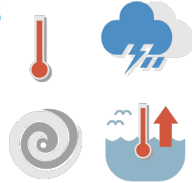


Customers

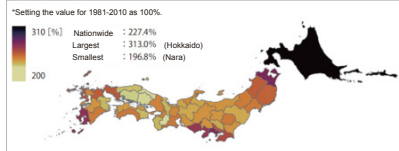
Major Factors of Impacts

Rising average temperatures, increased number of summer days, increased heavy rainfall and large typhoons, rising sea levels and storm surges



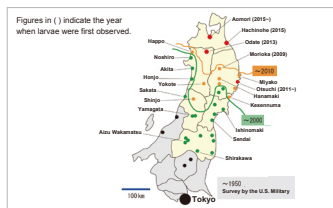
Current Situation and Future Projections

There is a nationwide trend of increase in number of emergency medical transports, etc., due to heat stroke. A study projecting number of people transported due to heat stroke in the future showed that number of people transported would be approximately 1.3 to 2.9 times higher for RCP 2.6 and 3.2 to 13.5 times higher for RCP 8.5, compared to current number for each prefecture.



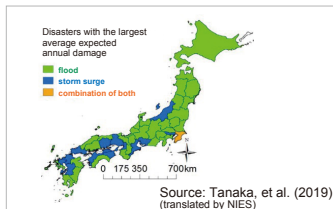
Heat stroke risk map in the future (2031-2050) climate under RCP8.5 scenario (average of 4 GCM) Source: Kusaka (2020) (translated by NIES)

It has been observed that habitat range of *Aedes albopictus*, an infectious disease vector, is expanding and period of time during which they can be active is growing longer. In the future, frequency of infectious disease outbreaks may increase as period of their activity grows longer.



Changes in the northern limit of the *Aedes albopictus* in the Tohoku region (2018) Source: National Institute of Infectious Diseases (edited and translated by NIES)

Heavy rainfall events with potential to cause floodings are projected to increase at the end of the century in major river basins, with 31 prefectures projected to suffer the greatest level of damage from floods alone.



Types of disasters that cause the greatest damage**
**Note that this figure only shows type of disasters that cause the largest amount of damage between flood, storm surge, and combination of both, but other disasters are also projected to occur.

Adaptation

To address health risks, health of customers will be protected from both soft measures (e.g., improvement of work styles) and hard measures (e.g., improvement of facilities). For disaster risks, lives of customers will be protected from disasters by strengthening disaster countermeasures such as BCPs.

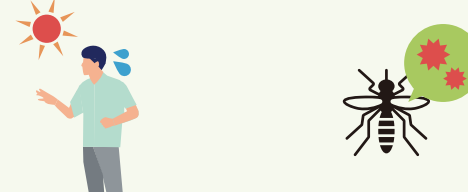
Factors

Rising temperatures, increased heavy rainfall / large typhoons

Impacts

Increased health risk

- Increased heat stroke, etc.
- Increased costs for heat stroke prevention
- Increased risk of infectious diseases
- Increased costs for infection control



Increased disaster risk

- Increased risk of suffering from disasters
- Increased costs for disaster countermeasures, damage insurance, etc.
- Inhibits people from going out



Soft measures Informing customers

Raise public awareness

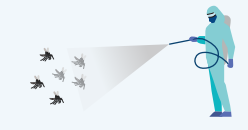


Soft measures/Hard measures Environmental management

Heat control measures

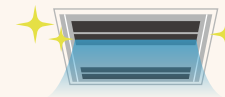


Infection control measures

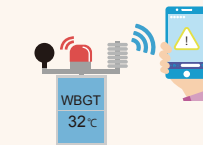


Hard measures Install and improve equipment

Install highly efficient air conditioning



Install alarm systems



Introduce robot technology, ICT, etc.



Soft measures Strengthen disaster countermeasures

Formulate and implement BCP

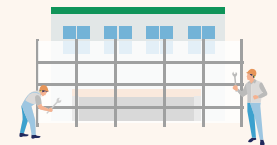


Review hazard maps

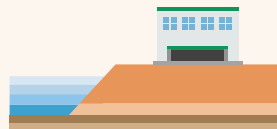


Hard measures Improve disaster prevention functions

Repair/reconstruct facilities



Raise ground level



Optimal placement of facilities



Adaptation measures



Customers

[Back](#)

Climate change impacts and adaptation measures on "customers" common to various industries

Factors

Rising temperatures, Increase d heavy rainfall/large typhoons

Impacts

Increased health risk

- Increased heat stroke, etc.
- Increased costs for heat stroke prevention
- Decreased number of customers and customer satisfaction due to heat

- Increased infectious disease risk (e.g., mosquito-borne)
- Increased costs for infectious disease control
- Lost opportunities due to increased health risks

Increased disaster risk

- Increased risk of suffering from disasters
- Inhibits people from going out
- Increased costs for disaster countermeasures, non-life insurance, etc.
- Damages such as suspension of online transactions due to infrastructure damage, etc.

Adaptation measures

Soft measures

[Informing customers]

- Raise awareness of heat stroke and infectious disease prevention
- Disseminate heat stroke and infectious disease prevention manuals
- Adjust or shorten business hours
- Secure rest areas
- Recommend water and salt intake
- Recommend use of sunshades
- Check weather information

[Environmental management (heat/infection control measures)]

- Heat control: install rest areas (cooling shelters, etc.)
- Monitor heat index (WBGT)
- Control air conditioning settings
- Infection control measures (surveys and countermeasures for outbreaks and distribution of vectors, insect repellent spray, and recommendations for appropriate clothing such as long sleeves, etc.)

[Others]

- Take out accident insurance

Hard measures

[Install and improve equipment]

- 1) Install highly efficient air conditioning
- 2) Install alarm systems
 - Disseminate heat index set by Ministry of the Environment
 - Monitor heat index set by Ministry of the Environment
- 3) Introduce robot technology, ICT, etc. (e.g., reduce outdoor waiting time)
- 4) Improve services through introduction of technology
 - Improve effectiveness of heat countermeasures by improving performance of machinery
- 5) Optimal placement of facilities
- 6) Introduce highly insulated facilities

Soft measures

[Disaster response measures]

Precautionary measures

- Formulate and operate BCP
- Review hazard maps
- Evacuation drills
- Raise public awareness

Remedial measures

- Planned shutdowns

[Development of service methods]

- Provide online contents

[Others]

- Take out accident insurance

Hard measures

[Improve disaster prevention functions]

Buildings

- 1) Repair and reconstruct facilities
- 2) Reinforce structures and take countermeasures based on regular inspections of structures
- 3) Raise ground level
- 4) Construct outer embankments
- 5) Optimal placement of facilities

Facilities and equipment

- 6) Place critical equipment (e.g., power receiving and transforming equipment) on upper floors
- 7) Install backup sites for information systems
- 8) Install watertight panels and watertight doors

Effect

Low

1) ~ 4)Low ~ Medium 5) ~ 6)High

Low

1) ~ 6)Medium ~ High 7) ~ 8)Low ~ Medium

Cost

Low

1) ~ 4)Low ~ Medium 5) ~ 6)High

Low

1) ~ 6)Medium ~ High 7) ~ 8)Low ~ Medium

Time span

Short

1) ~ 4)Short ~ Medium 5) ~ 6)Long

Short

1) ~ 6)Medium ~ Long 7) ~ 8)Short ~ Medium

How to proceed with adaptation measures

[Current approach] Ensure to prevent heat stroke by learning correct knowledge about risk of heat stroke for customers when using services of company, and take appropriate measures when a customer suffers from heat stroke. Be able to take action to reduce risk of disasters for customers and take measures to reduce risk of damage in the event of an emergency.

[Climate change-aware approach] Heat stroke is one of direct effects of heat, which is strongly correlated with climate change, and as for mortality risk, an increase in excess mortality has been observed due to rising temperatures. Long-term shutdowns and large amounts of damage caused by disasters and other events are major threats to business continuity and reliability of companies, and climate change adaptation needs to be mainstreamed in terms of customer security.

[Preparing and planning for climate change] To address health risks, it is necessary to take measures to protect customers' health from both soft measures (e.g., raise public awareness and improve environment) and hard measures (e.g., improve facilities). To address disaster risks, it is necessary to protect customers' lives from disasters by strengthening disaster countermeasures including formulation of business continuity plan (BCP).

[References]Ministry of the Environment (2018) "Heat Stroke Environmental Health Manual 2018" https://www.wbgt.env.go.jp/heatillness_manual.php, Ministry of the Environment (2008) Global Warming Impacts and Adaptation Research Committee Report "Smart Adaptation to Climate Change" http://www.env.go.jp/earth/ondanka/rc_eff-adp/index.html, Ministry of the Environment (2022) "Climate Change Adaptation Guide for Private Sector - Preparing for Climate Risk and Surviving-" https://adaptation-platform.nies.go.jp/private_sector/guide/index.html, National Institute of Infectious Diseases "Expansion of the distribution range of Aedes albopictus" (IASR Vol. 41 p92-93: June 2020) <https://www.niid.go.jp/niid/images/idsc/iasr/41/484.pdf>, Tanaka, Yukako et al. (2019) "Assessment on the Risk of Flood and Storm Surge with Flood Control Facilities" https://doi.org/10.2208/jscejhe.75.2_1_109, Kusaka, Hiroyuki (2020) "Future Heat Stroke Risk Assessment (SI-CAT Guidebook Editorial Board, Social Implementation Guidebook for Climate Change Adaptation Technologies)" https://www.mext.go.jp/content/20200325-mxt_kankyou-1345230_3.pdf, Smith, Michael (2013) "Assessing Climate Change Risks and Opportunities for Investors: Property and Construction Sector - Investor Group on Climate Change and ANU", DOI:10.13140/RG.2.1.3851.4169