EXTREME WEATHER EVENTS
AND
MENTAL HEALTH

Stephan Böse-O’Reilly; Hanna Mertes
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More extreme weather conditions are expected in the future.

"Precipitation conditions will change, and we now believe that rainfall will increase, especially in winter."

Extreme precipitation, which often falls in very small space, will also increase.

DWD Vice President Paul Becker in Tagesschau and Tagesthemen from 29.12.2017
CHANGE IN PRECIPITATION IN SOUTHERN GERMANY (1931-2000)

Increase / decrease of days with precipitation ≥20mm/d in % of average value

Hydrological winter period

415 stations

1931-2000

Arbeitskreis KLIWA 2006
DIRECT HEALTH EFFECTS OF METEOROLOGICAL-RELATED EXTREMES IN GERMANY (1984-2014)

<table>
<thead>
<tr>
<th></th>
<th>Deaths</th>
<th>Victims</th>
<th>Damage (in Mio USD)</th>
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<tr>
<td><strong>Extreme temperatures</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Cold 1984-2014 (n=7)</td>
<td>49</td>
<td>295</td>
<td>0,3</td>
</tr>
<tr>
<td>Heat 1984-2014 (n=3)</td>
<td>9.400</td>
<td>k.A.</td>
<td>1,7</td>
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<tr>
<td><strong>Heat August 2003</strong></td>
<td>9.350</td>
<td>k.A.</td>
<td>1,7</td>
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<td><strong>Flooding</strong></td>
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<tr>
<td>1984-2014 (n=16)</td>
<td>60</td>
<td>550.000</td>
<td>26,5</td>
</tr>
<tr>
<td><strong>August 2002</strong></td>
<td>27</td>
<td>330.000</td>
<td>11,6</td>
</tr>
<tr>
<td><strong>Storms</strong></td>
<td></td>
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<tr>
<td>1984-2014 (n=40)</td>
<td>211</td>
<td>30.500</td>
<td>26,0</td>
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<tr>
<td><strong>Vivien 1990</strong></td>
<td>24</td>
<td>K.A.</td>
<td>1,2</td>
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EXTREME FLOODING EVENTS – IMPACTS ON PHYSICAL INFRASTRUCTURE

- Supporting health services include flooded health facilities
- Evacuation of patients
- Interruptions to power and water supplies
- Safety of and access to patient records
- Interruption to ambulance services, continuity of outreach and community care

Katrina Flood
Flooded Hospital
PHYSICAL AND MENTAL HEALTH EFFECTS

 Extreme weather events endanger the physical and mental health of the affected population

- Physical acute health effects can be
  - Drowning
  - Injury by submerged or floating debris, fire or electrocution
  - Toxicity or infection linked to water shortages or contamination
  - Heart attacks
PRIMARY AND SECONDARY STRESSORS

Primary stressors
• Factors that are directly derived from personally experiencing an adverse extreme weather event

Secondary stressors
• Occurring after the extreme weather event and can be a burden even longer after the event
SECONDARY STRESSORS

Secondary stressors

• Economic (loss of income)
• Problems with compensation / rebuilding
• Loss of valuables / memorables
• Need e.g. to change school / workplace
• Negative media reports
• Psychological problems with family members
• Problems with social environment / hobbies
• Chronic health problems (e.g. after an injury -> disability)
• Reduced access to health care facilities
ACUTE AND CHRONIC MENTAL HEALTH EFFECTS

- Trauma and shock
- Post-traumatic stress disorder
- Compounded stress
- Strains on social relationships
- Depression
- Anxiety
- Suicide
- Substance abuse
- Aggression and violence
- Loss of personally important places
- Loss of autonomy and control
- Loss of personal and occupational identity
- Feelings of helplessness, fear, fatalism, solastalgia, and ecoanxiety
Solastalgia is a neologism that describes a form of psychic or existential distress caused by environmental change. In many cases this is in reference to global climate change. Anxiety disorder.
HURRICANE KATRINA AND SANDY

Hurricane Katrina

Suicide and **suicidal ideas** more than doubled

One in six people met the diagnostic criteria for post-traumatic stress disease (PTSD)

Half of people living in an affected area developed an anxiety or mood disorder such as depression

Hurricane Sandy

14.5% showed symptoms of PTSD
KLEPS – PROJECT IDEA TO ASSESS MENTAL HEALTH EFFECTS DUE TO EXTREME WEATHER EVENTS

Effects of climate change which can not be avoided demand long term responses to support and care for affected population, here mental health effects due to extreme weather events.
KLEPS – PROJECT IDEA

- Combine climate change with health data
  - (data and projections from Munich Re for extreme weather events)
- Determine point prevalence of psychiatric disorders in Bavarian regions, with high risk for flooding events, and regions with low/medium risk
- Analyse the effects on mental health
  - Effects of living in a low/medium/high risk area
  - Effects after an event
- Action plan to care for affected subjects
Evaluation of the Bavarian regions and selection of the study regions on the basis of the

- Climate projections for Bavaria
  - Data of the MunichRE
    - Affected region
    - Event description
    - Total damage and type of damage
    - Deaths, injuries
  - Probability of event occurrence
  - Number of persons at risk
  - Extent of the expected health risk
ACTION PLAN

Psychological and psychosocial interventions within disaster response and emergency management

Social adaptation processes can mediate public risk perceptions and understanding, psychological and social impacts, coping responses, and behavioural adaptation (Reser JP, Swi JK 2011)
Existing measures are recorded, evaluated and optimized

Networking of affected regions

Development of effective prevention measures and development of the necessary structures on the basis of the collected data

Development of low-threshold care services based on the collected data

Linking climate change and health data will enable better planning and preparation in the future

Similar to other civil protection plans, local organizations and involved aid organizations are involved
CONCLUSION

- Climate change will cause more extreme weather events
- Health will be affected, long-term effects will be increased mental health problems
- Data are needed to define the dimension of those mental health problems
- Action plans are needed to prevent as far as possible those negative mental health effects and/or
- Ensure that the necessary diagnostic and treatment capacities are available after such events
KLEPS

- KLEPS is a research proposal
  - To combine climate data with health data
  - To assess the dimension of possible negative mental health effects due to extreme weather events

- We look for
  - Funding opportunities
  - Partners from other Alpine regions
  - Collaboration
THANK YOU VERY MUCH FOR YOUR ATTENTION

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