

# Development of positive and negative knowledge in a professional community

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# Development of positive and negative knowledge in a professional community

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EARLI 2011, Exeter UK

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# no indications in think-aloud protocols

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# Domains where negative knowledge apply

- Mathematics and logic
  - negative evaluation of two propositions
  - together with positive knowledge it is part of the same database
- Law
  - negative know-how; can be considered a commodity and the property of a business
- Education and lifelong learning
  - Life is always more complex than law and logic



# Negative knowledge in LLL and education

Gartmeier, Bauer, Gruber and Heid (2008):

- negative knowledge is *learned from errors*



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## Gartmeier et al.:

“The concept of negative knowledge augments existing theories of professional knowledge by emphasizing knowing about *what to avoid* as part of experts’ effective actions. **During routine actions, negative knowledge enhances professionals’ certainty of how to proceed and increases the efficacy through the avoidance of impasses and suboptimal problem-solving strategies. Quality and depth of reflective processes after actions are related to the development of negative knowledge.**”





# Issues

- Dichotomy?
- Part of the same knowledge base?
- Individual or group process?



# Research questions

- What kind of pre-existing knowledge is required and what kind of errors is required for building negative knowledge?
- Is negative knowledge an end-product or is it 'just' a step in further knowledge building?





# Method

- Case study in ‘the’ medical community
  - Community, hospitals, northern hemisphere
- Topic: Development of positive and negative knowledge on Lyme’s disease (borreliose)



# Results

## Time line

- 1975: outbreak in Old Lyme, Connecticut
- 1983: identification of spirochete in ticks' stomach by Burgdorfer

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# Results

## Time line

- 1880 – 1940: endemic in Europe; unsystematic descriptions of symptoms complexes; indications about the role of ticks (vector)
- 1930: Hellerstrøm of Karolinska hypothesised a spirochete as causal factor
- 1950: antibiotics work but have mixed effects (as in syphilis and in tuberculosis)
- 1975: outbreak in Old Lyme, Connecticut
- 1983: identification of spirochete in ticks' stomach by Burgdorfer

## Positive and/or negative knowledge?

- Little knowledge about complex issues

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# Groups involved

patients

Physicians

Epidemiologists

Biomedical researchers

Literature

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# Results - 2

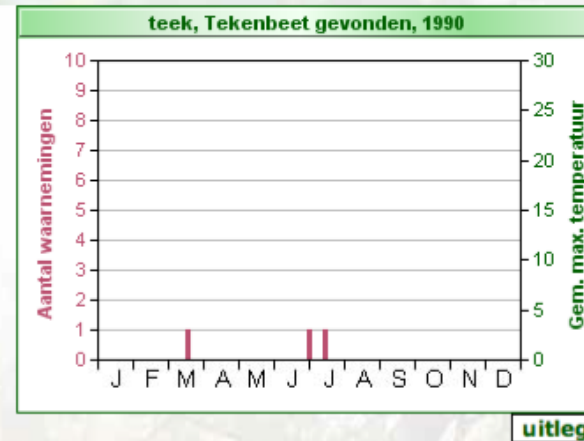
- Epidemiology:
  - Percentage of affected ticks, percentage of infection, percentage showing/seeing EM
- Multi-system
- The big ‘impersonator’
- Three-staged: early, mid and late
- Type of diagnosis
  - History! Clinical plus lab
  - Lab turned out problematic



# Yearlong observations

Nieuws en agenda  
Meedoen  
Scholen  
Projecten  
Waarnemingen  
Informatie soorten  
Achtergrondinformatie  
Links  
Zoeken  
Landbouw  
Tekenen  
Hooikoorts  
Eikenprocessierups  
Ganzen

Op onderstaand kaartje vindt u de doorgegeven waarnemingen van de tekenbeten:



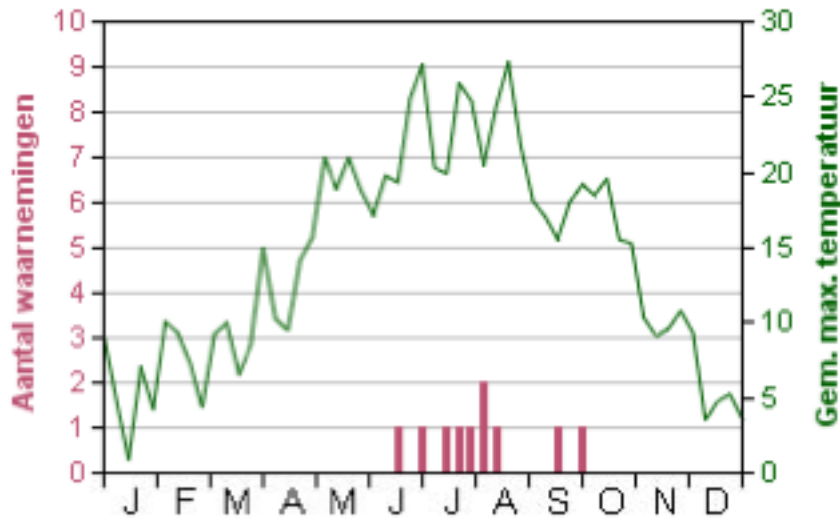
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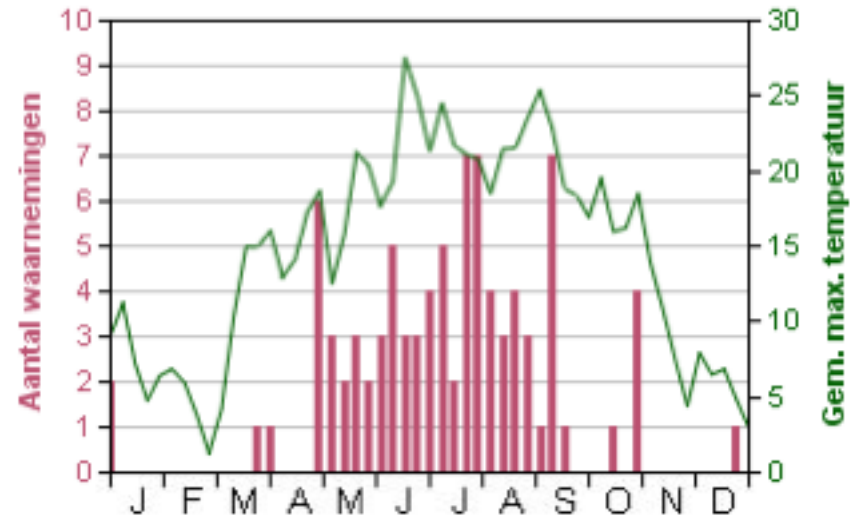
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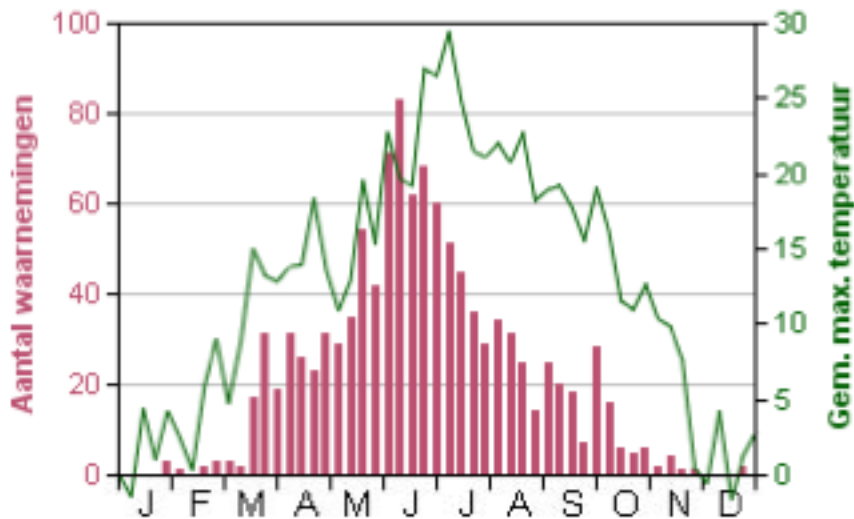
teek, Tekenbeet gevonden, 2001



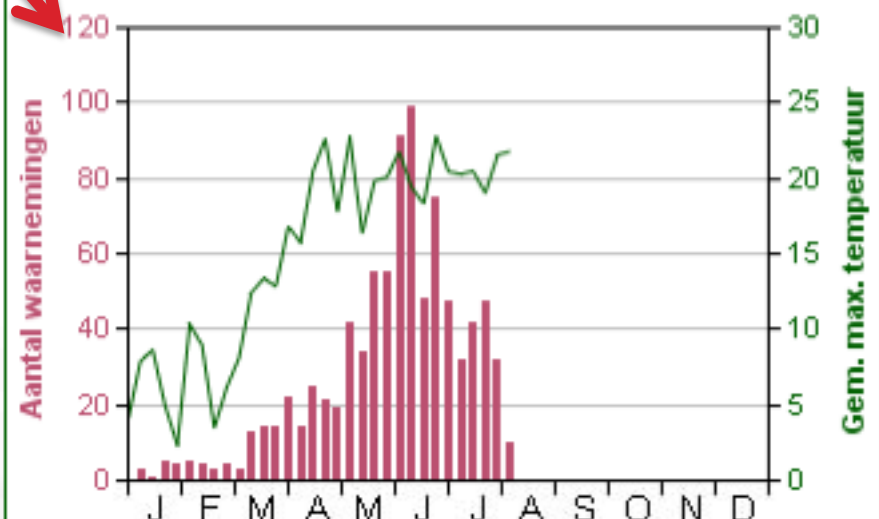
teek, Tekenbeet gevonden, 2005



teek, Tekenbeet gevonden, 2010



teek, Tekenbeet gevonden, 2011





# Results - 3

- Evidence-based protocols
- BUT stable situation was of short duration, if it ever happened
  - 2 conflicting theories/communities
  - More stakeholders: insurance companies



# Conclusions

|         | <b>incompetent</b> | <b>competent</b> |
|---------|--------------------|------------------|
| unaware | 1978               | --               |
| aware   | 2011               | 2011             |

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# Conclusion

- Community or individual?
- Positive/negative
- Awareness of not-knowing and dealing with uncertainty transcends the positive/negative dichotomy, and is probably a stronger driver for knowledge development.



# Finally

- Poor research?



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