

The impact of climate change on the public health of the Netherlands

23rd November 2021

Jeffrie Quarsie, MD, MA

Medical resident in Environmental Medicine

Be-cause health Conference

Table of content

II. The 5 health effects

II. Case study

III. Recommendations

Part I.

The 5 health effects

Climate change globally

“Biggest threat to human health of the 21st century” (Watts, et al. 2018)

Global effects:

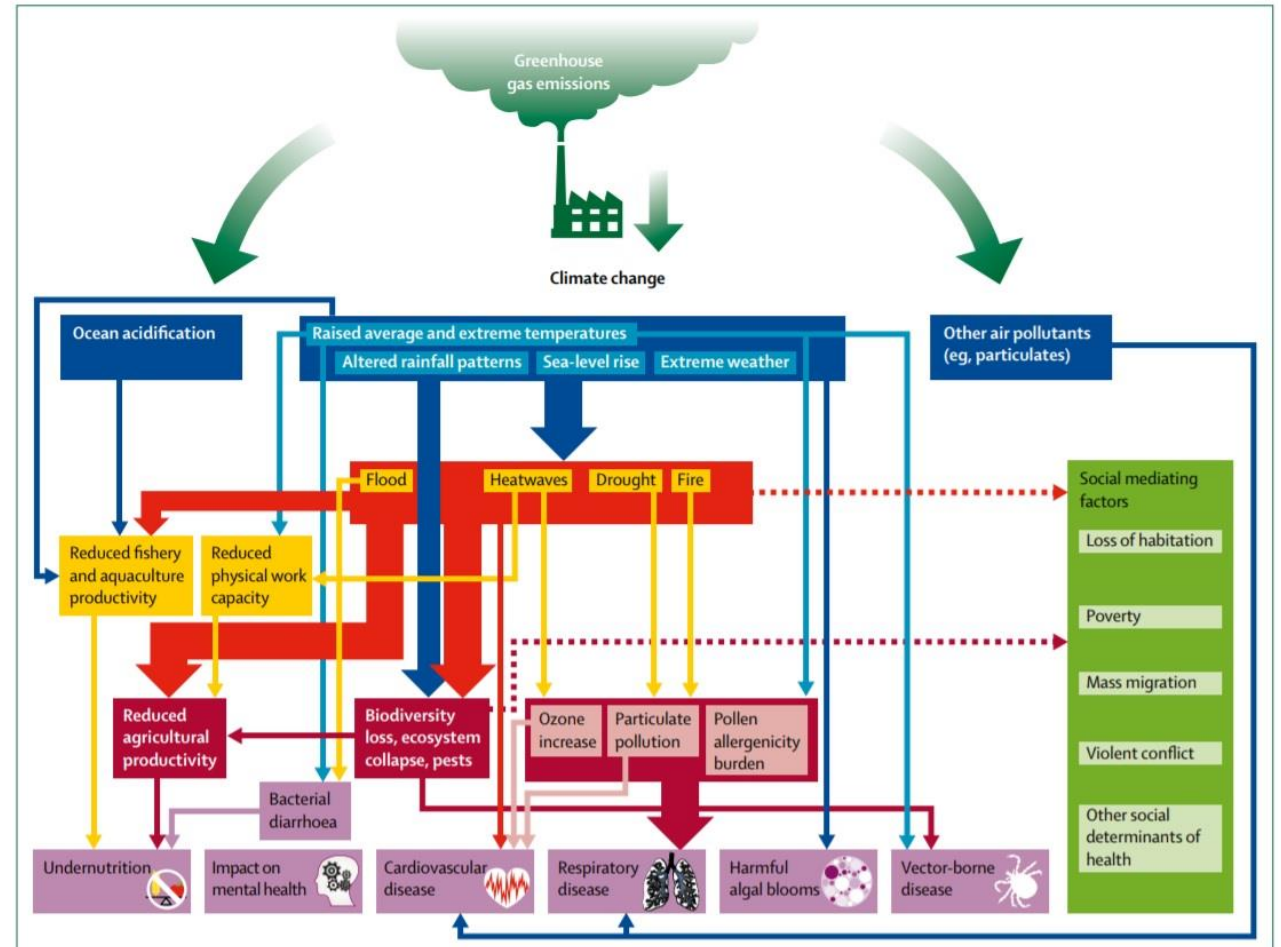
Extreme drought

Food insecurity

Hunger

Conflict

Mass migration



Watts et al, 2018

Impact of climate change in the Netherlands

STAND VAN ZAKEN

DISCLAIMER



Onafhankelijke informatie is niet gratis. Het NTVG investeert veel geld om het hoge niveau van haar artikelen te waarborgen, door een proces van peer-review en redactievoering. Het NTVG kan alleen bestaan als er voldoende betaalde abonnementen zijn. Het is niet de bedoeling dat onze artikelen worden verspreid zonder betaling. Wij rekenen op uw medewerking.

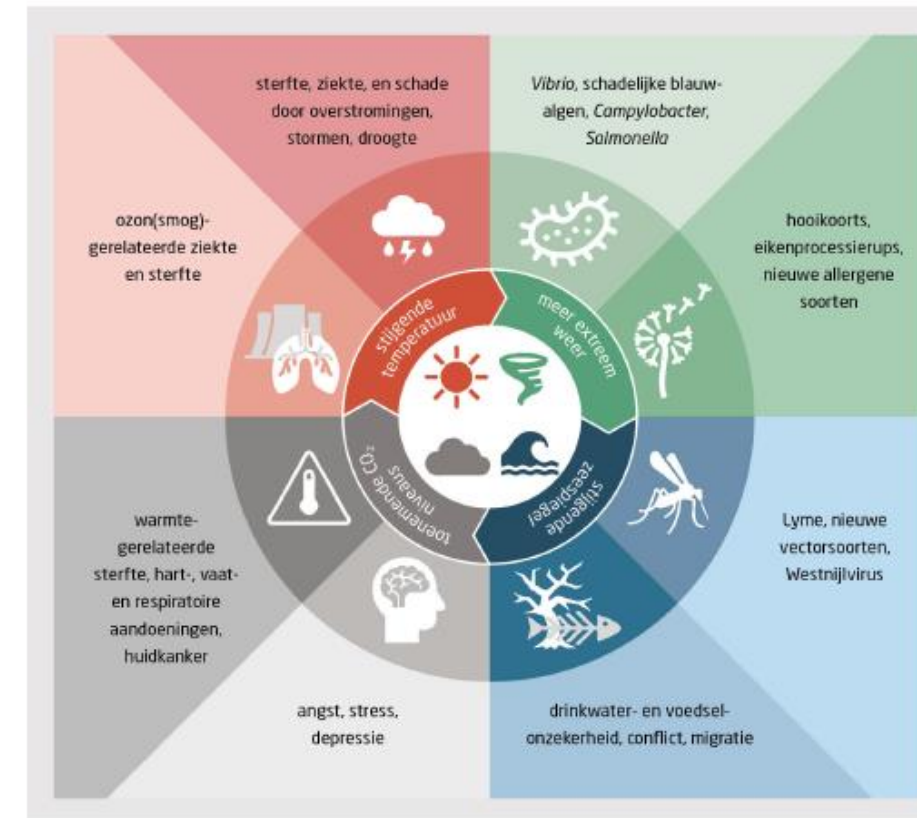
De impact van klimaatverandering op gezondheid in Nederland

De nieuwste inzichten

Jeffrie Quarsie, Remco van de Pas, Ewout Fanoy en Peter van den Hazel

Review in Dutch Journal of Medicine

With Dr. R. van de Pas, Dr. E. Fanoy and Dr. P. Van den Hazel



Figuur

Gevolgen van klimaatverandering voor de gezondheid en veiligheid in Nederland²⁰

5 main health effects

- 1) Heat related diseases
- 2) Allergies
- 3) Air pollution related diseases
- 4) Infectious diseases
- 5) UV-radiation related diseases

1) Heat

Climate aspect	Recent developments in the Netherlands	Projection of 2050
Average temperature per year	Has increased over all seasons (1991 – 2020) NL warms 2x as fast as world average	Will increase with 1 to 2,3 C
# of summer days with a maximum temperature of 25 C or higher per year	1991 – 2020 warmest period in history of the Netherlands	From current 28 summer days to 35-35 summer days
# of ice days per year	1991-2020 had on average 6 ice days per year	Will decrease to 1 or 4 ice days per year
# of consecutive days with a surface water temperature above 20 C per year	Around 26 days per year (1994-2006)	Will increase to 38 days per year
# of tropical nights of 20 C or higher	Significantly increased in period 1981-2010	Further increase of 0,5 to 2,2%

1) Heat related disease

3 largest natural disasters in the Netherlands?

Relatively high mortality

Heat stress

Exacerbation of nefrological disorders (dehydration)

Aggravation of cardiovascular disease (overheating)

Heat stroke



1) Heat

Sleep disturbance

Reduced labour productivity

Labour related accidents

Sick leave

Social unrest

Psychological complaints

More psychiatric hospital admissions

More suicides

31% of heat related mortality attributed to climate change
(250 persons p/y)

Netherlands at risk

Elderly (75+)

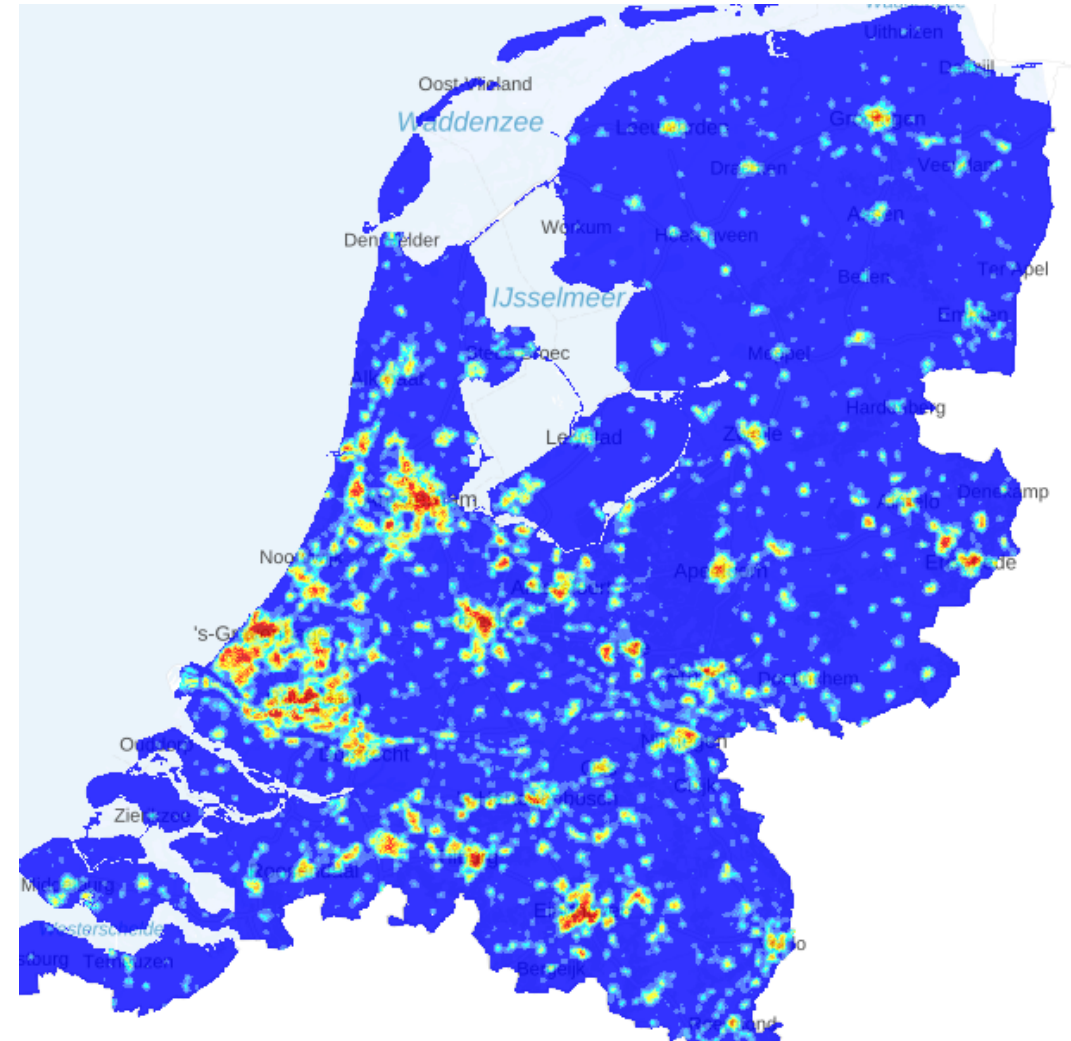
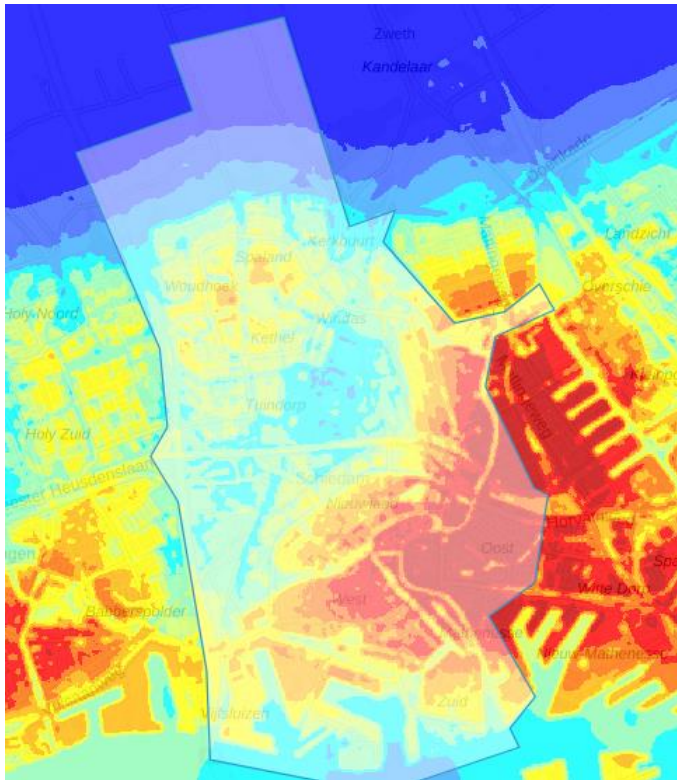
Urban people

Obese people

Lonely people



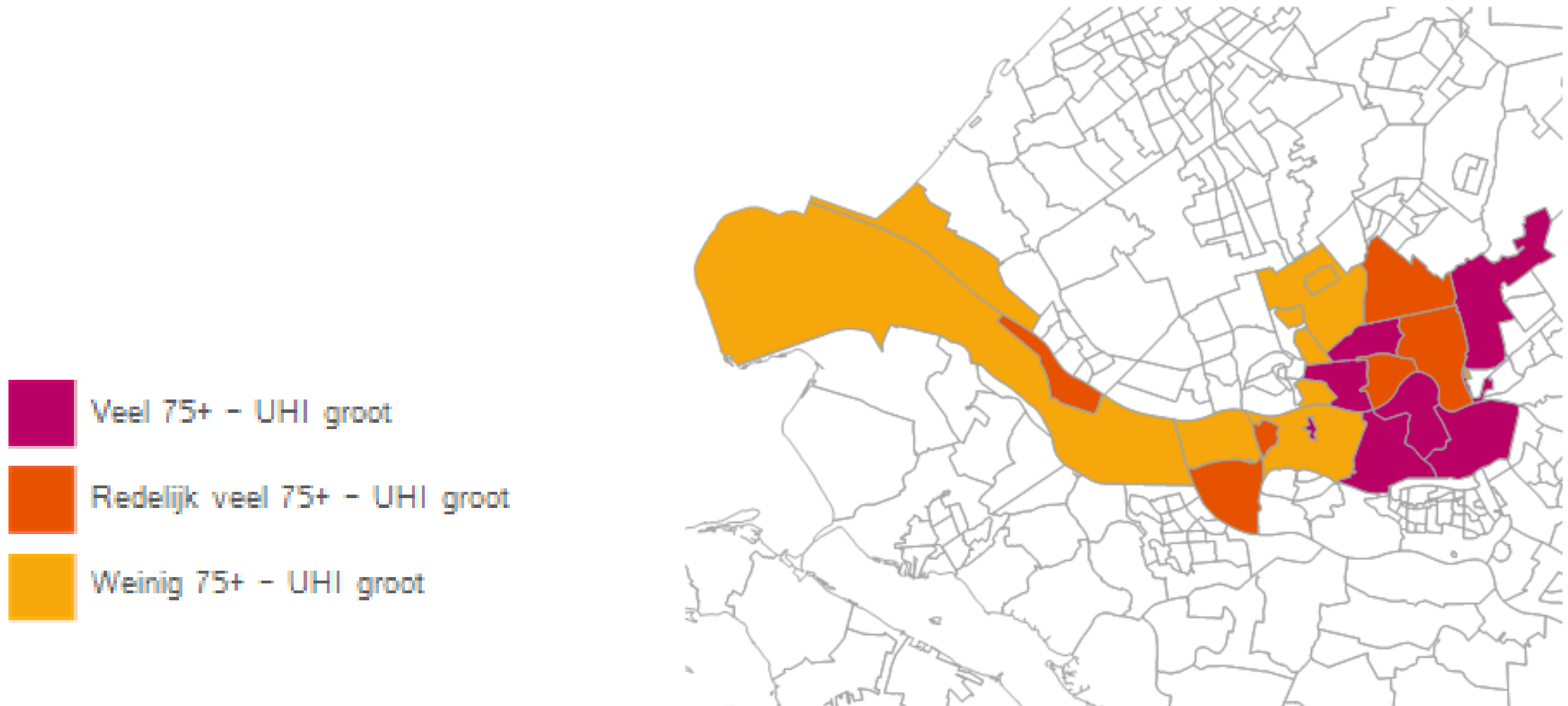
Netherlands: high risk of urban heat island effect



Heat

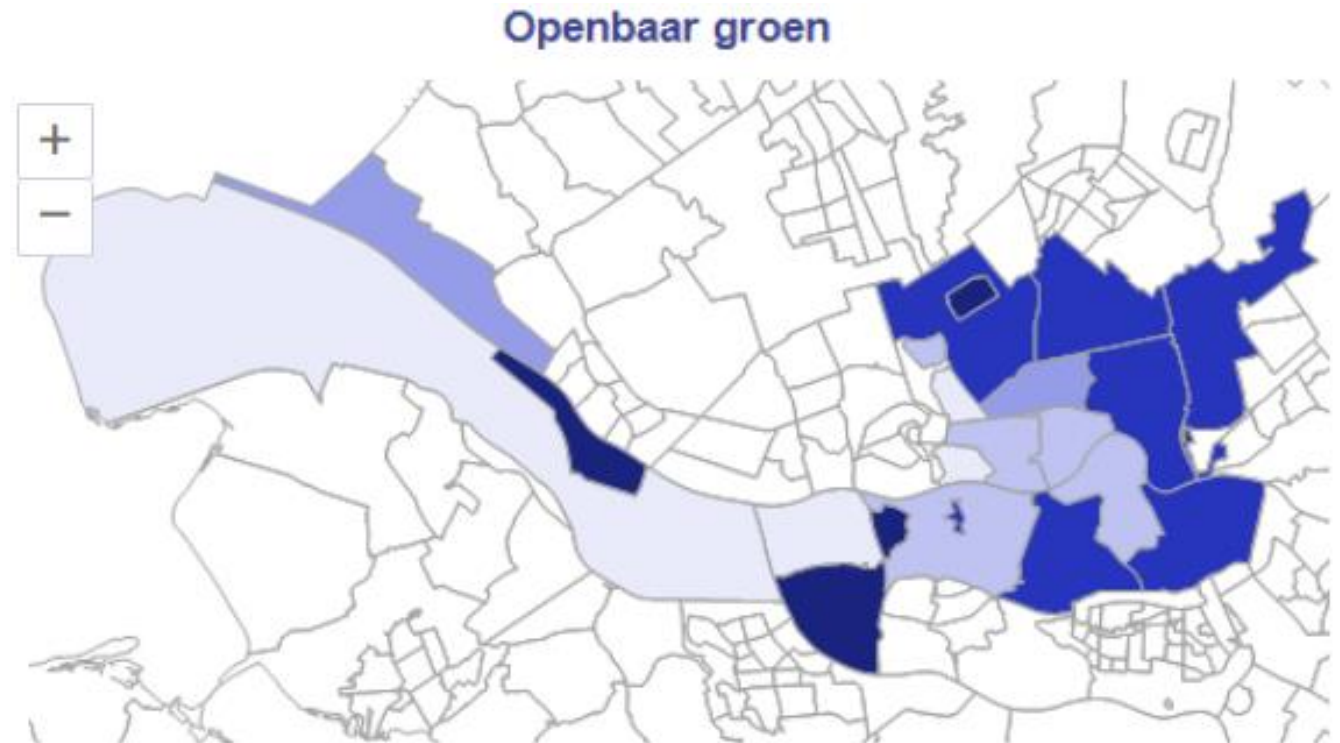
Rotterdam high risk – heat-loneliness map

Hitte-eenzaamheidskaart



Heat

Green and heat in Rotterdam



Milder winters?

- Suspected lower cardiovascular and respiratory mortality among 65+
- Suspected lower morbidity and mortality of influenzae
- Less accidents/mortality through slippiness and glazed frost
- Less risk of winter smog

Limited insight in effects – not yet observed



2) Allergies

Prolonged and more intense pollen season
New kinds of pollen have arrived
20% sensibilisation

Allergic rhinitis
Sleep disturbance
Concentration problems
Poorer daily functioning
Sick leaves
Medication use
GP consultations



3) Air pollution related diseases

Long-term air pollution increases risk of:

- Hypertension
- Coronary atherosclerosis
- DMII

Mortality in the Netherlands 2018

- Particulate matter (9900)
- Nitrogen oxide (1600)
- *Ozone (410)*

Ozone smog

- Aggravation of cardiovascular disease



4) Infectious diseases

Tick bites (73.000 pt in 2006 naar 91.000 in 2017)

Erythema migrans consultations increase (6500 in 1994 naar 25.500 in 2017)

Multifactorial aetiology



Infectious diseases

Exotic mosquitos on the rise

Aedes albopictus: carrier of dengue and chikigunya



Culex pipens spotted – West Nile virus



Dependent of availability of water and higher temperatures

Water related diseases

More frequent and more intense precipitation

Warmer weather

Increased water temperature

Expected deterioration quality surface water

Expected proliferation:

- *Vibrio* spp
- *Legionella* spp
- *Leptospiren*
- Noroviruses
- Blue-green algae



Insect plagues

Since 1990s: oak processionary caterpillar on the rise

- Intense itch
- Urticaria
- Exanthema
- Ocular and respiratory irritation

Taponima nigerrimum on the rise

Vespa velutina on the rise



5) UV-related diseases

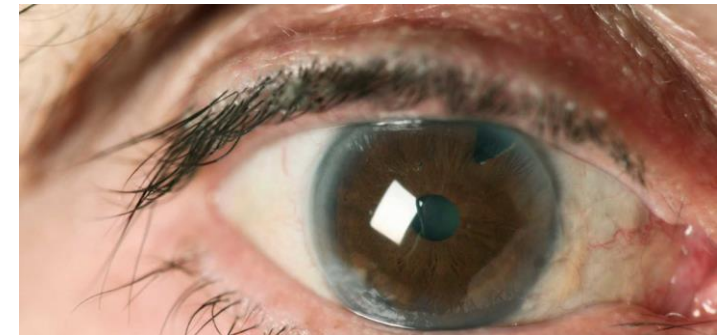
More sun hours, more UV radiation

Skin cancer and opthomological disorders

Incidence skin cancer from 3839 to 22.063 (1990-2020)

Prevalence of cataract 3fold increase (1991-2014)

Simultaneously: more UV radiation, more vitamine D



Part II.

Case study

Case: what can the doctor do?

A general practitioner in the city centre receives a warning about an impending heat wave with code orange from the Public health services. The doctor learns about the importance of preventive advice and to be extra alert to early warning signs in vulnerable patients. The next day, a 71-year-old woman comes to the GP because of a skin rash. She has obesity, hypertension, DM type 2, heart failure and chronic kidney damage, for which she takes acetylsalicylic acid, metformin, nifedipine and furosemide. She lives alone in a social rented house.

When questioned, it turns out that her home is uncomfortably hot. She feels dizzy and has a headache. In consultation with the pharmacist, the general practitioner decides to temporarily discontinue furosemide during the heat week in combination with daily self-weighing by the patient at home. The GP advises the patient to eat enough and also to control blood sugar check, and drink 5 glasses of water daily this week.

The doctor also advises to stay in touch extra this week with the most important people in her social circle and to find cooler places nearby during the day, such as the library or shady spots along the water. The GP refers the patient to the environmental health department for more extensive preventive heat advice and structural measures, such as preventive behavioural advice, roof insulation and un-tiling the garden.

Part III.

Conclusion.

Conclusion

Climate change: not just a future risk but a current burden

Also in the Netherlands, associated with significant morbidity and mortality

Limitations: many qualitative effects, fewer quantitative effects

Future effects depend on climate mitigation and adaptation



Recommendations

Three dimensions:

- 1) Medical doctor in the consultation room
- 2) Medical doctor in the health sector
- 3) Medical doctor in the society



Thank you

Questions?

Contact: J.quarsie@alumni.maastrichtuniversity.nl