# Lessons from Itaewon Crowd Crush Disaster in Korea 1 year ago

Soon-Joo Wang Hallym University, Korea I. Understanding Itaewon Crowd Crush II. Lessons after Itaewon Crowd Crush

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*Website* => *https://crowdcrushcenter.blogspot.com* 



## **I. Understanding Itaewon Crowd Crush** What happened in Itaewon on 2022. 10. 29?

### Haloween Party in Itaewon, Seoul, 2022. 10. 29

### Death: 159 Injured: 196



Crowd Crush beside Hamilton Hotel



Pumpkin & High Heel

## **1. Crowd Gathering**

People gathered from the early afternoon.

Itaewon area is crowded by Halloween Festival participants.



### 2. Crowd Packing Understanding of Disaster Environment - Place

T shaped Alleyway was the Key place.



### Post Event Analysis : 1<sup>st</sup> On-site research



Street with Key Spot of Crowd Crush

Joint Incense Burner in Subway Station

2023.1.7 1<sup>st</sup> on-site Examination

### **Convergence vs Counterflow**



(1) Convergence of Crowd Flow

### (2) Counter-Flow : Collision of Flow

### **Example of Crowd Wave**

02/07/05 09:05:21 PM M4 C34

## 3. Crowd Crush – Early Stage

People gathered from the 3 direction.

Increased crowd density, but no on-site control



### 3. Crowd Crush – Aggravation **Crowd Wave, Crowd Collpase**

Crush & crowd collapse occurred

Singapore time)

Asphyxia & trauma occurred



### 3. Crowd Crush – Deterioration Start of Rescue, Victims Increased

Rescue efforts, difficulties of access

Delayed crowd control by police => worsens crowd density



### 4. Emergency Care Multiple CPRs by EMTs, Police, Citizins

Multiple CPRs by citizens, EMTs

Delayed multiple CPRs after golden time



### **Spot of Pt. Occurrence, Rescue, CPR**

Many who died were trapped in a crowd crush in the alley next to the Hamilton Hotel.

Locations where videos show crowding

Seoul

Itaewon

ITAEWON-RO 27GA-GIL

Areas where videos show CPR being administered to victims

> Ambulances lined up along this street

Washington Post, 2022.10.30

Hamilton Hotel

ITAEWON-RO

BOGNIANG-RO

Itaewon Station

**200 FEET** 

15

### **5. Delayed Rescue & Deaths**

Multiple CPRs by police

Dead bodies in the street



## Serial Photo F/U at Itaewon

29<sup>th</sup>, 6pm : No. of Crowd Increased



29<sup>th</sup>, 11pm : Crowd Crush & Collapse=> Rescue Start



29th, 10pm : Crowd Packing, closer to Threshold



30<sup>th</sup>, 1am : Citizen & Prehospital Personnel CPR



• Reference : Munwhailbo Newspaper, Korea

### 6. Transport

Delayed transport, mostly dead patients



A period of national mourning is declared. Mr Yoon says Saturday's "tragedy and disaster should never have happened".



# **II. Lessons after Itaewon Crowd Crush**



### 1. Lesson after Itaewon Crowd Crush

- Crowd Management
  - Pre-positioning site administrators
  - Early Crowd Control by Police
  - Crowd management Planning before Event
  - Crowd management Education & Training

#### **Drill for Crowd Disaster : Seoul Police (2023.4.6)** Medical Response • 4 Stages of Crowd Crush Response Sharing Risk Information Sharing Field Information ○(1<sup>st</sup> Stage) Crowd Packing : 6/m<sup>2</sup> – Start Prepare onsite Medical Post of Danger DMAT Dispatch (Standby) Prepare hospital • (2<sup>nd</sup> Stage) Crowd Floating : 8/m<sup>2</sup> – Setting up onsite Medical **Increase of Danger** Post **DMAT Field Activities** • (3<sup>rd</sup> Stage) Crowd Crush : Accident **Special DMAT Onsite Medical Post Activate** Occur **Initiate Transport** • (4<sup>th</sup> Stage) Crowd Collapse : Accident **Expanding DMAT Activities** Medical Post Activities Spread **Expand Transport**

**Dead Body Management** 

### Drill for Crowd Disaster : Seoul Police (2023.4.6)



## Drill for Crowd Disaster : Seoul Police (2023.4.6)



#### 한림대학교 왕순주

- - \* Crowd Packing resolved
  - Crowd Control
  - One Way (Traffic Control)
  - Support Pt. Transport

### 2. Lesson after Itaewon Crowd Crush

### OPrevention of Crowd Crush

- Temporary bypass of subway stop (Itaewon Station)
- CCTV + AI Monitoring
- Transportation Control (Prevent Input)
- Prevent illegal construction. (Prevent bottle-neck phenomenon)

### **Subway : Bypass Itaewon Station?**

Number of people getting on and off at Itaewon Subway Station on Halloween Saturday by year







### Post Event Analysis : 2<sup>nd</sup> On-site research



2023.3.25 2<sup>nd</sup> on-site Examination

### **Bottleneck & Illegal Construction**







### 3. Lesson after Itaewon Crowd Crush

### • Prediction of the Event

- Prediction of Large Crowd Gathering
- ⊙ 1<sup>st</sup> Festival after COVID-19
- ⊙SNS + AI
- Monitoring of Regional Foot Traffic(Geo-population) by Cellular phone comm. Monitoring, Credit Card Usage Monitoring etc.

### Yearly Mass Crowding/Crowd Density

![](_page_28_Figure_1.jpeg)

• Reference : KBS

### 4. Lesson after Itaewon Crowd Crush

- Very Short Golden Time
  - Cause of Death : Asphyxia, Trauma
- Access to Victims : Very Difficult
  - => Delayed Rescue => Delayed Triage => Delayed CPR/Em. Care
  - Early Access to the Patients is the Key!!
  - Early Access can be accomplished by Crowd Mx., Prevention, Prediction.
- Importance of Countermeasures
  - Prevention/Crowd Control > Early Rescue > Early Em. Care

## **2 Initial Access Viewpoints on Crowd crush**

# **Chain of Survival for Adult OHCA 2020**

![](_page_30_Picture_2.jpeg)

- Early Access Viewpoint : Early Access is Critical, but Delayed Golden Time for Emergency Tx.
- High Quality CPR Viewpoint : Cause of Death for Crowd crush is Asphyxia. High ROSC is expected by Adequate CPR in Asphyxia related Arrest.

• Difficulties/Delay of Access to the Patients

Elapsed Time according to the Transport Stage

![](_page_31_Figure_2.jpeg)

### 5. Lesson after Itaewon Crowd Crush

### • Problems of Patients Transport

- Severe Pt. & Dead Pt. transported to the big & nearest hospitals [Geographic Effect!!]
- Mild cases transport should be distributed.
- ⊙Some dead Pt. were transported to the big & nearest hospitals first, and then transported again to Mortuary.

### **Patients Transport Analysis(1)**

### • Triage

![](_page_33_Figure_2.jpeg)

Death

- Cardiac arrest
- Urgent
- Emergent
- Non-emergent

![](_page_34_Figure_0.jpeg)

### **Patients Transport Analysis (3)**

• Transport Distance based on Severity

![](_page_35_Figure_2.jpeg)

### **Various Academic Approach to Crowd Crush**

![](_page_36_Figure_1.jpeg)

# Thank You!!

![](_page_37_Picture_1.jpeg)

![](_page_37_Picture_2.jpeg)

Life

Safety

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