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Patterns and scales in infectious disease surveillance data: an exploratory data analysis approach

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PATTERNS AND SCALES IN INFECTIOUS DISEASE SURVEILLANCE DATA

An exploratory data analysis approach

door Loes Soetens

1. More effort should be put in acquiring data of different data types (time, place, person, pathogen) and in developing novel methods for comprehensive joint analysis of these data types for infectious disease surveillance. (this thesis)
2. When using statistical algorithms to detect infectious disease clusters, it is essential to assess the plausibility of transmission between persons within the detected clusters. (this thesis)
3. Dynamic patterns of infectious diseases should be studied at different resolution levels to identify relevant changes for public health and to prevent studying artefacts due to aggregation at an arbitrary level. (this thesis)
4. Infectious disease epidemiology and surveillance departments at a regional, national and international level should employ experts in data management, data visualization and data science to make optimal use of data to inform and evaluate infectious disease control. (this thesis)
5. Exploratory data analysis is the foundation stone, as well as the first step in analyzing infectious disease surveillance data. (Tukey, 1977)
6. Finding ways to protect privacy while sharing valuable confidential data is crucial to the future of infectious disease surveillance.
7. The COVID-19 pandemic has forced infectious disease surveillance to operate at a higher level, whilst under extremely high pressure. The COVID-19 surveillance infrastructure regarding human resources, expertise, data, data processing and outputs should serve as an example to professionalize surveillance of other infectious diseases in the Netherlands.
8. Data visualization techniques are crucial to identify, understand and communicate complex data patterns.
9. Combining work with education keeps you curious and open to new experiences. That is when we learn the most. (freely adapted from Dumas, 1847)
10. Do wander to not get lost. (freely adapted from J.R.R. Tolkien, 1954)