Climatotherapy in the world and the potential of Japanese climate and geographical features to health promotion and disease prevention.

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COI Disclosure

Lead Presenter: Hitomi Kanayama
Affiliated Organization: University of Fukui

There are no COI with regard to this presentation.
Objective and Methods

- Our objective was to review the related articles and consider the potential of Japanese climate and geographical features to health promotion and disease prevention in the context of health resort medicine.

- To summarise the studies concerning climatotherapy in the world, PubMed database was searched from 1965 to 2013. Additional references were identified from bibliographical searches of included studies.

- Japanese climate and geographical data were obtained from Japan Meteorological Agency (JMA), Ministry of Land, Infrastructure, Transport and Tourism (MLIT), Forestry Agency, and Japan Institute of Country-ology and Engineering (JICE).
Literatures on Climatotherapy/Climate therapy derived from PubMed database from 1965 to 2013:

Published literatures by language
Literatures on Climatotherapy/Climate therapy derived from PubMed database from 1965 to 2013: Health resorts in the world

Köppen’s classification of climate

- Tropical climate
  - Tropical rainforest/monsoon climate
  - Tropical savanna climate

- Dry climate
  - Steppe climate
  - Desert climate

- Temperate climate
  - f: wet climate
  - w: dry season in winter
  - s: dry season in summer

- Continental climate

- Polar & Alpine climate
  - Tundra climate
  - Ice-cap climate
## Literatures on Climatotherapy/Climate therapy derived from PubMed database from 1965 to 2013: Health resorts in the world

<table>
<thead>
<tr>
<th>Health resort</th>
<th>Climatic and Geographical features</th>
<th>Diseases: evaluated effective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dead Sea</td>
<td>Maritime climate</td>
<td>Psoriasis, Atopic dermatitis, Rheumatic diseases, Vitiligo, Uveitis, Mycosis fungoides, Hypertension</td>
</tr>
<tr>
<td>Canary Islands</td>
<td>Subtropical Maritime climate</td>
<td>Psoriasis, Atopic dermatitis, Cerebral palsy</td>
</tr>
<tr>
<td>Alpine mountain area</td>
<td>Moderate- and high-altitude Mountain climate</td>
<td>Bronchial asthma, Atopic eczema, COPD, Circulatory diseases, Osteoporosis, Metabolic syndrome</td>
</tr>
<tr>
<td>Adriatic Sea shore</td>
<td>Mediterranean Maritime climate</td>
<td>Bronchial asthma</td>
</tr>
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Literatures on Climatotherapy/Climate therapy derived from PubMed database from 1965 to 2013:
Health resorts in the world

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<tr>
<td>North Sea</td>
<td>Maritime climate</td>
<td>Bronchial asthma, Atopic dermatitis</td>
</tr>
<tr>
<td>Baltic Sea</td>
<td>Maritime climate</td>
<td>Bronchial asthma, Psoriasis, Chronic bronchitis, Pulmonary silicosis, Children after rheumatic disease</td>
</tr>
<tr>
<td>Island of Jerba, Tunisia</td>
<td>Mediterranean Maritime climate</td>
<td>Fibromyalgia</td>
</tr>
<tr>
<td>Kyrgyz mountain area</td>
<td>High-altitude Mountain climate</td>
<td>Aplastic anaemia, Idiopathic thrombocytopenic purpura</td>
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Literatures on Climatotherapy/Climate therapy derived from PubMed database from 1965 to 2013: Health resorts in the world

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<tr>
<td>Black Sea, Crimea, Ukraine coastal zone</td>
<td>Maritime climate</td>
<td>Chronic dermatoses, Atherosclerosis, Coronary heart disease, Rheumatic heart disease, After lung resection in children</td>
</tr>
<tr>
<td>Caspian Sea</td>
<td>Maritime climate</td>
<td>Cerebrovascular disorder</td>
</tr>
<tr>
<td>Sea of Japan, North shore</td>
<td>Maritime climate</td>
<td>Children with oncological disease</td>
</tr>
</tbody>
</table>
Japanese Climate and Geographical features:
The Climate Normals (1981–2010) ... Data from Japan Meteorological Agency (JMA)
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The Climate Normals (1981–2010) ... Data from Japan Meteorological Agency (JMA)

*Mean Temp. (Celsius)*  *Precipitation (mm)*  *Sunshine (hours)*

**Tokyo**

Celsius degree  mm, hours

Japanese Climate and Geographical features:
The Climate Normals (1981–2010) … Data from Japan Meteorological Agency (JMA)

Mean Temp. (Celsius)  Precipitation (mm)  Sunshine (hours)

Celsius degree

mm, hours

Osaka

Japanese Climate and Geographical features:
The Climate Normals (1981–2010) ... Data from Japan Meteorological Agency (JMA)

![Graph showing mean temperature, precipitation, and sunshine in Fukuoka](image-url)
Japanese Climate and Geographical features:
The Climate Normals (1981–2010) … Data from Japan Meteorological Agency (JMA)

Kagoshima

Mean Temp. (Celsius) Precipitation (mm) Sunshine (hours)

Celsius degree Precipitation (mm) Sunshine (hours) mm, hours


Data from Japan Meteorological Agency (JMA)
Japanese Climate and Geographical features:
The Climate Normals (1981–2010) ... Data from Japan Meteorological Agency (JMA)

Celsius degree

Celsius degree

Naha
Japanese Climate and Geographical features:

**Geographical features**  ... Data from Ministry of Land, Infrastructure, Transport and Tourism (MLIT), Forestry Agency, Japan Institute of Country-ology and Engineering (JICE)

<table>
<thead>
<tr>
<th>Sea Level (m)</th>
<th>Area (km²)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-5</td>
<td>11,753</td>
<td>3.1</td>
</tr>
<tr>
<td>5 - 10</td>
<td>8,676</td>
<td>2.3</td>
</tr>
<tr>
<td>10 - 50</td>
<td>42,626</td>
<td>11.4</td>
</tr>
<tr>
<td>50 - 100</td>
<td>37,091</td>
<td>9.9</td>
</tr>
<tr>
<td>100 - 250</td>
<td>81,585</td>
<td>21.8</td>
</tr>
<tr>
<td>250 - 500</td>
<td>91,355</td>
<td>24.5</td>
</tr>
<tr>
<td>500 - 1000</td>
<td>76,697</td>
<td>20.5</td>
</tr>
<tr>
<td>1000 -</td>
<td>23,743</td>
<td>6.4</td>
</tr>
</tbody>
</table>

Forest Area

- Moderate-altitude mountain area: 45.0%
- High-altitude mountain area: 6.4%
- 33.6%

**Islands of Japan**

<table>
<thead>
<tr>
<th>Islands</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>the mainland</td>
<td>Hokkaido, Honsyu, Shikoku, Kyusyu, Okinawa main island</td>
</tr>
<tr>
<td>solitary islands</td>
<td>inhabited islands, uninhabited islands</td>
</tr>
<tr>
<td>total</td>
<td></td>
</tr>
</tbody>
</table>

Total coastline 35,558 km

the 6th rank among the world
Japanese Climate and Geographical features:
Maximum and minimum mean temperature — the middle 10 days of August, 2000 and 2001 in the Hokuriku area

**Kanazawa city**
Height 5.7m
Mean Temperature
Max. 32.0 ; Min. 25.1

**Fukui city**
Height 8.8m
Mean Temperature
Max. 32.5 ; Min. 24.0

**Toyama city**
Height 8.6m
Mean Temperature
Max. 31.6 ; Min. 23.8

**Hakusan, Murodo**
Height 2450m
Mean Temperature
Max. 18.7 ; Min. 11.8

**Tateyama, Murodo**
Height 2450m
Mean Temperature
Max. 16.9 ; Min. 10.7

**Tokyo**
30km
Conclusion

- The number of published literatures on Climatotherapy/Climate therapy had decreased in the 1990s. From 2000 onwards, literature publication have been increasing again and a language of the greater part of literatures became English.

- In PubMed search, Health resorts of Maritime climate and Mountain climate which had been studied are centered in Mid-Latitude of the Northern hemisphere.

- Japanese Climate is rich in variety. There are great differences between the Northern part and the Southern part, and between the Pacific side and the Sea of Japan side.

- Japanese remarkable Geographical features are rich in Mountain area and Forest area, long coastline, and the closeness of Mountainous region and Coastal zone.

- There would be a high potential of Japanese Climate and Geographical features as a Health resort of Climatotherapy and Terrain kur.