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Blood safety: how we reduce the risks of infection

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Overview

How we maintain the safety of the blood supply

How do we provide assurance that safety is maintained

How to spot when something has gone wrong and what we do about it

What's on the horizon: emerging infections

Recognising risk-reflections from the infected blood inquiry



Slow to act on possible infections- in part due to search for certainty



Risks to patient not addressed quickly enough, clear structure for decision making required



Better understanding of risk- requires right expertise and need to be listened to



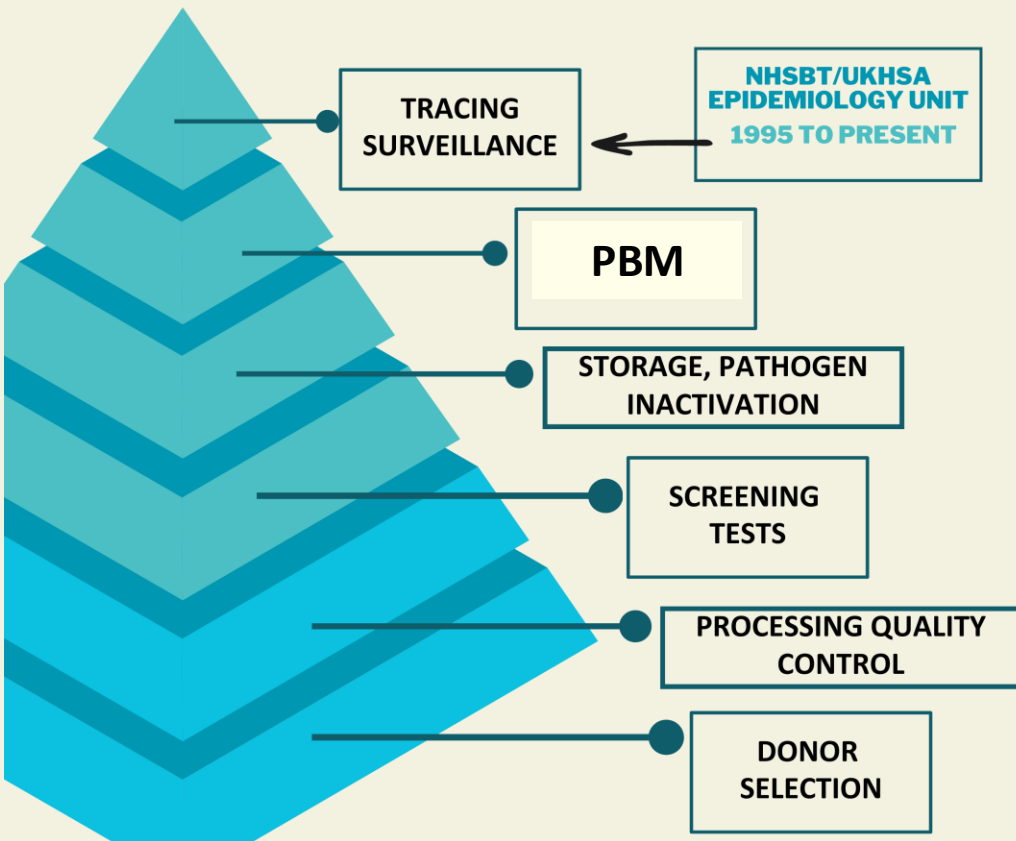
Need for horizon scanning-investment in wider PH



Coherent approach to data- trending

Blood safety steps at different stages

Complexity of ensuring blood safety



- Many steps in place to ensure safety in blood supply
- These greatly reduce the risk of transfusion transmitted infections

Protective measures include:

- Selecting donors: healthy individuals- travel, medication, lifestyle
- Screening donations for *selected* pathogens
- Robust surveillance in place
- *Horizon scanning for emerging infections...* which feeds into selection and testing

Transfusion guidelines

[Advisory Committee on the Safety of Blood, Tissues and Organs \(SaBTO\) - GOV.UK](https://www.gov.uk/guidance/advisory-committee-on-the-safety-of-blood-tissues-and-organs-sabto)

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Advisory Committee on the Safety of Blood, Tissues and Organs (SaBTO)

The Advisory Committee on the Safety of Blood, Tissues and Organs (SaBTO) advises UK ministers and health departments on the most appropriate ways to ensure the safety of blood, cells, tissues and organs for transfusion or transplantation.

JPAC Joint Professional Advisory Committee to the UK
Blood Transfusion and Tissue Transplantation Services

[Guidelines](#) [Resources and documents](#) [Transfusion practice](#) [About JPAC](#)

Guidelines for the UK Blood and Tissue Services

Search guidelines, updates and documents

View the guidelines

The following guidelines are for healthcare professionals working in the UK Blood and Tissue Services.

- [Geographical Disease Risk Index](#)**
For the assessment of travel-related risks
- [Whole blood and components](#)**
For red cells, platelets, plasma or granulocytes
- [Tissue \(deceased donors\)](#)**
For donations of tissue from deceased donors

[Guidelines for the UK Blood and Tissue Services - JPAC](https://www.jpac.org.uk/guidelines-for-the-uk-blood-and-tissue-services)

Donors

FAIR

- more individualised donor selection

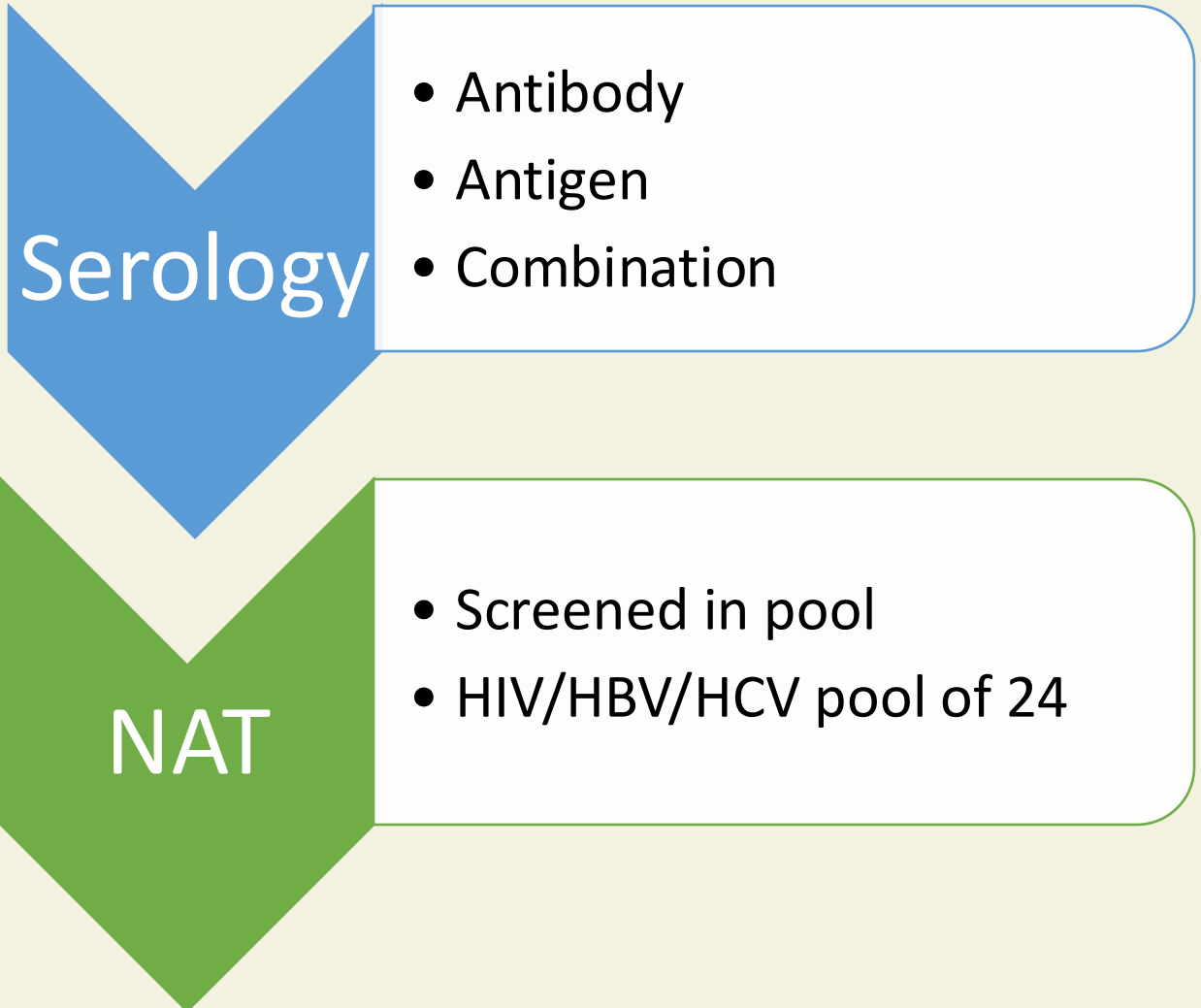
Potential
higher risk
behaviours

- sex
- travel-constant updates
- injecting drug use

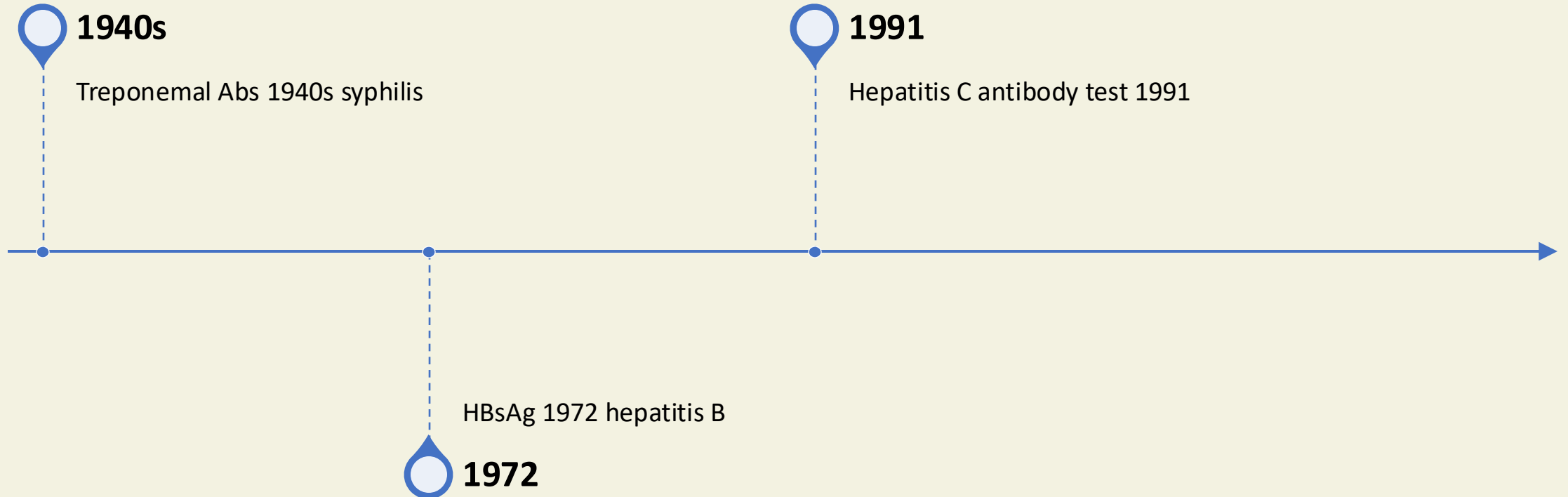
Donation testing

Two main testing platforms:
serology/NAT

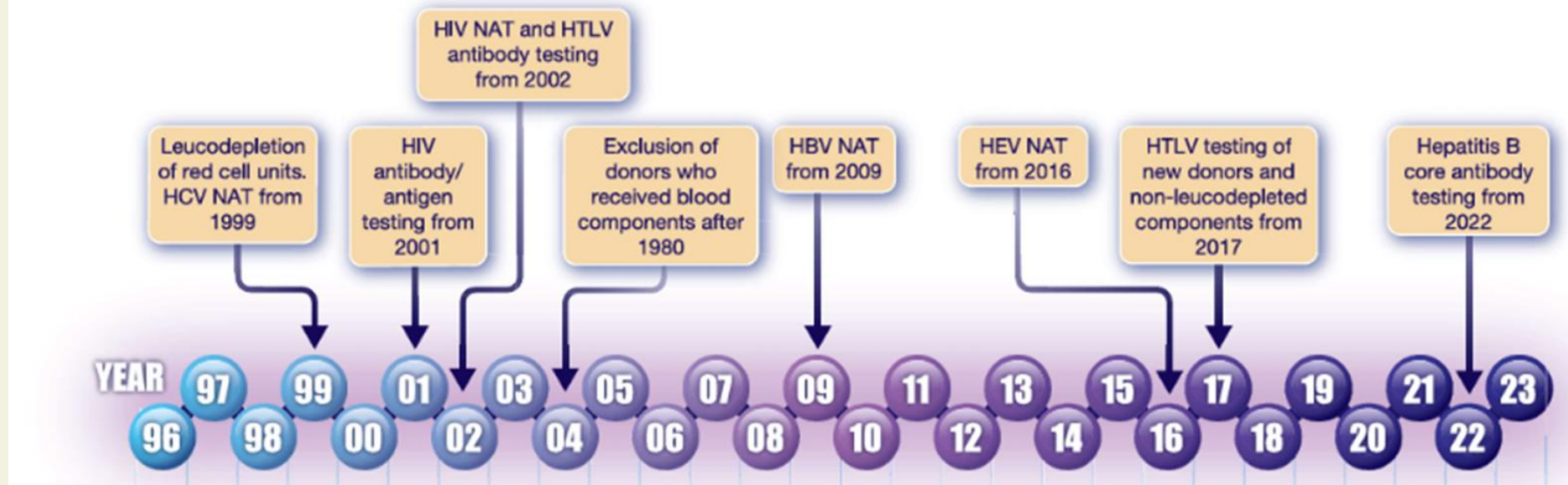
If repeatedly reactive donation
is **discarded** and samples sent
for reference testing



Early tests



Timeline of Risk Reduction Strategies and Transfusion Transmitted Infections for Viruses, Parasites and Prions, UK 1996 to 2023



- Leucodepletion from November 1999
- Bacterial screening of platelets
- New B19/HAV

SHOT resources cumulative SHOT data by category

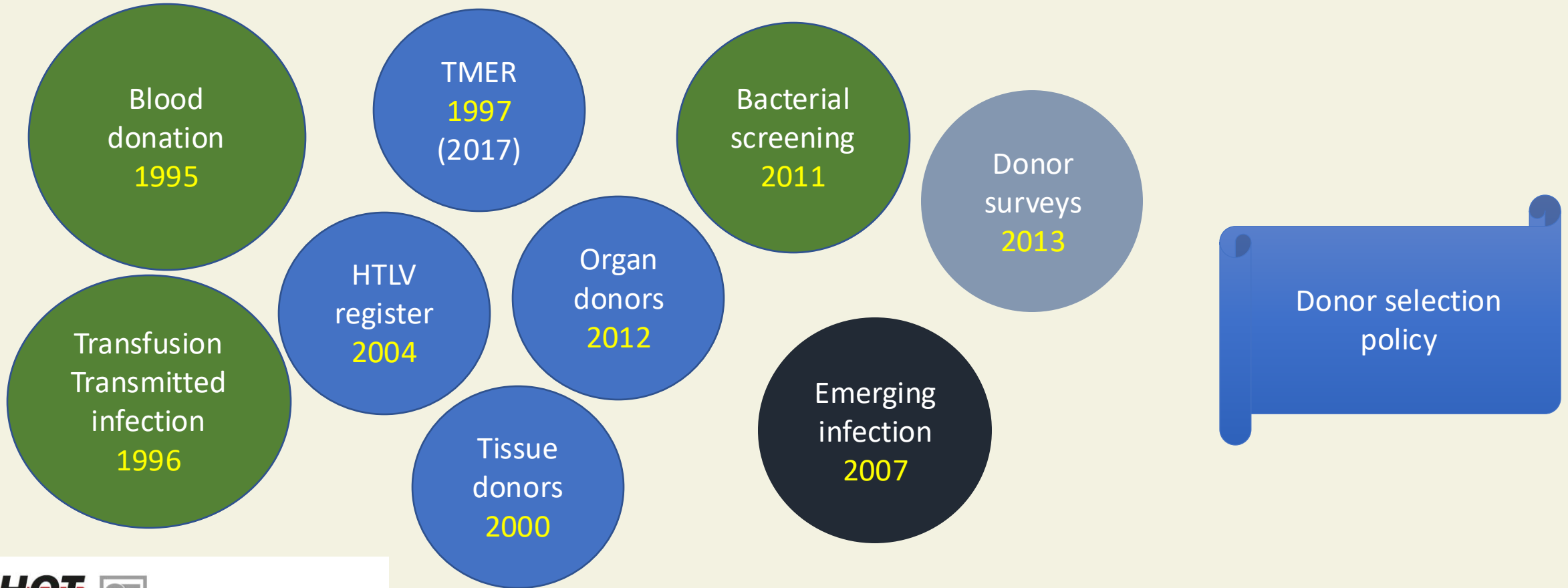
<https://www.shotuk.org/resources/current-resources/data-drawers/tti-cases-cumulative-data/>



Surveillance and Haemovigilance

- NHSBT/UKHSA Epidemiology Unit annual report
- [Epidemiology - Hospitals and Science – NHSBT](#)
- [Blood, tissue and organ donors: surveillance schemes - GOV.UK](#)
- SHOT

Current surveillance systems



Routine donation testing

Blood donors with markers of infection, UK 2024



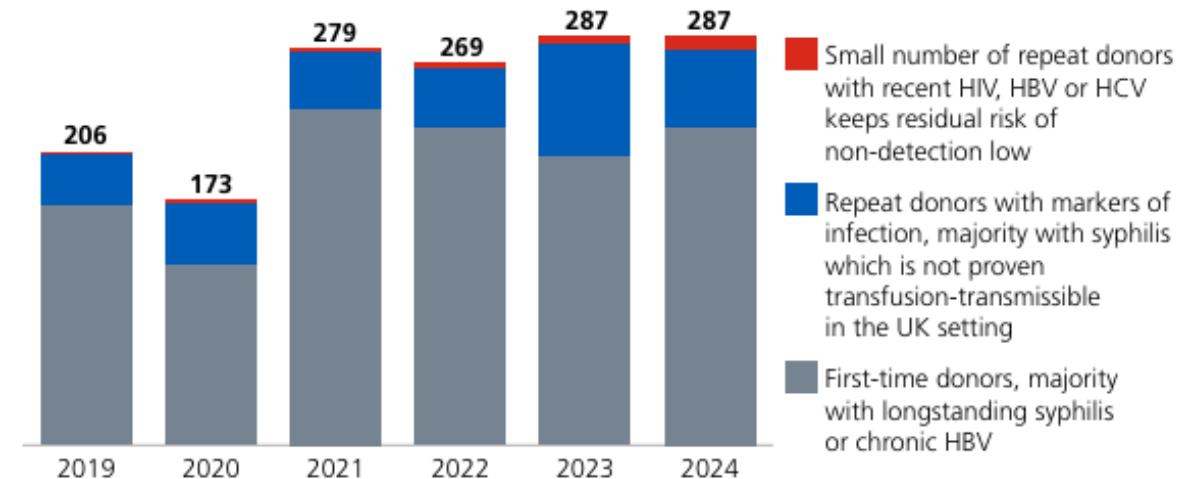
Donor selection helped keep the number of UK blood donors with markers of infection low in 2024.

1.8 million blood donations were made by **964,000** UK blood donors, selected to be at low risk of blood-borne infection.

Just **287** gave a donation which was confirmed positive for either chronic, occult or acute hepatitis B, hepatitis C, HIV, HTLV or syphilis and removed from the supply. Only **10** repeat donors had markers of recent infection.

Most infections are chronic, or past infections that have not been previously identified and that the donor is unaware of

Figure 1: Blood donors with donations confirmed positive for markers of chronic HBV, occult HBV, acute HBV, HCV, HIV, HTLV and syphilis, UK 2019 to 2024.



Importance of testing



HEV RNA screening removed **417** positive donations in 2024. HEV transfusion-transmission is now **rare**, with **2** confirmed and **2** probable HEV transfusion-transmissions reported under screening. Donors recently ill with HEV must not give blood and should report any post-donation infections.

Hepatitis E is associated with consumption of undercooked contaminated food and therefore no specific donor deferral is in place.

Screening continues to detect and remove infections from the blood supply



Syphilis is one of the most detected markers in donors but is not a transfusion risk in the UK. Testing is an **additional safety measure** to identify donors who may be at increased risk of HIV. Donors with a **history of syphilis** are not eligible to donate.

Hepatitis B core antibody screening aims to reduce chance of **occult HBV transmission**.

In 2024, this led to the deferral of 1,875 donors with past exposure to HBV, 3 of whom had markers of occult HBV.

Black and Asian heritage donors were disproportionately affected by the deferral.



Additional **testing for travel** associated infections averted up to 6% loss of donations, in the UK in 2024.

Risk of non-detection of hepatitis B, C and HIV UK 2024



Blood and Transplant



Few HBV, HCV and HIV seroconverters combined with sensitive screening maintains the very **low chance of non-detection**.

In 2022-2024 this was estimated to be around **1 in 1 million donations screened**, highest for HBV.

Non-detected cases are estimated at **~2 HBV per year, 1 HIV every 6 years, and 1 HCV every 59 years**.



As new infections reduce in donor pool and window period remains stable the overall risk of non-detection decreases

Transfusion transmission also affected by susceptibility in the recipient

Observed transmissions are rare

Residual risk estimate – the number of seroconverters detected over 3 years, are used to estimate the residual risk of not detecting HBV, HCV or HIV in the window period before assays can detect very early infection

Infectious window period in days

HBV NAT and HBsAg – 30 days

HCV NAT and Anti-HCV – 4 days

HIV NAT and HIV Ag/Ab – 9 days



When lookback may be required

All relate to a newly identified infection in a donor...may be due to:

- **Introduction of new test** –most recently additional test for hepatitis B
- **Post donation information**
 - Hepatitis A
- **Seroconversion of donor**

What does this mean for blood recipients



Lookback is carried out to ensure that there has been no transmission of infection-lookback to previous donations



We may ask your clinical team to talk to you about what has happened, the clinical risk and where appropriate for a blood sample to check that transmission has not occurred



For example, for syphilis, there are no reported cases of transfusion transmission from donations in the last few decades but we may still follow up patients

Post Transfusion Infections

- No other likely risk
- Recipient may have previous negative results on file
- NHSBT will investigate
 - Archives
 - New samples from donors
 - Different tests



TTI and lookback investigations support the UK blood services in monitoring blood safety and haemovigilance by identifying donors and recipients potentially at risk.



In 2024, there were **0** confirmed viral TTI among 18 investigations of suspected transmission.

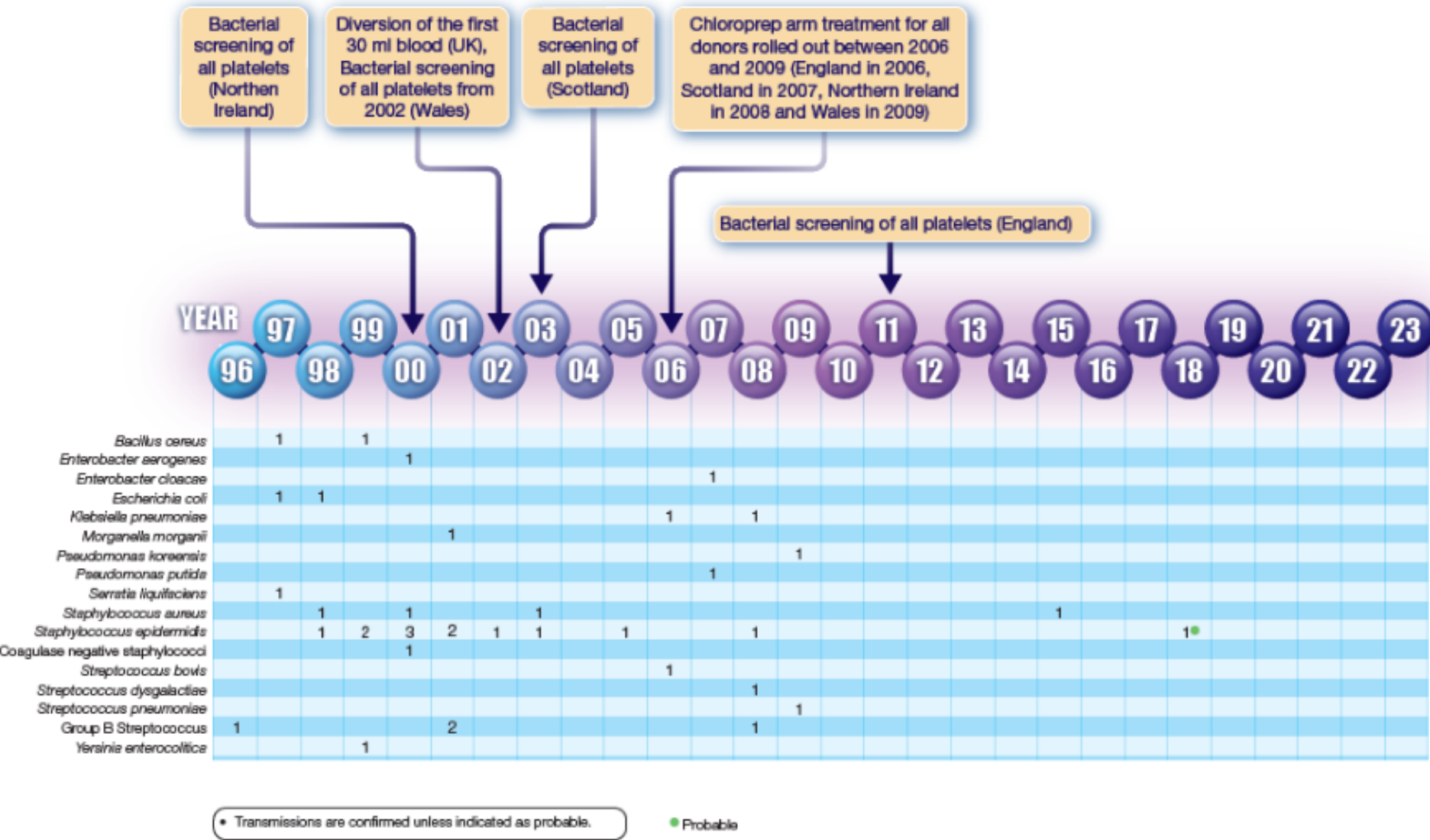


Hospital engagement and collaboration are key to ensure those affected are promptly identified, tested, and referred for appropriate care.

Bacteria- are they still a risk?



Timeline of Risk Reduction Strategies and Transfusion Transmitted Infections for Bacteria, UK 1996 to 2023



Bacterial screening is very effective but...



Potential for non-detection

Low numbers of bacteria in screening sample

Specific bacterial growth

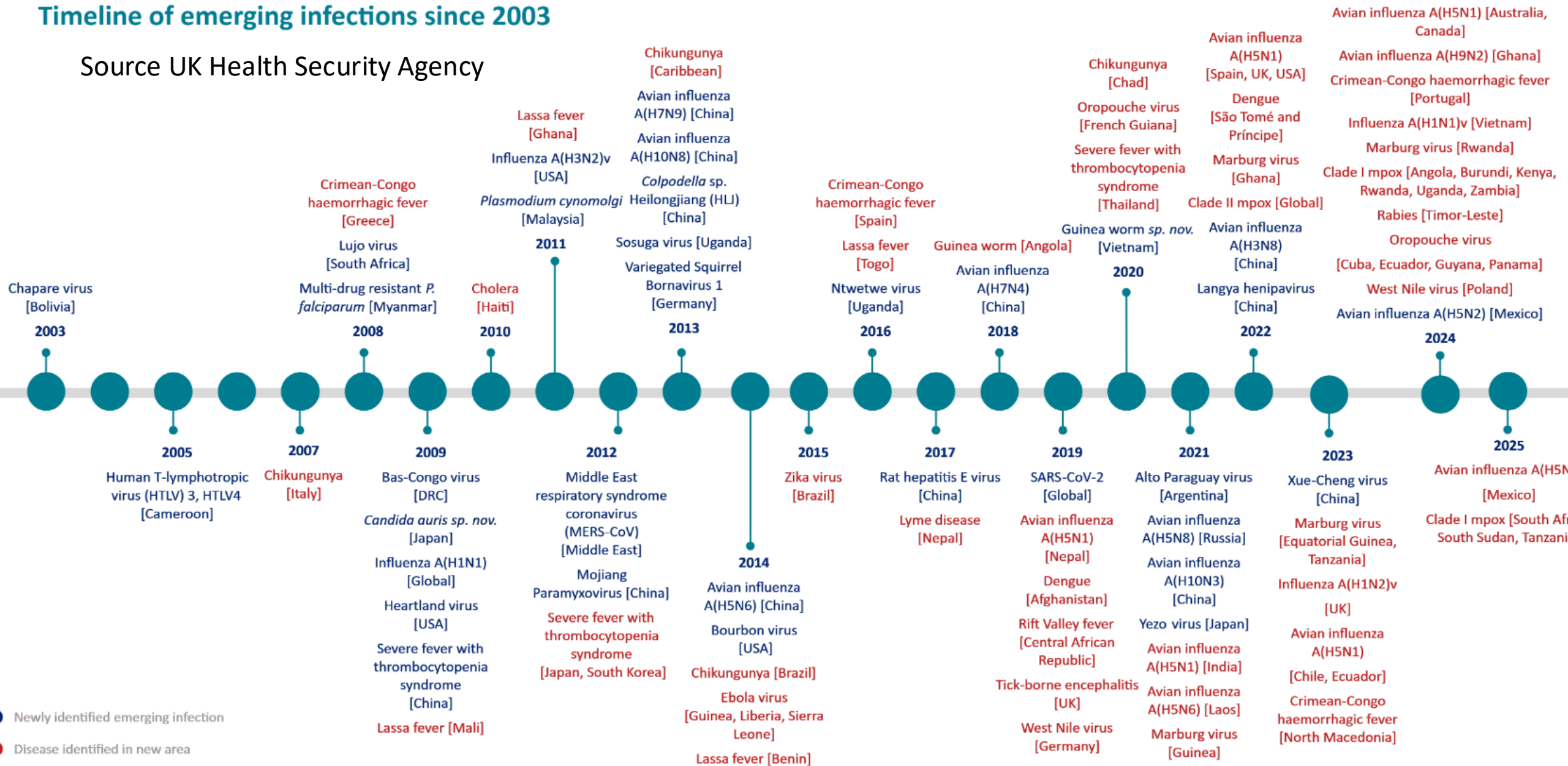


An investigation will be carried out if a post transfusion reaction is thought to be due to bacterial contamination

New and emerging..and emerged infections

Timeline of emerging infections since 2003

Source UK Health Security Agency



Prevention strategies

Horizon scanning for emerging infections, UK 2024

There is a clear process for horizon scanning for emerging infections that may impact the safety or sufficiency of the blood supply that relies on close links with public health and One Health surveillance.

In 2024, **952 entries** in the Emerging Infection Report were reviewed with spread of arboviruses, mpox and avian influenza accounting for a significant proportion of activity.

Horizon scanning for emerging infections



A monthly **EIR** lists emerging infections with potential to affect the UK blood and tissue supply. A range of national and international sources are used. Urgent items sent without delay for review



Good links to public health surveillance are crucial



Feedback helps refine EIR reports

JPAC SAC actions included:



Changes to travel-related deferral areas.



Updating risk assessments.



Monitoring epidemiology:

- Oropouche virus.
- Usutu virus in UK mosquitos.
- Mpox.
- Avian influenza H5N1.

Clear process for risk assessment and action



EIR sent to the JPAC SACTTI for **risk assessment**



SACTTI highlight whether further action required by JPAC and its Standing Advisory Committees including changes to donor selection or donation testing

- Close collaboration with public health agencies
- R+D investment, importance of donor and patient partners
- Research ongoing into new tests and ways of detecting viruses
- New tests under development and evaluation for insect-borne infections

Summary



Donor selection and donation testing are both important in blood safety



New/recent infections are rare in blood donations



Ongoing surveillance and horizon scanning important in responding to new potential threats

‘To ensure the greatest possible safety, we need to avoid complacency. There is no basis for assuming that threats are all in the past: but watchfulness and learning the lessons of what happened in the infected blood disaster are critical to this’