

Medical and Public Health Needs in Disaster

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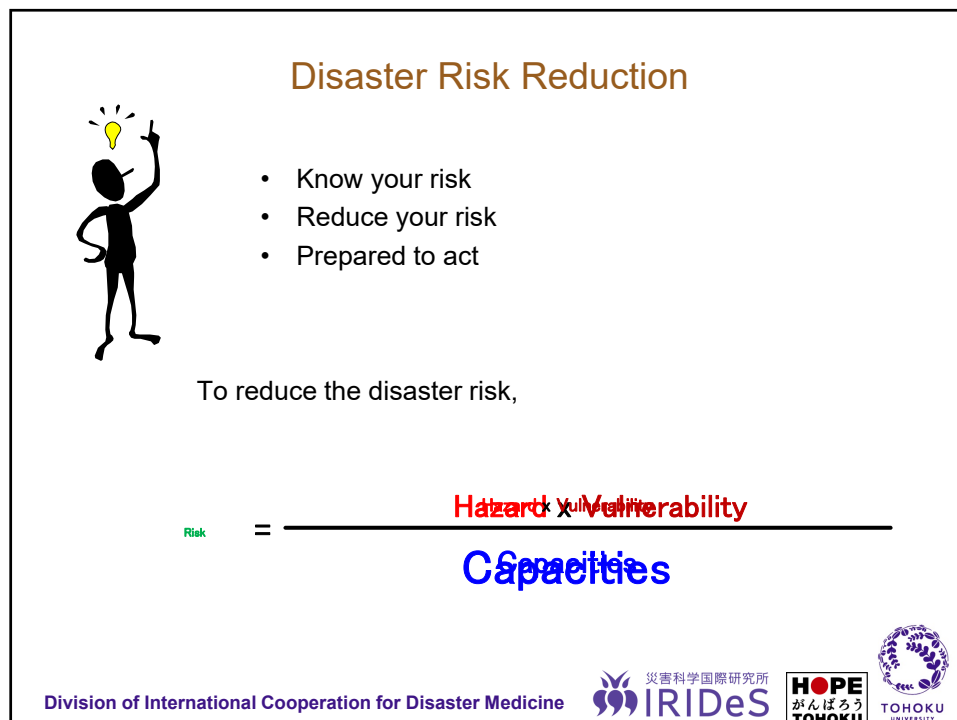
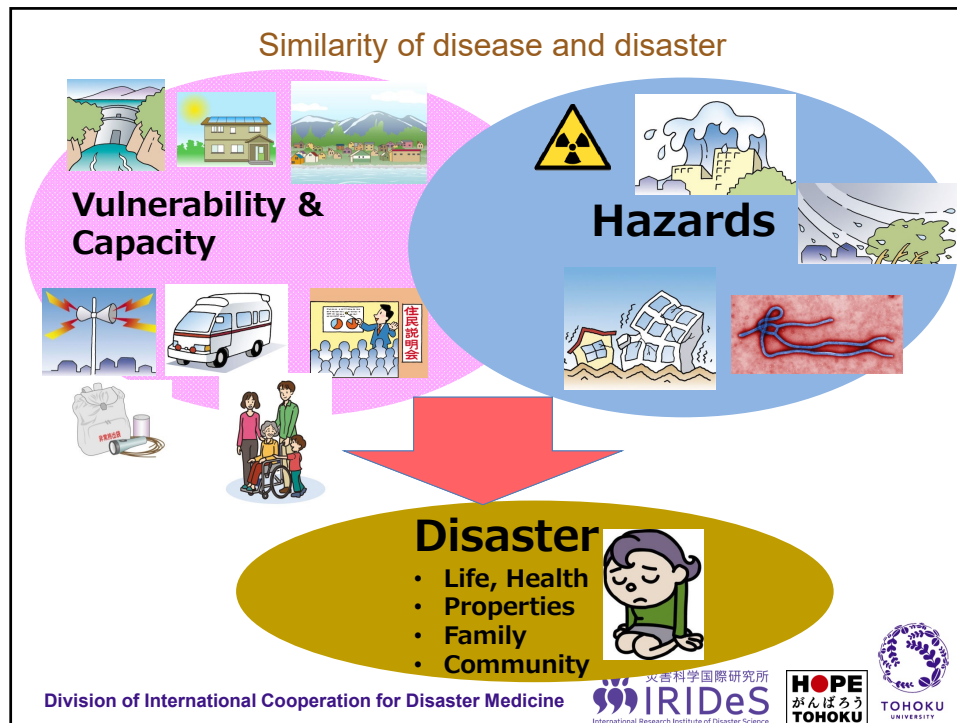
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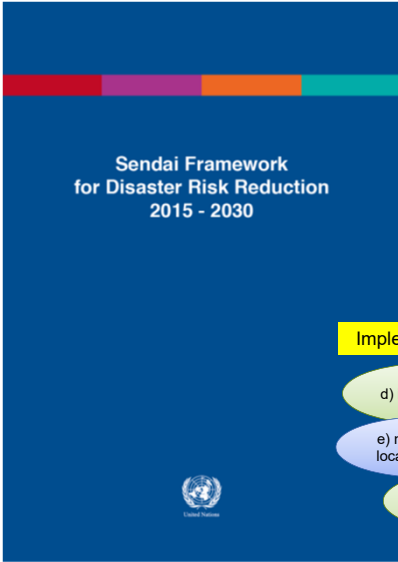
Agenda

1. Health in Sendai Framework.
2. Change of Health Risks in disaster.
3. Simulation analysis





Sendai Framework



**Sendai Framework
for Disaster Risk Reduction
2015 - 2030**

Four Priorities

Priority 1: Understanding Disaster Risk
 Priority 2: Disaster Risk Governance
 Priority 3: Investment in Disaster Risk Reduction
 Priority 4: Enhance preparedness for effective response and “Build Back Better” in recovery, rehabilitation and reconstruction

Seven Global Targets

Implementations

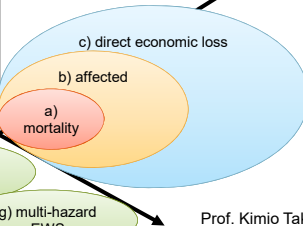
d) infrastructure

e) national and local strategies

f) International cooperation




g) multi-hazard EWS

Outcomes

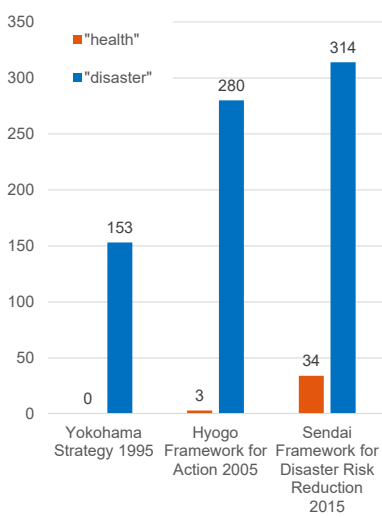


Prof. Kimio Takeya
JICA and TU

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Health in DRR framework






Framework	"health"	"disaster"
Yokohama Strategy 1995	0	153
Hyogo Framework for Action 2005	3	280
Sendai Framework for Disaster Risk Reduction 2015	34	314

Sendai Framework described for the first time,

To reduce “disasters losses with a significant economic, social, **health**, cultural and environmental impact”

Why?

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Bangkok Principles



1. Health to DRR, DRR to health.
2. Cooperation between health and other stakeholders for DRR
3. Stimulate people-centered investment in DRR including health
4. Integrate DRR into health education and training, health into DRR.
5. Disaster data and health data into risk assessment.
6. Advocacy and support by science, information and technology
7. National policies and strategies for DRR and health

http://www.preventionweb.net/files/47606_bangkokprinciplesfortheimplementati.pdf

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Know your risk

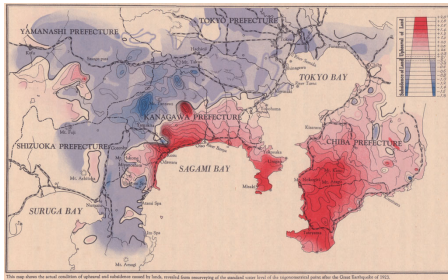
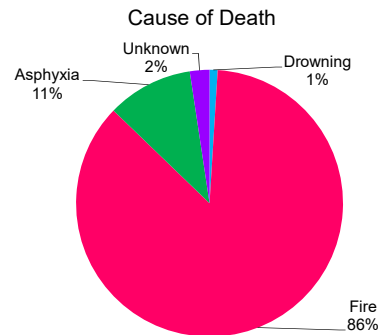
Change of Health Risks in disaster



1923 Great Kanto Earthquake



September 1, 1923
11:58:32
M7.9



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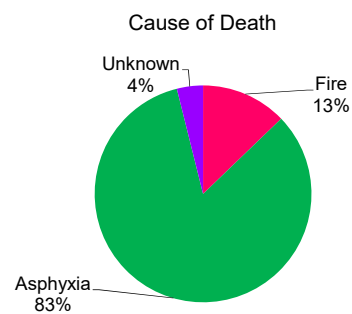
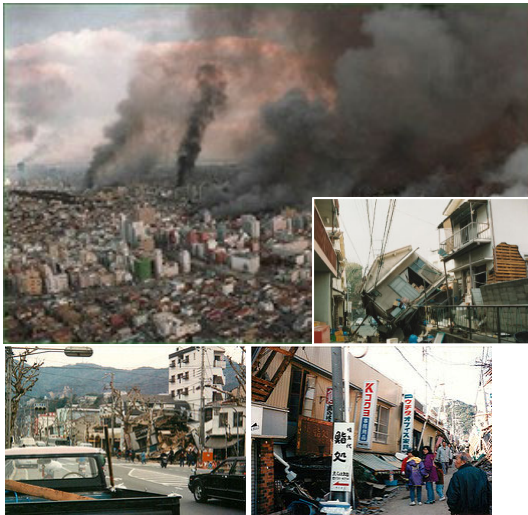
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The buildings should be fire-resistant
Every Sept. 1 is the Disaster Drill Day

1995 Great Hanshin Awaji Earthquake

January 17, 1995
05:46
M7.3



The buildings should be quake-proof
Japanese Association for Disaster
Medicine was established

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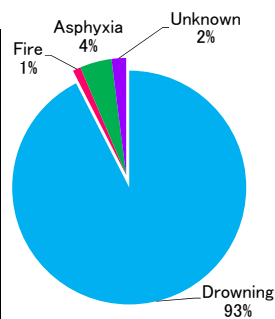
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2011 Great East Japan Earthquake

Mar. 11, 2011, 14:46 M9.0



2011 White pages,
Japan Gov.

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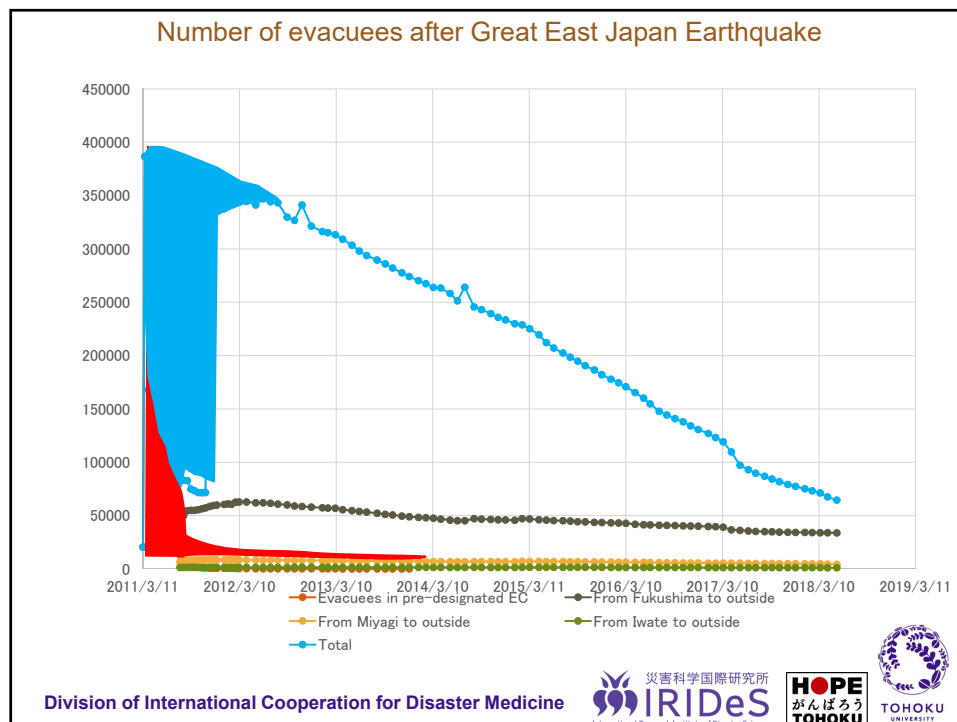
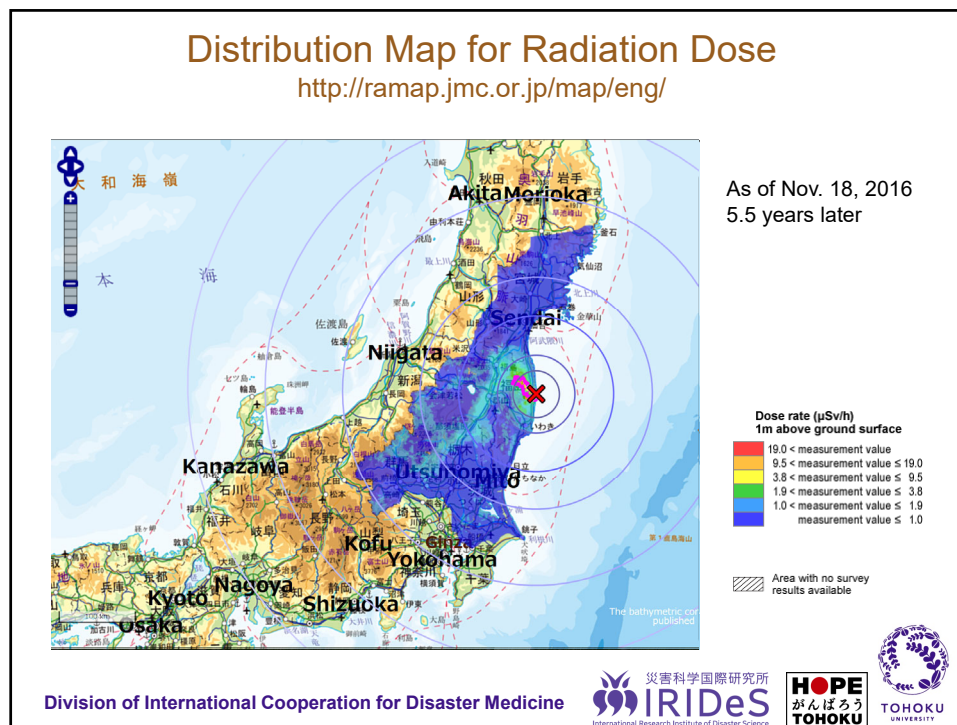
Change of health risks in Great East Japan Earthquake

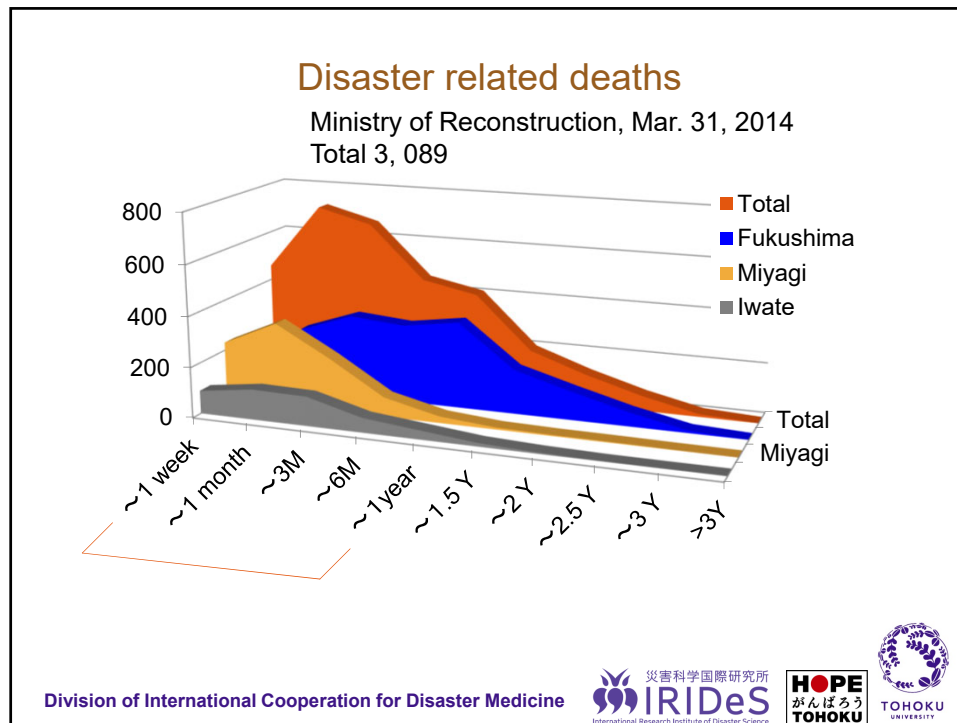
	Injured	Dead and lost	Displaced
Hanshin-Awaji Earthquake 1995	43,800	6,433	307,200
Great East Japan Earthquake 2011	5,942 ↓	19,582 ↑	488,000

- Less injuries, but different medical needs lasted longer
- Disruption of traffic and communication made health sector paralyzed
- Complicated radiological disaster
- Mental health of affected people was devastated
- Health facilities were also destroyed by disaster
- Education of disaster medicine was not generalized in health professionals

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What irradiation exposure will not cause

1. Immediate death
 - One engineer died of acute radiation injury 66.5 h later in 1997 Russian Salov criticality accident
2. Immediate burn and physical injury
 - Think of heat material or casualty
 - Decontamination sometimes cause skin inflammation
3. Harmful irradiation of care giver
 - Less than 1 mSv even the patient had 26,000 cpm contamination in the upper body



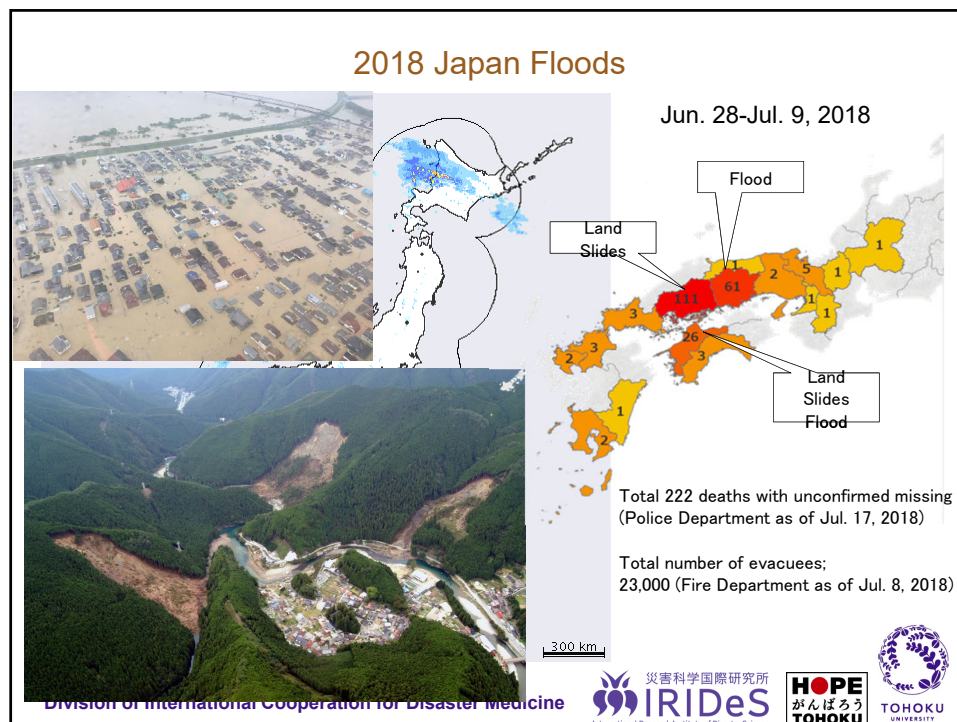
Acute radiation injury occurs when more than 1000 mSv effective dose was irradiated in a short time.

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Reduce your risk

Capacity building of disaster medicine
in Japan

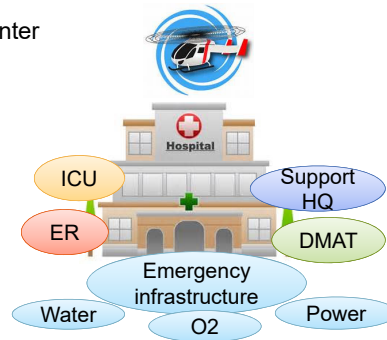
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Disaster Base Hospital

- 725 DBHs in Japan
 - 1 National Disaster Medical Center
 - 788 DMAT providing DBH
 - 271 Emergency Center
 - 54 Radiological DBH



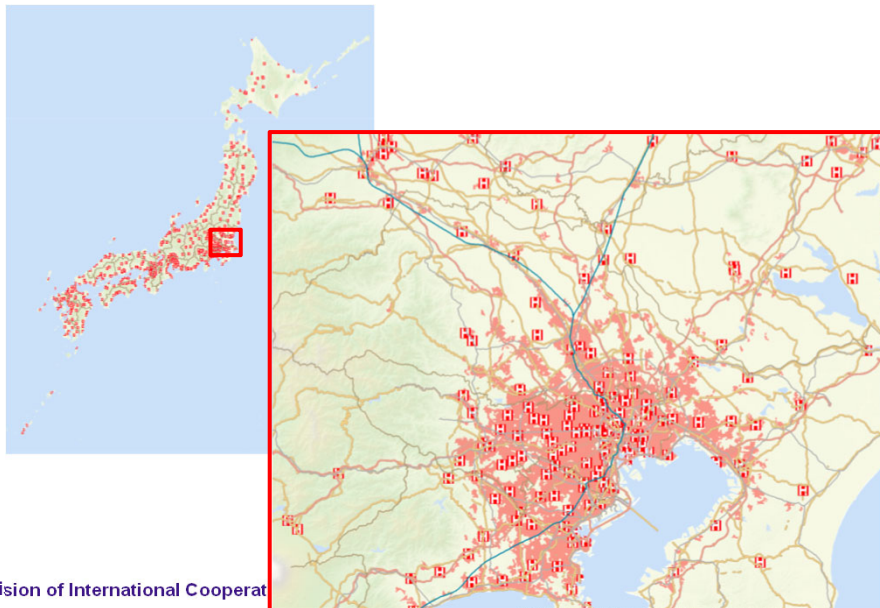
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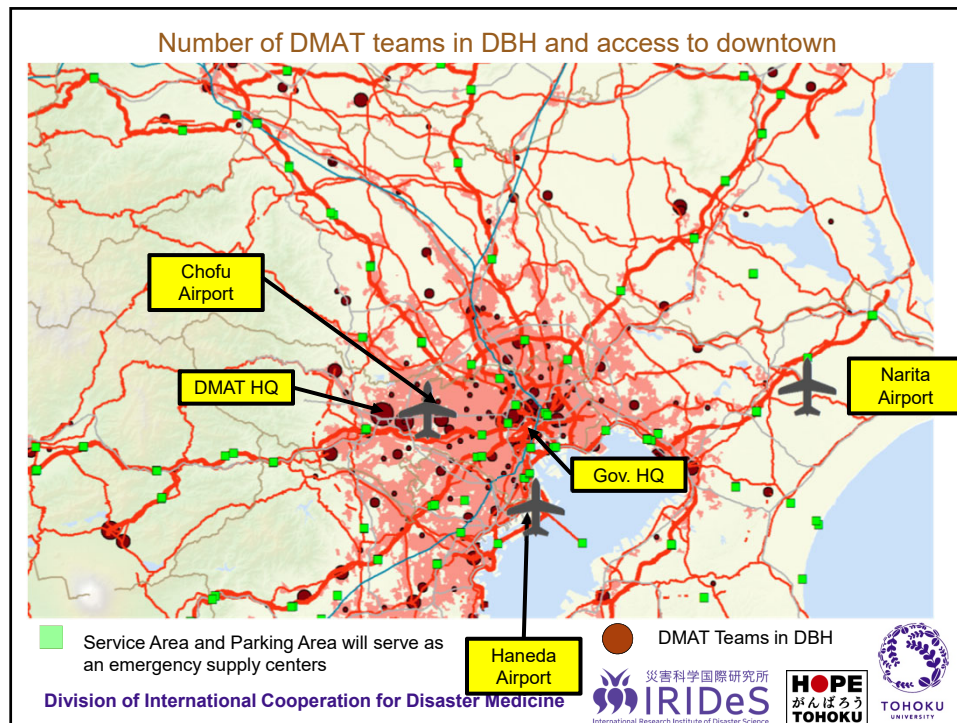
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Disaster Base Hospitals in Japan

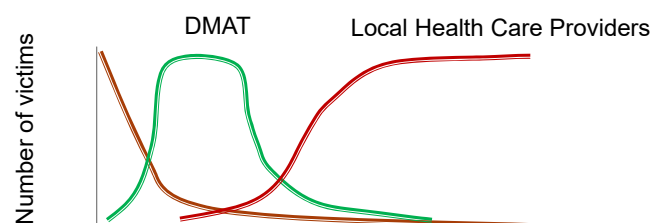


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Disaster Medical Assistant Team (DMAT)

- More than 1000 teams were trained in Japan after Hanshin Awaji Earthquake
- Arrives in the affected area within 24 hours and save the lives from preventable death until 72 hours when the local health care recovers.
- Consists of a medical doctor, a nurse, a pharmacist and a logistician with self-standing materials and vehicle.
- Specific training for confined space medicine and wide area transportation.

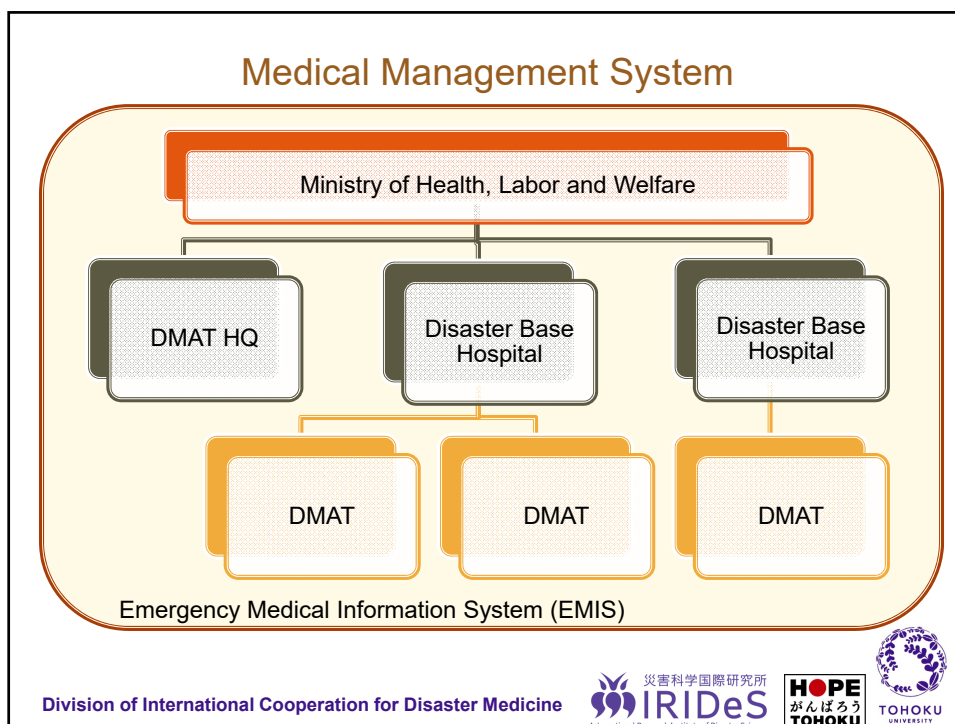


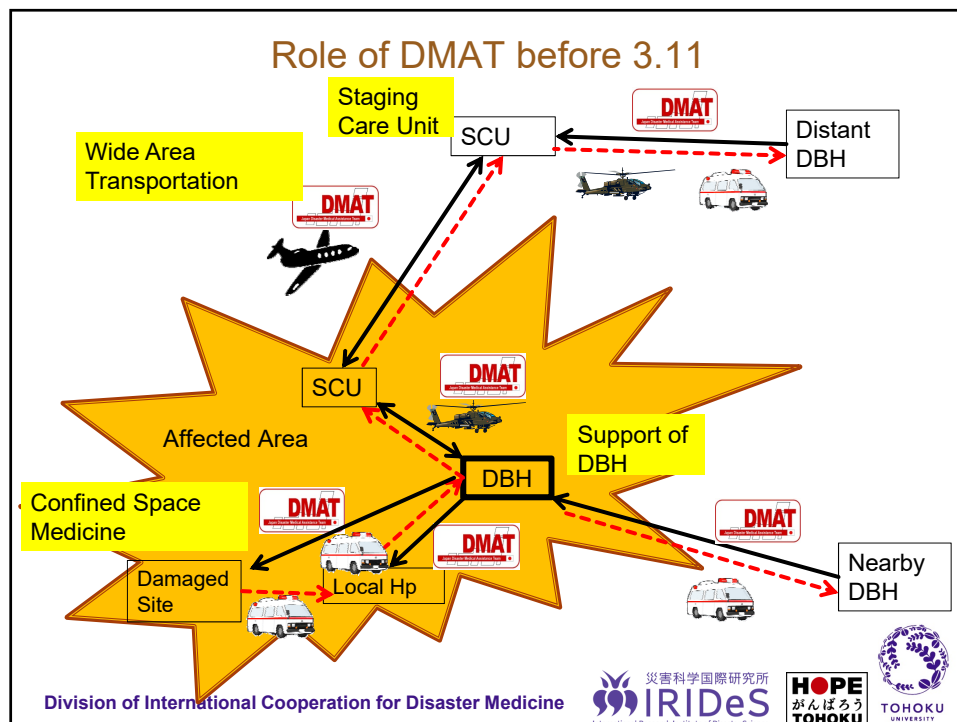
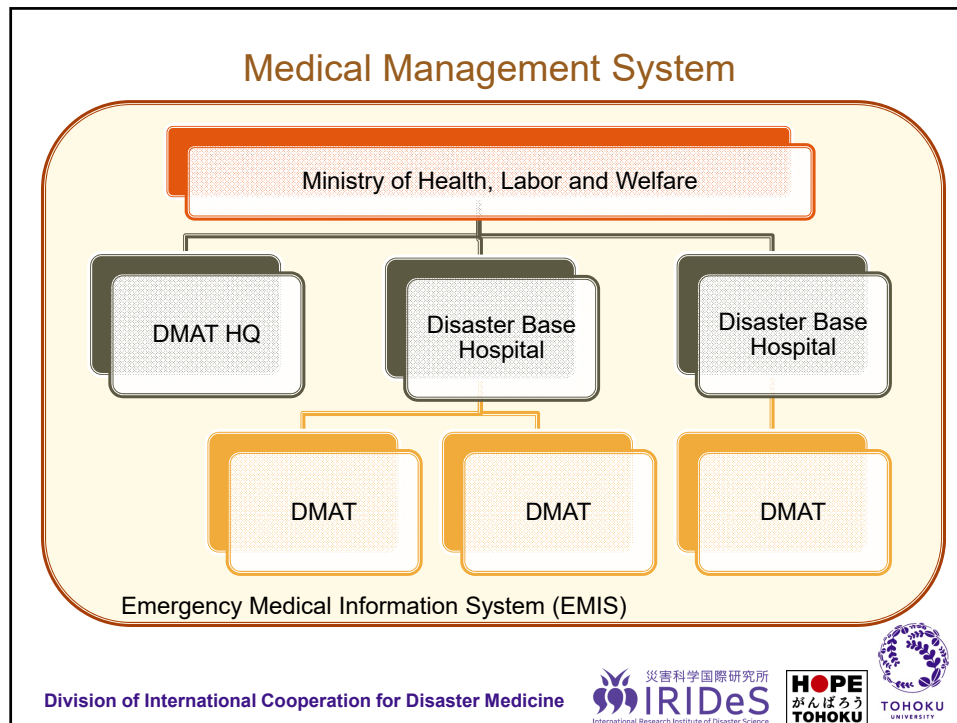
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Aircrafts for Wide Area Transportation



C1 (Self Defense Force)



C130 (Self Defense Force)



CH-47 (Self Defense Force)

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Capacities

8 Patients with stretchers in C1 and C130

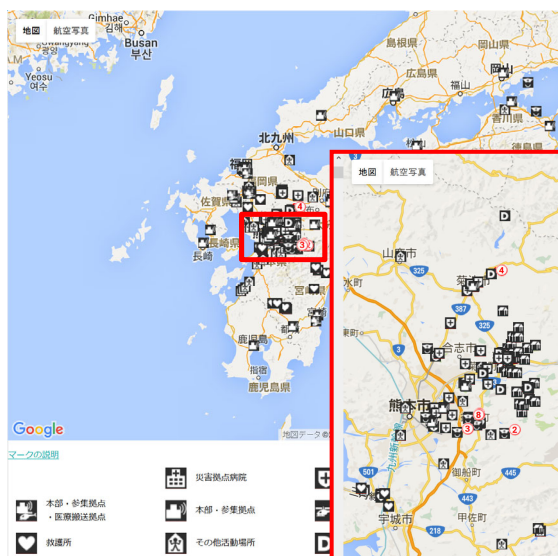
4 Patients with stretchers in CH-47

SCU triages

Multiple injuries, Head injury, Crash syndromes and
Severe burns that require intensive care in Life saving
emergency center outside the affected area.



EMIS Emergency Medical Information System

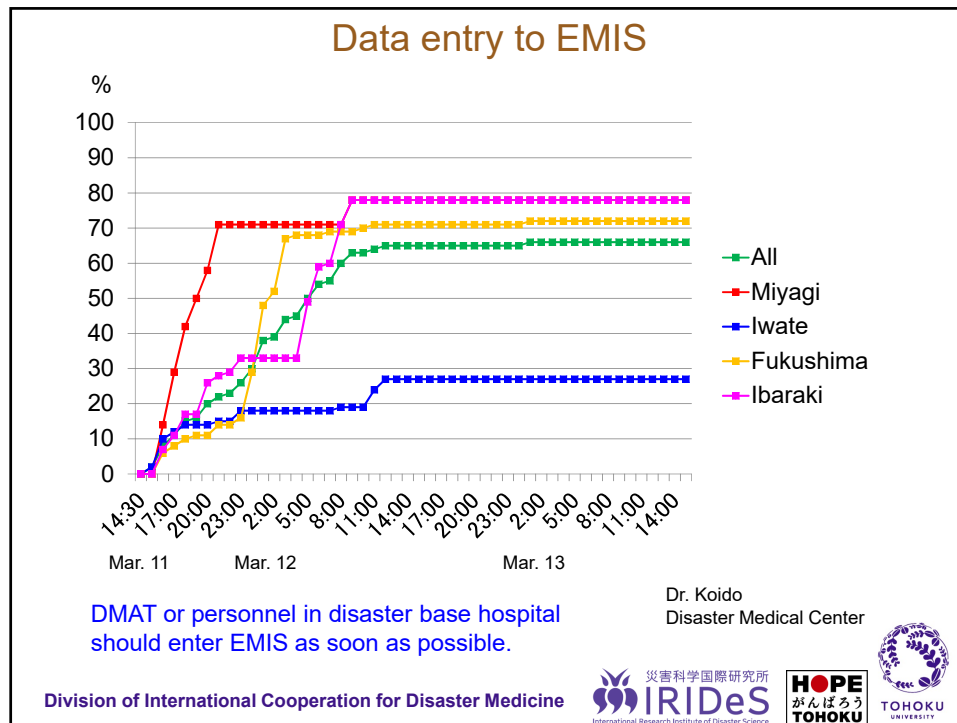





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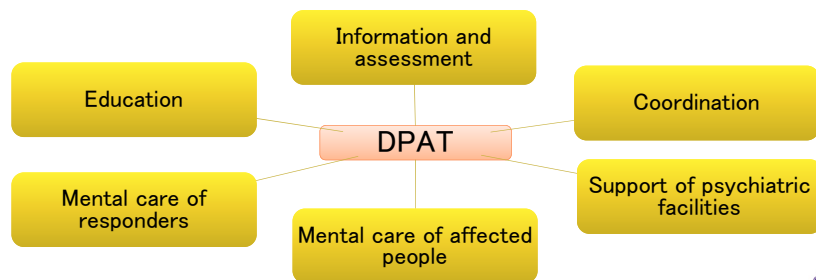
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- ### Further improvement after GEJE
1. Increased assignment of disaster medical and public health coordinator
 2. Specialized teams to assist mental health, reproductive health, rehabilitation, public health and oral health
 1. DPAT (Disaster Psychiatry Assistance Team)
 2. Mental Care Team
 3. ALSO (Advanced Life Support in Obstetrics)
 4. DHEAT (Disaster Health Emergency Assistance Team)
 5. JRAT (Japan Rehabilitation Assistance Team)
 6. Disaster oral care coordinator
 3. Improved management of evacuation center and welfare evacuation center
 4. Collaboration with other sectors.
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Disaster Psychiatric Assistance Team (DPAT)

- Multidisciplinary team managed by prefectures and Ministry of Health
- Main psychiatry hospitals has DPAT
- Composed of a psychiatrist, a nurse and a logistician
- Equipped with self standing materials and vehicles.
- Coordinates with DMAT
- Disaster Mental Health Information Support System (DMHISS)



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Japan Rehabilitation Assistance Team (JRAT)



Kumamoto Earthquake
Apr. 14, 2016, M7.3
Dead 50, Related Death 76
Related Death by Rainfall 5
Injured 2,337 as of Sep 30, 2016
Japan Police

JRAT JAPAN DISASTER
REHABILITATION
Assistance Team



JRAT Kumamoto Earthquake Report 2017



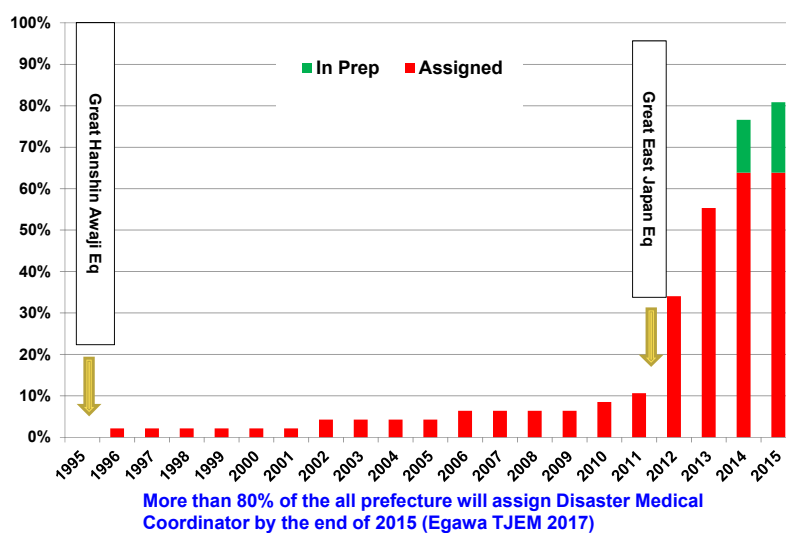
Disaster Medical Coordinator

- First established in Hyogo in 1997
- Four out of 47 prefectures (10.6%) had designated medical coordinators before GEJE.
- Miyagi prefecture assigned 6 coordinators, but Iwate and Fukushima did not.



Implementation of Disaster Medical Coordinator in Japan

As of Aug. 2015

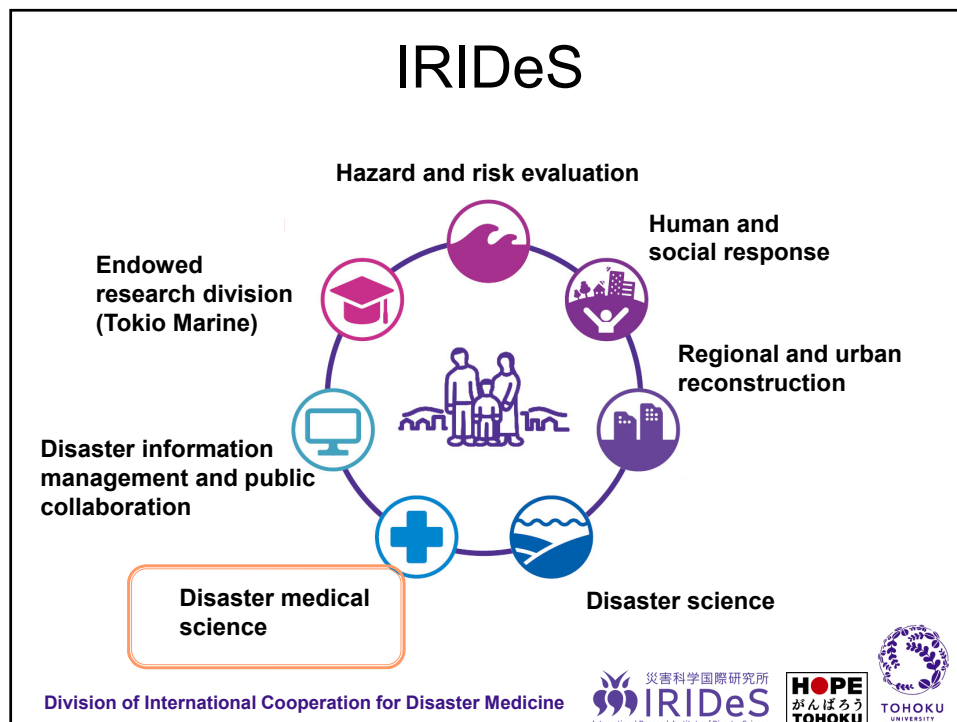
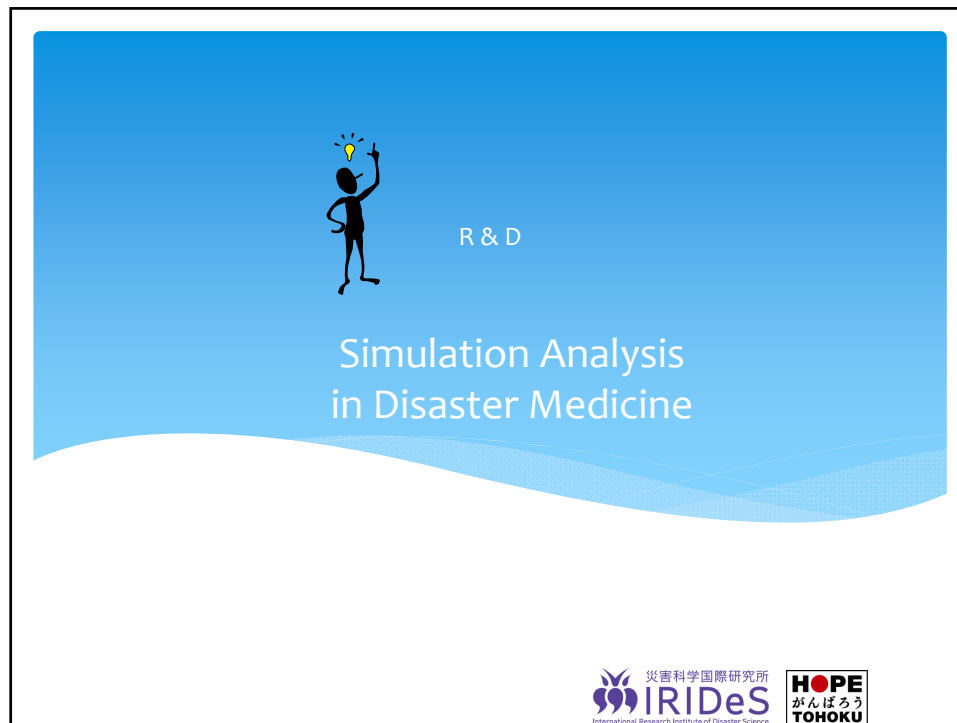


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Simulation in disaster science

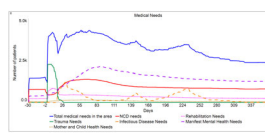


- Reproducible without actual damage
- Controllable parameters
- Impact on decision making
- Low cost

Simulators in medical education



Simulation software in science



System Dynamics

Agent Based

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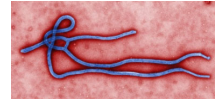
Types of Simulation

- System Dynamics
 - Complex phenomenon can be divided into interactive factors
 - Interactions can be expressed by simple equations
 - Robust forecasting of the outcome
- Agent Based
 - Agent takes action according to the specified rules
 - Parameters define the action of each agent
 - Statistical analysis of actions

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Ebola Virus Disease (EVD)



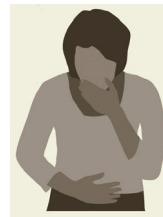
Ebola virus.
Source: CDC

Deadly disease: Average case fatality ratio is 50% (WHO).

Symptoms

- Fever
- Vomiting
- Diarrhea
- Bleeding
- Stomach pain
- Muscle pain
- Symptoms may appear anywhere from 2 to 21 days after exposure to Ebola, but the average is 8 to 10 days.

A person is only contagious after Ebola symptoms begin.



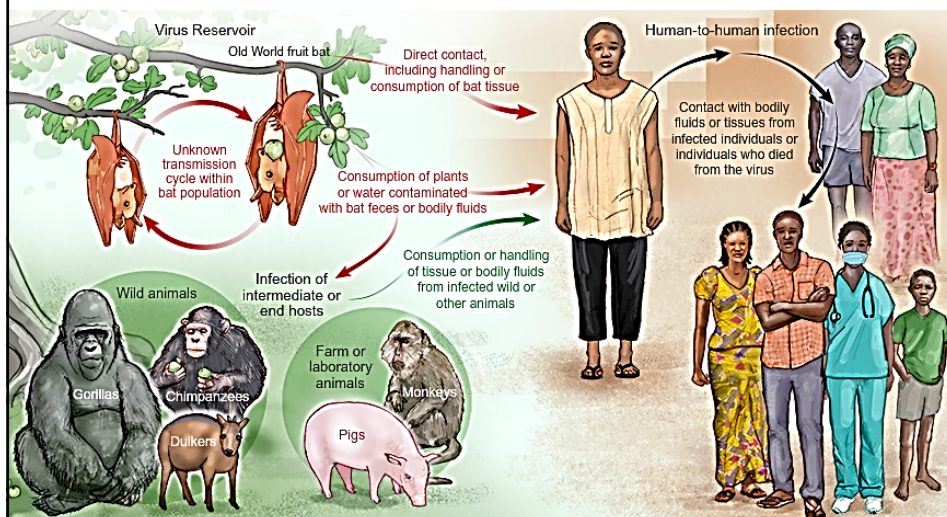
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Zoonosis



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Capacity building

- Community engagement is key to successfully controlling outbreaks.
 - case management
 - surveillance and contact tracing
 - a good laboratory service
 - safe and dignified burials and social mobilization.
- What we should know
 - EV transmits by contact with body fluids including sweat
 - EV transmits from bush meats
 - EV is easily inactivated by disinfection (75-80% alcohol, boiling water)
 - Incubation period 2-21 days

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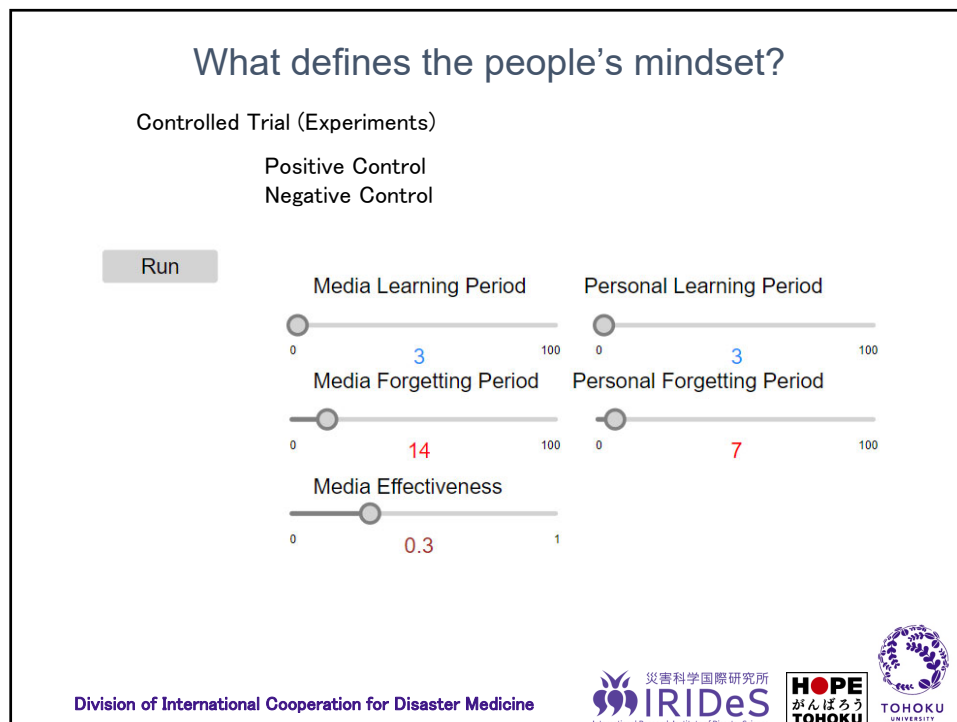
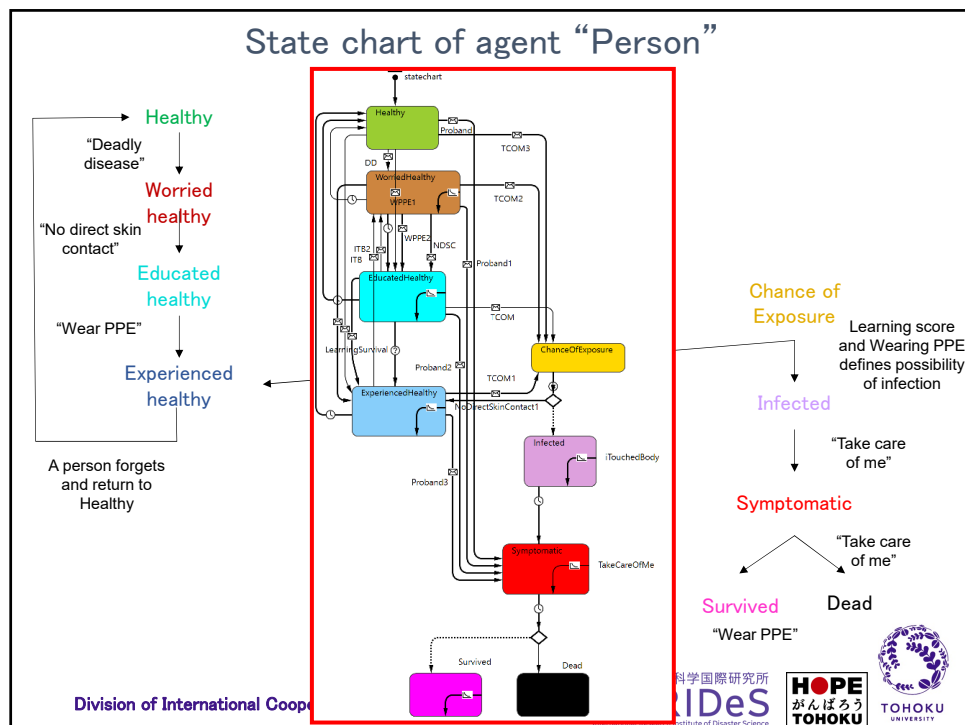


People's mindset in Ebola Virus Disease Outbreak

- | | |
|---|--|
| <ul style="list-style-type: none"> • Key words <ul style="list-style-type: none"> – Deadly Disease – Possible Outbreak – No direct skin contact – Wear PPE – Happy Birthday! | <ul style="list-style-type: none"> • Communication of People and Media <ul style="list-style-type: none"> – Learning Period – Forgetting Period – Effectiveness |
|---|--|

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Results

- Scenario 1: Naïve community
 - 3, 3, 14, 7, beginning 122
- Scenario 2: Educated community
 - 3, 3, 14, 7, pre-messages, after PFP 146
 - 3, 3, 14, 7, pre-messages, before PFP 77
- Scenario 3: Forgetful community
 - 3, 3, 6, 3, beginning 368
 - 3, 3, 6, 3, pre-messages, after PFP 329
- Scenario 4: Experienced community
 - 3, 3, 14, 30, beginning 162
 - 3, 3, 14, 30, pre-messages, before PFP <10

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Implications

- Sustainable risk perception and education
- Role of Media
- Role of Academia
- DRR at all levels



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