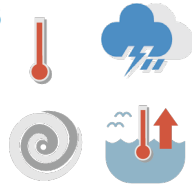


Healthcare and welfare

Major Factors of Impacts

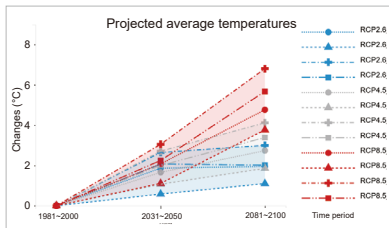
Rising temperatures, changes in precipitation amounts and patterns, rising sea water temperatures, and an increasing level of air pollutants



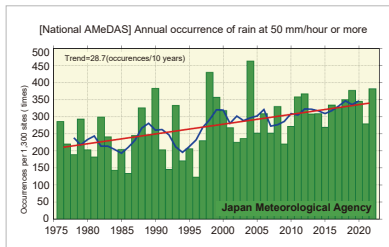
Current Situation and Future Projections

Average temperatures in Japan are increasing at a rate of 1.24°C/100 years, and annual number of waterfall-like rainfall events of 50 mm or more/hour is also increasing. Further increased temperature and heavy rainfall events are predicted in the future.

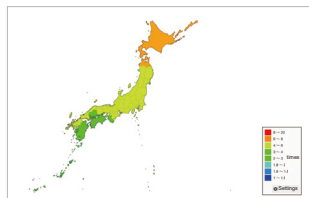
Heavy rains and other events may increase the number of patients and customers affected, as well as arthropod-borne infectious diseases such as heat stroke and dengue fever.



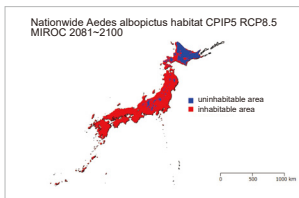
Projected average temperatures (annual average temperature projections based on emission scenarios and climate models (difference from standard period))Source: A-PLAT



Changes in the annual occurrence of precipitation of 50 mm/hour or more in Japan Source: Japan Meteorological Agency website (translated by NIES)



Percentage Increased the number of people transported for heat stroke at the end of the 21st century Source : A-PLAT



Habitat areas of Aedes albopictus at the end of the 21st century Source : A-PLAT

Adaptation

The number of patients suffering from heat stroke, various infectious diseases, and air pollution is expected to increase. It is desirable to consider implementation of mid- to long-term adaptation measures while working on adaptation measures that can be implemented in a relatively short period of time, depending on the impact in each region.

Factors

Rising temperatures and sea water temperatures/change in precipitation and patterns

Management resources

Core business

Adaptation business

Increased disaster risk

- Flooding in hospitals, facilities, etc. due to water related disasters
- Increased risk of disaster for patients in hospital and hospital users
- Supply chain disruption

Increased number of patients/Seasonal changes

- Increased heat stroke patients and transported patients due to heat
- Increased arthropod-borne infectious disease patients
- Increased number of patients with diarrhea due to bacteria
- Increased diseases due to air pollution
- Seasonal changes in infectious diseases
- Increased drug-resistant bacteria and drug-resistance rates
- Increased procurement risk for pharmaceutical supplies

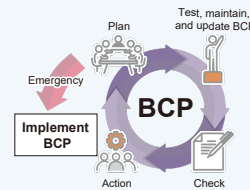
Increased number of patients/Seasonal changes

- Increased heat stroke patients and transported patients due to heat
- Increased arthropod-borne infectious disease patients
- Increased number of patients with diarrhea due to bacteria
- Increased diseases due to air pollution
- Seasonal changes in infectious diseases

Impacts

Adaptation measures

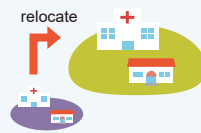
Formulate and implement BCP



Reinforce flood control measures



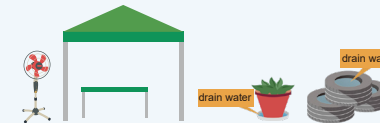
Relocate facilities/measures



Raise awareness of countermeasures against heat stroke, infectious diseases, and air pollution



Create environment and buildings that are less prone to heat stroke, mosquitoes, and other health pests and host animals



Introduce remote medical and nursing care



Appropriate treatment and medicine prescriptions



Support to develop early diagnosis kits for infectious diseases, vaccines and antibacterial agents (in cooperation with pharmaceutical companies, etc.)



Support to develop infection control products (in cooperation with pharmaceutical companies, etc.)





Healthcare and welfare

The healthcare and welfare industry is classified as establishments that provide services related to medical care, health and hygiene, social insurance, social welfare, and long-term care

Back

Factors	Rising temperatures and sea water temperatures/change in precipitation and patterns					
Management resources	Core business			Adaptation business		
Impacts	Increased disaster risk	Increased number of patients/ Seasonal changes		Increased number of patients/ Seasonal changes		
	<ul style="list-style-type: none"> • Flooding in hospitals, facilities, etc. due to water related disasters • Increased risk of disaster for patients in hospital and hospital users • Supply chain disruption 	<ul style="list-style-type: none"> • Increased heat stroke patients and transported patients due to heat • Increased arthropod-borne infectious disease patients • Increased number of patients with diarrhea due to bacteria • Increased diseases due to air pollution • Seasonal changes in infectious diseases 	<ul style="list-style-type: none"> • Increased drug-resistant bacteria and drug-resistance rates • Increased procurement risk for pharmaceutical supplies 	<ul style="list-style-type: none"> • Increased heat stroke patients and transported patients due to heat • Increased arthropod-borne infectious disease patients • Increased number of patients with diarrhea due to bacteria • Increased diseases due to air pollution • Seasonal changes in infectious diseases 		
Types of adaptation measures	Soft	Hard	Soft	Hard	Hard	
Adaptation measures	<ol style="list-style-type: none"> 1)Formulate and operate BCPs: check hazard maps, prepare disaster prevention plans, conduct evacuation drills, secure stockpiles of water, food, toilets, etc., and strengthen disaster response according to each situation 2)Diversify supply chains 	<ol style="list-style-type: none"> 1)Reinforce flood prevention measures: install watertight panels on openings, waterproof exterior walls, raise floors and grounds 2)Place critical equipment in safe locations: locate critical equipment such as emergency generators, medical equipment, and outdoor units of air conditioners in safe locations 3)Relocate facilities: if the risk of damage is still high even after implementing the measures above, relocate to a safer location 	<ol style="list-style-type: none"> 1)Raise public awareness of countermeasures against heat stroke, infectious diseases, and air pollution: conduct public awareness programs to prevent increased number of patients. For those that are seasonal, such as heat stroke and dengue fever, implement measures well in advance of the epidemic 2)Appropriate treatment and drug prescriptions: obtain new information as needed and prescribe appropriate treatment and drugs. Provide appropriate information and avoid unnecessary antibiotic prescriptions to prevent the increase of drug-resistant bacteria 3)Introduce remote medical and nursing care: if the morbidity risk is increased by outings, introduce assistance for in-person medical care, remote medical and nursing care 	<ol style="list-style-type: none"> 1)Create environments and buildings where heat stroke is less likely to occur: carefully control indoor air conditioning, install high-performance air conditioning systems, and improve building insulation. Use of sunshades and misting in outdoor areas, and calls for people to avoid staying outside for long periods of time during hot weather 2)Create environments where mosquitoes and other insect pests and their host animals are less likely to occur: exterminate mosquitoes around business sites, avoid creating watering holes, mow lawns, and install screen doors in order to create environments where mosquitoes etc. are less likely to occur 	<ol style="list-style-type: none"> 1)Appropriate treatment and medicine prescriptions 2)Support to develop early diagnosis kits for infectious diseases, vaccines and antibacterial agents: develop vaccines and antibacterial agents, by cooperating with pharmaceutical companies, etc. and implementing clinical trials, etc. 3)Support to develop infection control products: develop products for heat stroke, arthropod-borne infections, air pollution, diarrhea, etc., in cooperation with pharmaceutical companies, etc. 	
Effect	1) ~ 2)Medium	1) ~ 2)Medium 3)High	1)Low 2) ~ 4)Medium	1)Medium ~ High 2)Low	1) ~ 2)Medium 3)High	
Cost	1) ~ 2)Low ~ Medium	1) ~ 2)Low ~ Medium 3)High	1) ~ 2)Low 3)Medium ~ High 4)Medium	1)Low ~ Medium 2)Low	1) ~ 2)Low 3)Medium ~ High	
Time span	Short ~ Medium	1) ~ 2)Short ~ Medium 3)Long	1) ~ 3)Short 4)Medium	1)Short ~ Medium 2)Short	1) ~ 2)Short 3)Medium ~ Long	

How to proceed with adaptation measures

[Current approach] Providers in the health and social care industry often take meticulous care of their patients/users, as they are often vulnerable to heat, infectious diseases, and the effects of disasters. On the other hand, the industry also faces challenges, such as the fact that healthcare has been under pressure from 2020 due to the COVID-19 pandemic, and that many social welfare and care facilities are located in areas with high disaster risk due to land prices and relationships with the surrounding population.

[Climate change-aware approach] There are concerns that rising temperatures and changing precipitation patterns will have many health effects in the future, including increased number of people transported for heat stroke, prevalence of arthropod-borne infectious diseases such as dengue fever, and increased health risks due to accelerated production of ozone and other substances. Increased heavy rainfall will also increase the risk of flooding and other disasters. Healthcare and welfare providers, many of whose patients and users are vulnerable to health impacts, need to monitor and respond to the daily impacts of weather conditions on their operations, while considering how they will be affected by future climate change in the medium to long term, and take hard and soft measures to deal with these impacts. Cooperation with pharmaceutical companies and others developing countermeasure products including early diagnosis sets for infectious diseases, vaccines, and other products that reach people who do not have direct access to each enterprise will also help to diversify and expand business.

[References] Japan Meteorological Agency "[National AMeDAS] Annual occurrence of rain at 50 mm/hour or more" https://www.data.jma.go.jp/cpdinfo/extreme/extreme_p.html, EASAC (2019) "The imperative of climate action to protect human health in Europe" <https://easac.eu/publications/details/the-imperative-of-climate-action-to-protect-human-health-in-europe>, Khan et al. (2019) "Aggravation of Human Diseases and Climate Change Nexus" <https://www.ncbi.nlm.nih.gov/pubmed/31390751>, Ministry of the Environment (2018) "Climate Change Adaptation Plan" <http://www.env.go.jp/earth/tekiou/tekioukeikaku.pdf>, Japan Meteorological Agency (2020) "Climate Change Monitoring Report 2019" https://www.data.jma.go.jp/cpdinfo/monitor/2019/pdf/ccmr2019_all.pdf, Ministry of Land, Infrastructure, Transport and Tourism (2017) "Case Studies of Efforts to Prevent Flood Damage - Towards Minimizing Socio-Economic Damage" <https://www.mlit.go.jp/river/bousai/shinsuihigai/index.html>, Ministry of the Environment (2020) "Assessment Report on Climate Change Impacts in Japan (Detailed) (Draft as of November 27, 2020)" <http://www.env.go.jp/press/files/jp/115262.pdf>, Ministry of the Environment (2022) "Climate Change Adaptation Guide for Private Sector - Preparing for Climate Risks and Surviving" https://adaptation-platform.nies.go.jp/private_sector/guide/index.html