# Thermal challenges in modern day humans

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Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Other condition
Study type	Interventional

# Summary

### ID

NL-OMON42547

**Source** ToetsingOnline

Brief title Thermal challenges in modern day humans

# Condition

• Other condition

#### Synonym

nvt

#### **Health condition**

geen directe aandoening onderzocht

### **Research involving**

Human

### **Sponsors and support**

**Primary sponsor:** Universiteit Maastricht **Source(s) of monetary or material Support:** TKI-ENERGO en TKI-SOLAR (TRECO)

### Intervention

Keyword: Activity, Behaviour, Body composition, Thermoregulation

### **Outcome measures**

#### **Primary outcome**

The main study parameter is the fraction of time spent relative to the thermoneutral zone. The distance from the thermoneutral zone is defined by comparing measured skin temperature and operative temperature to the theoretical centroid of the thermoneutral zone (as calculated by biophysical model).

#### Secondary outcome

The secondary research questions relate to the primary objectives and aim to give insight in how the thermal states are related to physical, physiological and subjective parameters:

- \* Physiological
- o Metabolic rate distinguished by:
- \* Basal metabolic rate
- \* Activity level
- o Insulation distinguished by:
- \* Body composition
- \* Skin blood flow

- \* Physical
- o Thermal environment by:
- \* Air temperature
- \* Humidity
- \* Clothing
- \* Subjective
- o Thermal comfort

# Study description

#### **Background summary**

Modern day Western humans predominantly work and live in climate controlled buildings, and it is hypothesized that they expose themselves to thermal conditions that maximize thermal comfort and minimize the effort for the body to regulate body temperature. Body temperature regulation is strongly linked to cardiovascular and metabolic function. Therefore, variation in thermal challenges, or the lack thereof may be related to long-term health status. Current indoor climate standards are biased towards males. This is caused in part by only considering male metabolic rate in calculations of thermal demand. As a consequence, males may be predisposed to less thermal challenges than females.

### Study objective

This study aims to chart which thermal challenges modern day humans are exposed to and compare this to their thermoneutral zone. Therefore we hypothesize that modern day humans (both males and females) are predominantly within their thermoneutral zone, and are consequently exposed to an environment that predispositions people to develop metabolic and cardiac diseases.

### Study design

Mixed study design: between subject observational field study, and within subject intervention laboratory study.

#### Intervention

During the field study subjects are encouraged to behave as they normally would, therefore no intervention is planned. During the laboratory visit the thermal environment of subjects is altered by changing clothing conditions while subjects perform several activities (sitting \* walking) on a treadmill.

#### Study burden and risks

No significant burden or risk for the subjects is expected. Subjects will visit the laboratory one full day and participate in a field study for two days. Physiological measurements are non-invasive and include skin temperature, core temperature, heart rate, blood pressure, skin blood flow, activity and metabolic rate in the lab study. Subjective measurements are performed by questionnaires to indicate thermal comfort. During the field study physiological measurements include skin temperature, core temperature, heart rate, blood pressure and activity. Also during the field experiment subjects will fill in questionnaires to indicate thermal comfort and clothing worn.

# Contacts

**Public** Universiteit Maastricht

Universiteitssingel 50 Maastricht 6229 ER NL **Scientific** Universiteit Maastricht

Universiteitssingel 50 Maastricht 6229 ER NL

# **Trial sites**

### **Listed location countries**

Netherlands

# **Eligibility criteria**

#### Age Adults (18-64 years) Elderly (65 years and older)

### **Inclusion criteria**

- \* Age between 18 and 60 years old
- \* BMI between 20 to 25 kg/m2
- \* Sharing the same office with another participant of different gender

# **Exclusion criteria**

- \* Is a minor or senior (i.e. younger than 18 years or older than 60 years)
- \* Age difference within couple greater than 10 years
- \* BMI difference within couple greater than 2 BMI points
- \* Health issues
- \* Within couple at least 1 participant works more than 1 night-shift per month
- \* Incapacitated

# Study design

# Design

Study type: Interventional	
Masking:	Open (masking not used)
Control:	Uncontrolled
Primary purpose:	Other

### Recruitment

NL	
Recruitment status:	Recruitment stopped
Start date (anticipated):	23-02-2016
Enrollment:	20
Туре:	Actual

# **Ethics review**

Approved WMO Date: Application type: Review commission:

17-12-2015 First submission METC academisch ziekenhuis Maastricht/Universiteit Maastricht, METC azM/UM (Maastricht)

# **Study registrations**

# Followed up by the following (possibly more current) registration

No registrations found.

### Other (possibly less up-to-date) registrations in this register

No registrations found.

### In other registers

Register	ID
ССМО	NL54274.068.15
Other	NTR nummer nog niet ontvangen