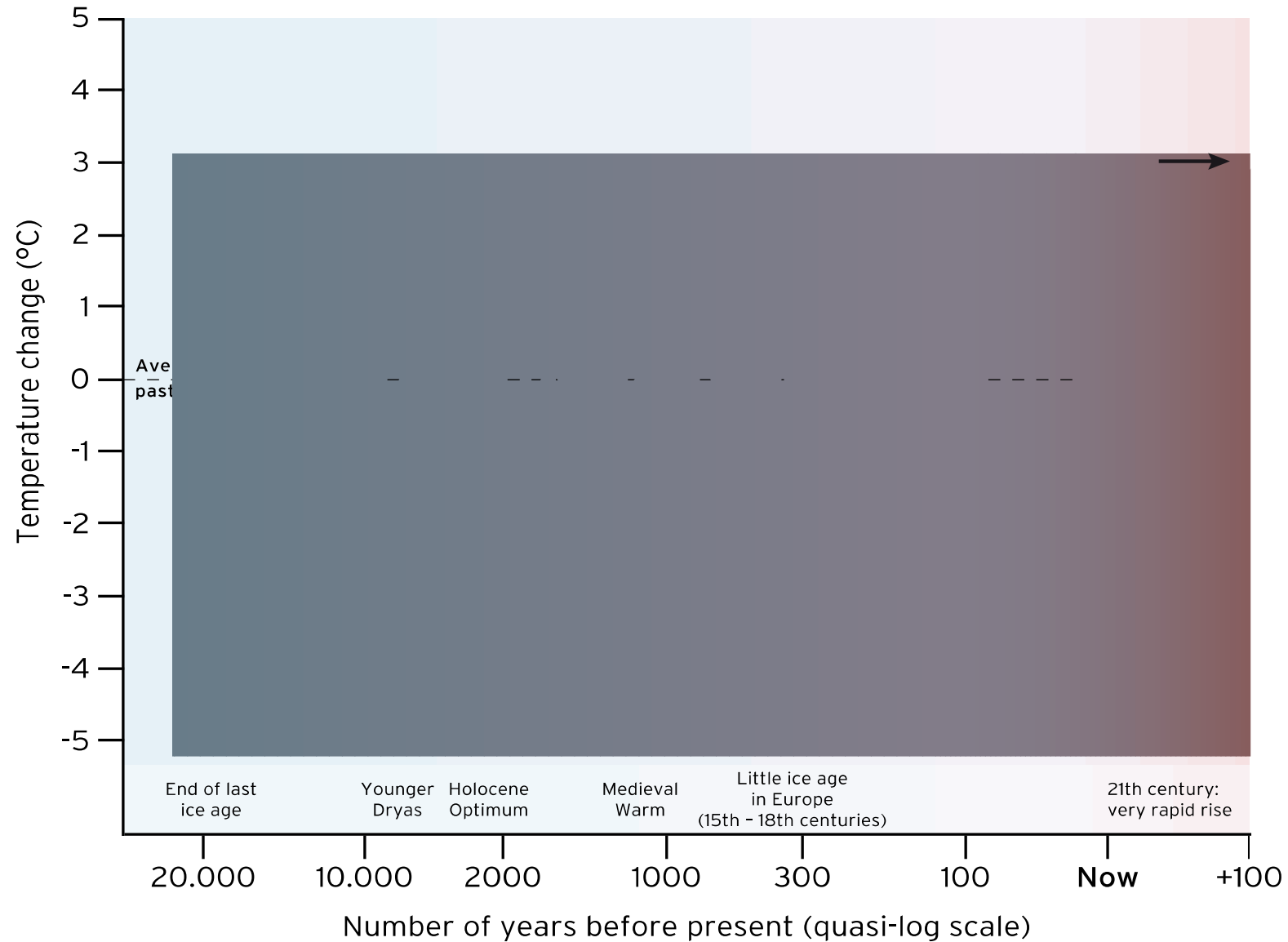


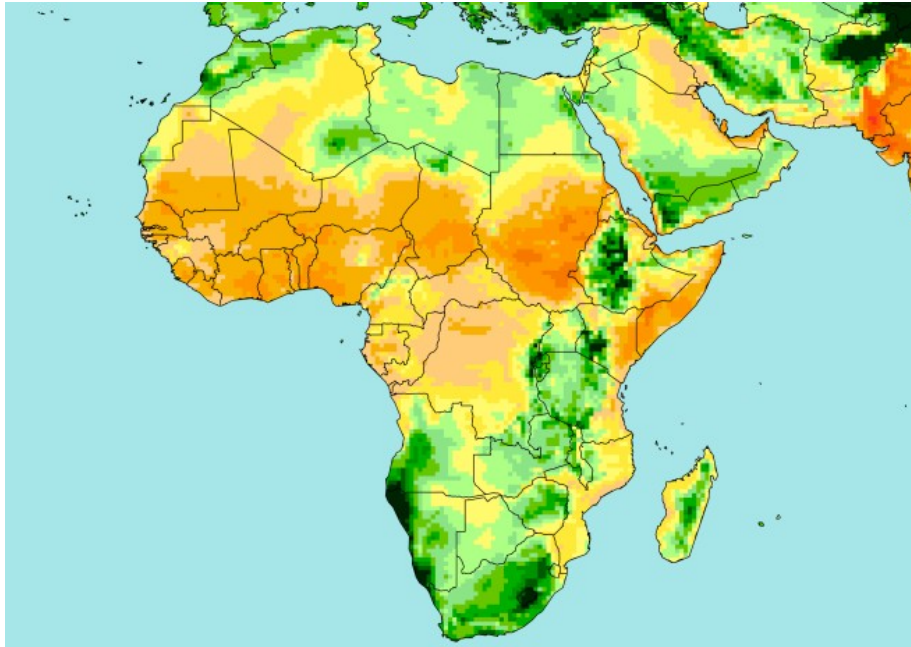
Climate Change

Variations in Earth's average surface temperature over the past 20,000 years

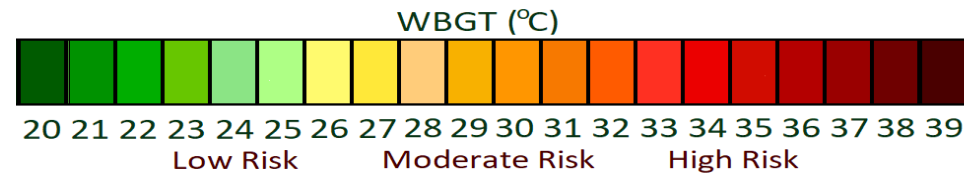
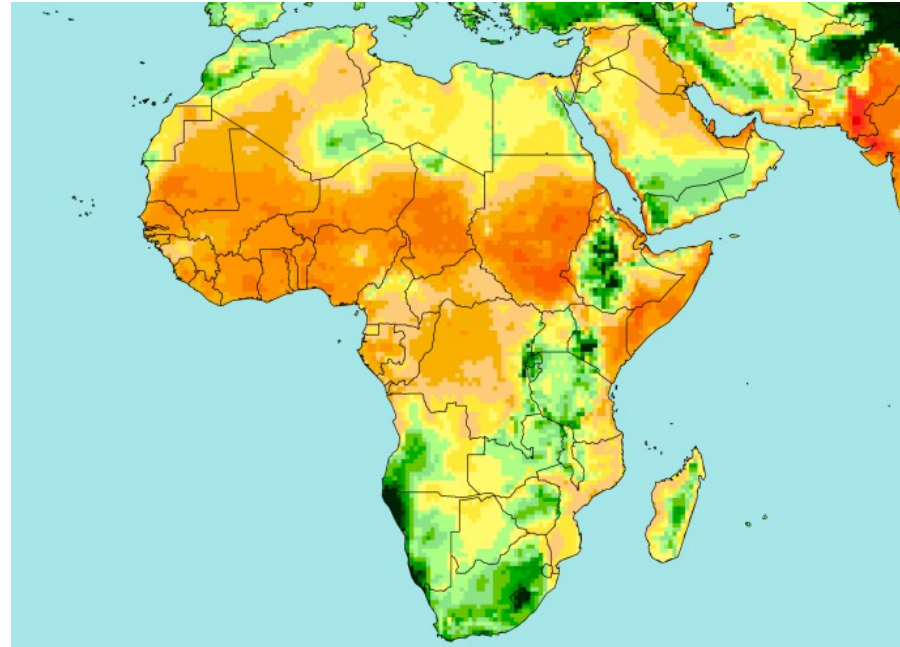


Increasing heat exposure in Central and Western Africa

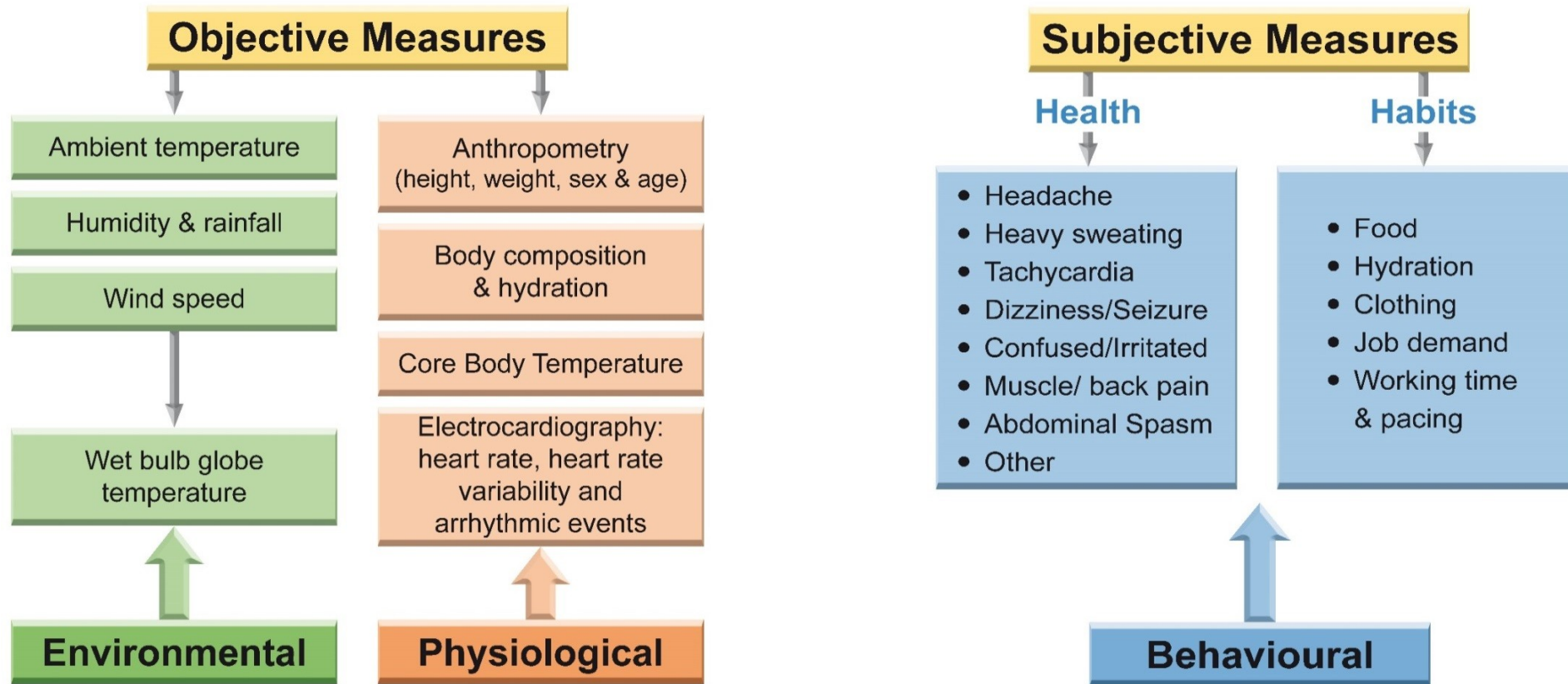
1995



2030



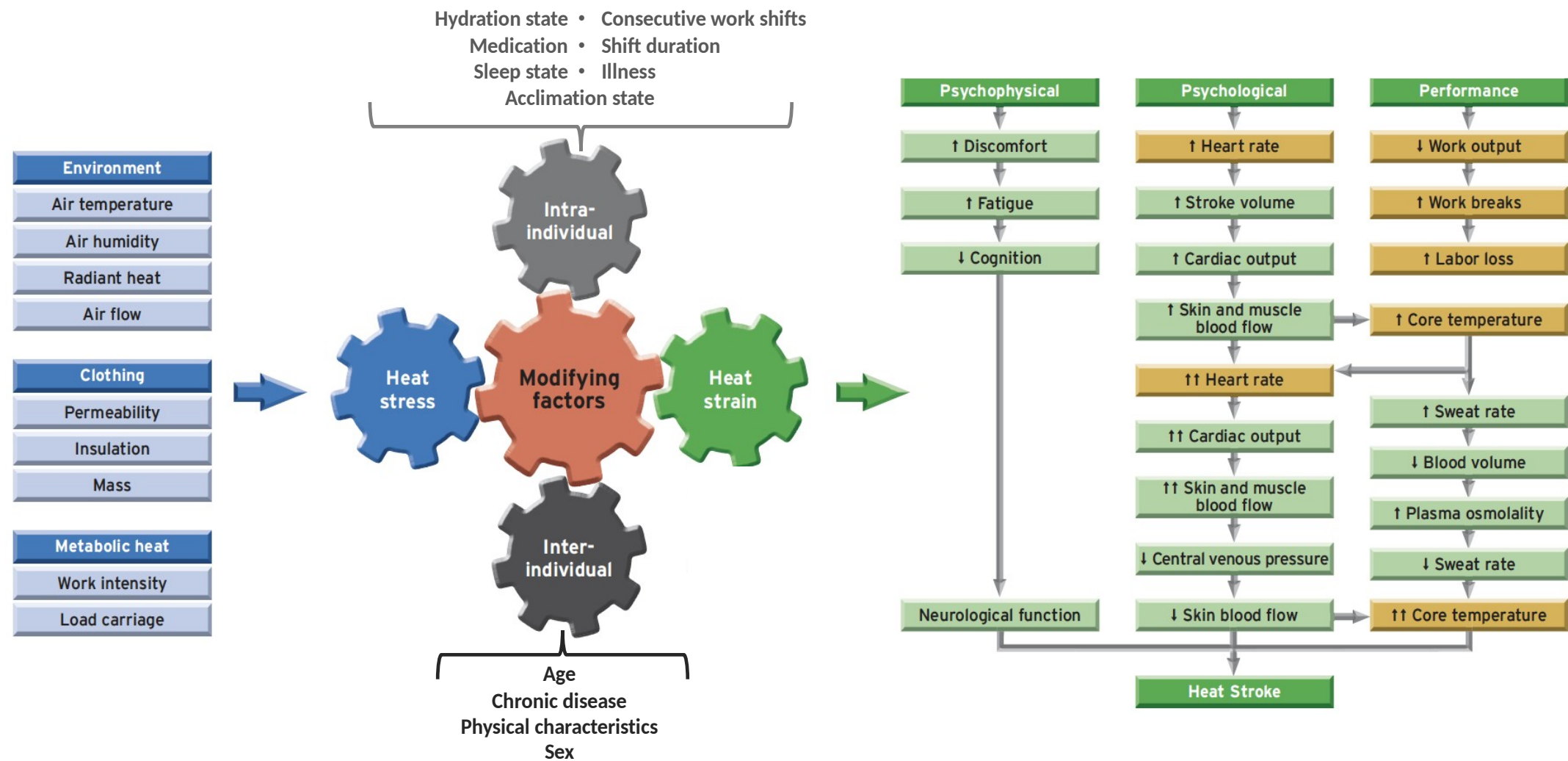
Conceptual flow chart to assess the impact of heat stress on human health and work capacity



(adapted from Sen and Nag, Urban Climate 2019)

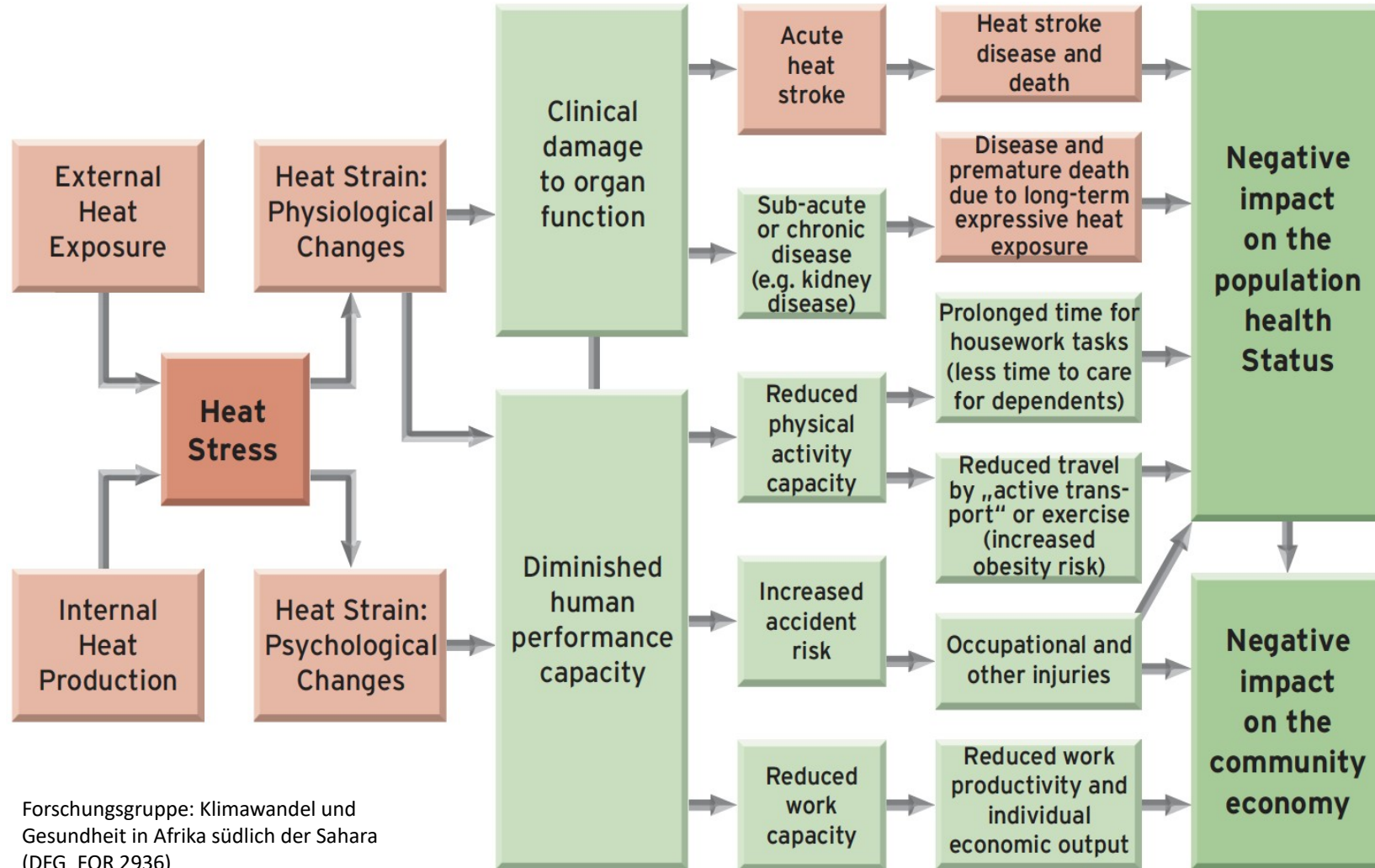
Summary of the potential sources of occupational heat stress, which may be enhanced by climate change

Heat stress depends on environmental factors, clothing, and the amount of physical (metabolic) activity. Heat strain addresses the physiological, psychological, and performance changes induced by that in the body. Highlighted in yellow are the specific responses we are measuring in the present proposal. Excessive heat stress can result in labor loss and multiple physiological adjustments that can progress to heat-related illness



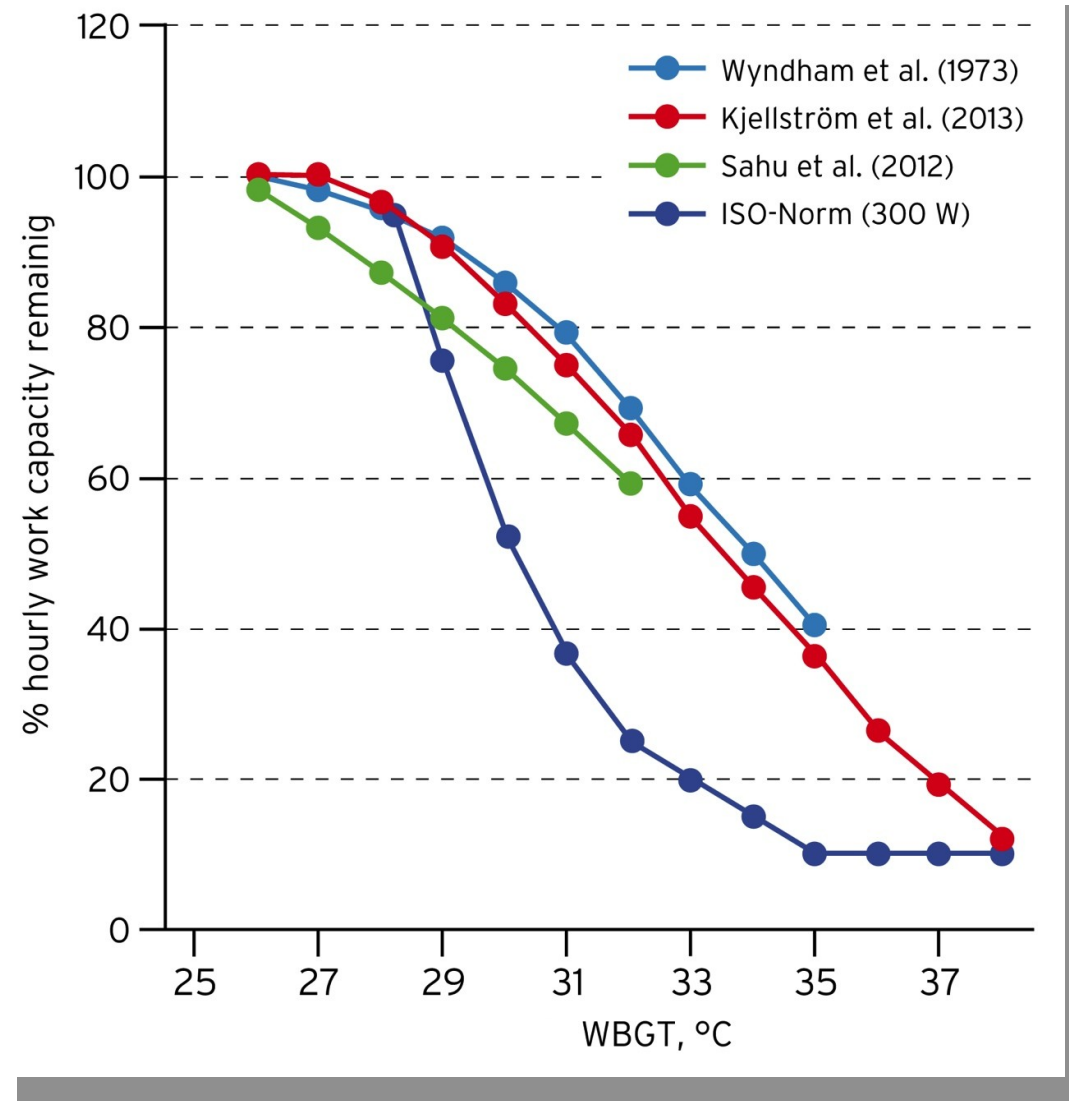
Framework of causal pathways for direct heat effects on working people

(adapted from Kjellstrom et al., Ann. Rev. Public Health, 2016)



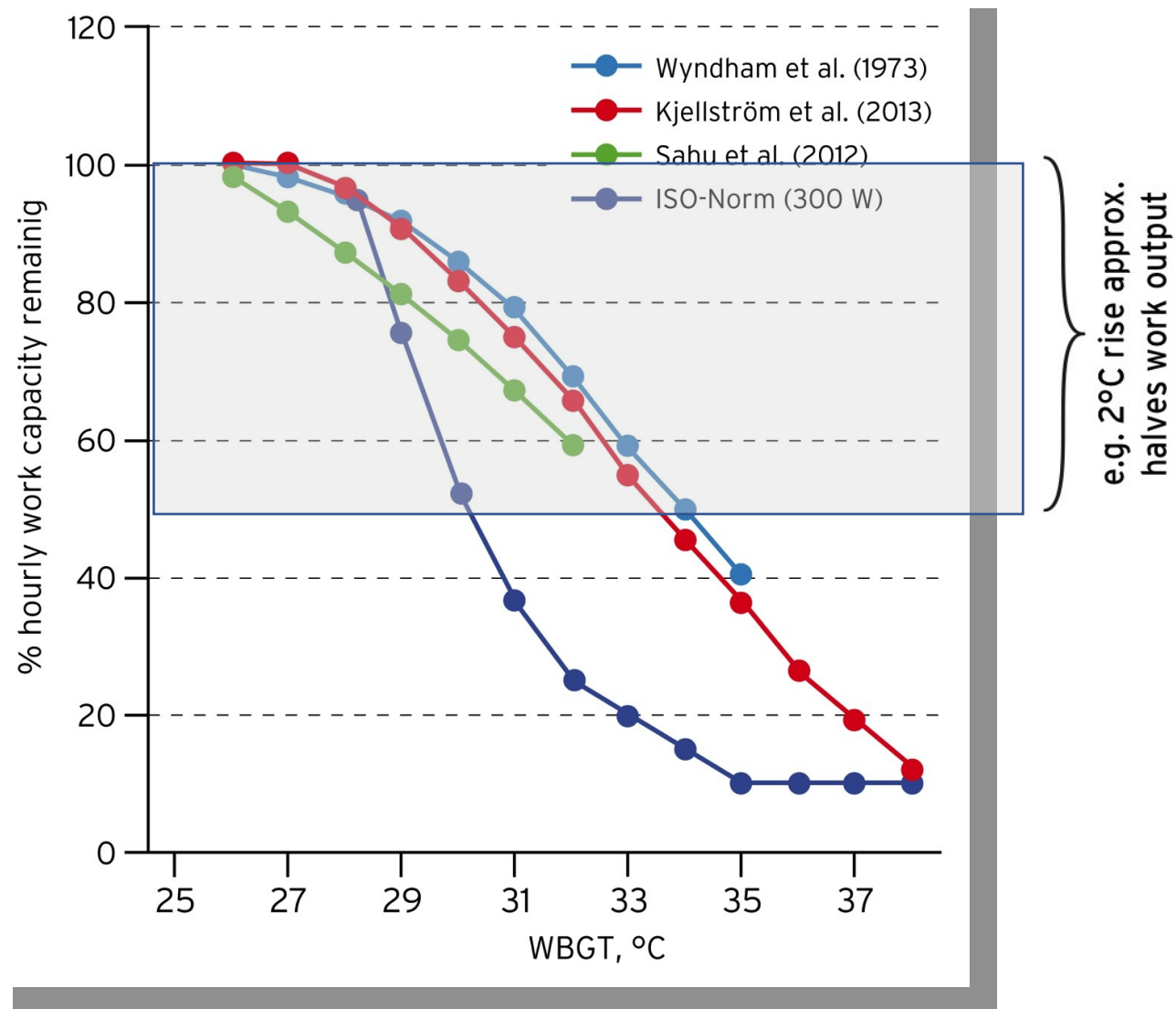
Hourly work capacity depending on WBGT (°C)

(moderate work 300W)



Hourly work capacity depending on WBGT (°C)

(moderate work 300W)

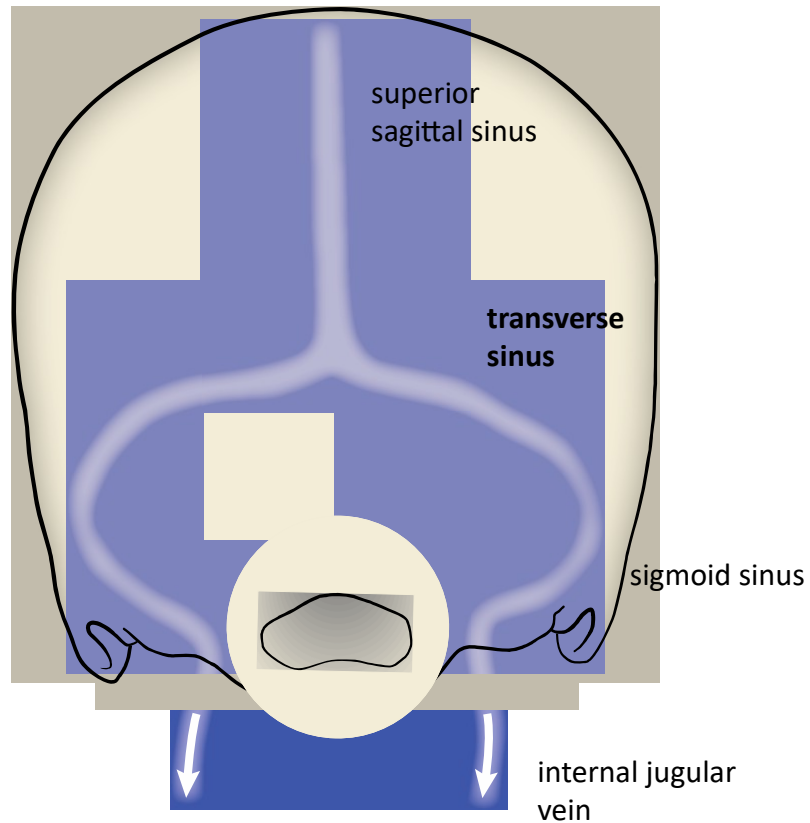


Back-up slides

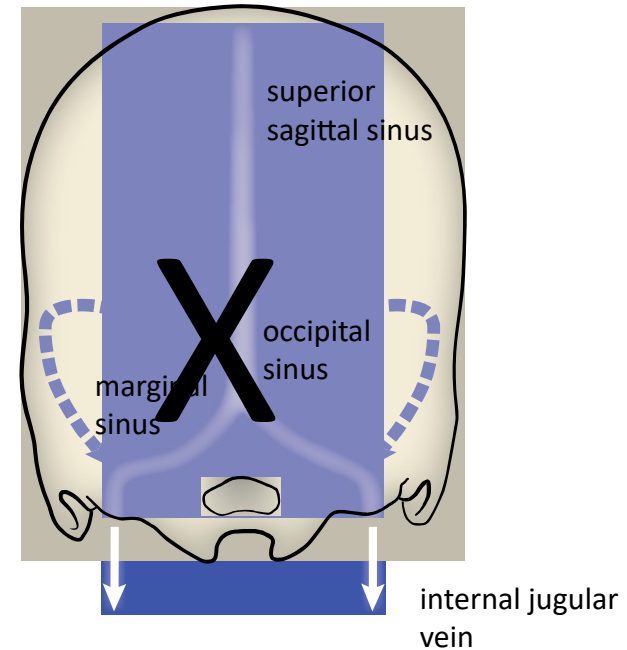
Evolutionary Physiology - Brain in Modern and Early Humans

Different brain volumes and anatomical features to remove venous blood from the brains

Modern Humans



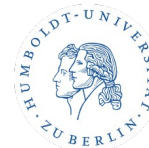
Early Humans
(*Australopithecus robustus*)



Falk and Conroy, 1983



SwissTPH



CLIMATE CHANGE AND HEALTH IN SUB-SAHARAN AFRICA: PROPOSAL FOR A RESEARCH UNIT

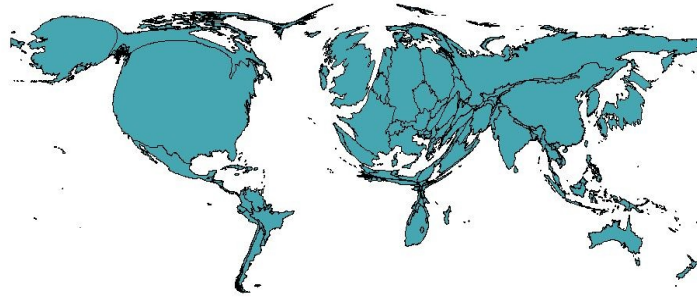
Deutsche Forschungsgemeinschaft
HEARING | 02 April 2019 | DFG

DFG Research Unit 2936 recently established (2020-2023):

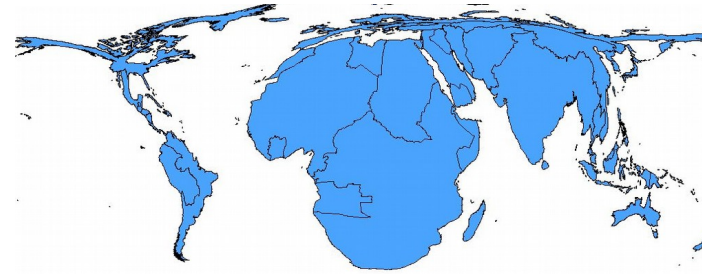
Climate change and health in the Sub-Saharan Africa (Speaker: Sauerborn, Heidelberg)

Social motivation

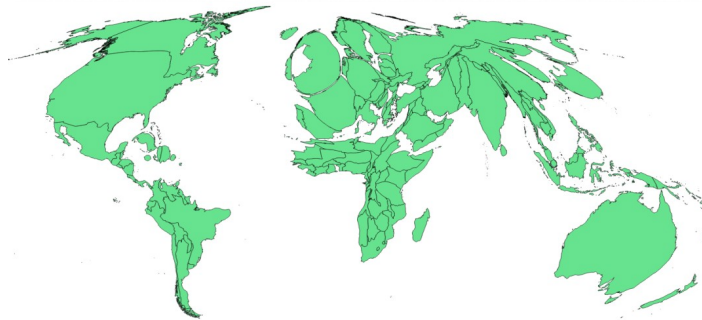
Cumulative emissions, 2000



Estimated mortality impact, 2000



Publications: Climate change
and health, 1992-2015



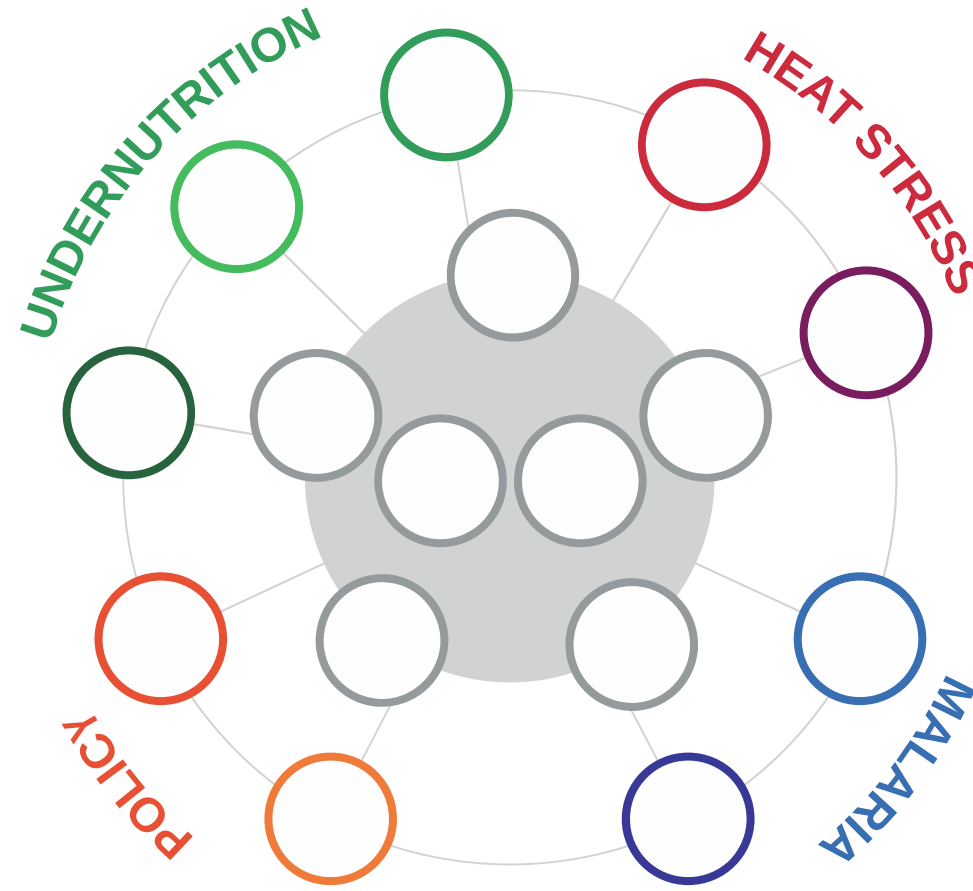
Verner et al. 2016

Established July 2019

DFG Research Unit 2936

Sprecher SAUERBORN, Heidelberg

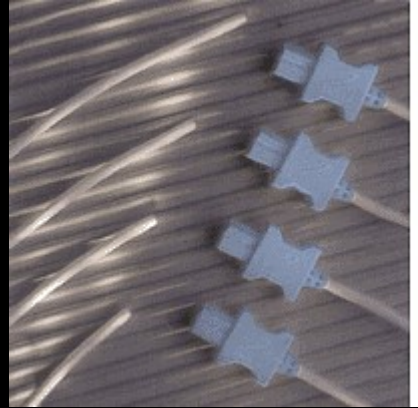
The global and diverse team



COOPERATION

Core body temperature probes

Rectal



TempPill



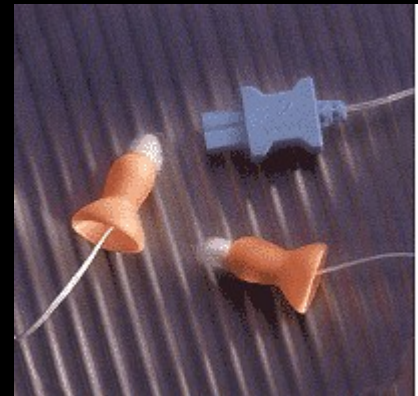
Bladder



Esophageal

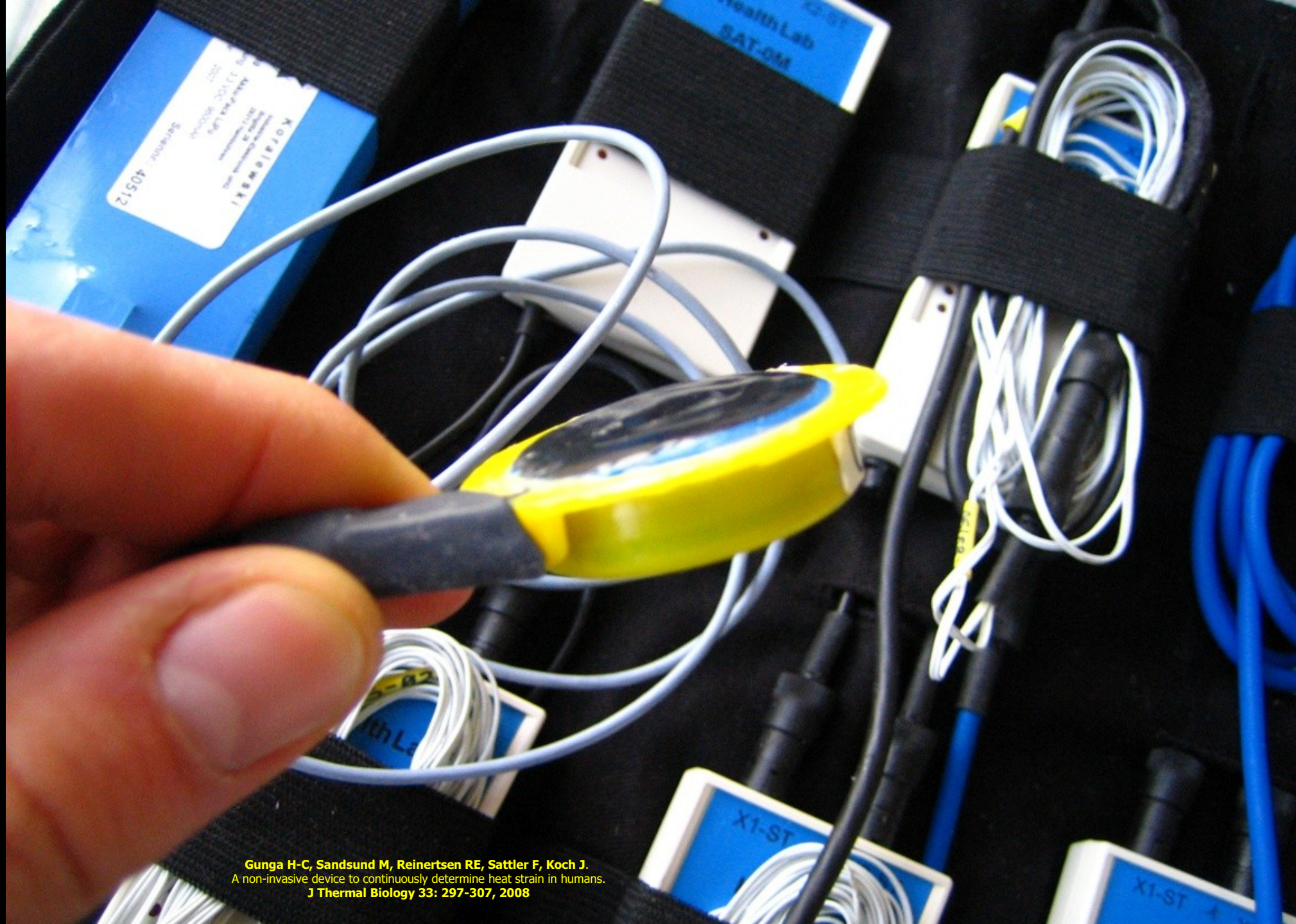


Tympanic



Temporal





Gunga H-C, Sandsund M, Reinertsen RE, Sattler F, Koch J.
A non-invasive device to continuously determine heat strain in humans.
J Thermal Biology 33: 297-307, 2008



German Astronaut A. Gerst
Commander of the ISS 2017