Klimaforandringer i Skandinavien – Sundhedsvæsenets beredskap

Björn Fagerberg
Prof em, Medicin, Sahlgrenska Akademin,
Göteborgs Universitet, Sahlgrenska
Universitetssjukhuset, Göteborg

Arbetsgruppen för Klimat och hälsa, Sveriges Läkarförbund

Sahlgrenska Akademin
Climate change is a real risk

Paris Agreement 2015
• Global temperature rise this century (well) below 2°C
• 133 out of 197 countries have ratified

• Likelihood: Extreme weather event (1)
• Impact: Extreme weather event (2), failure of climate change mitigation and adaptation (5)

Direct, indirect effects of climate change on living conditions and social dynamics

**Direct**
- Storms
- Drought
- Flood
- Heatwave

**Indirect**
- Water quality
- Air pollution
- Land use change
- Ecological change

**Social dynamics**
- Women, elderly, children
- Chronic diseases
- Low socio-economy
- Conflict, Migration

Modified from www.the lancet.com, vol 386, nov 7, 2015
Effects of climate change on disease panorama

Cardiovascular diseases
Infectious diseases
Mental illness
Respiratory disease
Allergies
Undernutrition

How to act on climate change?

**Mitigation:**
reductions in human emissions of greenhouse gases

**Adaptation:**
lower the risks posed by the consequences of climatic changes
When will Scandinavia be fossilfree?

... and the health care systems – national plans?

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National programs for mitigation in Health Care?

**England:** yes - carbon footprint has fallen by 10% between 1997 and 2015

[Climate Change Act levels of ambition for the wider sector](http://www.sduhealth.org.uk/policy-strategy/reporting/sustainable-development-in-health-and-care-report-2016.aspx)

**Sweden, Denmark:** no

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Mitigation: Size of emissions of greenhouse gases in health care?

<table>
<thead>
<tr>
<th>Country</th>
<th>Health Care (% of GDP*)</th>
<th>Health Care: greenhouse gas emission, % of all emissions</th>
<th>Health Care: greenhouse gas emission, MT CO$_2$e,</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>10.8</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>Sweden</td>
<td>11.9</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>England</td>
<td>9.1 (UK)</td>
<td>3-4%</td>
<td>22.8 MT</td>
</tr>
<tr>
<td>USA</td>
<td>17.1</td>
<td>10%</td>
<td>655 MT</td>
</tr>
</tbody>
</table>

*GDP – gross domestic product


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## Klimaregion Nordjylland - klimaregnskap

<table>
<thead>
<tr>
<th>CO₂e udledninger (ton):</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bygninger og arealer</td>
<td>55.350</td>
<td>45.598</td>
<td>43.400</td>
<td>45.002</td>
<td>39.282</td>
</tr>
<tr>
<td>Patientartikler</td>
<td>22.725</td>
<td>22.161</td>
<td>21.333</td>
<td>22.897</td>
<td>22.737</td>
</tr>
<tr>
<td>Service og administration</td>
<td>26.126</td>
<td>22.506</td>
<td>23.618</td>
<td>28.318</td>
<td>20.479</td>
</tr>
<tr>
<td>Transport</td>
<td>15.501</td>
<td>15.720</td>
<td>20.330</td>
<td>20.917</td>
<td>19.671</td>
</tr>
<tr>
<td>Øvrig sundhed</td>
<td>51.677</td>
<td>41.439</td>
<td>42.967</td>
<td>44.470</td>
<td>42.437</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>212.177</td>
<td>187.489</td>
<td>189.745</td>
<td>197.198</td>
<td>177.734</td>
</tr>
</tbody>
</table>

http://www.rn.dk/Om-Region-Nordjylland/KlimaRegion/~/media/Rn_dk/Om%20Region%20Nordjylland/KlimaRegion/RN%20Klimaregnskab%202014%20-2020.ashx

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Distribution of CO2 emissions in health care:
Example Skåne Region, 2011


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1. Mapping the climate impact of the clinic (Urology Clinic and the Clinical Hand Unit, SUS University Hospital in Malmö)

2. Identifying the areas with the greatest impact

3. Measures to reduce impact

4. Evaluating the results


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Benefits and co-benefits of reducing carbon footprint

Reduce emission of CO$_2$ (9-41% reduction during 4 years)

And important co-benefits:

- Make activities/flows more effective
- Reduce wastefulness
- Free up value-creating time


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Adaptation

- Heatwaves
- Changing panorama of infections
- Storms, floods
- Exposure to pollen → allergies
Fremtidens temperatur i Danmark

• Den årlige middeltemperatur i Danmark er steget cirka 1,5˚C siden 1870 og forventes at fortsat at stige
• Temperaturen vil stige 1,2 – 3,7 grader i løbet af dette århundrede (lave- højescenarie)
• Hedebølge* – øget frekvens (x2-3) og længd

Gennemsnittet af de højeste registrerede temperaturer målt over tre sammenhængende dage overstiger 28˚C

https://www.dmi.dk/klima/fremtidens-klima/danmark/ekstrem-vejr/

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Effects of extreme heat on health

• Sweating, reduction of blood volume
• Redistribution of blood flow
• Increase in heart rate

• Increased breathing

• On day 2 of a heat wave with temperature above 27.5°C - mortality increases 10%, and on day 7 by 20-25% in vulnerable groups

Vulnerable groups for extreme weather events

- Infants, small children
- Age above 65 years
- Chronic heart/lung/renal diseases
- Severe obesity/diabetes
- Treatment with specific pharmaceutical agents (diuretics, ACE-inhibitors, digoxin, litium, antiepileptic medication)
- Severe mental illness or dementia
- Socially isolated elderly/chronic diseases
- Work or physical activity in heat exposed environment
Heat-health action plans to reduce mortality*

Heatwave early warning systems
(Swedish Meterological and Hydrological Institute):

• Information on high temperatures: Maximum 26°C at least 3 consecutive days

• Class 1 warning for very high temperatures: Maximum 30°C at least 3 consecutive days

• Class 2 warning for very high temperatures: Maximum 30°C at least 5 consecutive days or maximum 33°C at least 3 consecutive days

Heat-health action plan to reduce mortality in the municipalities and regions

1. Action plan that is implemented in the organisations
2. General advice to staff within home care service, home nursing, nursing home, primary health care.
3. Advice to doctors and nurses within hospital care

- Considerable increase of health risk in vulnerable groups at temperatures of 26°C and above lasting for 3 days or more (heat warning from SMHI).
- Preventive measures are monitored drinking, cool environment, shower, minimized physical activity, focus on high risk medications.
Infections

- Heat, more rain, humidity, flooding of sewers etc → change of infection panorama and exposure (tapwater)
- Foodborne infections such as Salmonellosis, Campylobacteriosis, E. coli (VTEC).
- Tapwater – Legionella
- Seawater - Vibrio vulnificus (badsårsebeber)
- Ticks: Borrelia, tick born encephalitis
- New vectors (mosquitos) and new infections

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More pollen- increase in allergy

- Better growth conditions for pollen-bearing plants
- Prolonged pollen seasons for allergens such as hazel, alder, birch, grass and sageworts
- New pollen-bearing species: ragweed (Ambrosia) - gained a footing in Denmark
- Stronger allergens
- One third of all 5-year old children in Denmark/Sweden have at least one of atopic dermatitis, asthma, or allergic rhinoconjunctivitis

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Climate change – slight increase in the risk of accidents

- Strong winds, heavy rains and thunder storms
- Danger from flying objects and falling trees
- Traffic accidents
- Lightning

Conclusions
Sundhedsvæsenets beredskap?

Mitigation –

• Reduction of carbon footprint in health care systems need more focus to reach the goal of a fossil free society within 30 years (disposable material, pharmaceuticals, reduce waste)
• N.B. Co-benefits (cost-effectiveness, better care)

WIN-WIN SITUATION!

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Conclusions
Sundhedsvæsenets beredskap?

Adaptation –

• **Heat-health action plan**
  More need to be done on the national and regional levels

• **New infection panorama**
  Education, information, resources, overlap with antimicrobial resistance

• **Pollen**
  Education, information, resources

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An active role of the medical profession is needed!

2015

Policy
Climate and health
The Swedish Medical Association

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https://www.slf.se/Pages/82076/Policy_climate_and_health_2.pdf
And other issues...

• A diet for both sustainability and better health
• The health co-benefits of a fossil free society
Tak!

Nord-Koster

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Effekter av kyla och värme på mortalitet i Tokyo och Stockholm

Streckade linjer anger 2,5:e och 97,5:e percentilen. Nivåer under 2,5 är extrem kyla och över 97,5 extrem värme

Temperaturen med minimal mortalitet Temperaturer under denna nivå är kyla (blå linje) och över är värme (röd linje)