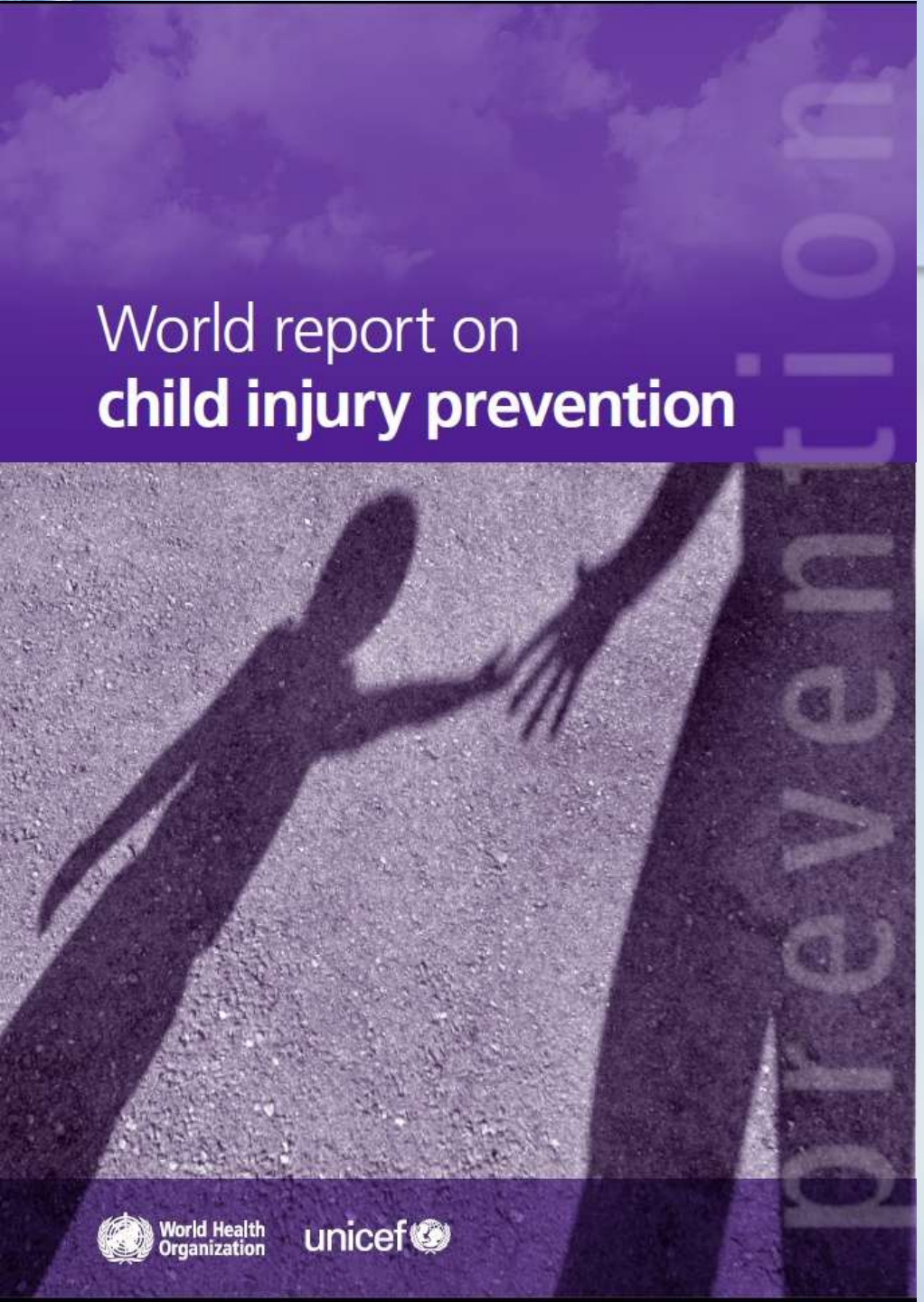
Product modification. One of the best examples of how changes to the design of a product can contribute to reducing the incidence of childhood injuries is provided by the development of child-resistant closures for pharmaceuticals and other household chemical products. Innovations of this type have helped to reduce the number of childhood deaths from poisoning in several high-income countries. Victoria, Australia, for instance, has reported reductions of 45–60% in child poisoning mortality and 60–90% in emergency department attendance for injuries of this type (*21*).

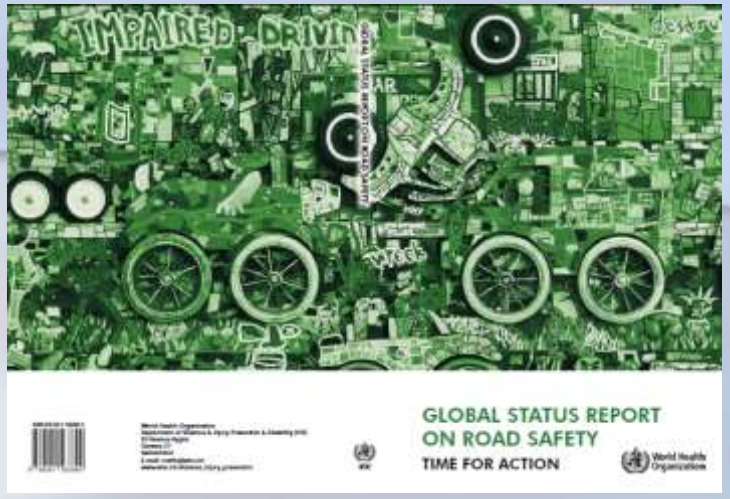
Environmental modification. Modification of the local environment – to make it more "user-friendly" – has become an important approach in injury prevention, benefiting not just children but individuals of all ages in the passive protection it affords. Assessments of traffic calming schemes on crash-related deaths and injuries in all age groups have repeatedly shown that area-wide traffic calming schemes in towns have the potential to reduce road traffic injuries (*22, 23*).

Supportive home visiting. Home visits have been used to meet a wide range of objectives, including the improvement of the home environment, family development and the prevention of behavioural problems in children. Early childhood home visits have been shown to have substantial positive effects, especially in relation to the prevention of child maltreatment (*24*).

Education, skills development. While the training of people from a wide spectrum of disciplines in injury prevention is likely to have been a contributory factor in the reductions in child injury deaths that have been seen in high-income countries, the value of educational programmes as a form of injury prevention has been the subject of considerable debate in recent years. Where there has been specific training, pedestrian skills training programmes have been shown to improve selected behavioural skills (*25*). There are also indications that swimming training in children of school age has value (*26–28*), but results of more detailed studies on the relationship between swimming training and drowning prevention, currently underway, are needed before firm conclusions regarding the true merits of such measures can be drawn.

Community-based studies. Given the broad range of injury types and possible counter measures, injury prevention lends itself particularly well to community-based approaches. The use of multiple interventions, repeated in different forms and contexts, helps to develop a culture of safety within a community (*29*). Of particular note in this regard is the Safe Communities model, which has repeatedly been shown to be successful in reducing injuries in whole city or local government area populations (*30*).





Dr Margaret Chan
Director-General
World Health Organization

Key messages from World Report Dec 2008

- Child injuries are a major public health issue
- Injuries directly affect child survival
- Children are susceptible to injuries
- Child injuries can be prevented
- The cost of doing nothing is unacceptable
- Few countries have good data on child injury
- Research on child injuries is too limited
- There are too few practitioners in child injury prevention
- Child injury prevention is the responsibility of many sectors
- Child injury prevention is under-funded
- Awareness needs to be created and maintained

WHA Resolution May 2011

World Health Organization

SIXTY-FOURTH WORLD HEALTH ASSEMBLY
Provisional agenda item 13.14

A64/23
17 March 2011

In resolution WHA57.10, the Health Assembly accepted the invitation, issued by the United Nations General Assembly in resolution 58/289, for WHO to act as a **coordinator** on **road safety issues** within the United Nations system, working in close collaboration with the United Nations regional commissions.

Child injury prevention

Report by the Secretariat

The Health Assembly in resolution WHA58.23, on disability, including prevention, management and rehabilitation, urged Member States to take all necessary steps to reduce risk factors contributing to **disabilities in childhood.**

17. The joint WHO/UNICEF *World report on child injury prevention* describes how children's abilities and behaviours differ from those of adults, and how this difference influences their risk of injury and the effectiveness of interventions to prevent injury. It consolidates the best available information on patterns of injury and evidence on the effectiveness of preventive interventions. It also makes seven recommendations: integrate child injury into a comprehensive approach to child health and development; develop and implement a child injury prevention policy and a plan of action; implement specific actions to prevent and control child injury; strengthen health systems to address child injuries; enhance the quality and quantity of data for child injury prevention; define priorities for research, and support research on the causes, consequences, costs and prevention of child injuries; and raise awareness of and target investments towards child injury prevention. The report called for international, development and donor organizations to contribute to translating these recommendations into reality.

WHO & UNICEF's 7 recommendations

1. Integrate child injury into a comprehensive approach to child health and development.
2. Develop and implement a child injury prevention policy and a plan of action.
3. Implement specific actions to prevent and control child injuries.
4. Strengthen health systems to address child injury.
5. Enhance the quality and quantity of data for child injury prevention.
6. Define and support priorities for research on causes, consequences, cost and prevention .
7. Raise awareness on and target investments towards child injury prevention.

EUROPEAN REPORT ON CHILD INJURY PREVENTION 2008

- Provide leadership in integrating the prevention of injury among children and adolescents into a comprehensive approach to their health and development
- Develop and implement a policy and plan for preventing injury among children that involves other sectors.
- Implement evidence-based action to prevent and control injuries among children
- Strengthen health systems to address injuries among children
- Build capacity and exchange best practice
- Enhance the quality and quantity of data for preventing injury among children
- Define priorities for and support research and evaluation on the causes, effects, costs and prevention of injury among children
- Raise awareness and targeted investment for preventing injury among children
- Address inequity in injury among children

We have data, we have expertise, we have infrastructure….

WHAT WE NEED IS LEADERSHIP AND COMMITMENT *FROM ?*

Wilfred Wong
Ivy Chiu
Frederick Ho
Leung Ming

ACKNOWLEDGEMENT