



Tracing in the UK: current challenges and applications of Food Chain-Lab

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Public Health England

Overview

- Arrangements for food safety, traceability and outbreak investigation in the UK
- STEC O157 PT34 outbreak background
- Application of FCL to the outbreak
- Challenges
- Shigella sonnei* 2018
- STEC O157 and sheep.
- Ongoing challenges
- Further work in the UK
- Final thoughts

Food safety framework in the UK

- Food Standards Agency - set policy, develop standards for food and feed, issue guidance and audit local authority performance. Competent body for RASFF, Infosan etc.
- Local authorities - enforce legislation and undertake inspections including microbiological sampling and food standards sampling. Investigate cases of 'food poisoning' and outbreaks.
- PHE - conduct routine surveillance, detect outbreaks and lead on their investigation.

Traceability in the UK

Food Law

Code of Practice (England)

(Issued ~~March 2017~~)

←
Currently under public consultation

- Food hygiene and food standards carried out by local authorities should include:
- ...an assessment of compliance with the traceability requirements of Article 18 of Regulation 178/2002 (Hygiene)
- ...assess compliance with the traceability requirements of Article 18 of Regulation (EC) 178/2002 as read with Regulation (EU) 931/2011 (Standards)

Outbreak detection and investigation

- PHE detects outbreaks using routine surveillance data.
- Confirmed outbreaks are investigated and managed by a multidisciplinary Outbreak Control Team (OCT) led by PHE
- If the outbreak appears to be foodborne, the FSA is always invited to join the OCT.
- Epidemiological and microbiological investigations are used to develop hypotheses for further investigation and to direct traceability investigations.
- Traceability is led and coordinated by the FSA

Guidance



Public Health
England

Management of outbreak
illness in England and Wal

Communicable Disease Outbreak Management

Operational guidance

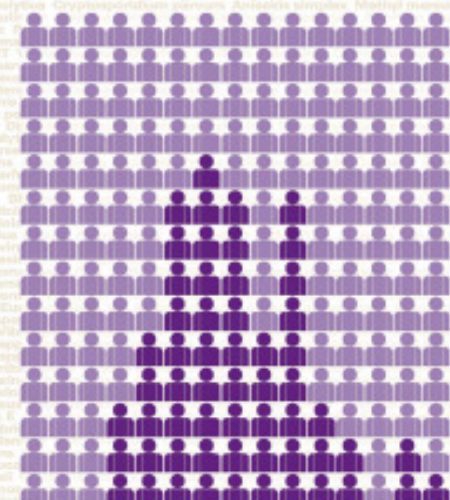


Chartered
Institute of
Environmental
Health



FOODBORNE DISEASE OUTBREAKS

Guidelines for Investigation and Control



This is a guidance document for the management of foodborne disease outbreaks. It provides a framework for the investigation and control of such outbreaks, covering the following areas:

- Introduction:** Defines foodborne disease outbreaks and outlines the scope of the guidance.
- Objectives:** States the purpose of the guidance, which is to provide a framework for the investigation and control of foodborne disease outbreaks.
- Principles:** Outlines the key principles that should guide the investigation and control of foodborne disease outbreaks, including the importance of a multi-agency approach and the need for a systematic and evidence-based approach.
- Investigation:** Provides a detailed framework for the investigation of foodborne disease outbreaks, covering the following steps:
 - Identifying the outbreak.
 - Establishing the source of the outbreak.
 - Identifying the vehicle of the outbreak.
 - Identifying the exposure window.
 - Identifying the risk factors.
 - Identifying the control measures.
- Control:** Provides a detailed framework for the control of foodborne disease outbreaks, covering the following steps:
 - Identifying the control measures.
 - Implementing the control measures.
 - Evaluating the effectiveness of the control measures.
 - Monitoring the situation.
 - Communicating the findings.
- Conclusion:** Summarizes the key points of the guidance and emphasizes the importance of a multi-agency approach and a systematic and evidence-based approach.

The guidance is intended for use by public health professionals, including those working in local authorities, public health England, and the NHS. It is also intended for use by food businesses and other stakeholders who may be involved in the investigation and control of foodborne disease outbreaks.

The guidance is based on the best available evidence and is subject to regular review. It is intended to provide a framework for the investigation and control of foodborne disease outbreaks, rather than a prescriptive set of rules.

The guidance is available in English and Welsh. It is also available in other languages upon request.

The guidance is published by Public Health England and the Association of Directors of Public Health. It is also published by the Chartered Institute of Environmental Health.

The guidance is available for download from the following website: <https://www.food.gov.uk>



STEC O157 PT34 2016



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Surveillance and outbreak report

 Open Access

National outbreak of Shiga toxin-producing *Escherichia coli* O157:H7 linked to mixed salad leaves, United Kingdom, 2016

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Abstract



Full-Text



Figures & Tables



References (31)



Supplementary
Material



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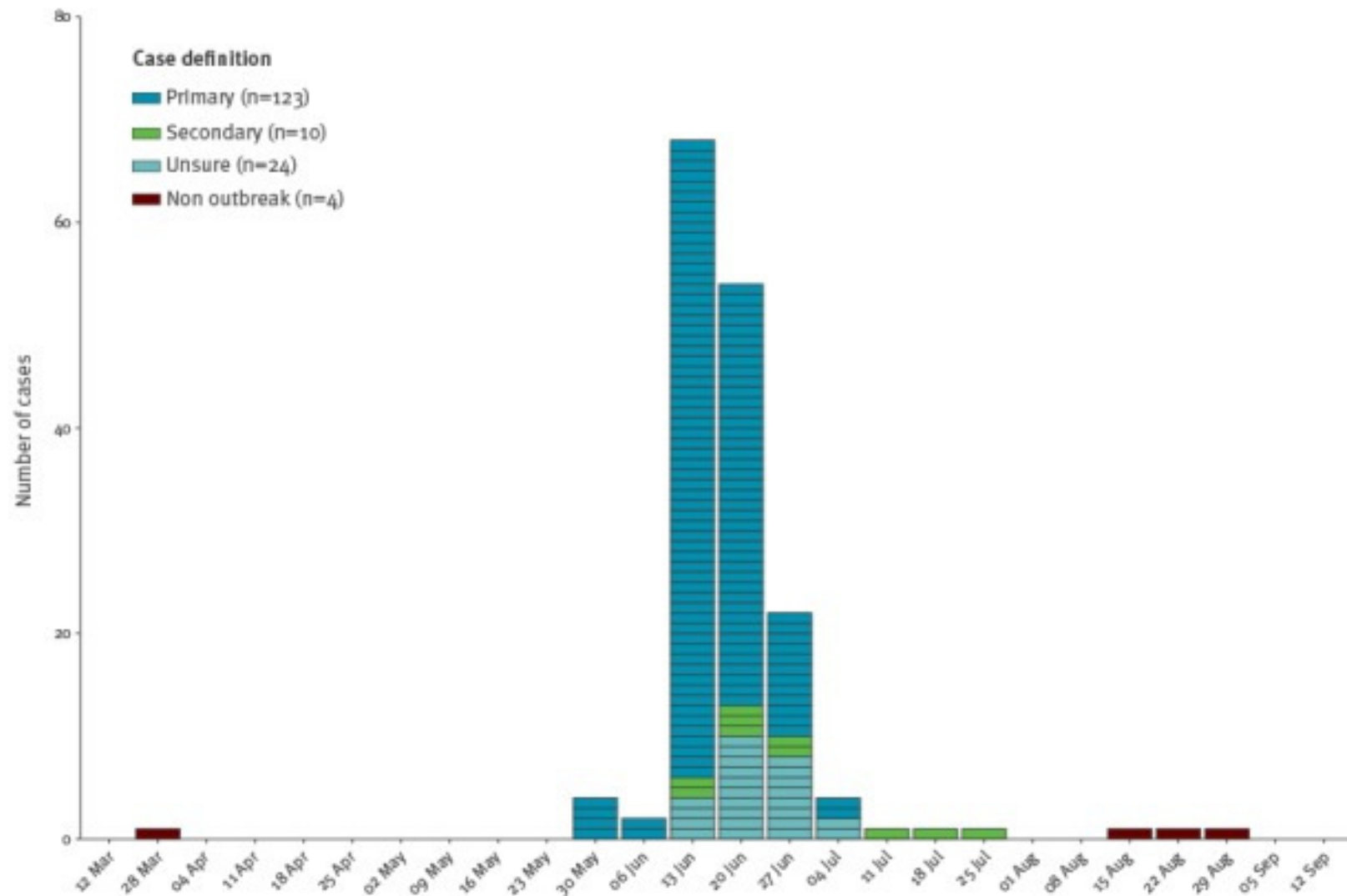
Related Content

Introduction

Go to section...

In June and July 2016, a large outbreak of Shiga toxin-producing *Escherichia coli* (STEC) serotype O157:H7 occurred in the United Kingdom (UK). The increase was first observed in the south-west of England where isolates of STEC O157:H7 phage type (PT) 34 *eae+* *stx2+* *stx1-* were recovered from 24 cases reporting gastrointestinal symptoms within 1 week (20 to 26 June 2016). This represented a 10-fold increase over the expected rate at this time of year in England and Wales. Whole genome sequencing (WGS) revealed that the isolates belonged to a 5-SNP single linkage cluster designated: 5.156.1329.2502.2965.3081.%.

Epidemic curve



165 cases in total

2016

Analytical results

Single variable and final multivariable model, case-control study, outbreak of shiga toxin-producing *Escherichia coli*, United Kingdom, June-July 2016 (n = 112)

Exposure/risk factor	Single variable analysis			Final multivariable model		
	OR	95% CI	p value	aOR	95% CI	p value
→ Salad in catering premises	18.92	4.69–81.19	< 0.01	8.30	1.96–35.15	<0.01
→ Mixed salad	8.88	2.75–31.01	< 0.01	4.56	1.17–17.79	0.03
Supermarket SB	3.45	1.14–10.33	0.01	2.70	0.01–0.39	0.12
Any tomato	0.84	0.25–3.33	0.77	1.47	0.29–7.33	0.64
Any lettuce	0.89	0.30–2.90	0.82	1.31	0.34–5.10	0.70
Supermarket SA	2.03	0.60–6.34	0.18	1.21	0.28–5.22	0.79
Region of residence	ND	ND	ND	0.78	0.18–3.43	0.74
Male sex	ND	ND	ND	0.52	0.09–3.19	0.48
Cucumber	0.84	0.29–2.61	0.73	0.41	0.10–1.73	0.22

aOR: adjusted odds ratio; CI: confidence interval; ND: not done; OR: odds ratio.

Delivery data

Human readable excel spread sheets



PDFs



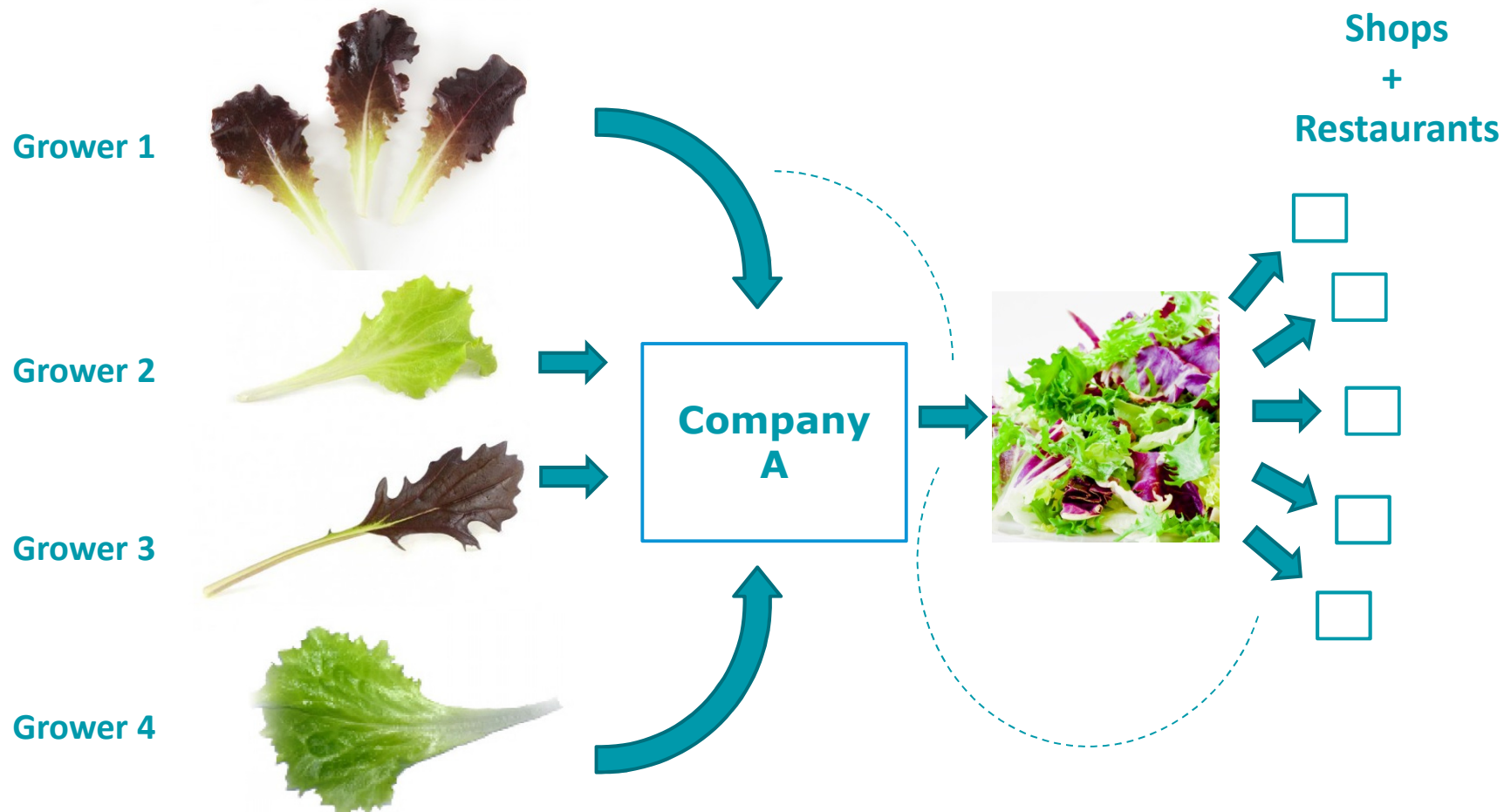
PDFs of scanned text images



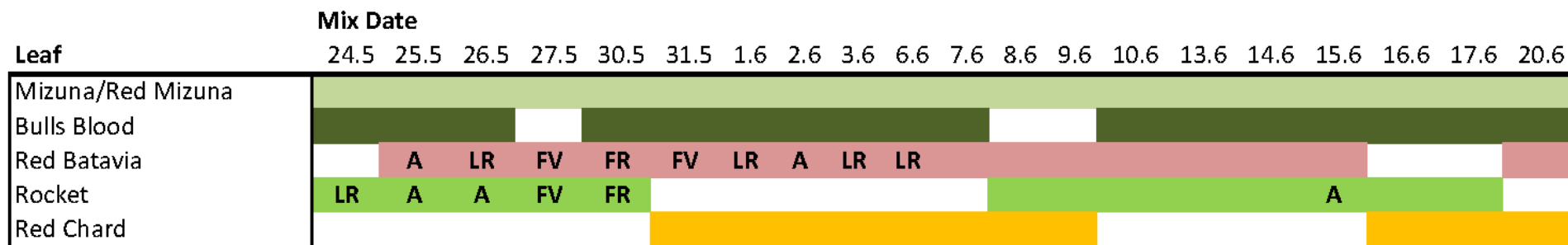
Missing required data



STEC O157 PT34 Outbreak 2016



What was in the Mixed Baby Leaf?



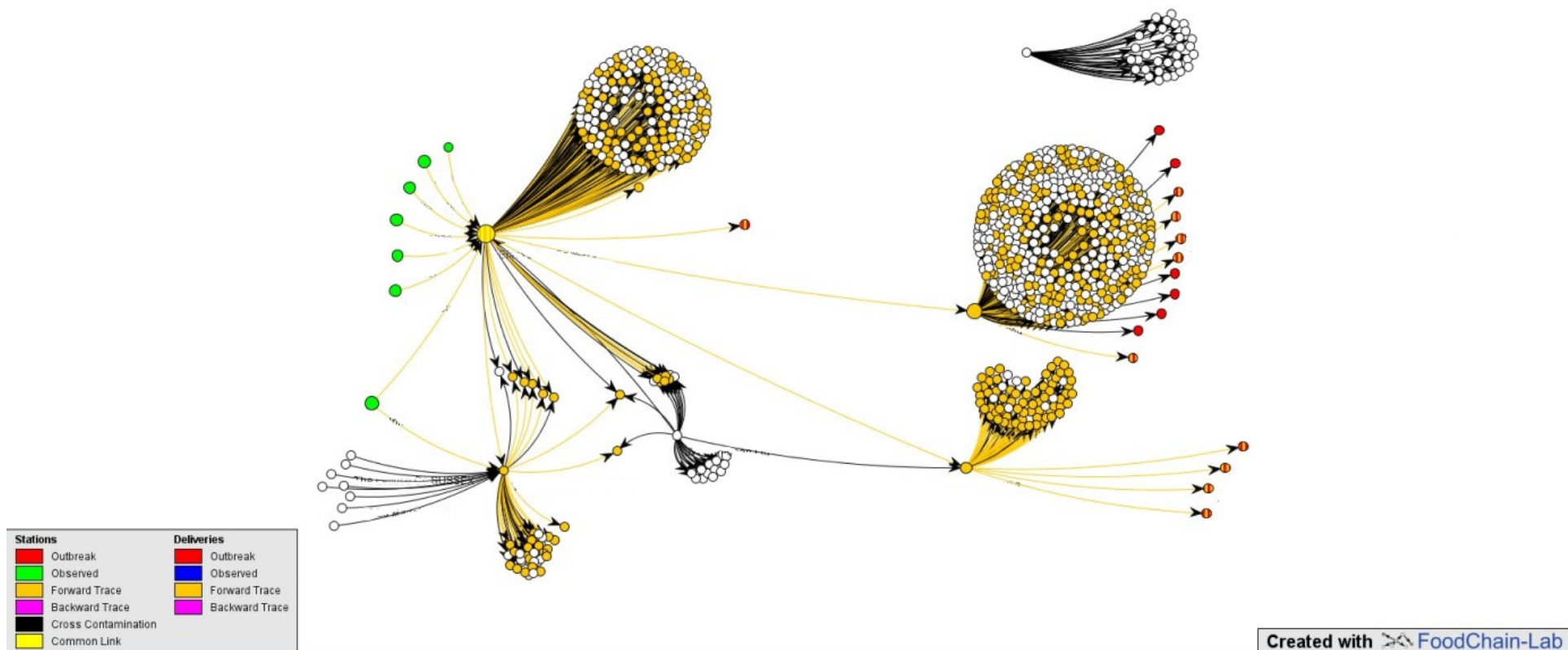
Premises

A Café
 Hotel 1
 Garden Centre
 Golf Club
 Pub 1
 Hotel 2
 Hotel 3
 An Office
 A restaurant
 Another pub
 Yet another pub



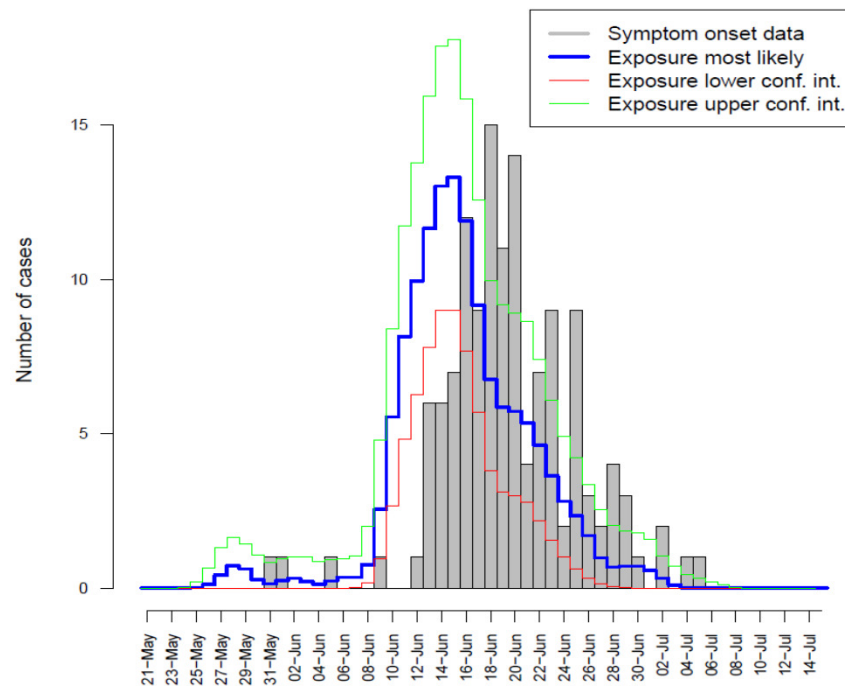
...and who received a delivery on what day?

Focus on 10th June

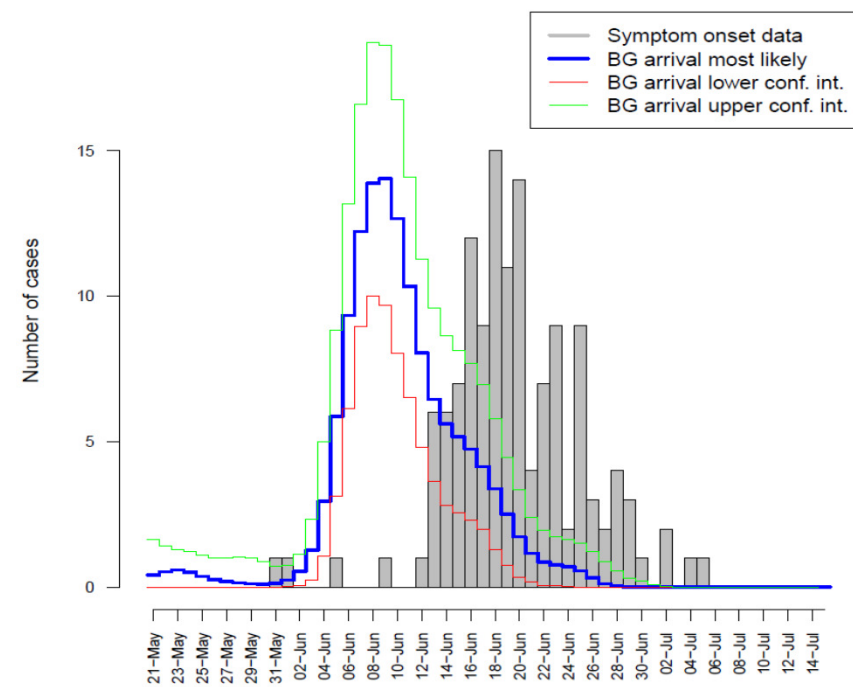


Modelling traceability information

STEC O157 PT34 linelist 2016-07-25 back calculation national



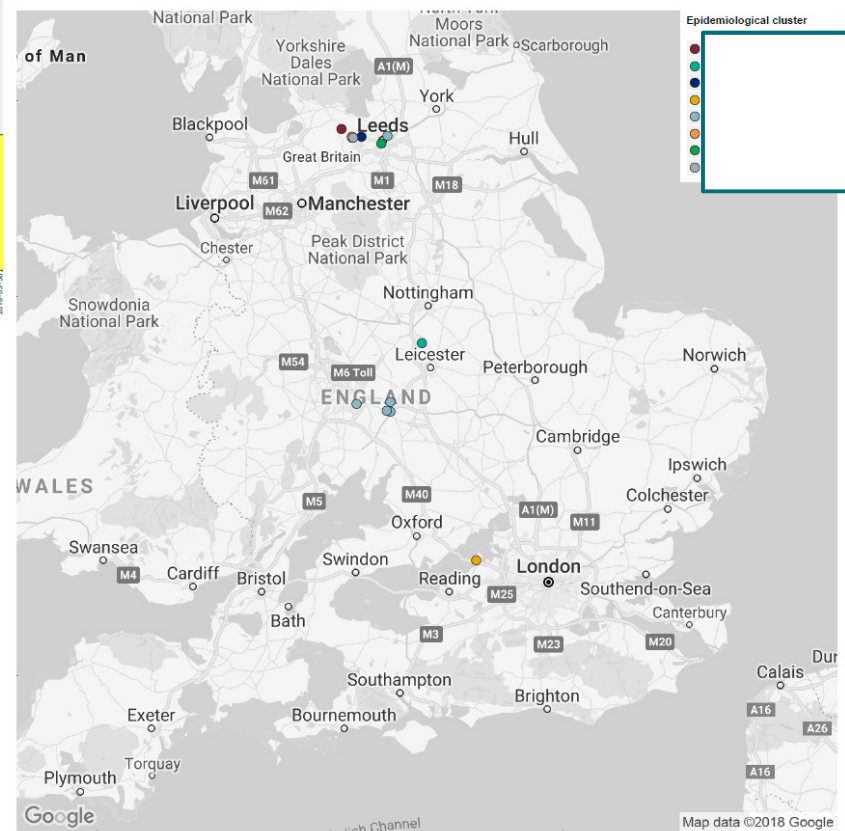
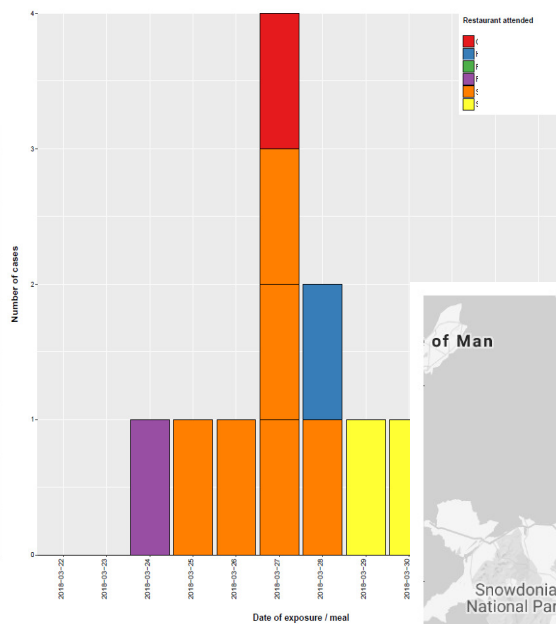
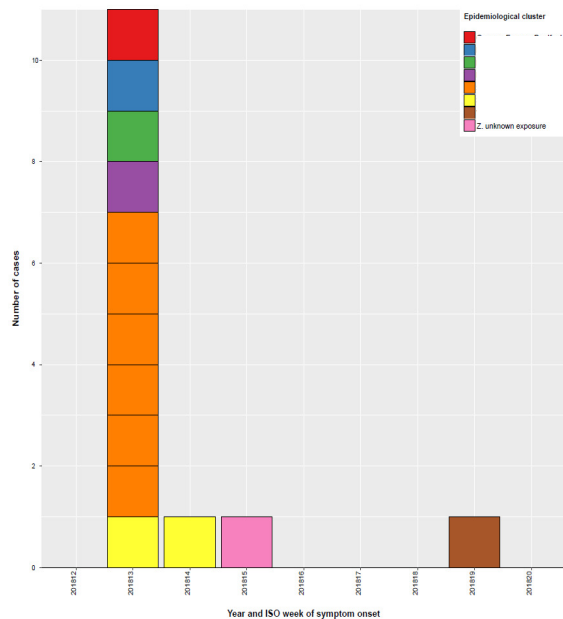
STEC O157 PT34 linelist 2016-07-25 back calculation national



Some challenges

- Primarily affected wholesale/catering market.
- Multiple agencies involved – not unique to UK.
- Communication was indirect - questions on traceability went from the OCT to the FSA and onto the local authority and back the same way.
- Assumptions made about products.
- Huge volume of data provided in various formats.
- Varying feedback on FCL tracing template - some came back perfectly completed others not.
- Long time to receive data from some companies and not so useful when provided.

Shigella sonnei 2018



Tracing investigation

- Four catering premises in England were identified that met the inclusion criteria (2 or more cases).
- Food chain trace back information was collected for ingredients of dishes served to cases from three of the four affected premises.

- Four food items were served at all four premises:
 - Chicken
 - Green chillies
 - Fresh coriander
 - Onions

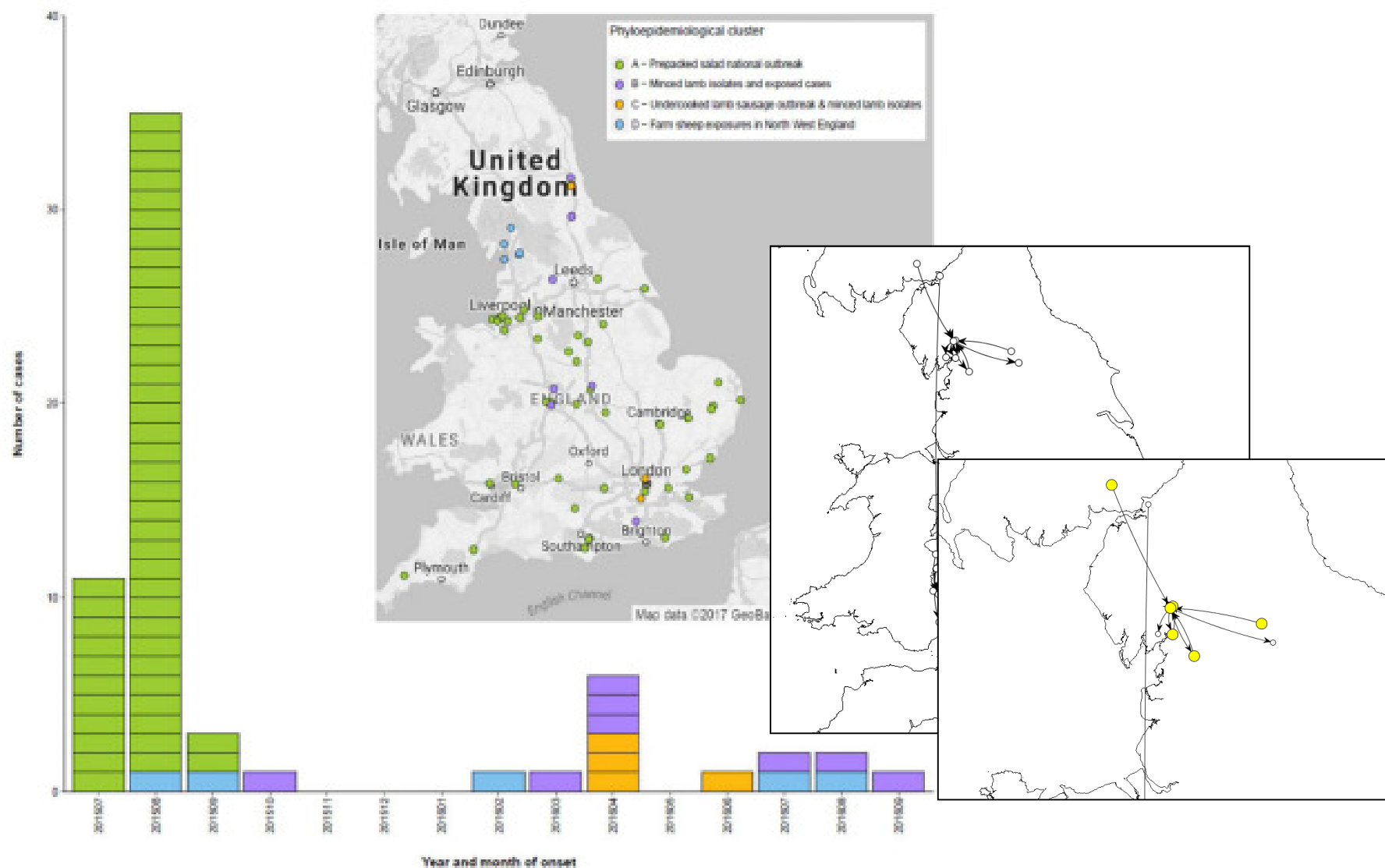
- No single common supplier was identified.

Shigella sonnei 2018



- Geographic distribution of wholesalers supplying catering premises linked to two or more cases

STEC 0157 with an ovine source.



Ongoing challenges



Further work in UK

- **FCL has been applied in different ways to at least six outbreaks in the UK since 2016:**
 - STEC O157 PT8 with an ovine source
 - STEC O157 PT24 with descriptive link to frozen coconut
 - STEC O157 PT34 linked to salad leaves
 - MRSA outbreak in a healthcare setting
 - *S. typhimurium* linked to fresh lamb
 - *S. sonnei* with descriptive link to fresh herbs.
- **BfR training provided in UK in June 2017 for PHE and FSA – thank you!**
- **Draft guidance produced for chairs of OCTs**
- **Ongoing discussions with the FSA and food industry around sharing data during outbreaks.**



Protecting and improving the nation's health

Food traceability

Operational guidance for outbreak control teams

Final thoughts on UK experience

- Standardise requests – let the industry know what's needed so they can prepare
- Separate traceability requests over requests for other information from food companies.
- Proactively work with the food industry before outbreaks happen...and work with them during outbreaks.
- Should traceability be treated as a specialised discipline?
- How best to keep FCL skills up to date and ready to go?

Thanks

- Armin Weiser and his team at BfR
- Olaf Mosbach-Schulz and EFSA colleagues
- My colleagues at PHE
- The Food Standards Agency