

BEAT THE HEAT

WAKAYAMA MEDICAL UNIVERSITY
WORLD PARA ATHLETICS
JAPAN PARA ATHLETICS

TATSURU IBUSUKI



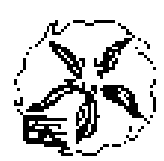
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Agenda

- Summer heat environment in TOKYO
- Physiological characteristic of Para Athletics Athletes
- Cooling strategy to Para Athletics Athletes
- The system of weather prediction “MiCATA”
- Marathon Race on 6th SEP

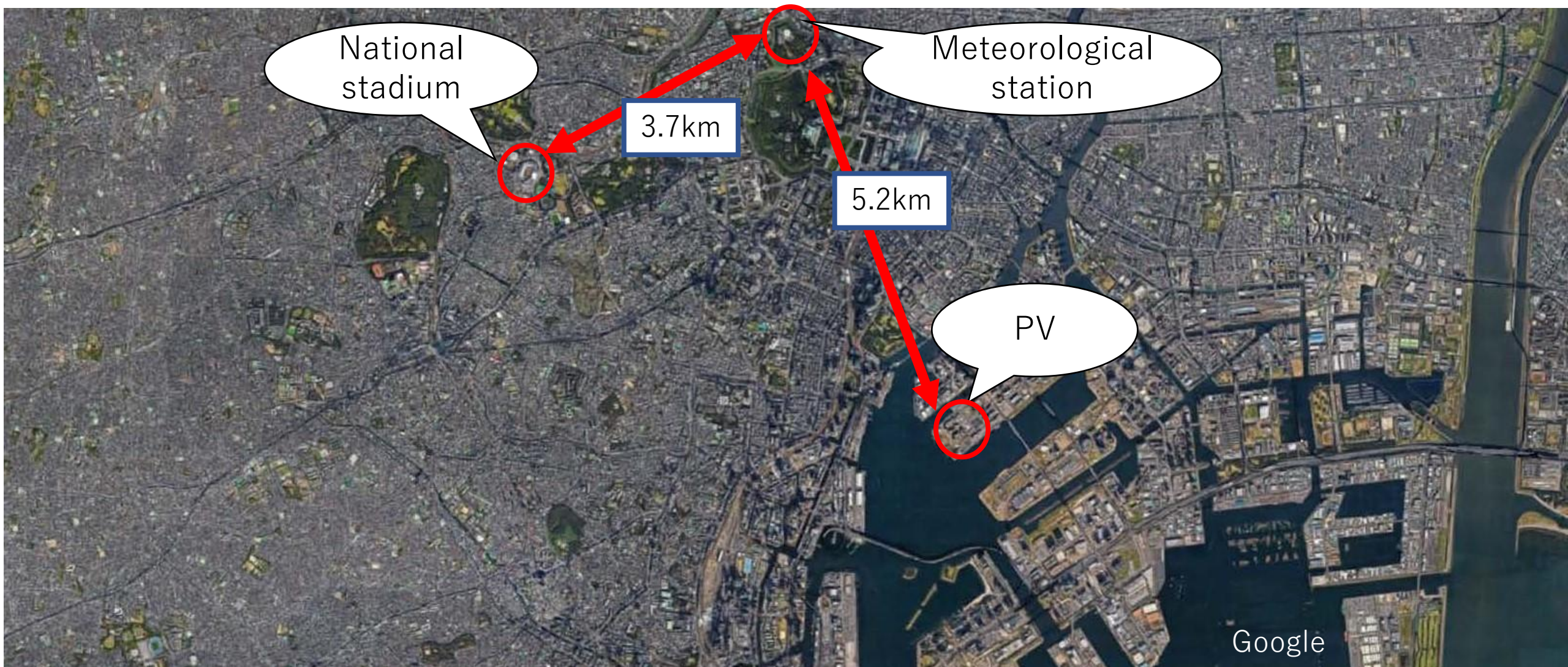
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JPA
JAPAN PARA ATHLETES

The measurement point of data

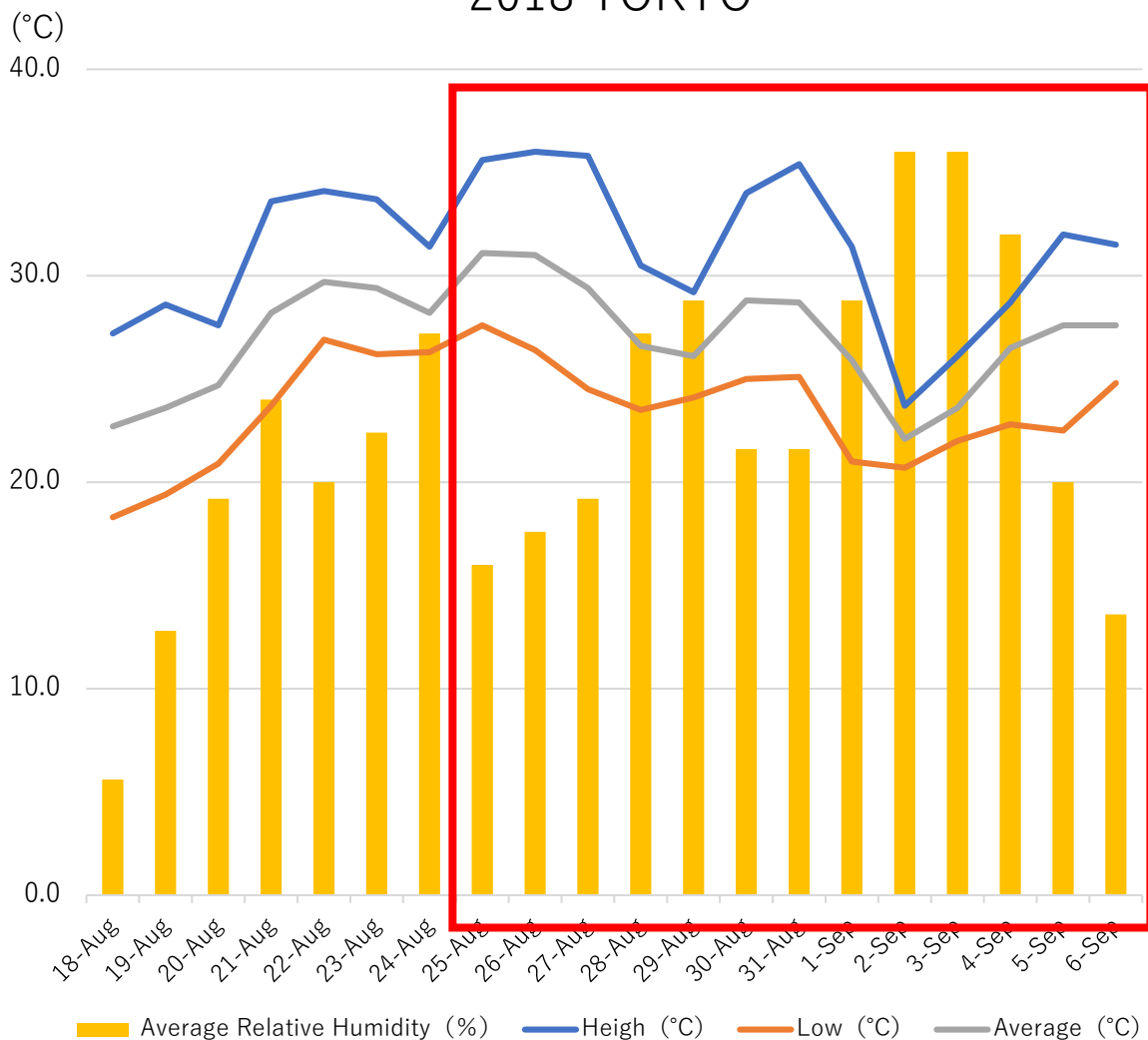




JPA

Change of Temperature and the Relative humidity

2018 TOKYO



1999-2018 TOKYO

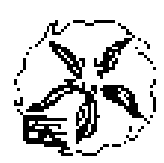


weather news Co., Ltd

Competition Environment: Temperature 30°C, Relative humidity 80%

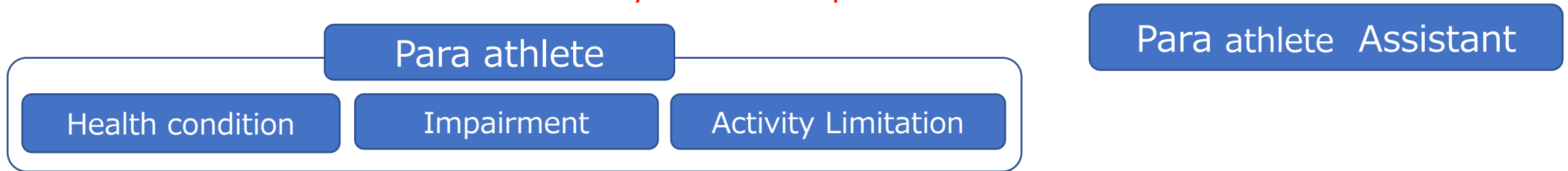
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Physiological characteristic of Para Athletes

- Body temperature response
1. Behavioral temperature response
Clothing(take off, or change) or Air conditioner(turn on, or turn up)
 2. Autonomous temperature response
Sweaty (heat dissipation)



For example

CSCI



Leg amputation



Visual impairment and Guide



Assistant



Competition Environment: Temperature 30°C, Relative humidity 80%

Physiological characteristic of Para Athletes

Health Condition	Problems in the heat environment
Spinal Cord Injury	<ul style="list-style-type: none"> Autonomic nervous system disorders Inhibition of Sweating Heat retention
Cerebral Palsy	<ul style="list-style-type: none"> Hypertorus Sweat rate increase Dehydration
Amputee	<ul style="list-style-type: none"> Body surface decrease Sweat rate increase Dehydration
Visual Impairment	<ul style="list-style-type: none"> The sunshine and the shade are hard to find
Intellectual Impairment	<ul style="list-style-type: none"> Difficulty with declaration of intention Dehydration

Which does athlete choose?



Fan



Cold water



Crash ice



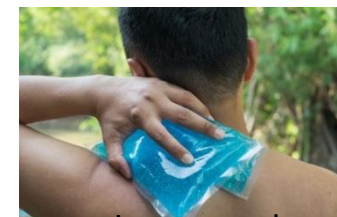
Ice slurry



Ice vest



Hand cooling



Ice pack



Ice bath

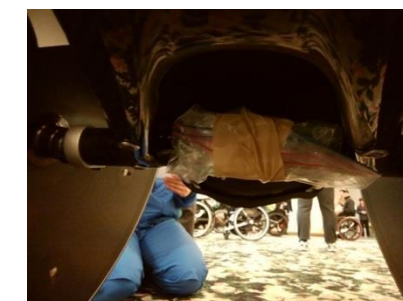
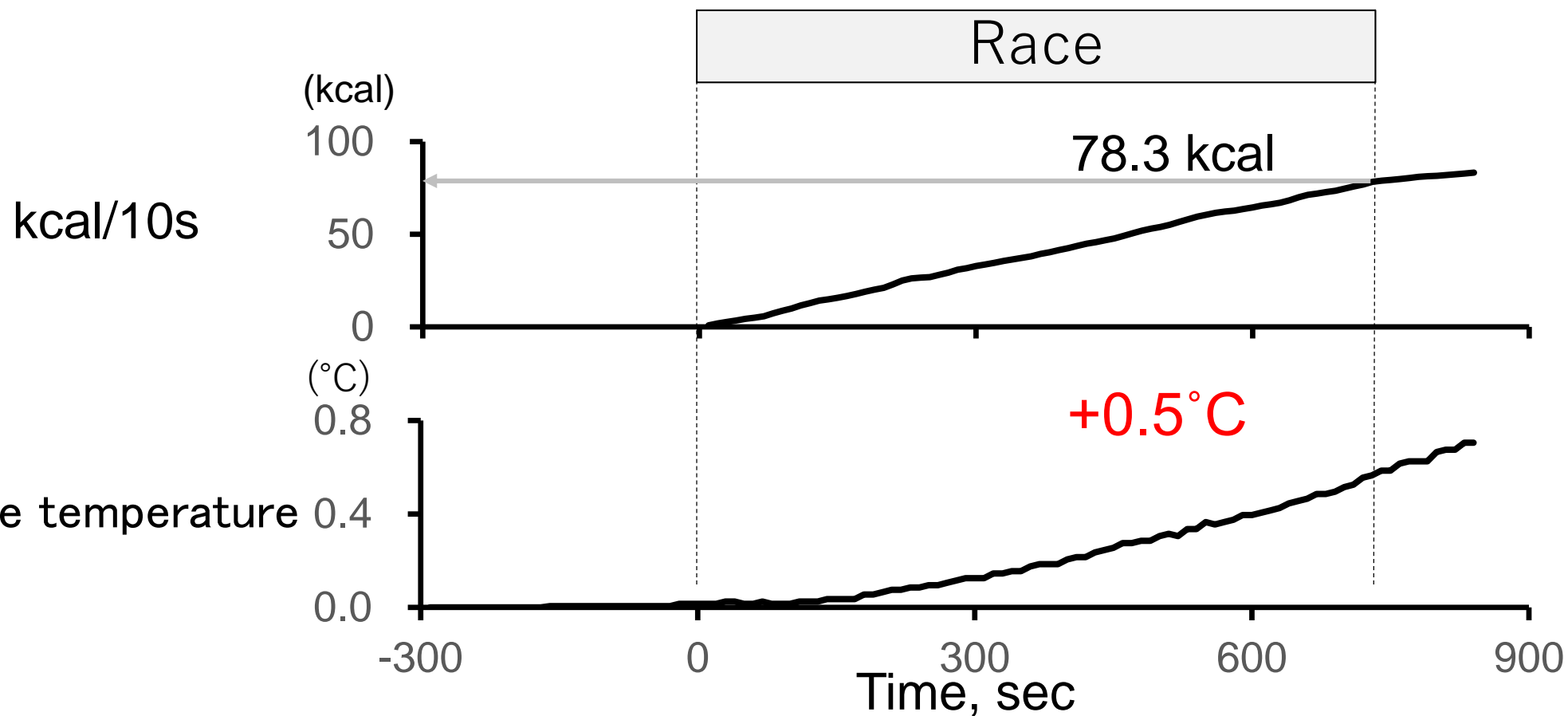
Research in Road Race

2018 Japan Ekiden Race

MAR/11/2018 @kyoto

Start at 11:30; Ta **12.5°C**; RH47%

6.4 km : time **12'04"**





Review Indonesia 2018 Asian Para Games

Oct/2018 : Average temperature 29.8°C
High temperature 33.3°C Low temperature 27.0°C
Relative humidity 68%

Heat stroke 7 athletes (In morning session) /64 JPA athletes

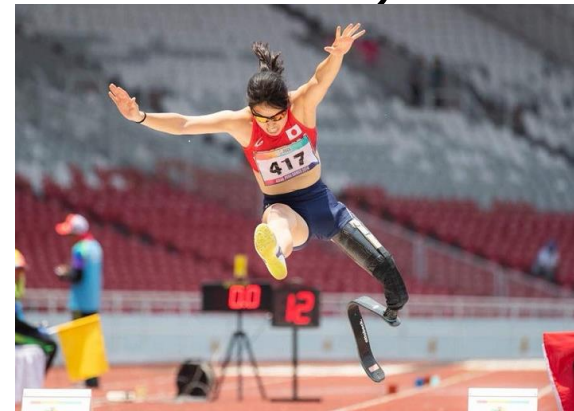


Track event

T52 Short Splint
T53 Middle Distance

Field event(1 hours-2 hours)

T64 Highs Jump
T64 Long Jump
T63 Long Jump
F46 Javelin Throw
F55 Sitting Throw



SCI and Limb deficiency

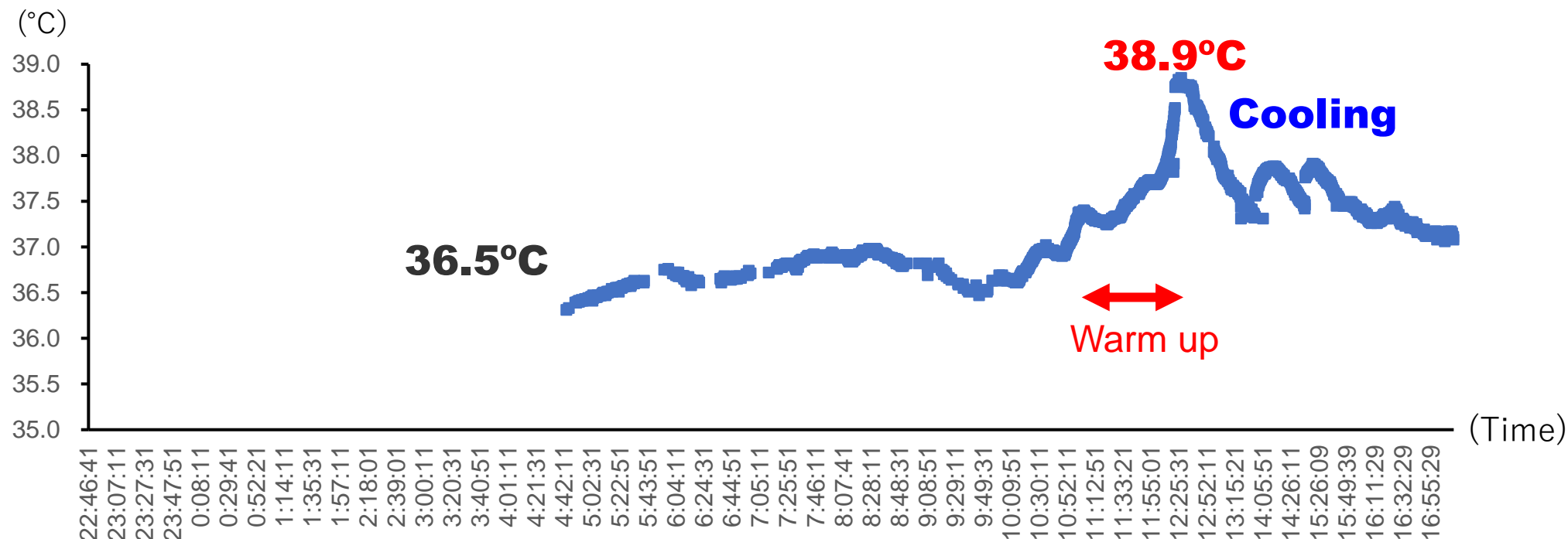
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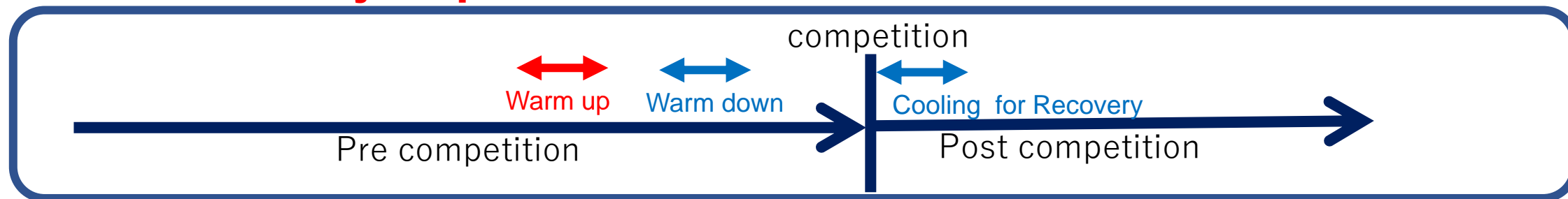


Core temperature change during a warm-up

Research in Track T52 Men xx/xx/2019



How do we control body temperature of wheelchair athlete with SCI in heat environment?



The experiment in the chamber

Competition Environment: Temperature 30°C, Relative humidity 80%

Warming up with Ice best



Cooling down by Ice bus



How does the core temperature change in heat environment?

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2week forecast for my schedule



Range of uncertainty



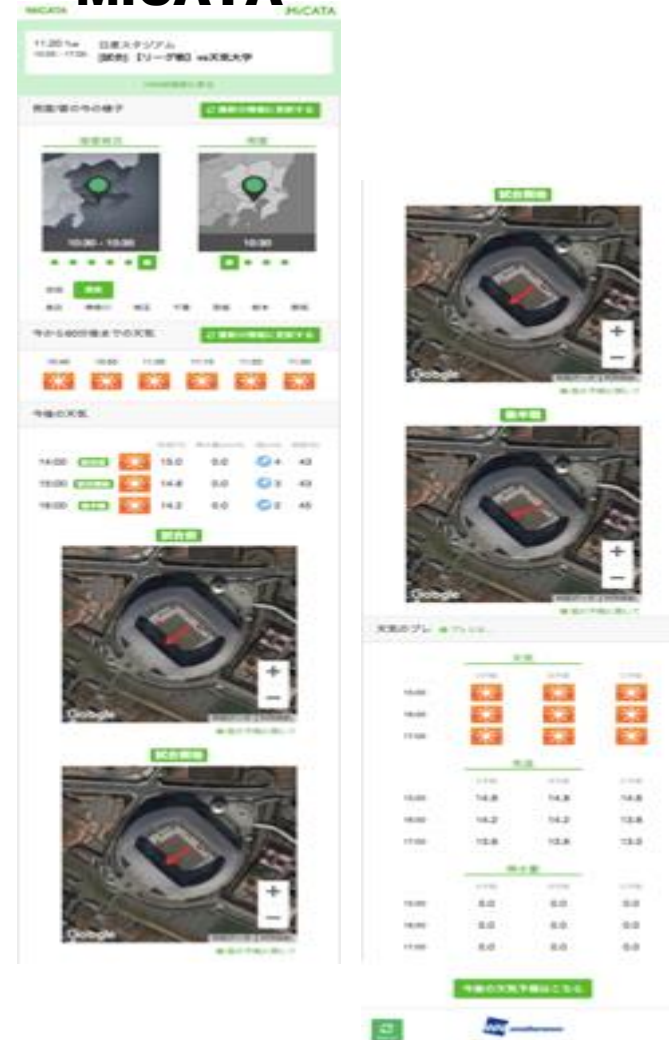
**Alert that
forecast has
changed**



Alerts with a range of uncertainty



Today's MiCATA



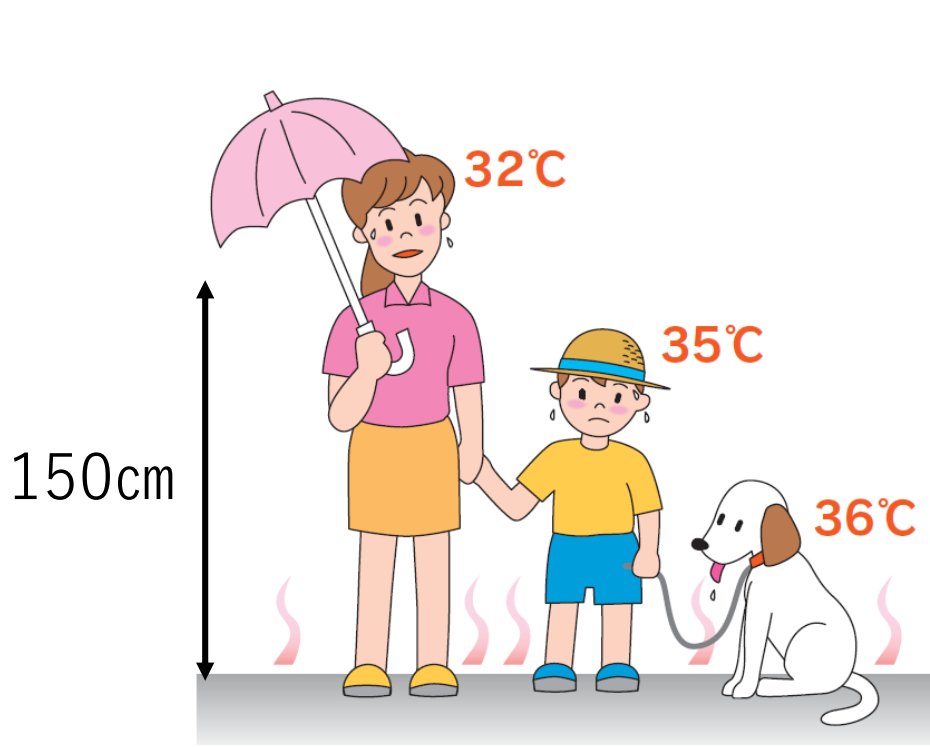
Lightning alert



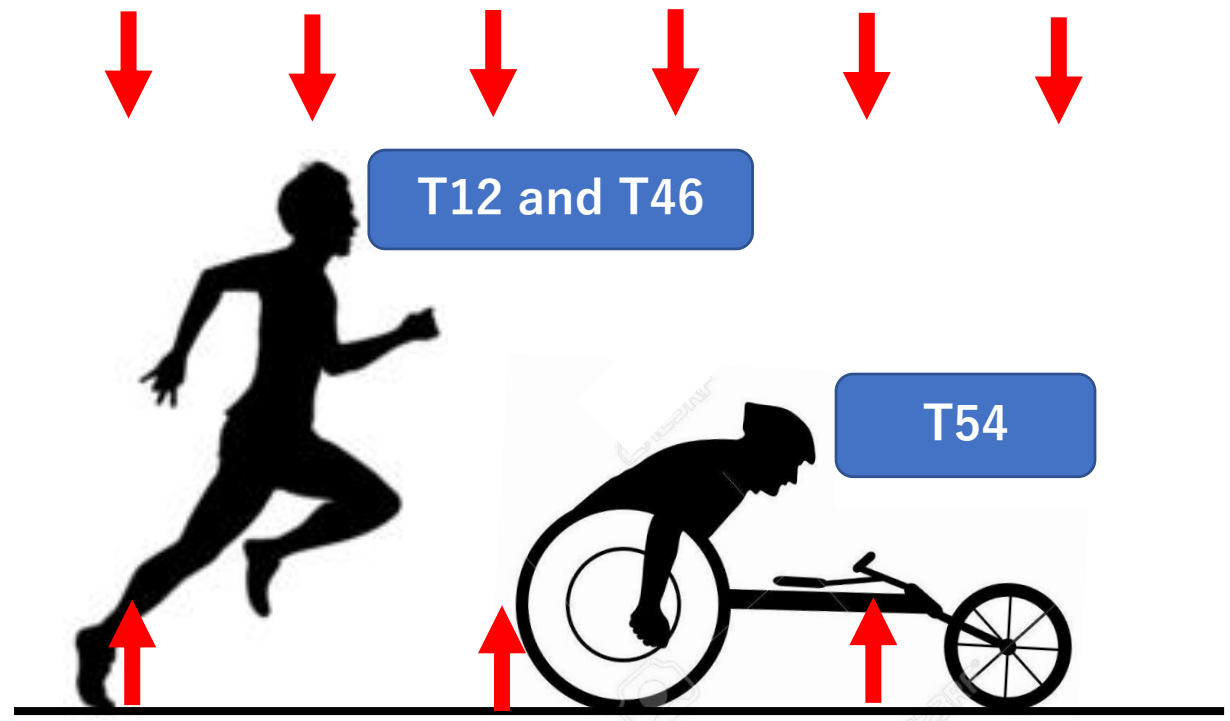
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Sensible temperature is different Ambulant athlete and Wheelchair athlete



Heat stroke environment health manual
Ministry of the Environment 2018



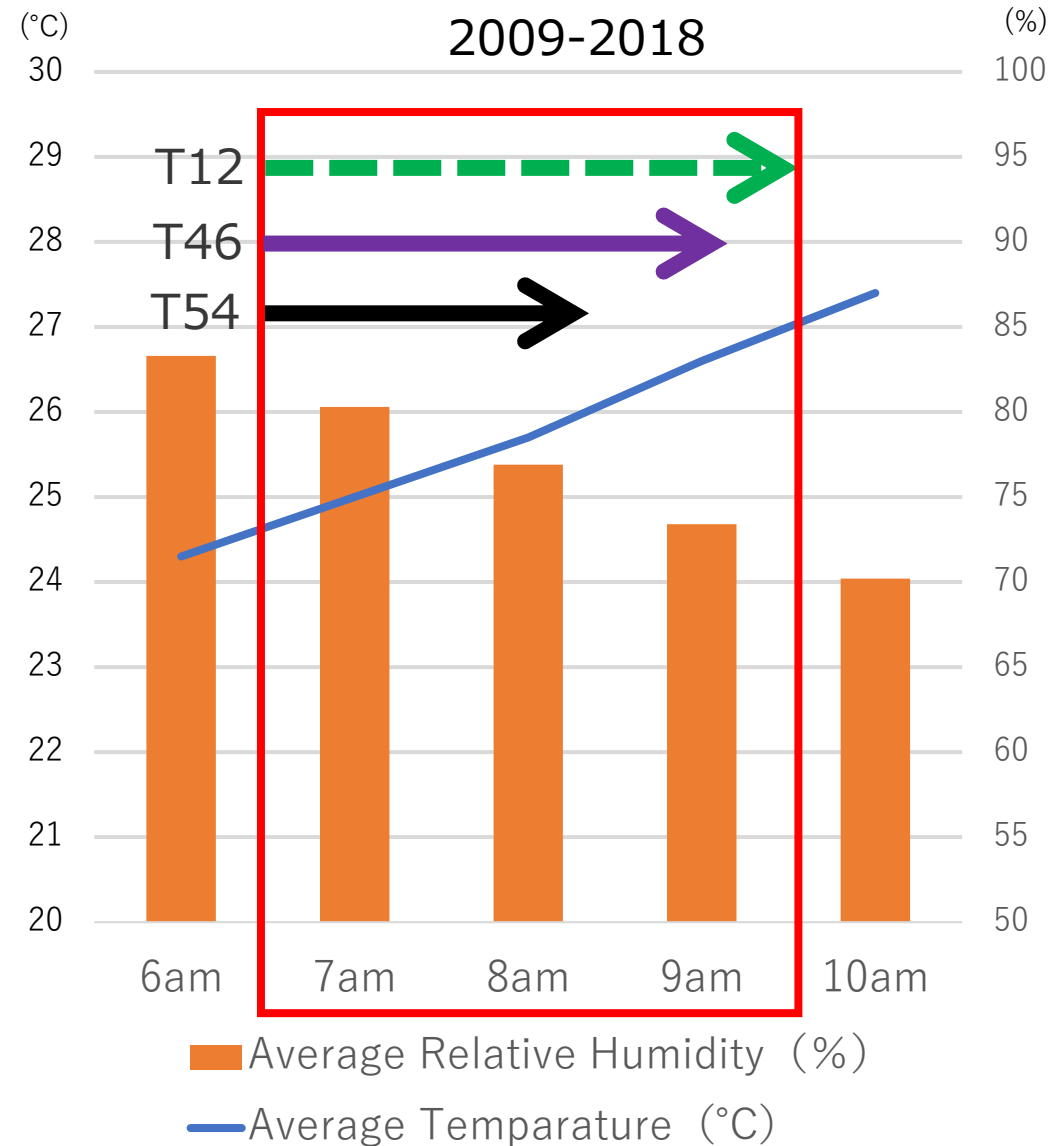
Marathon Finish time			
T12 Men	2:32:17	T54 Men	1:26:16
Women	3:01:43	Women	1:38:44
T46 Men	2:33:35		

Marathon Race : 6th SEP

Tokyo 2020 Paralympic Marathon Course

Paralympic Marathon Course:

T12 (Men/Women), T46 (Men), T54 (Men/Women)



Thank you for your attention!

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