

Human health surveillance

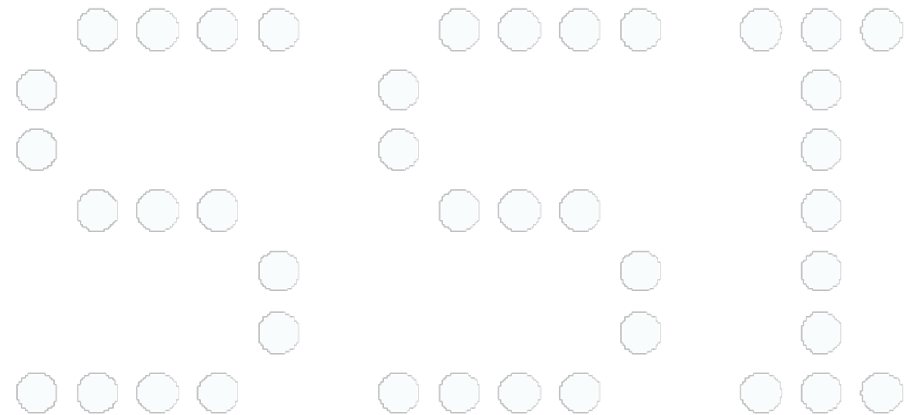
Global Health Security Risks from Microbial Threats in the Arctic
workshop
Hannover, November 6, 2019

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Systematic ongoing collection, collation and analysis of data and the timely dissemination of information to those who need to know so that action can be taken.

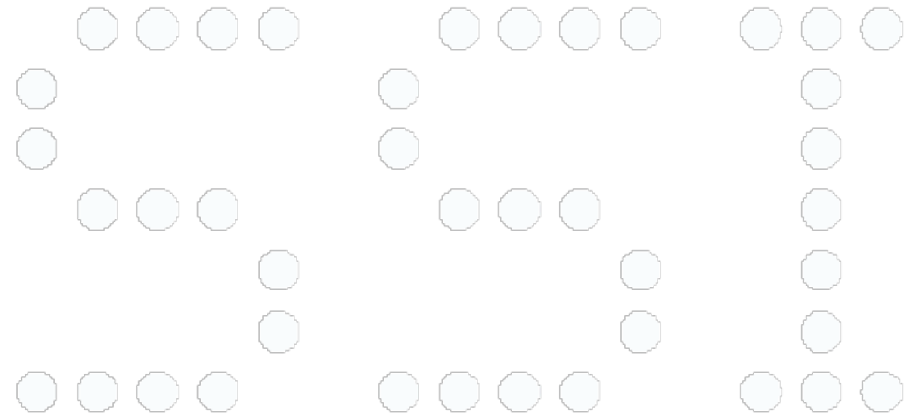
Source: *A Dictionary of Epidemiology*. 4th edition. Ed. Last J. Oxford University Press, 2001



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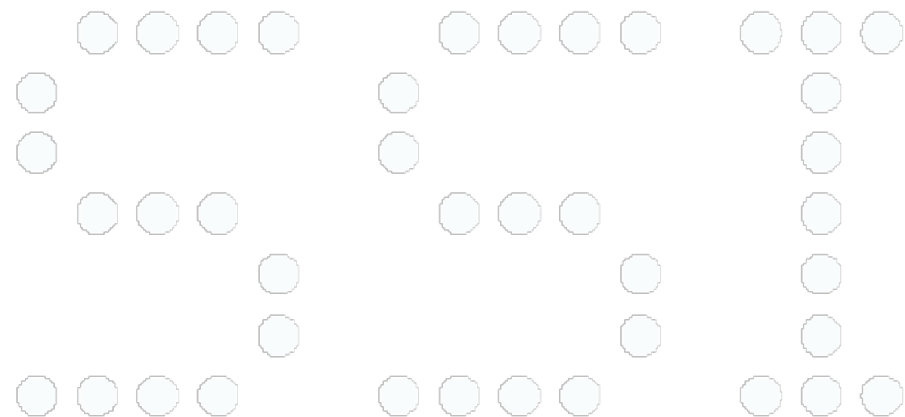
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DATA FOR ACTION!



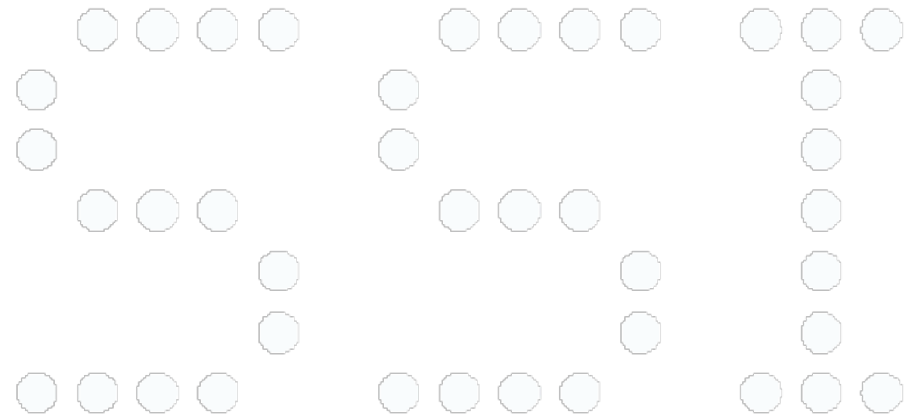
Objectives of a surveillance system

- ✚ Estimate the magnitude of a health problem in the population at risk
- ✚ Determine trends of a disease
- ✚ Detect outbreaks
- ✚ Evaluate control strategies
- ✚ Develop hypotheses about aetiology and risk factors
- ✚ Detect changes in isolation and health practices
- ✚ Follow microbiological evolution including antimicrobial resistance
- ✚ International obligations (EC, WHO)

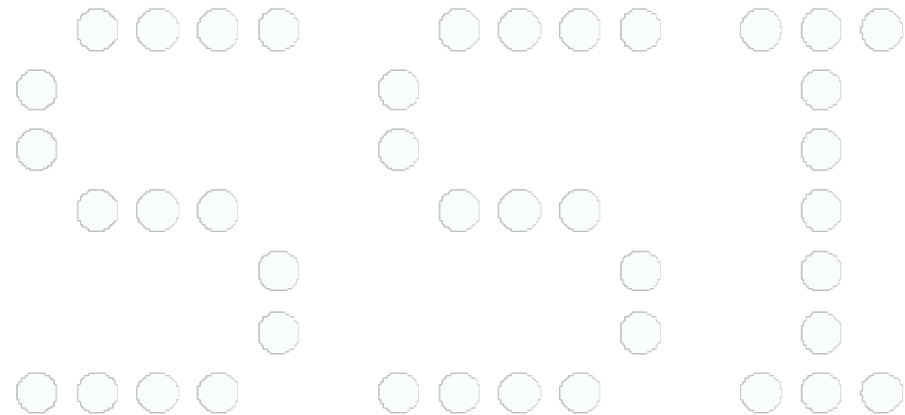


Criteria for selection of disease

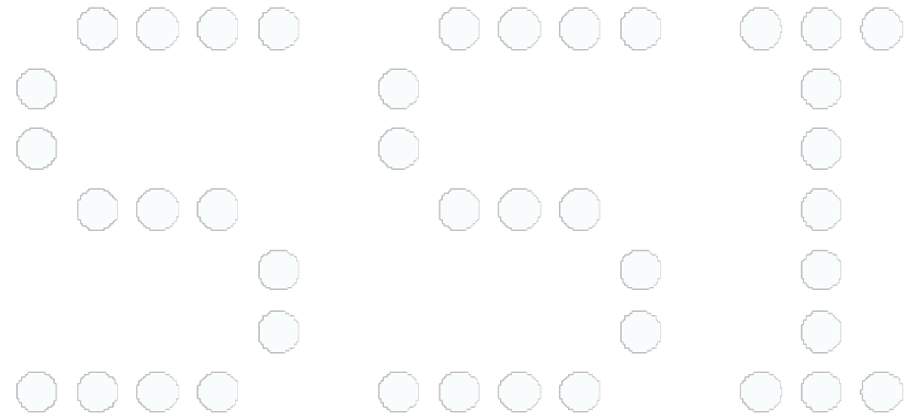
- ✧ Frequency
- ✧ Severity
- ✧ Communicability
- ✧ Costs
- ✧ Preventability
- ✧ Public and political interests
- ✧ International relevance

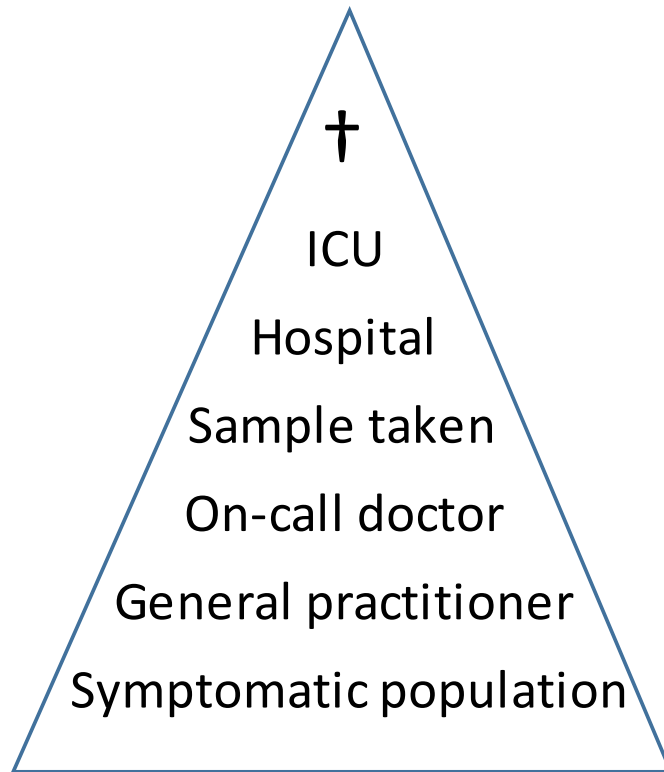


- ✧ The clinical mandatory notification system
- ✧ Laboratory based surveillance
 - Danish Microbiology Database (MiBa)
- ✧ Childhood vaccination coverage
- ✧ Voluntary systems
 - Sentinel-surveillance for influenza



- ✧ The back-bone of the surveillance system
- ✧ All national microbiological test results
- ✧ Real-time
- ✧ Information on positive and negative tests
- ✧ Allow surveillance by data capture
- ✧ Person-identifiable data
- ✧ Opportunity for register linkage



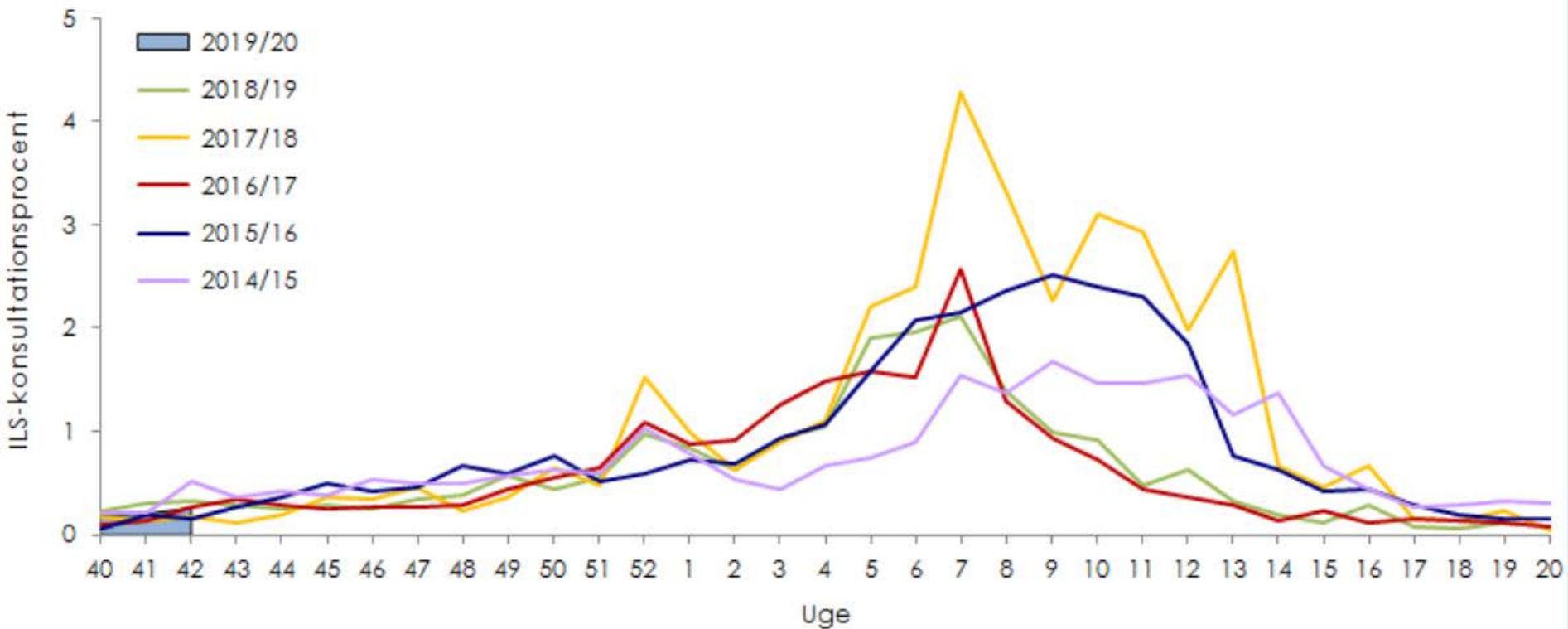


- ✧ Mortality (CPR)
- ✧ Danish patient register
- ✧ -
- ✧ MIBA
- ✧ Electronic surveillance of contacts
- ✧ Sentinel doctors
- ✧ Influmeter

Has the season started?

79 sentinel GP's report number of ILI patients and total number of consultations weekly, including a laboratory component

Sentinelovervågning: Influenzaaktiviteten i denne sæson sammenholdt med de fem forrige sæsoner



∴ Local outbreaks

- E.g. restaurant, private party, drinking water

∴ Responsible institutions

- Regional food offices
- Medical officer
- Local laboratories

∴ National outbreaks

- Cases in two regions or more
- International aspect

∴ Responsible institutions

- Statens Serum Institut
 - Reference laboratory
 - Department of infectious disease epidemiology
- Veterinary and food administration
- Food Institute at DTU

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The Central Outbreak Management Group

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Outbreak of
Listeria monocytogenes ST8
in cold-smoked salmon

2017

FLERE SYGE



Dansk Supermarked har tilbagekaldt et stort parti listeria-inficeret laks.

FOTO: /RITZAU/JENS DRESLING

Livsfarlig laks tilbagekaldes

❖ August 23, 2017

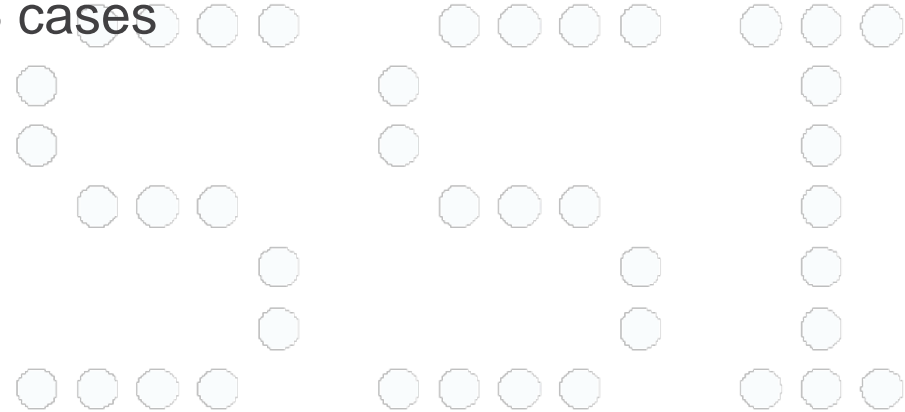
- A genetic cluster of 4 cases identified by whole-genome-sequencing
- 1 case from 2015, 3 from 2017 (May and August)

❖ August 25

- Two additional cases identified

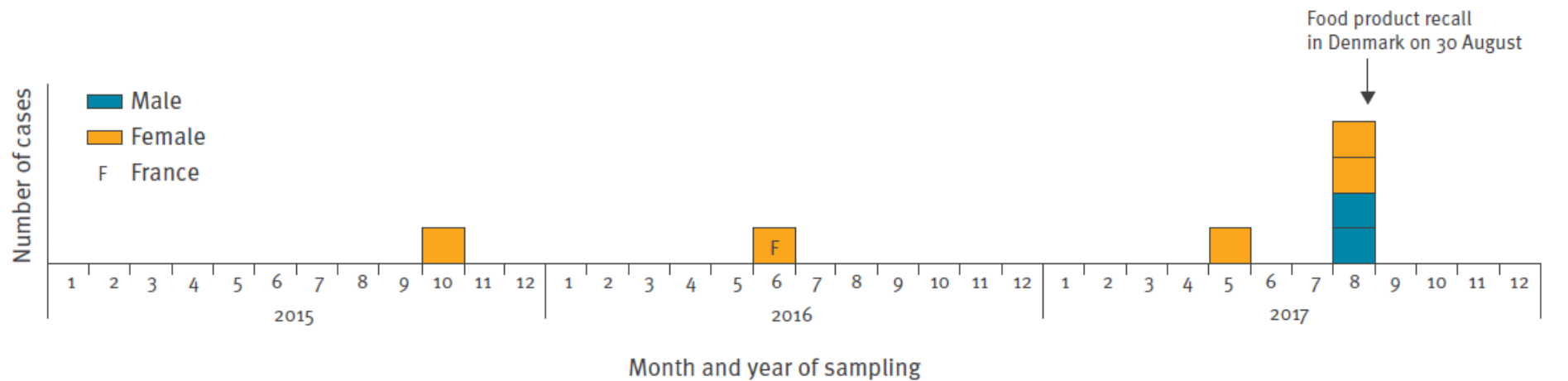
❖ August 30

- Compared with 16 *L. monocytogenes* ST8 food and environmental isolates identified in Denmark from 2014 to August 2017
- Match to cold-smoked salmon from Poland
- Salmon consumption reported for 5 cases
- Product recalled from the market



Listeriosis ST8 outbreak, 2015–2017

- 6 cases from Denmark
 - 4 female, 2 male
 - Aged 59-96 years
 - 1 died
- 1 case from France



✧ August 31

- Outbreak notified
 - European Epidemic Intelligence Information System for food- and waterborne diseases (EPIS-FWD)
 - Early Warning and Response System (EWRS)
 - Rapid Alert system for food and Feed (RASFF)

✧ September 1

- France reports 1 human case matching by WGS

✧ September 6

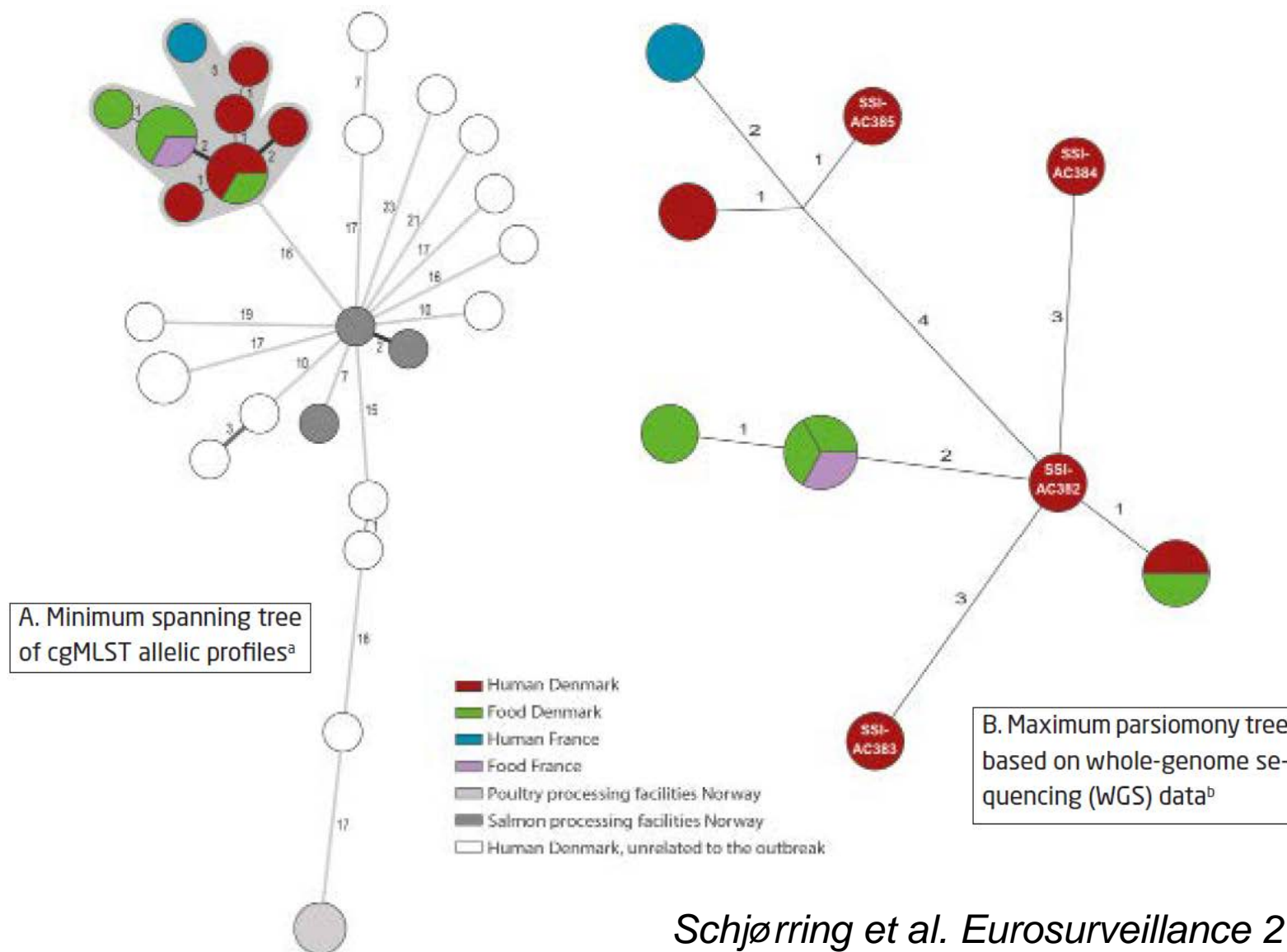
- France reports a matching food isolate salmon same Polish producer
- Product recalled in France

✧ End of November

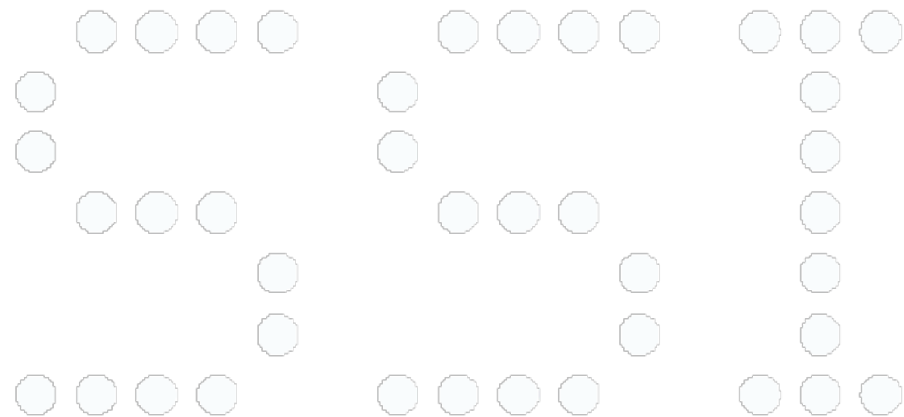
- Germany reports three cases matching by WGS



WGS results for listeria ST8, 2015-17



- ⌘ Collect data for action
- ⌘ Difficult to prioritize diseases to monitor
- ⌘ Expect and detect the unexpected
- ⌘ Compare surveillance data in humans with food and animals in a One Health approach
- ⌘ Harmonize and compare surveillance data across borders





Thank you!

