Sponsored by

Safe elderly Program:

another way to

reduce the injury in RCHE

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1- Princess Margaret Hospital , 2- Kwai Tsing Safe Community and Health City Association, 3-Kwai Tsing District Council, 4- Social Welfare Department

Kwai Tsing District

- 523,300 population
- 75% living in public housing estate
- 21 housing estates
- 35 secondary schools
- 41 primary schools
- 67 kindergartens
- 1 higher education institute
- 1 acute general hospital
- 1 psychiatric hospital
- 43 nursing homes
- Mean income $14,500

Collaborations

- *Center for safety promotion and injury prevention of Kwai Tsing Safe Community and healthy City association*

- *Princess Margaret Hospital*

- Social Welfare Department

Sponsored by Kwai Tsing District Council

Background

- Had established Injury Surveillance System in Kwai Tsing District

- Average 100 OAH injury-related hospital attendance per month

- 28% of them need hospital admission; 16% need operative intervention

- Hospital injury cost above HK$ 25,000 per day ,

- Euro 944 per elderly fall in institutional care (Nurmi I & Luthje P. 2002)

- High injury severity and delay recovery (Bergland A et al.,2006)

- Need to prevent the injury and improve the outcome with sustainable effect

It is necessitate preventing the injury and improving the outcome with a sustainable program

WHO Collaborating Centre on
Community Safety Promotion

Indicators for Safe Elderly

Safe Elderly in a Safe Community setting have:

1. An infrastructure based on partnership and collaborations, governed by a group of managers, elderly and their voluntary organisations representatives, technical staff, and safety professionals that is responsible for safety promotion for elderly people; The group should be chaired by a local administration representative with a Voluntary Organisation representative as a co-chair;

2. Safe Elderly policies developed by the Group in a Safe Community setting;

3. Long-term, sustainable operational programs covering both genders, all old age groups, environments, and situations;

4. Programs that target high-risk groups and environments, and programs that promote safety for vulnerable groups;

5. Programs that document the frequency and causes of injuries – both non-intentional (accidents) and intentional (violence and self-inflicted);

6. Evaluation measures to assess their policies, programs, processes and the effects of change;

7. Ongoing participation in Safe Elderly networks – at community, national and international levels.
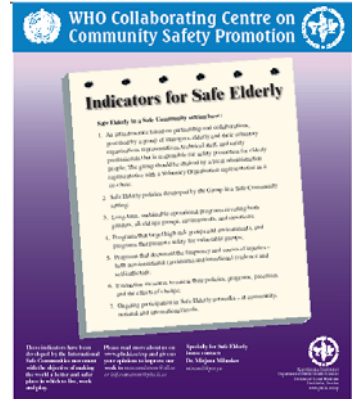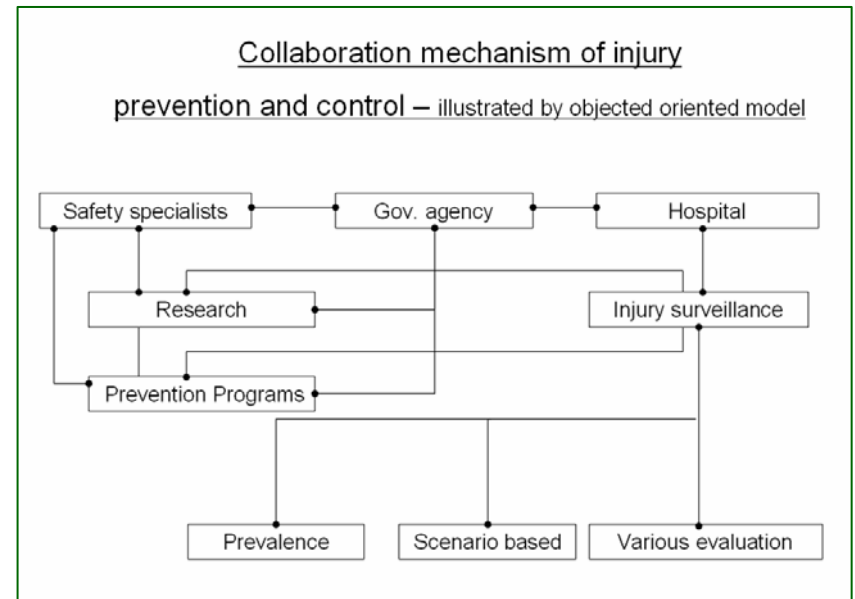
Objective

(1) To develop a new approach in safety promotion program in RCHE

(2) To identify a simple and cost effective way to reduce injury in RCHE with sustainable effect

Center for safety Promotion and Injury Prevention

- Maintain liaison within team members

- Coordination of related activities and resource utilization

- Statistic support and program evaluation

Proposed relationship of each elements

Collaboration mechanism of injury prevention and control – illustrated by objected oriented model
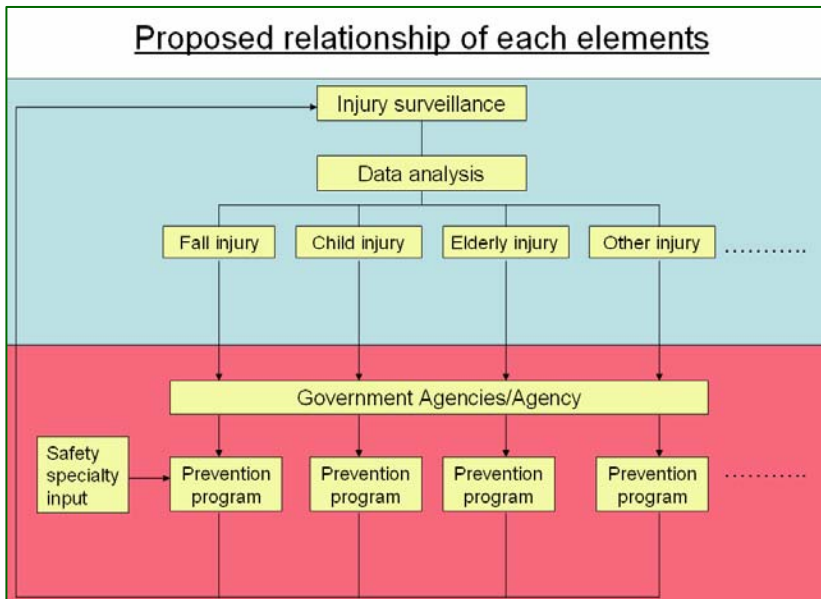
Community Nurse

- Participates and collaborates in multi-disciplinary team to plan, implement interventions, evaluates the safety promotion pilot project

- Help in monitor the injury rate, the accuracy of reporting record and analyze the circumstance around the injury.

- Assessing and screening resident's risk of injury, advising injury prevention measures and making a referral to allied health professional when indicated for further assessment and interventions.

Occupational therapist

Provide advice on environmental screening and assessment to prevent elderly falls in pilot RCHE

Provide advice on fall prevention education program in pilot RCHE

Provide hip protectors to ambulant frequent fallers without incontinence

Physiotherapist input

Mainly for screening of mobility in terms of its height, ferrule condition and walking aids condition

Provide advice on fall prevention education program in pilot RCHE

Social Welfare Department

Provide advice on injury prevention program in the perspective of social welfare and RCHE license issue

Representative from District Council

Provide advice on injury prevention program in the perspective of District Council and liaison with concerned government agency

Task 1:

Descriptive study RCHE injuries in Kwai Tsing via an emergency department injury surveillance system

- Assess the prevalence of OAH injuries in Kwai Tsing
    - Via the surveillance system >> descriptive analysis
    - Intrinsic & Extrinsic factors analysis (Ozanne-Smith et al., 2002)

- To identify the potential subjects for the study
    - Inclusion criteria with population size of 50 or above
    - Cluster randomization and random assignment

- To investigate the injury factors
    - Case study protocol; holistic & in-depth investigation (Feagin et al., 1991)
    - Incidence case study approach
    - Based on mix of quantitative and qualitative evidence (Yin, 2002).

Age On Latest Selected Encounter (Year)

Age On Latest Selected Encounter (Year)

Elderly Home (English Name)
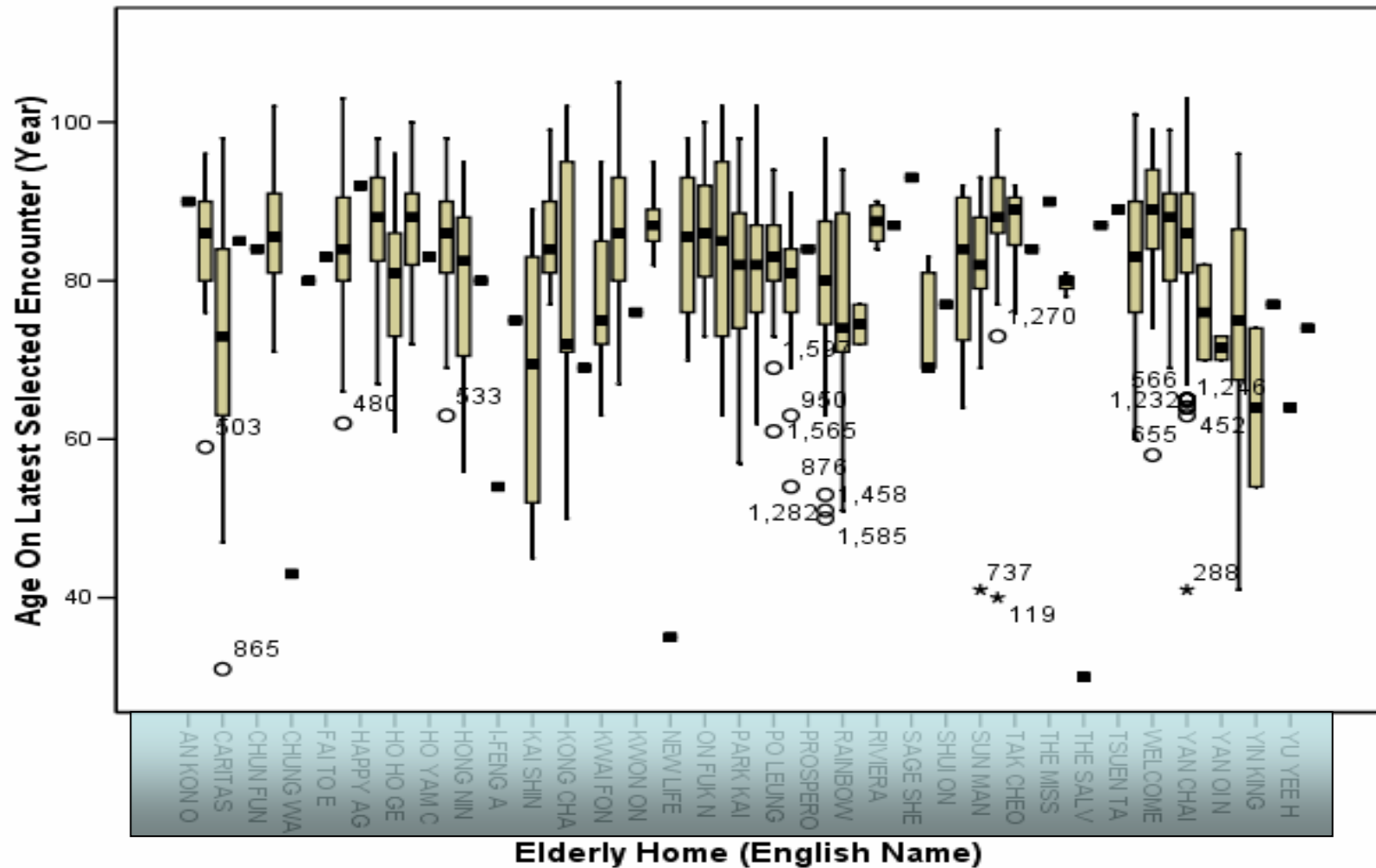
Bar Chart
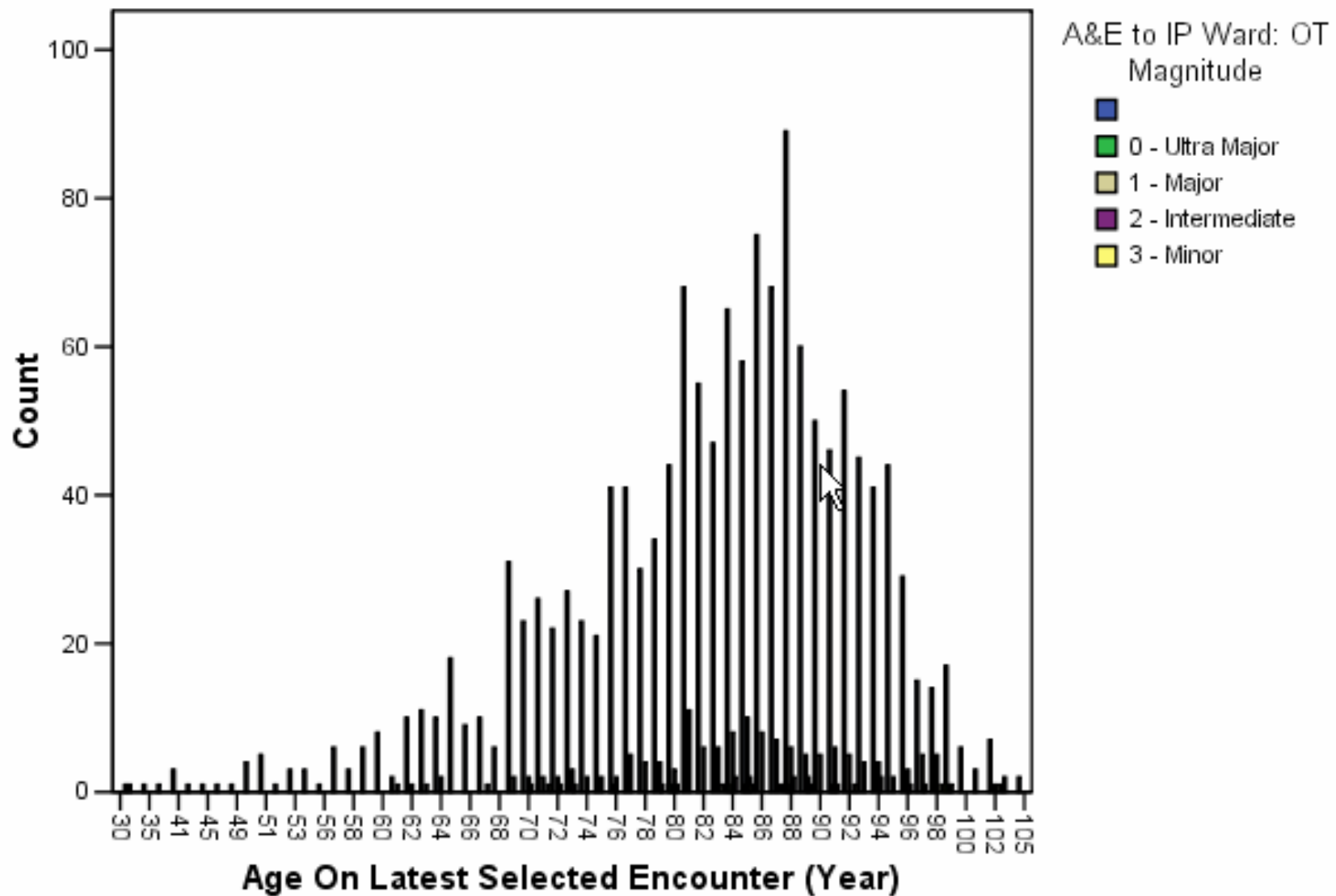
A&E to IP Ward: OT Magnitude * Traumatic Type Crosstabulation

206-2007

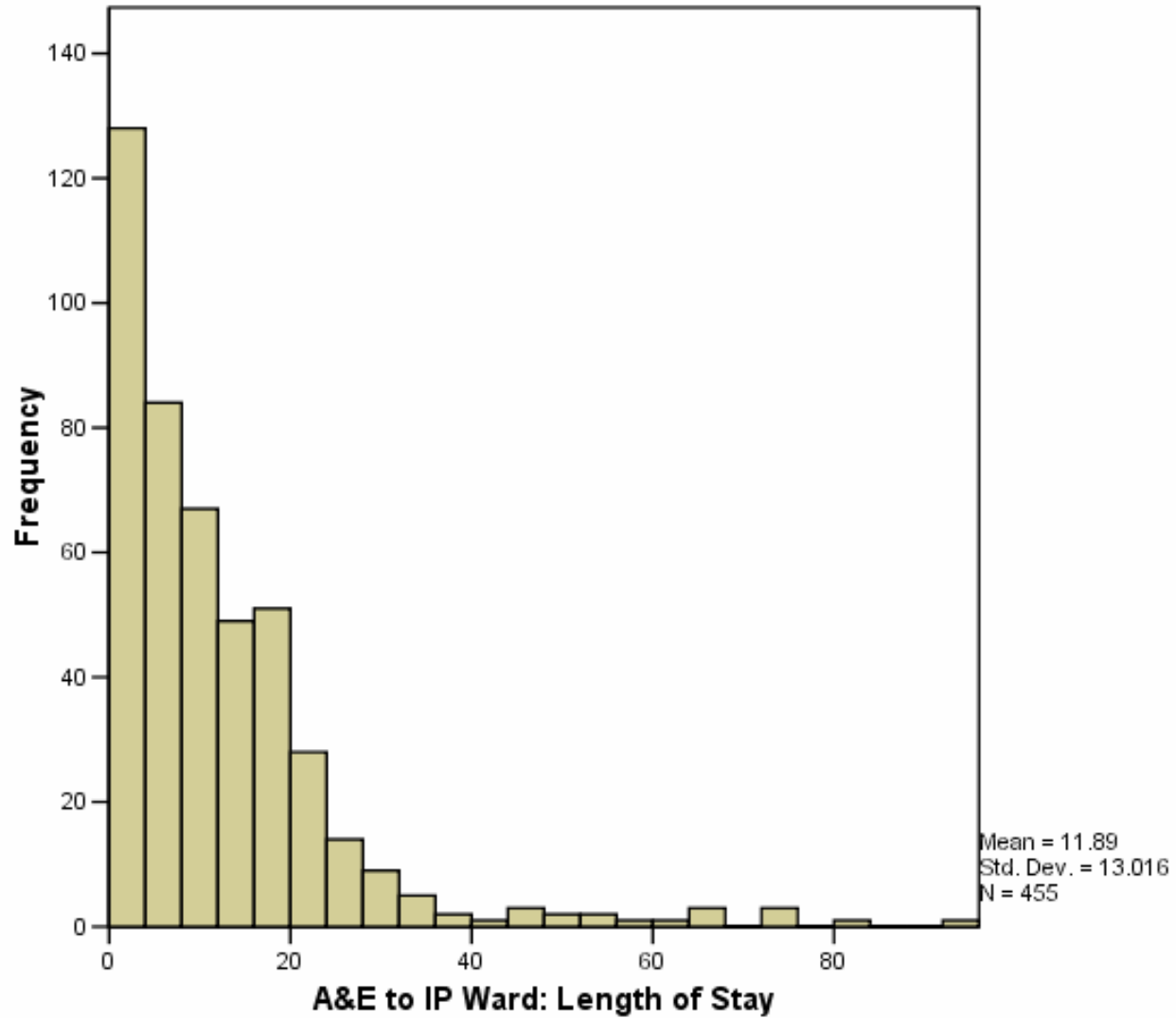| | | | Traumatic Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 Common assault | 3E Elderly abuse | 3S Spousal abuse | 4 Traffic | 5 Industrial | 6 Domestics | 7 Sports | 8 Unclassified | 9 Self-Harm | Total |
| A&E to IP Ward: OT Magnitude | | Count | 40 | 1 | 1 | 4 | 4 | 1277 | 4 | 118 | 0 | 1449 |
| | | % within A&E to IP Ward OT Magnitude | 2.8% | .1% | .1% | .3% | .3% | 88.1% | .3% | 8.1% | .0% | 100.0% |
| | | % within Traumatic Type | 100.0% | 100.0% | 100.0% | 66.7% | 100.0% | 89.0% | 100.0% | 86.8% | .0% | 88.9% |
| | | % of Total | 2.5% | .1% | .1% | .2% | .2% | 78.3% | .2% | 7.2% | .0% | 88.9% |
| | 0 - Ultra Major | Count | 0 | 0 | 0 | 1 | 0 | 6 | 0 | 0 | 0 | 7 |
| | | % within A&E to IP Ward OT Magnitude | .0% | .0% | .0% | 14.3% | .0% | 85.7% | .0% | .0% | .0% | 100.0% |
| | | % within Traumatic Type | .0% | .0% | .0% | 16.7% | .0% | .4% | .0% | .0% | .0% | .4% |
| | | % of Total | .0% | .0% | .0% | .1% | .0% | .4% | .0% | .0% | .0% | .4% |
| | 1 - Major | Count | 0 | 0 | 0 | 1 | 0 | 126 | 0 | 18 | 1 | 146 |
| | | % within A&E to IP Ward OT Magnitude | .0% | .0% | .0% | .7% | .0% | 86.3% | .0% | 12.3% | .7% | 100.0% |
| | | % within Traumatic Type | .0% | .0% | .0% | 16.7% | .0% | 8.8% | .0% | 13.2% | 33.3% | 9.0% |
| | | % of Total | .0% | .0% | .0% | .1% | .0% | 7.7% | .0% | 1.1% | .1% | 9.0% |
| | 2 - Intermediate | Count | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 0 | 0 | 19 |
| | | % within A&E to IP Ward OT Magnitude | .0% | .0% | .0% | .0% | .0% | 100.0% | .0% | .0% | .0% | 100.0% |
| | | % within Traumatic Type | .0% | .0% | .0% | .0% | .0% | 1.3% | .0% | .0% | .0% | 1.2% |
| | | % of Total | .0% | .0% | .0% | .0% | .0% | 1.2% | .0% | .0% | .0% | 1.2% |
| | 3 - Minor | Count | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 2 | 9 |
| | | % within A&E to IP Ward OT Magnitude | .0% | .0% | .0% | .0% | .0% | 77.8% | .0% | .0% | 22.2% | 100.0% |
| | | % within Traumatic Type | .0% | .0% | .0% | .0% | .0% | .5% | .0% | .0% | 66.7% | .6% |
| | | % of Total | .0% | .0% | .0% | .0% | .0% | .4% | .0% | .0% | .1% | .6% |
| Total | | Count | 40 | 1 | 1 | 6 | 4 | 1435 | 4 | 136 | 3 | 1630 |
| | | % within A&E to IP Ward OT Magnitude | 2.5% | .1% | .1% | .4% | .2% | 88.0% | .2% | 8.3% | .2% | 100.0% |
| | | % within Traumatic Type | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| | | % of Total | 2.5% | .1% | .1% | .4% | .2% | 88.0% | .2% | 8.3% | .2% | 100.0% |

Source: CDARS

Graph

Histogram of A&E to IP Ward: Length of Stay. Mean = 11.89, Std. Dev. = 13.016, N = 455

A&E to IP Ward: Length of Stay

A&E to IP Ward: Length of Stay (y-axis)

Elderly Home (English Name) (x-axis)
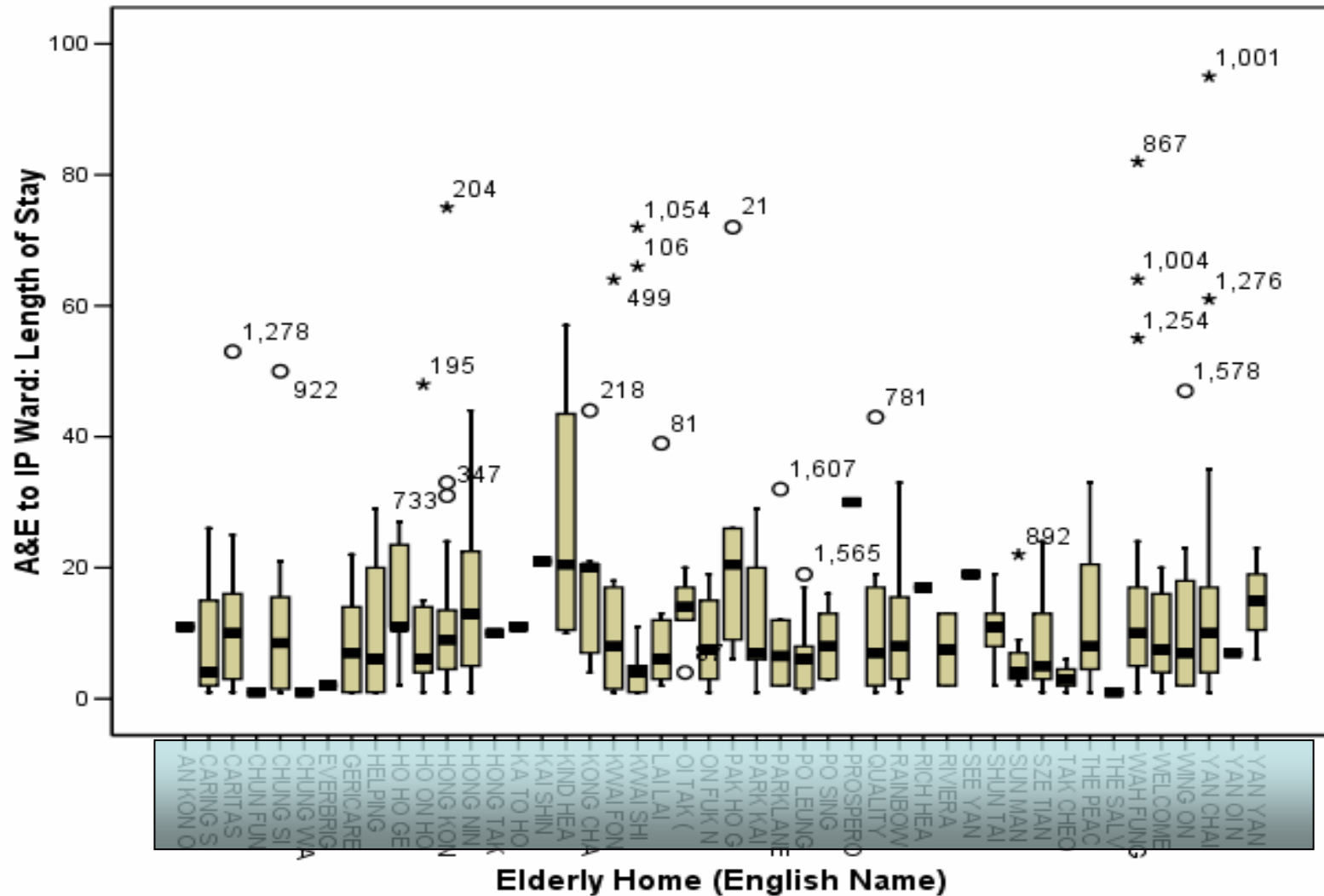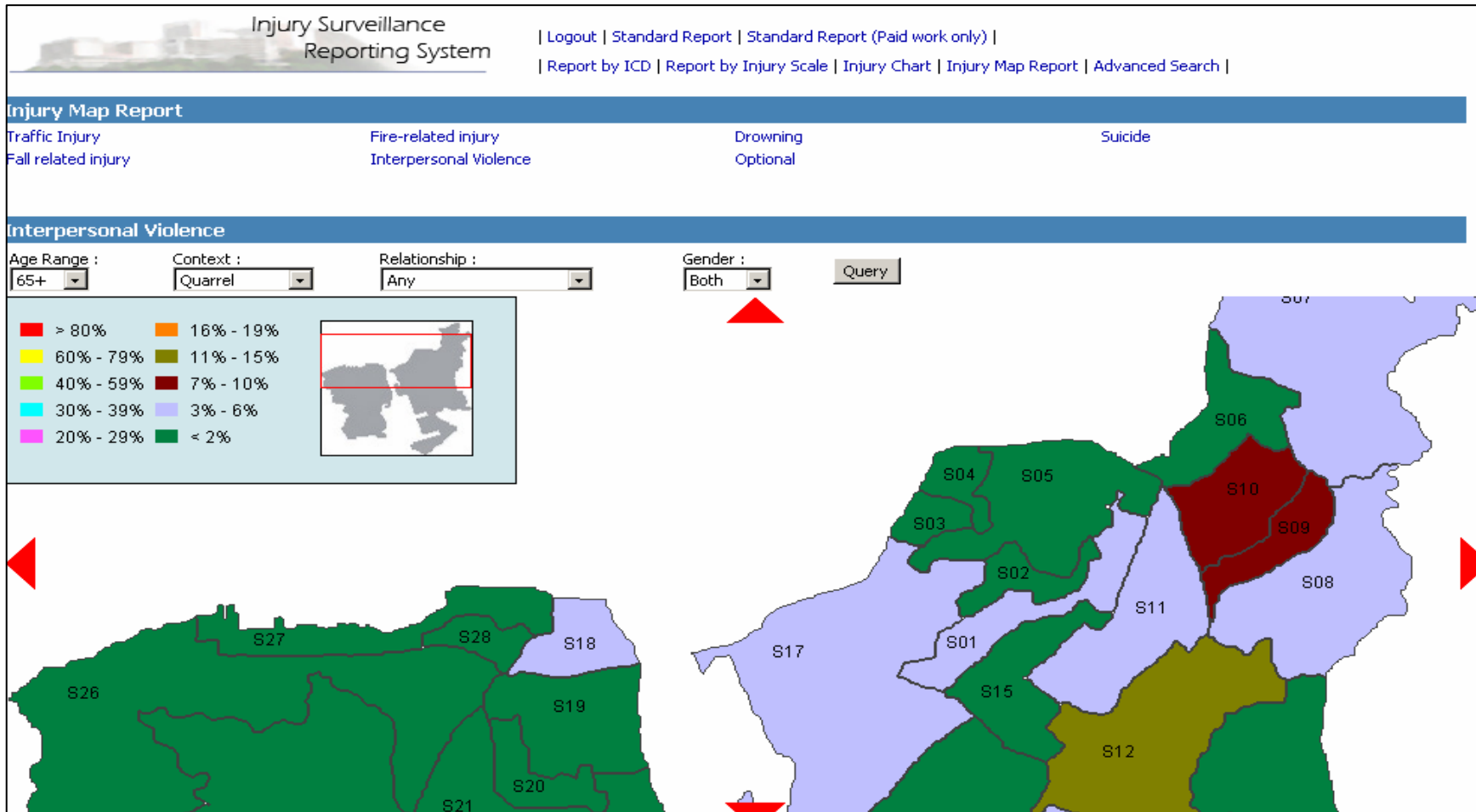
Further analysis from Injury surveillance system

Injury Map
Geographic representation of the injury occurrence by patient's address
-identification of high-risk group for prevention

Fall Prevalence – Kwai Tsing

- Total injury attendance **30,000**

- Total Fall cases **2217** (21% of all captured cases)

- Male : Female (4.8 : 5.2)

- Overall Incident rate for fall is **4.2 in 1000 people per year**

- **20% required admission**

- Top 3 areas for fall :
  1. Lai Yiu
  2. Tai Pak Tin
  3. Kwai Shing West Est.

ZONE	No. of fall	% of total fall	Incident rate per 1000 people)
Kwai Hing	72	3.25%	4.2
Kwai Shing East Est	98	4.42%	5
Upper Tai Wo Hau	13	0.59%	0.8
Lower Tai Wo Hau	12	0.54%	0.5
Kwai Chung Est	97	4.38%	5.4
Shek Yam	96	4.33%	4.2
On Yam	78	3.52%	3.6
Shek Lei Extension	91	4.10%	4.3
Shek Lei	66	2.98%	3.3
Tai Pak Tin	123	5.55%	7.7
Kwai Fong	139	6.27%	6.9
Lai Wah	73	3.29%	4.9
Cho Yiu	102	4.60%	5.4
Lai Yiu	144	6.50%	9.7
Hing Fong	64	2.89%	3.9
Lai King	104	4.69%	5.3
Kwai Shing West Est	119	5.37%	5.5
On Ho	69	3.11%	3.4
Wai Ying	47	2.12%	3
Tsing Yi Est	51	2.30%	2.5
Greenfield	45	2.03%	2.6
Cheung Ching	91	4.10%	4.4
Cheung Hong	63	2.84%	3.5
Shing Hong	71	3.20%	3.8
Tsing Yi South	116	5.23%	6.6
Cheung Hang	55	2.48%	2.7
Cheung Fat	72	3.25%	3.8
Cheung On	46	2.07%	2.4

Host analysis

- **Number of samples** : **404**

- **Gender** : **M:F= 201 : 203**

- **Age** : Range 3 yrs old to 102 yrs
  Standard deviation :28.53 yrs
  Mean age: **59.81 yrs**

- **Medical history (52%, n = 210)**
  - CVA = 60
  - Dementia = 25
  - DM = 24
  - HT = 19
  - Psychiatric = 8
  - Asthma = 8

Majority of the victims are elderly , half of them with pre-existing medical problem like CVA and Dementia

Falls in zone A (n=160)

No. of repeated episodes (n=99, 25%)
42 cases with repeated injury (38 cases lived in OAH)

25 cases with repeated injury for 2 x
14 cases with repeated injury for 3 x
2 cases with repeated injury for 4 x
1 case with repeated injury for 5 x

30 cases with **medical history** (neuro = 9, CVS = 6, CVA = 5)

No. of live alone = 3

*There were 42 cases identified with **repeated injuries**, they responsible for 99 episode, 25% of all the injury cases . Majority of the event **occurred in OAH***

Environmental analysis – RCHE

OAH	No. of case	Fell	Fell in toilet	Fell from Bed	Fell from Chair	Fell from wheelchair	Other Blunt force	Street	Restaurant	Cut	Collapsed	Unknown
OAH1	4	0	2	0	1	0	1	0	0	0	0	0
OAH2	1	1	0	0	0	0	0	0	0	0	0	0
OAH3	8	4	0	0	2	1	0	0	0	0	0	1
OAH4	1	1	0	0	0	0	0	0	0	0	0	0
OAH5	7	3	0	2	1	0	0	1	0	0	0	0
OAH6	12	4	2	3	0	0	2	0	0	0	0	1
OAH7	18	5	3	4	2	1	1	0	0	1	1	0
OAH8	5	3	0	0	0	0	1	1	0	0	0	0
OAH9	21	7	2	9	0	0	0	1	1	0	0	1
OAH10	6	2	3	0	0	0	0	0	0	0	0	1
OAH11	3	1	1	1	0	0	0	0	0	0	0	0
OAH12	1	0	0	1	0	0	0	0	0	0	0	0
OAH13	11	5	3	1	1	0	0	0	0	0	0	1
OAH14	53	23	4	9	1	2	5	3	0	1	2	3
OAH15	6	1	2	2	0	0	1	0	0	0	0	0
OAH16	13	5	5	1	1	0	0	0	0	0	1	0
Total	170	65	27	33	9	4	11	6	1	2	4	8

Present situation

- Elderly fall injury in OAH **(n=170)**

- Repeat elderly fall cases **(n=43, 99 episode)**

- Special measure/management to the toilets for elderly **(n=30, 27 in OAH)**

- Outdoor injury **: n=35** (exact location could not be identified at the moment)

- High risk group with special medical history like CVA, HT and dementia

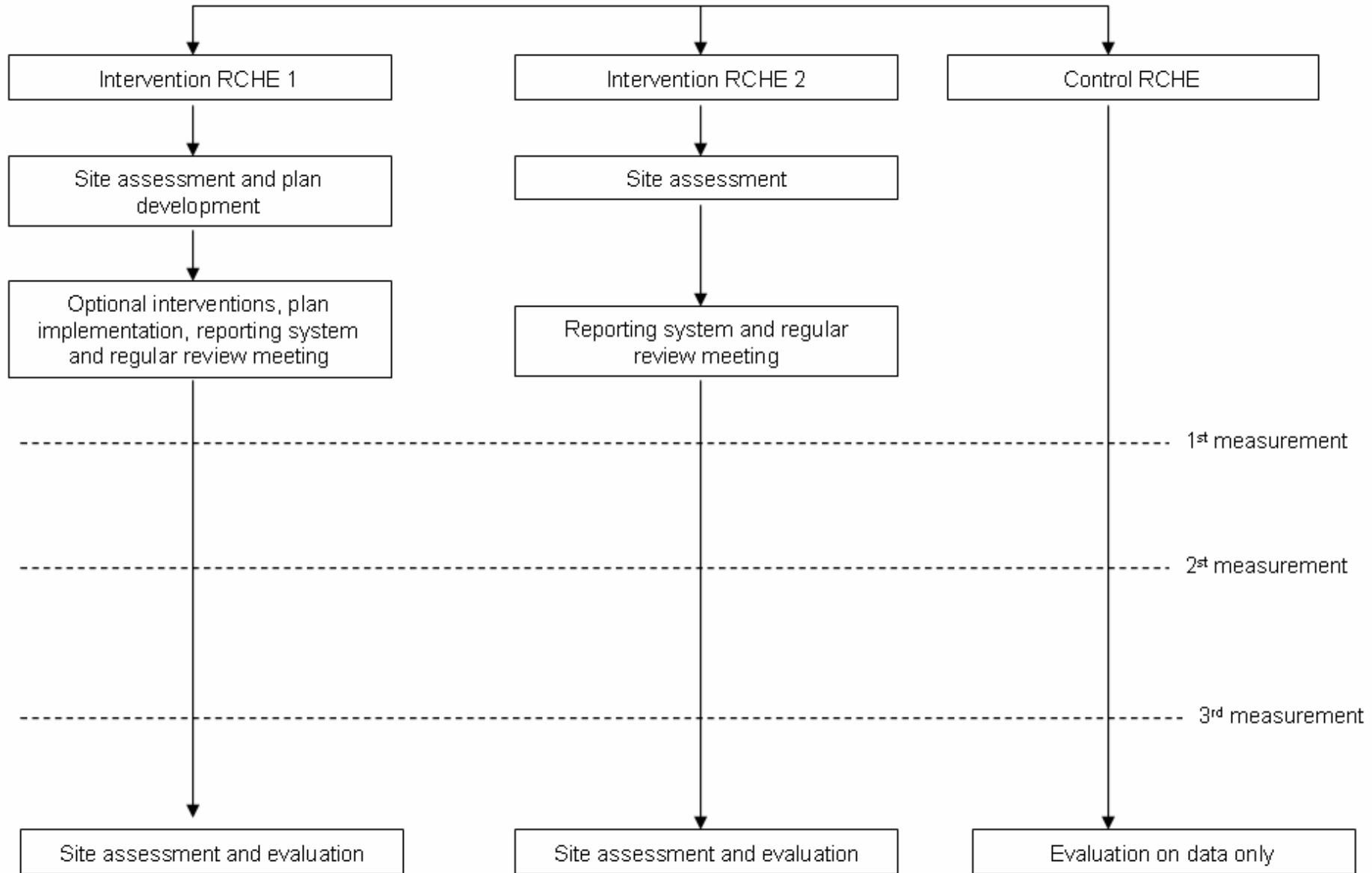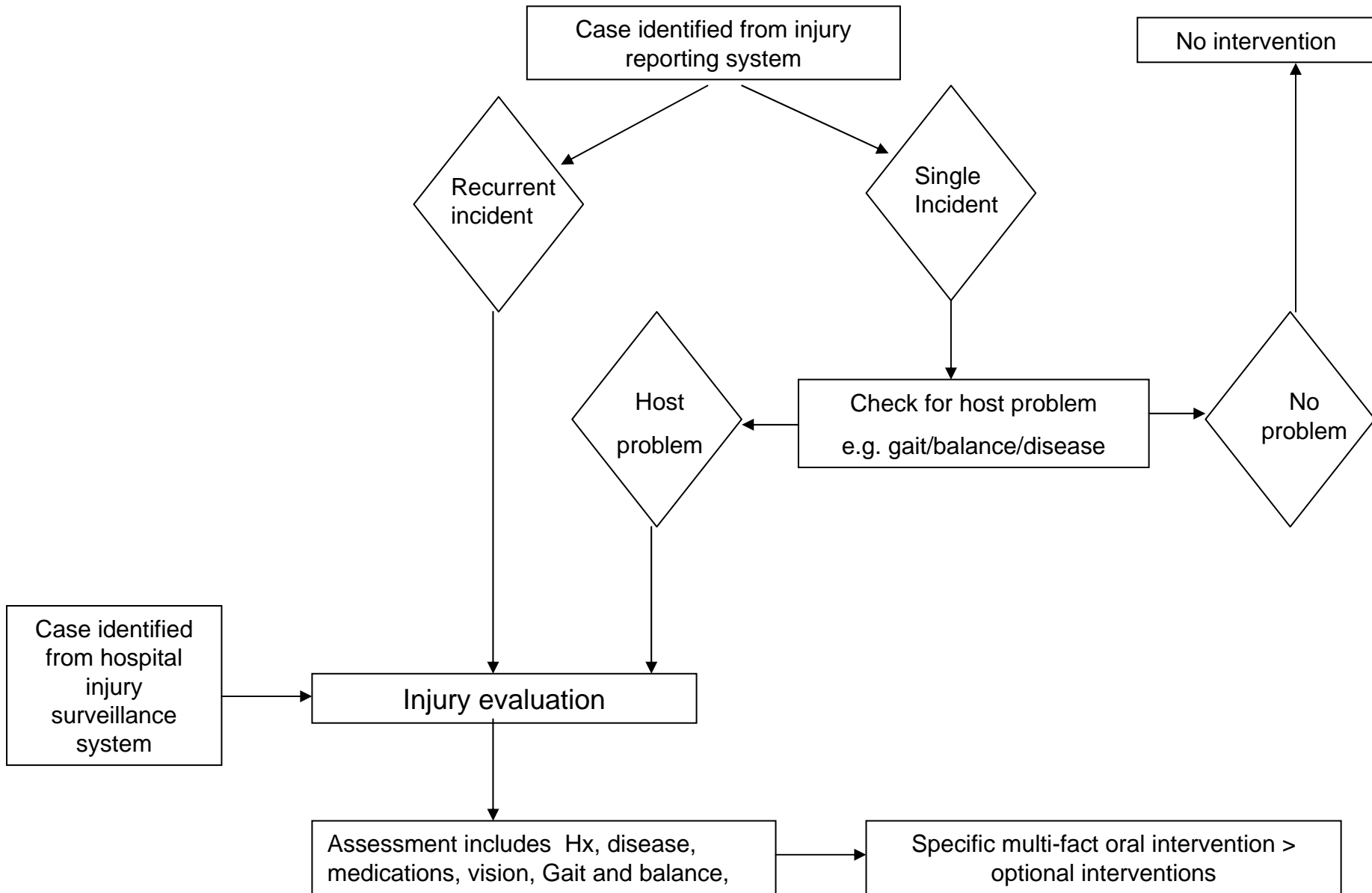# Established Local epidemiological model of RCHE injury

Host

Agent

Vector

Environment

WHO(2001)

Task 2:
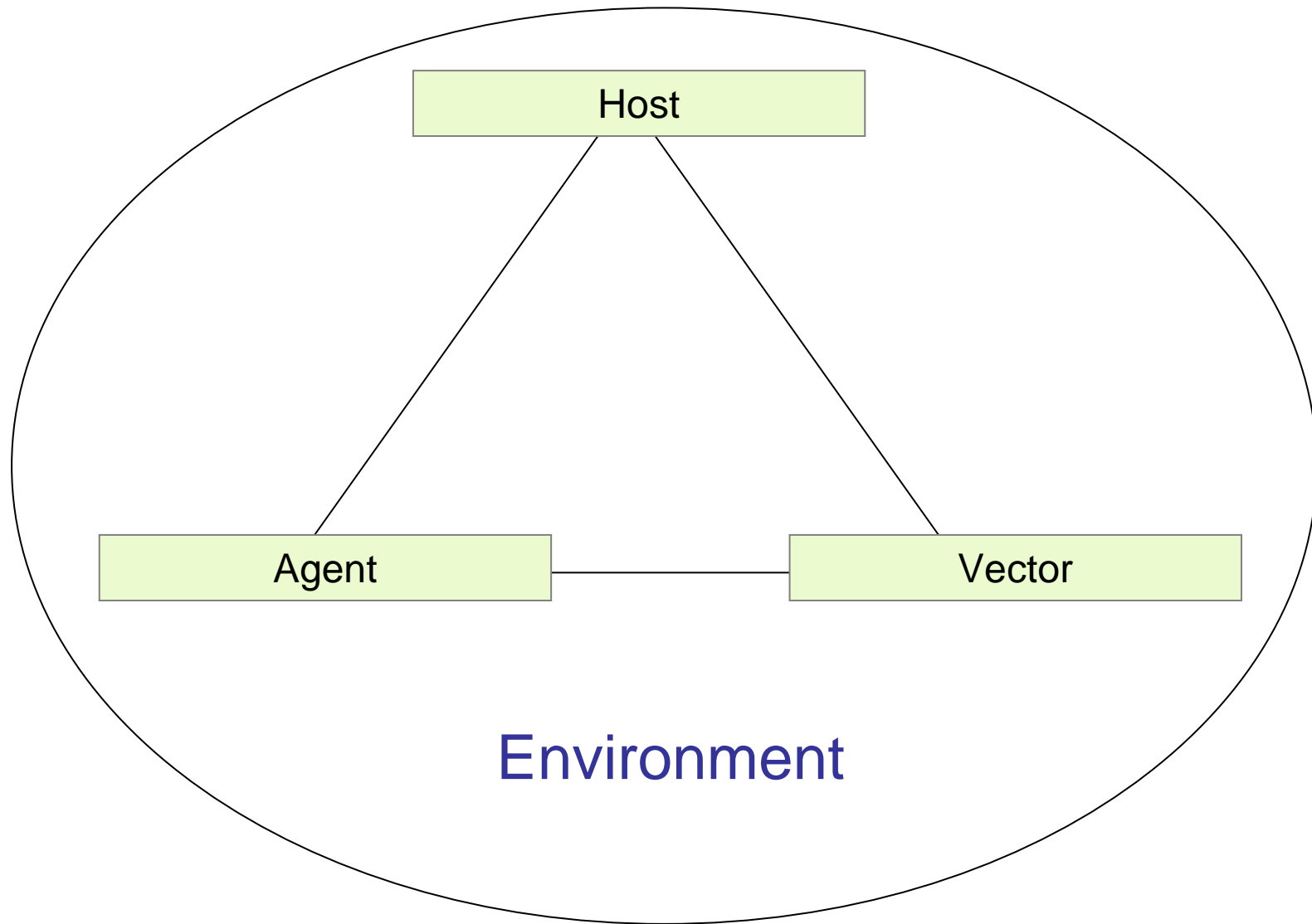
Develop and implement interventions for RCHE injuries

- To design and implement on-site assessment
  - Surveillance system guided
  - In-region & Out-region team survey
  - Haddon matrix check list

- To design intervention with reference to aggregated data from ED surveillance and on-site assessment
  - Literature review
  - Based on on-site assessment and sub project 1
  - Tailored recommendation

- To implement the intervention to the three intervention subjects (RCHE)
  - Four months counted from the start of intervention
  - 3 intervention options: Tailored intervention, Injury surveillance

Inclusion criteria: by case volume and number of residents

Intervention RCHE 1	Intervention RCHE 2	Control RCHE

| Site assessment and plan development | Site assessment | |

| Optional interventions, plan implementation, reporting system and regular review meeting | Reporting system and regular review meeting | |

- 1st measurement

- 2st measurement

- 3rd measurement

| Site assessment and evaluation | Site assessment and evaluation | Evaluation on data only |

Mx algorithm for identified cases

Multi-factorial intervention
To RCHE - 1

Multi-factorial intervention

Staff education

Environmental modification

Exercise

Supply and repair of aids

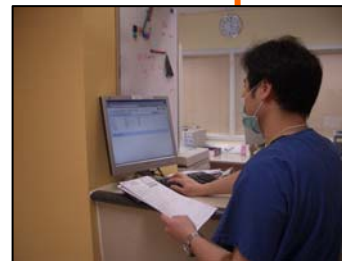Regular review meeting

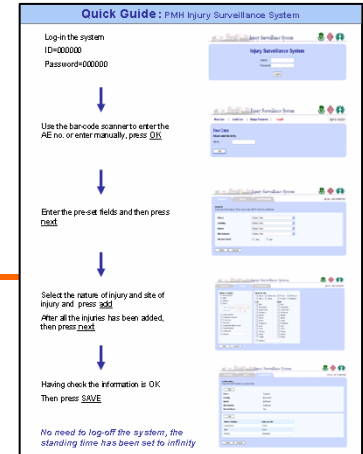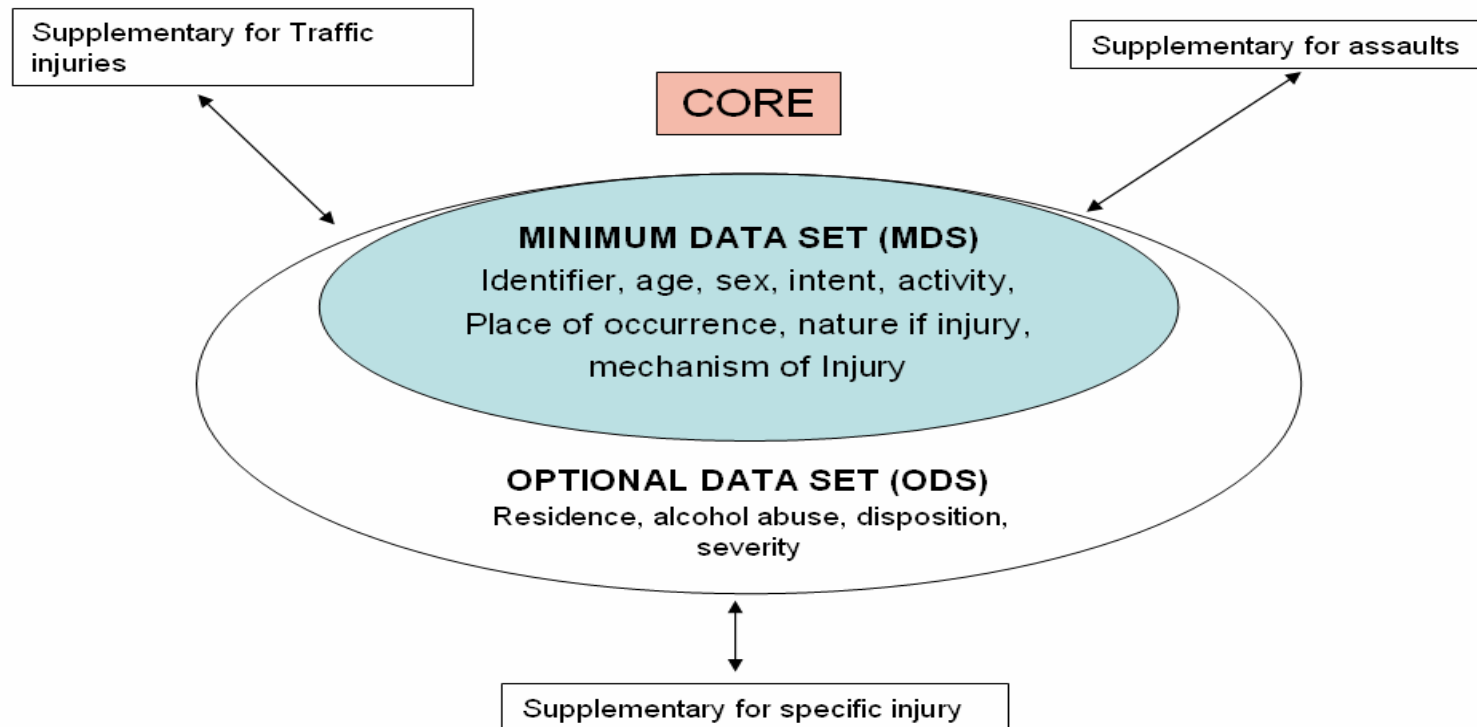Established injury reporting system

Referral

Establish Injury reporting system
To RCHE - 2

Develop a RCHE based survey system for OAH residential injuries

- To develop a OAH based information system in order to capture detailed information actively and monitor the trend continuously. (create a long term effect)

  - Local classification of injury data from the OAH

  - Work flow analysis of OAH

  - User interface design: simple, flexible, extensibility

  - Two level of training : data entry and report generating

  - Pilot

  - System refine

  - System evaluation

Minimum Data Set (MDS) - WHO

Supplementary for Traffic injuries

Supplementary for assaults

CORE

MINIMUM DATA SET (MDS)
Identifier, age, sex, intent, activity,
Place of occurrence, nature if injury,
mechanism of Injury

OPTIONAL DATA SET (ODS)
Residence, alcohol abuse, disposition,
severity

Supplementary for specific injury

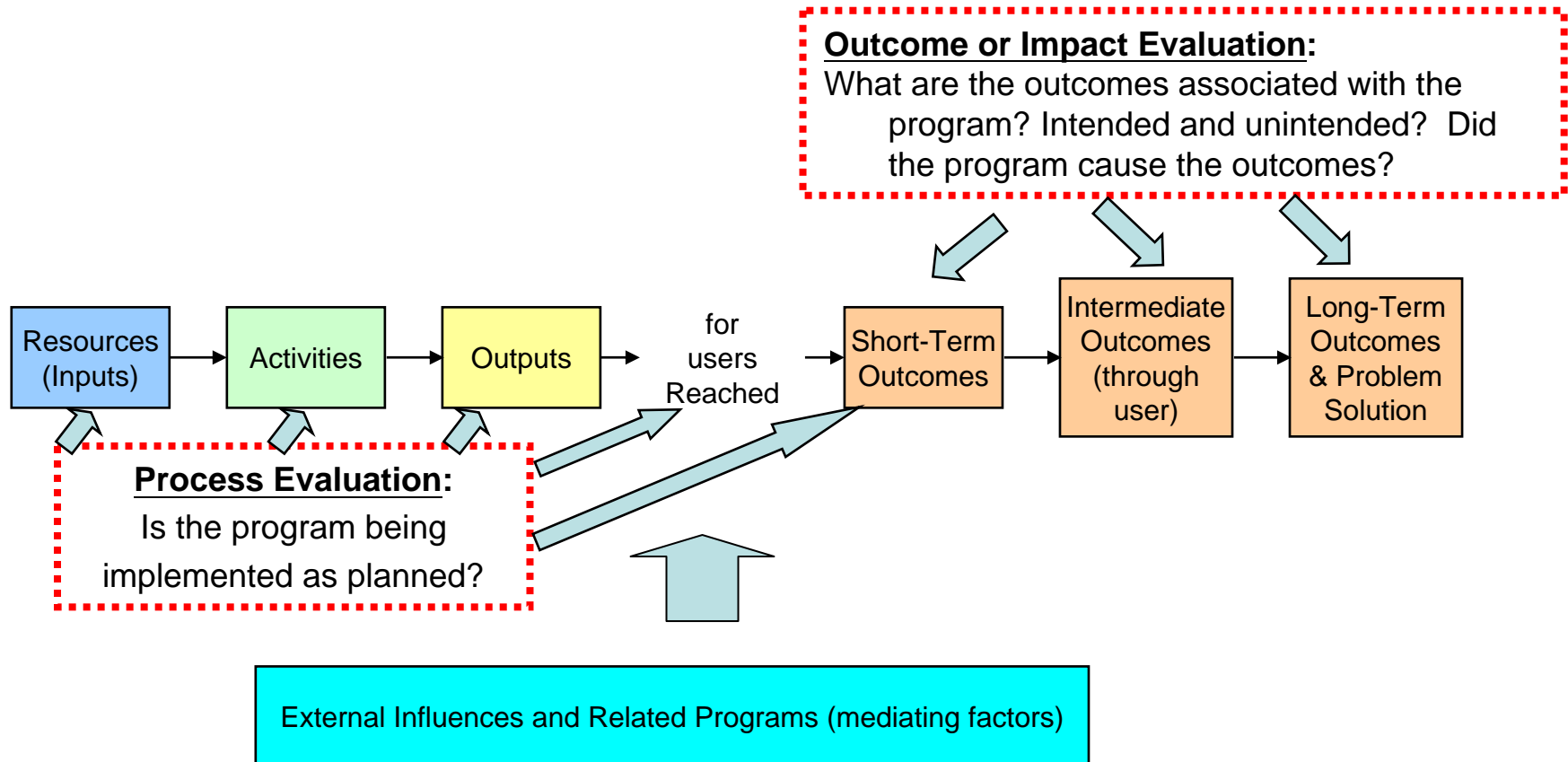Y holder (2001)

Impact study of injury prevention program via an emergency department injury surveillance system

- Outcome based of the program ; 32 weeks follow-up, 4 points of
  measurement
  - Outcome variables: number of residential injury event
    number of injury
    case with repeated injury

- Process based (Sixten Nolen & Kent Lindqvist, 2002)
  - Written material: surveillance report from OAH & review meeting: recommendation.
  - Data: classification by structure and process, classification of opinions expressed
  - Actors, categories of activities (planning & work), positive experience and detected problems

Generic Logic model

Outcome or Impact Evaluation:
What are the outcomes associated with the program? Intended and unintended? Did the program cause the outcomes?

Resources (Inputs) → Activities → Outputs → for users Reached → Short-Term Outcomes → Intermediate Outcomes (through user) → Long-Term Outcomes & Problem Solution

Process Evaluation:
Is the program being implemented as planned?

External Influences and Related Programs (mediating factors)

Sources: Gretchen B. Jordan, Sandia National Laboratories; and adapted from Wisconsin Extension Service website

Economic evaluation

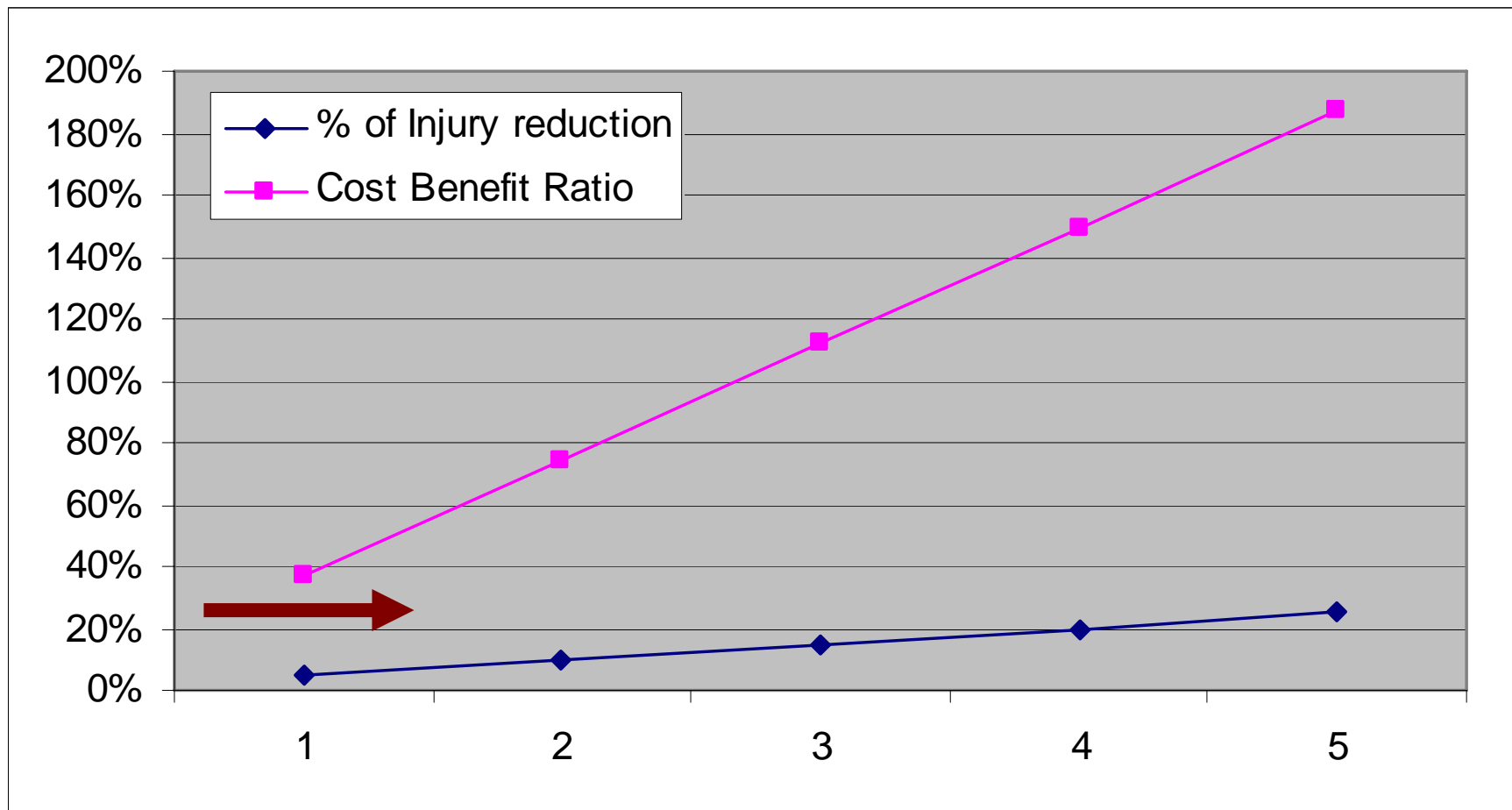|	RCHE-1	RCHE-2
Annual ED Cost	HK$ 40,250	HK$ 15,400
Hospital annual LOS Cost	HK$ 970900	HK$ 283100
Direct annual injury Cost	HK$ 1,011,150	HK$ 298,500
Injury cost per incident	HK$ 8792	HK$ 6784
Injury cost per day	HK$ 2770	HK$ 817

4% injury cost   **5% injury cost**

% of Injury reduction	5%	10%	15%	20%	25%
Cost Benefit Ratio	1.26	2.53	3.79	5.06	6.32
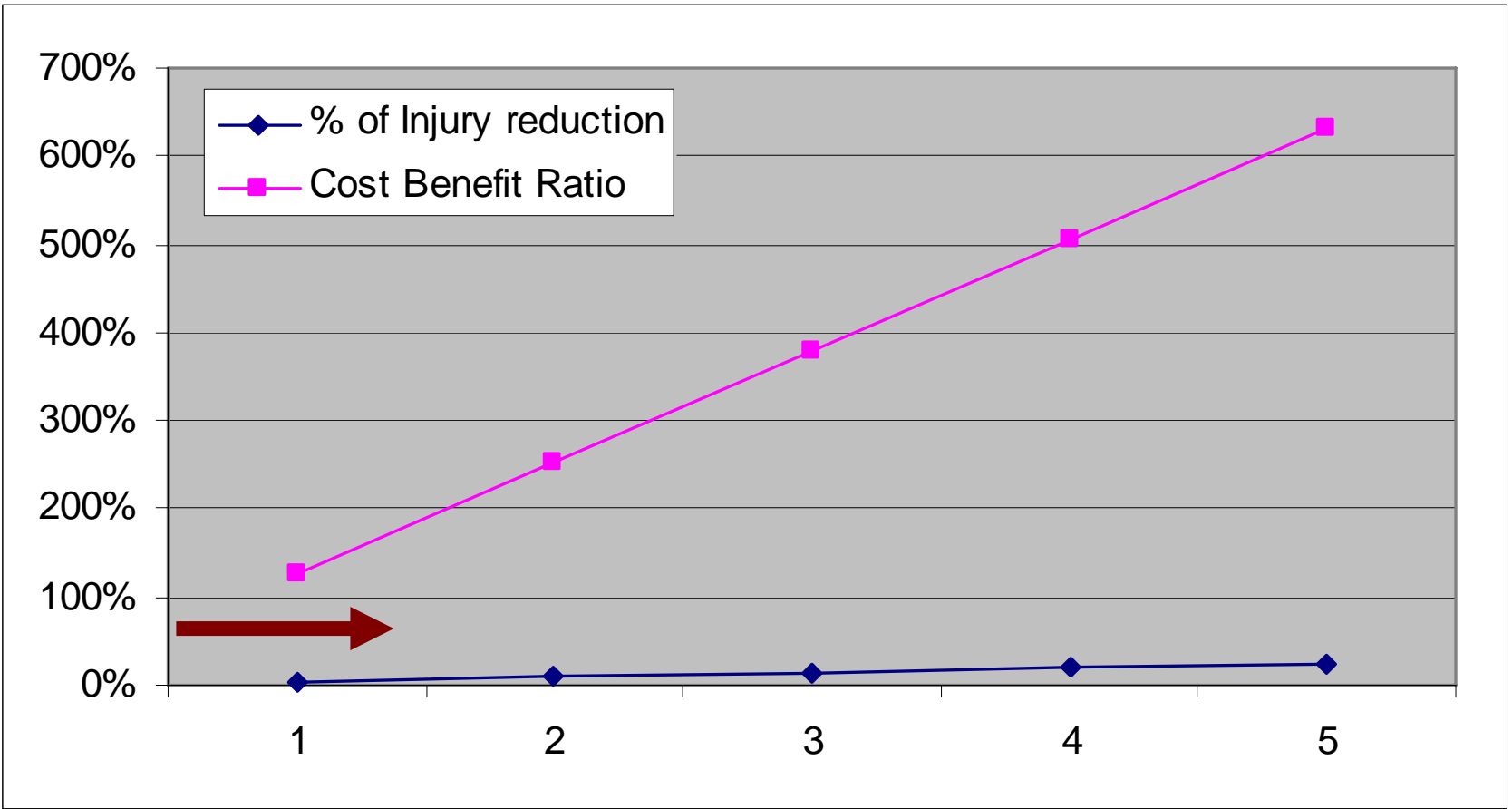
% of Injury reduction	5%	10%	15%	20%	25%
Cost Benefit Ratio	0.37	0.74	1.12	1.49	1.87

Proposed model

Stage 1

Surveillance system

set-up

Stage 2

Program development

Stage 3

sustainable effect

Program evaluation

System development

Hardware

Software

Program

Stakeholders recruitment

Injury prevention program

Cluster monitoring

Stake holder recruitment

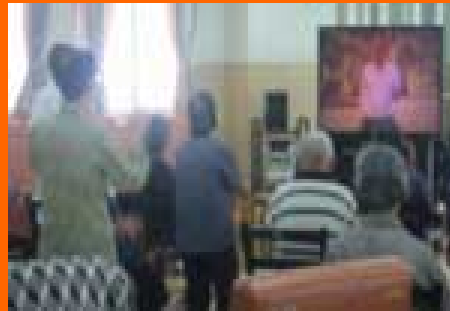Prevention program Evaluation

↓ Injury occurrence
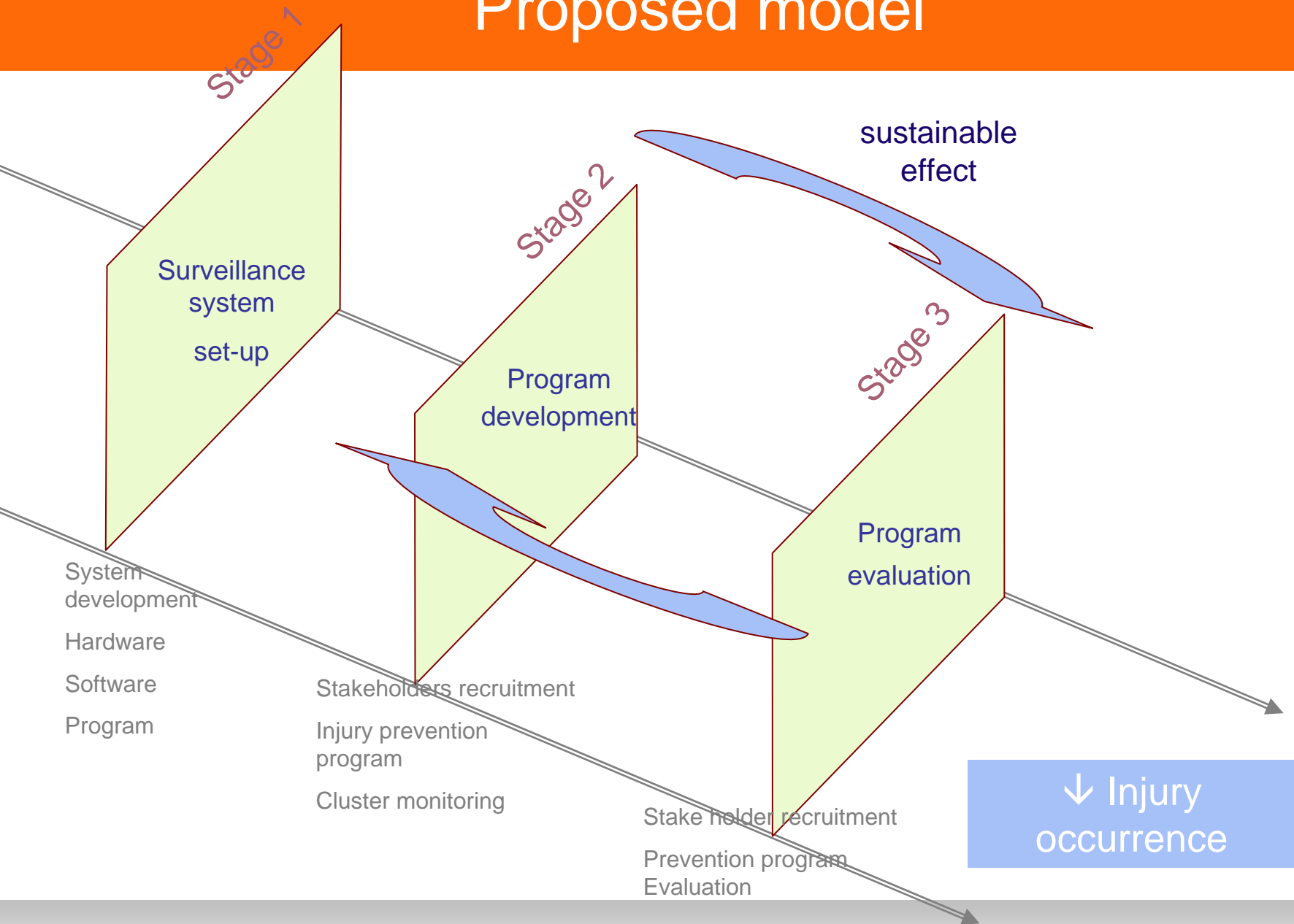
Anticipated benefits

Create surveillance-base injury prevention model for RCHE injury

Create an RCHE based injury surveillance system (network of surveillance among the OAH in the district)

Create a long lasting effect of intervention by a surveillance system

Identified a cost-effective way to reduce RCHE residential injury

Hospital related injury cost for this group will be reduced

Thank you