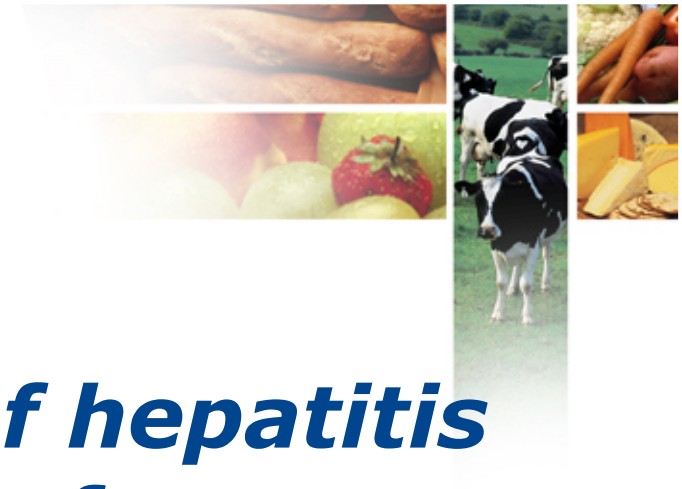

"Multistate outbreak of hepatitis A virus (HAV) linked to frozen berries - a European case study"

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Food Chain Lab Workshop

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Food Safety AUTHORITY OF IRELAND

Time line of events in 2013

- **March/April:** Alert on Nordic outbreak (HAV subgenotype **IB**)
- **April:** Alert on outbreak in EU travellers returning from Egypt (HAV subgenotype **IB)**
- **May:** Alert on Italian outbreak (HAV subgenotype **IA**)

- **18 June:** Three Irish HAV (subgenotype IA)cases identical (based on RNA sequence) to Italian outbreak strain – but no travel history to Italy
- **By mid-July:** 10 cases in Irish outbreak
- **22 July:** Advice to public - boil imported frozen berries
- **Oct:** Irish outbreak declared over **but**, Outbreak ongoing in Italy and appeared to have spread to at least one more Member State

Irish outbreak investigation

- **Focused** on asking cases about consumption of imported frozen berries due to Italian investigation (where contaminated mixed berries had been identified) **however**, Qs on other foods previously linked to HAV also asked.

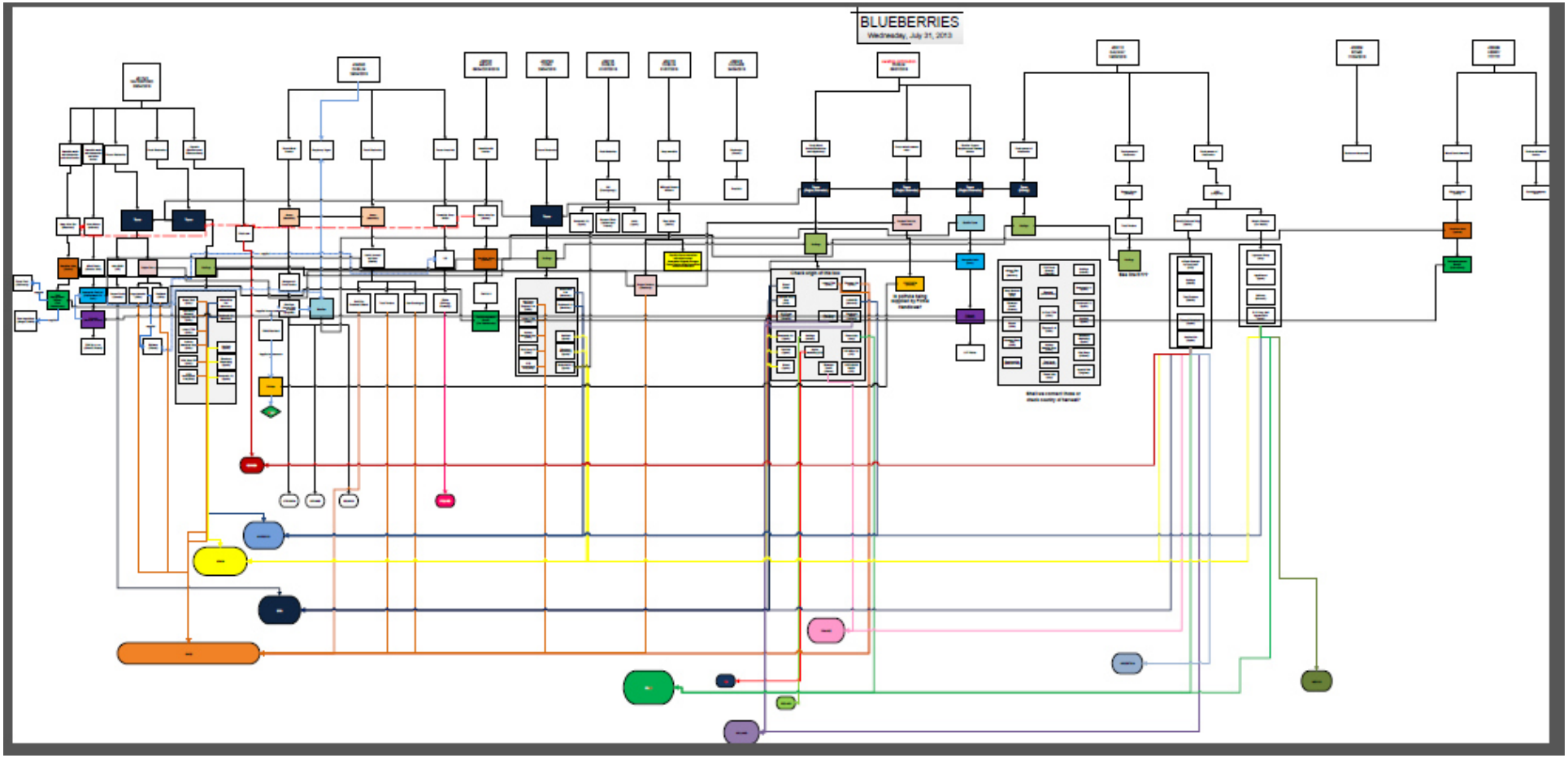
- The **challenge** of the very long incubation period (average 28 days; max 50 days, min 15 days):
  - long lists of foods for each case over this time
  - incomplete/general recall
  - most foods/ingredients no longer available for testing
  - no specific dates of consumption so often no specific batches identified
    - ➢ plausible batches based on incubation period were traced

Traceability investigation

- Over **100 foods** identified from **15 confirmed cases**

- Tracing focused on berries and berry containing foods:
  - Smoothies (multiple berry types used in each drink)
  - Desserts with berries (cheese cake & ice cream)
  - Yoghurt (containing a berry compote layer)

Example: A traceability trail for fresh blueberries



Each box is a business, coloured ovals are countries

Evidence for the frozen berry source

- Link with Italian outbreak (contaminated batches of mixed frozen berries identified in Italy)

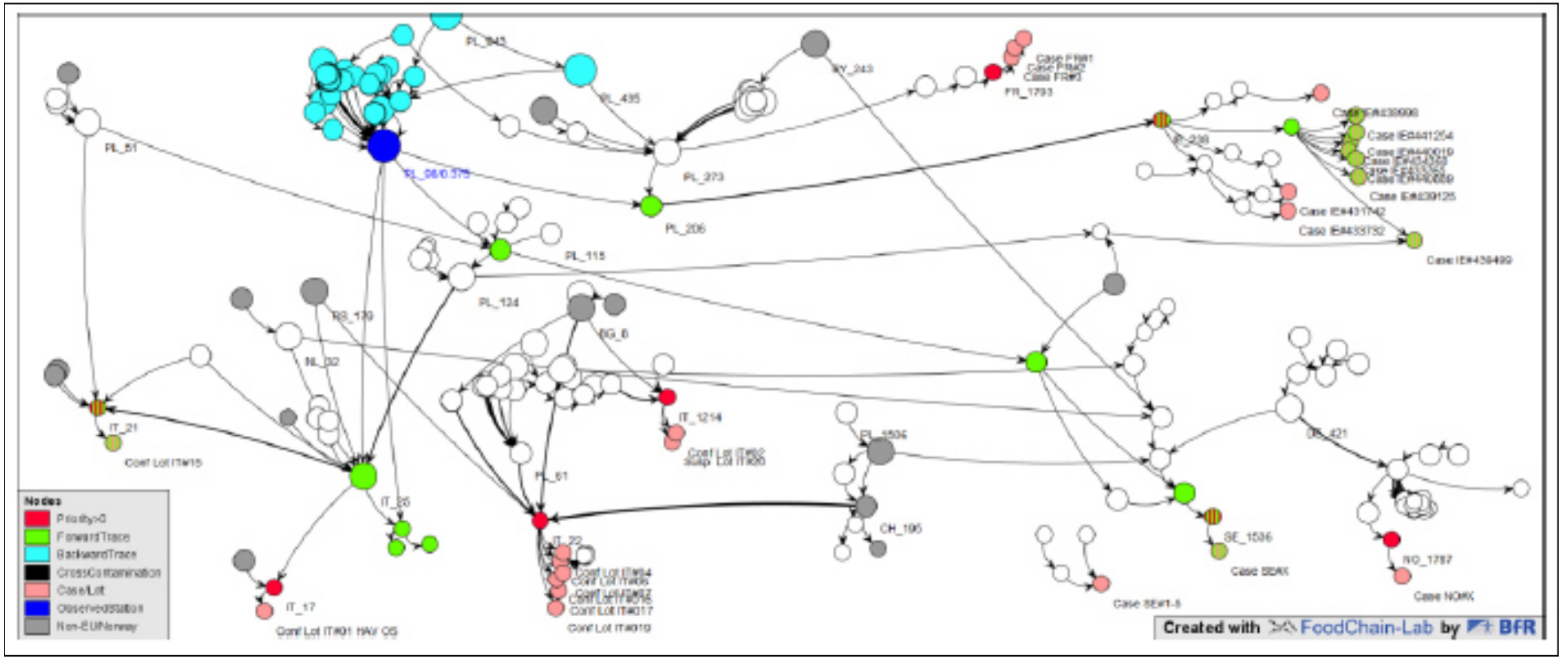
- Initially fresh berries looked like a possible source but the country of origin changes regularly and could not explain our Jan/Apr and June/Aug clusters

- **Case Control Study** conducted - it involved comparing foods typically consumed by cases to foods typically consumed by controls (people who weren't ill)
  - The results:
    - supported the frozen berry hypothesis
    - did not support fresh berries as a source

Traceback investigation summary

- Tracing began with 38 lots (batches) and or cases from Italy, Ireland and the Netherlands
- an additional 5 lots/cases were added from France, Norway and Sweden in spring 2014
- The tracing data were exchanged via the European Rapid Alert System for Food and Feed (RASFF) in a **standardised format**
- The final dataset comprises 6227 transactions among 1974 food business operators

Analysis of 'hotspot' (PL#98) by BfR using FoodChainLab



We can explain 7 of 15 confirmed primary Irish cases by exposure to four lots of raspberry crumb from —hotspot PL#98.

Issues considered during hotspot analysis

- Correct temporal order of delivers
- Year of harvest of berries
- Where cross-contamination should be taken into account, it is assumed that all deliveries from all suppliers are connected to all deliveries to all recipients.
- Taking cross-contamination into account still requires correct temporal order of the deliveries, i.e. a delivery from a supplier may not be connected to an older delivery to a recipient.

Lessons from this traceback investigation

- Collaboration between the epidemiologists and the tracing analysts of all countries involved is vital.
- The most critical part of the investigations is a timely and complete data collection at the local level.
- Investigations in emergency situation need a smooth and failure-free exchange of information.
  - RASFF has limitations
- Access to interactive visualisation tools is important, in order to perform real-time analysis on the transaction dataset in order to quickly identify possible hotspots for further investigations

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