Improving Health Protection response through collaboration and innovative use of data

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East of England Health Protection Team
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Introduction to the health protection team & reflections on iGAS clusters & outbreaks

Dr Smita Kapadia

East of England Public Health conference
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Function	Expectations	Delivery
	• Respond to a diverse range of enquiries, cases and clusters/outbreaks. • Provide expertise and guidance to local stakeholders. • Contribute to national incidents & outbreaks (e.g. GAS) & guidance. • Provide out of hours on-call provision (24/7)	• Acute Response Centre (ARC), Health Protection Topics of national and regional focus (topic) and localities (patch)
	• Delivery of UKHSA strategic objectives and meeting DHSC/WHO • Chair Joint Situational Awareness Meetings • Cross working (local Health Protection Boards, OHID and NHS England)	• Topic, patch • Communications
	• Timely response to emerging infections and unexpected situations	• EPRR, patch (LRF), topic
	• Cross-cutting function providing timely intelligence & information for action	• Data and Surveillance
	• Provide guidance, expertise and leadership	• All staff
	• Cross-cutting function providing support to all functional areas	• Business Operations

Notifiable infections: Legal requirement in the UK

Purpose is to enable early detection, prompt investigation & public health interventions

- Public Health (Control of Disease) Act 1984 & Health Protection (Notifications) Regulations 2010

- All laboratories in England performing a primary diagnostic role must also notify UKHSA

- Notifiable diseases and causative organisms: how to report - GOV.UK ([link](#))

How?

For urgent notifications: Telephone the EoE HPT on **03003038537**
Out of Hours: (Serco) - **01603 481221**
Generic email for non-PII: EastofEnglandhpt@ukhsa.gov.uk
Generic email for PII: phe.eoehpt@nhs.net

Reflections from the management of GAS outbreaks

Background

- Typical manifestations include sore throat, skin infections, scarlet fever

- Many 'virulence factors' e.g., M proteins, capsule, toxins, enzymes

- Can cause invasive infections (iGAS)
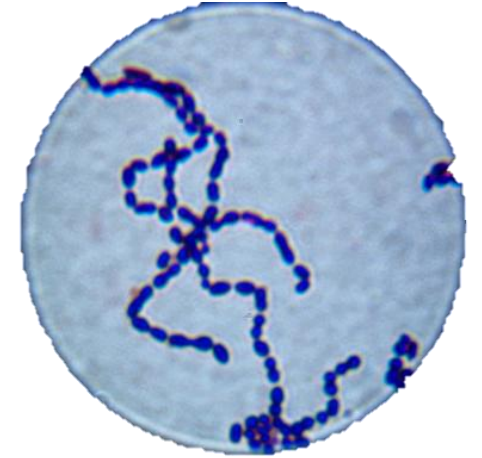
ASM Microbe Library © Sturm

Outbreak

- 2+ cases of probable or confirmed iGAS related by person, place and time

- In settings such as care homes, no finite time limit can be set

Practical implications

- High morbidity & mortality - a significant public health concern

- Elderly in long stay residential settings more likely to acquire iGAS

- Risk of death also higher

- Links challenging to determine (multiple exposures)

- Population at risk can be broad

- Notification flows diverse; need to cast the net wide

- Control measures more challenging to implement

- Notification process more straightforward

- Links easier to determine & population at risk well defined

- Unless the elderly are affected, morbidity and mortality may be limited

Improving detection of Group A Streptococcal clusters and outbreaks…….

efeu@ukhsa.gov.uk

Importance of early detection

- As early as possible so that the right intervention can be put in place to confine the infection and prevent is spread

- Earlier detected –
  - the smaller the eventual size of the outbreak
  - Greater impact on associated morbidity and mortality

- Constant surveillance needed to identify potential outbreaks and track the spread
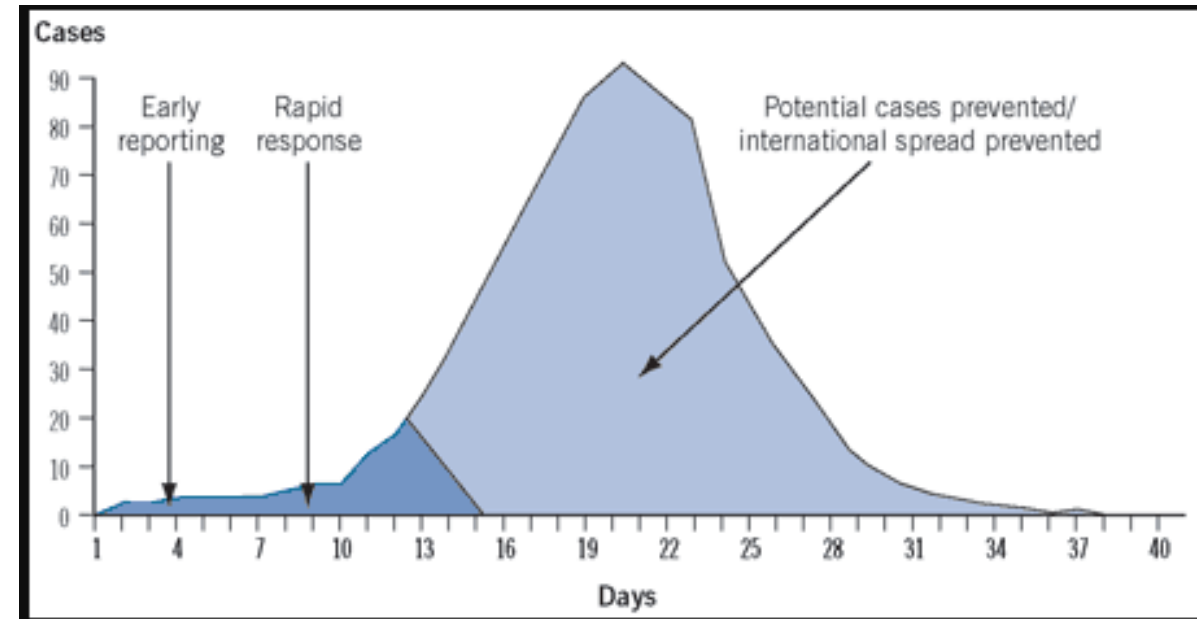
Source: WHO

Detecting clusters/outbreaks….looking for signals….
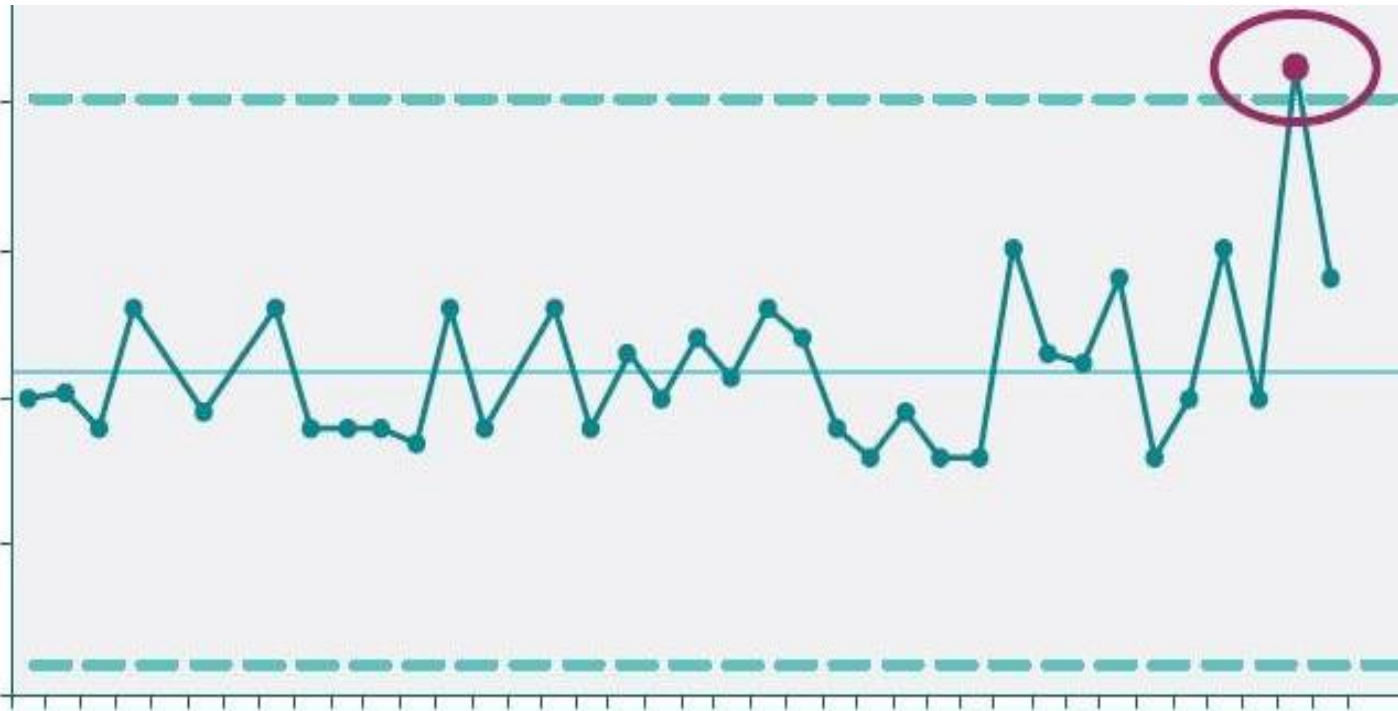
- Exceedance methodology often used as a prompt for further investigation

- Compare historical data (acts as baseline) to current trend to detect anything unusual

- If current trend confirmed as higher than baseline – investigations begin

Improving detection of Group A Strep clusters/ outbreaks…..

- **High impact:** can cause life-threatening invasive disease

- **Surveillance gap:** no routine 'detection' system in place (2 more invasive cases related by time, place, person considered an outbreak)

- **Challenges:** Intervals between cases may vary from over a few weeks to much longer (even in closed settings links may not be obvious that two cases are 'related')

- **Feasibility:** Ability to link cases exists:
  - Microbiological typing of invasive cases ('emmtyping') and Whole Genome Sequencing (WGS)
  - Information on invasive cases routinely collected by HPT e.g. community health care input

What data?
Routine laboratory testing - Group A Strep positive

- New cases identified (isolation of GAS from usually sterile site e.g. blood – invasive GAS)

- Closed setting e.g. care home

- Good detection and reporting (action!)

- Remember long time between cases……

Linking cases?
Same emmtype –appear the same…
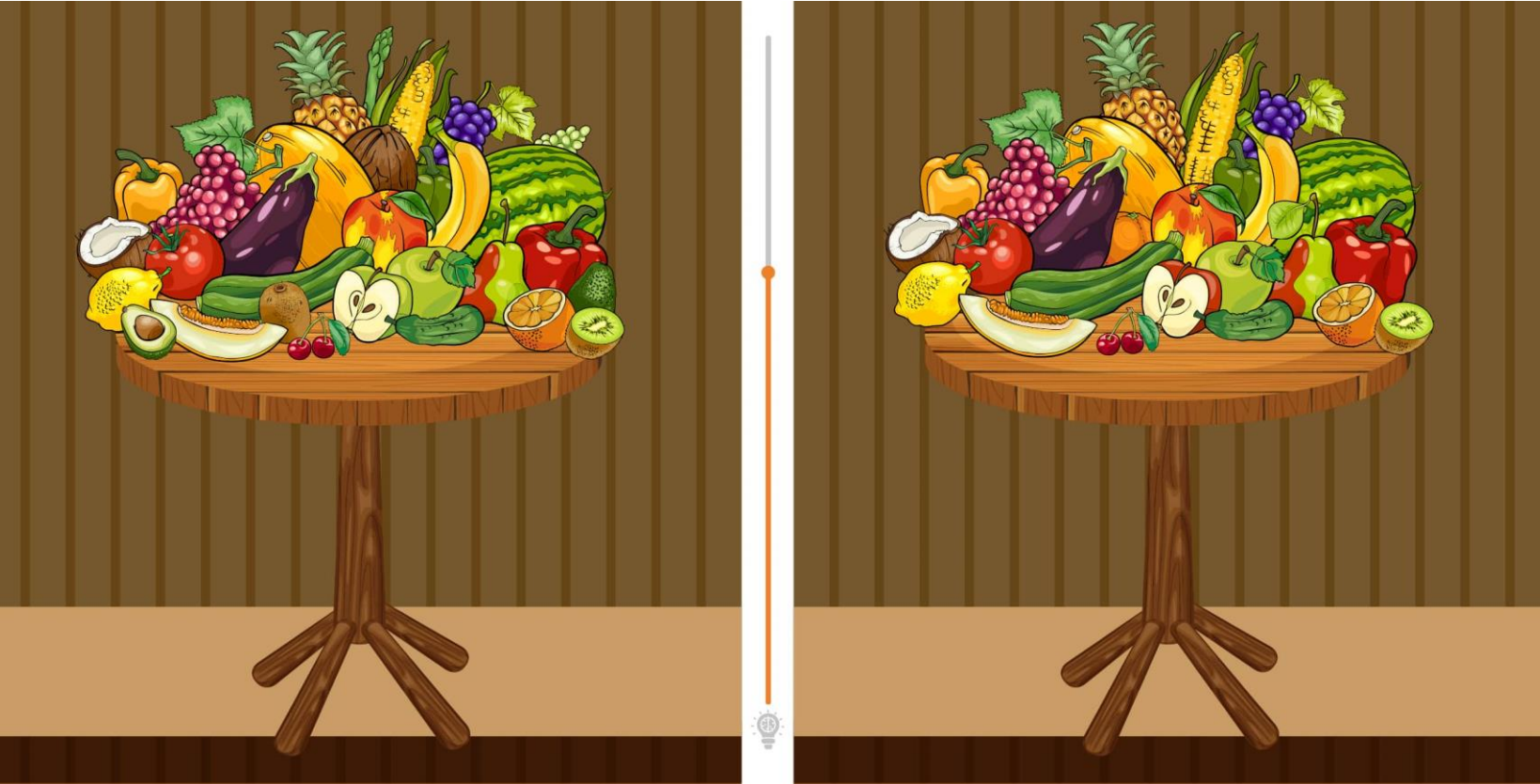
- All invasive GAS cases sent for typing

- Starting to pick up that cases may have a link (>200 different emmtypes)

- Review HPZone for epi links e.g. same district nursing team

- Request further testing (WGS – request results)

Linking cases?
WGS 1– subtyping – differences – not linked…

- Whole Genome Sequencing (WGS) shows cases have specific differences = not linked

Linking cases?
WGS 2 – linked!

- WGS is highly discriminatory
  - Confirm cases form a cluster (long interval)
  - Exclude epi linked cases of same emmtyped from further investigation

Detecting links between cases…..

Routine microbiological testing (**SGSS – AMR and CDR**)

Personal information (e.g. address, GP) - **HPZone**

Emmtyping data (**reference laboratory**)

Characteristics (e.g. PWID, homeless, receiving community care)- **HPZone**

Whole Genome Sequencing (WGS) (on request – work ongoing)

Locations e.g. care homes, HMOs, prisons **(GIS list)**

New tool – **new clusters/outbreaks**

- Link all the different data sources (automated process) and review records where needed
- Weekly review

Look back 180 days for 'linked/related cases'
- Same location e.g. two or more cases in the same care home or at same HMO or prison
- Same emmtype

Review HPZone for key information e.g. same district nursing team, same General Practice, hospital stays

New invasive cases (last 7 days)

Investigation and PH action
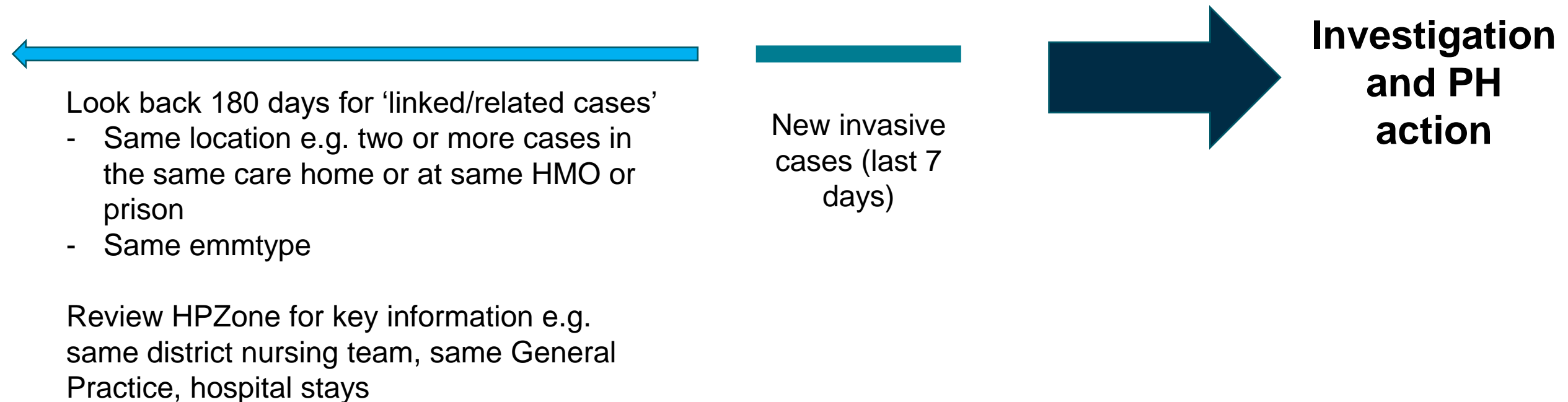
New tool – **new cases** linked to existing clusters/outbreaks

New cluster/outbreak detected

New invasive case (last 7 days)

- Are they linked to any existing clusters/outbreaks

Include newly identified case(s) in existing investigation
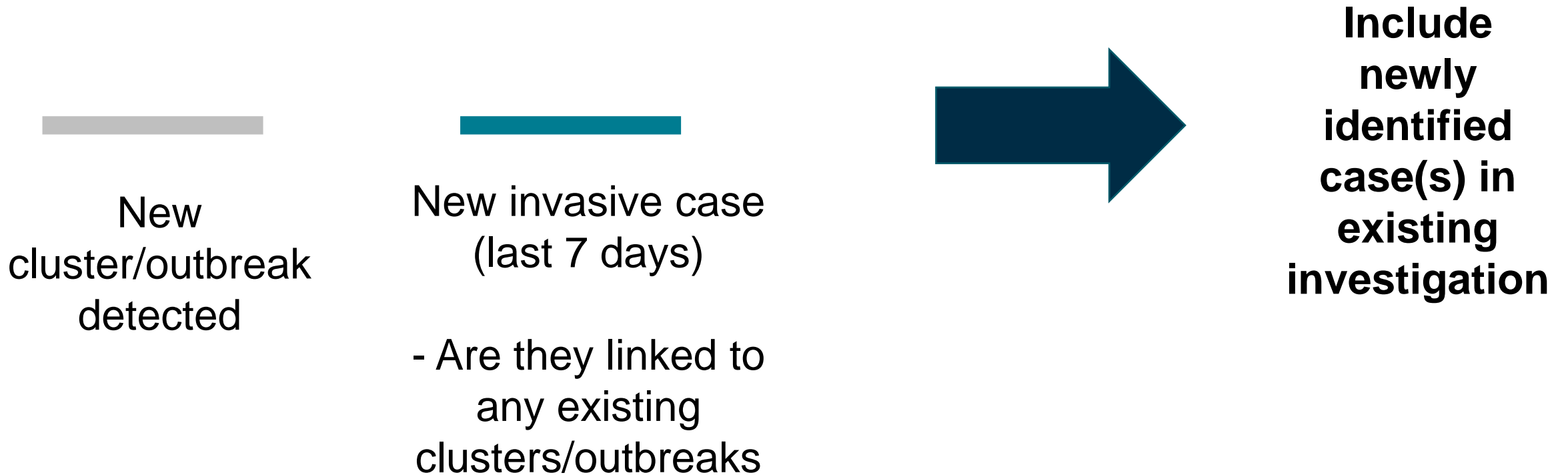
Change in approach….

Traditional – 'surveillance'

Ongoing routine surveillance to detect anything unusual (exceedance)

Unusual increase detected

Collection of data starts (e.g. completion of questionnaires to capture risk/exposure information)

Public health action
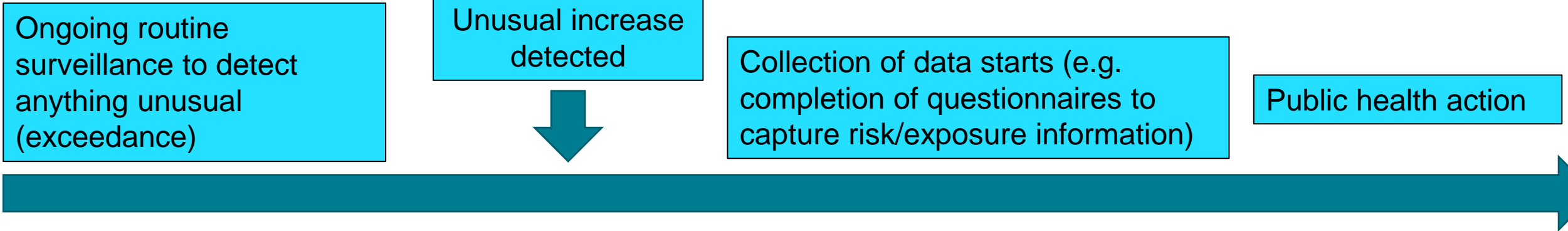
New – 'Public Health action oriented'

Ongoing collation of different information sources into master dataset

Weekly search for linked/related cases (2+)

Timely, directed investigations and public health action
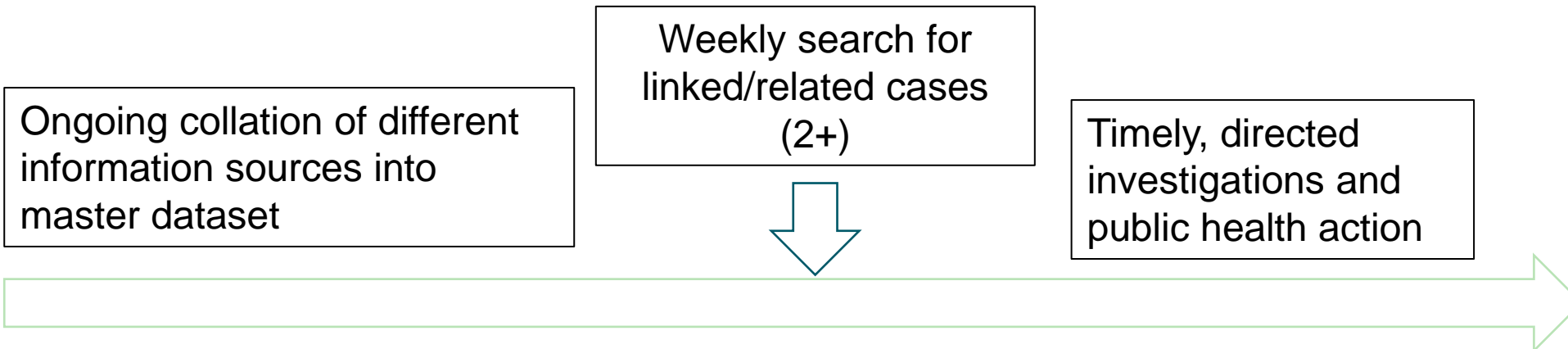
Summary

- Move from traditional ('exceedance' based) approach to new ('PH oriented') approach

- Brings together multiple data sources – mainly automated process - reviewing data for 'linked cases'

- Enables investigation and PH action (if required) of 2 or more linked cases

- Review of first 6 months – 12 clusters identified – 8 previously unknown to UKHSA- Full evaluation underway.

- Enables rapid detection of potential clusters, improved case finding for known clusters and strengthened outbreak response and public health action

- Important role and contribution of key stakeholders

UKHSA Collaboration – Partnerships

Angela Murphy
EOE Public Health Conference- October 2023

UKHSA Partnerships - Engagement

- Recognition of the changes that have occurred across the public health system across the last 2 years.

- UKHSA strategy presents the opportunity to re - confirm the role and remit of agency and our role in the wider public health system.

- To bring some visibility to the strategic - operational work of UKHSA which enhances our acute work but firmly sits within our strategic priorities of prepare & build.

- Investment in capacity to support this commitment, regional engagement role is part of that capacity building.

- Identify areas of existing joint work between partners and UKHSA and explore potential shared priorities.

We need you - our partners

- Our partners are often well placed and have the information, insights needed to support response.

- Our partners often have the levers to ask for information

- The data intelligence & surveillance is key and a key part of our role.

- But the sharing information, intelligence & learning across the system– is what harnesses our impact & improves our capability to prepare – build - respond

Opportunities & Commitment

- Commitment to improving information flows – accessible data

- Regional Health Protection Exchange an example of the opportunity for a two – way conversation.

- Events to build knowledge and capacity in the system & learn from each other.

- Collaboration to strengthen our relationships to further develop our partnerships across the system

UKHSA: Our vision, goals and priorities

UKHSA Vision: Through our scientific and operational expertise, we aim to protect every person, community, business and public service **in East of England** from infectious diseases and environmental hazards, helping to create a safe and prosperous society

Our goals:

Prepare
Be ready for, and prevent, future health security hazards

Respond
Save lives and reduce harm through effective health security response

Build
Build the UK's health security capacity

← **Achieve more equitable outcomes** →

Strategic priorities:

- Be ready to respond to all hazards to health
- Improve health outcomes through vaccines

- Reduce the impact of infectious diseases and antimicrobial resistance
- Protect health from threats in the environment

- Improve action on health security through data and insight
- Develop UKHSA as a high-performing agency

Summary

1. The HPT (part of UKHSA) provides

- Health protection acute response

- Leadership on topics of national, regional and local focus

- Support localities (patch)

- Timely response to EPRR via LRF and LHRP

2. The HPT can draw upon the specialist support provided by Field Services for more sophisticated data management and surveillance

3. None of this, however, would be possible without our Key Stakeholders and the engagement (proactive and reactive) to support and deliver a whole system approach to health protection issues in East of England.

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