NIHR | HealthTech Research Centre
Accelerated surgical care

How can IVD Diagnostics help us Prevent Disease?

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Chair European study group for *C. difficile* (ESGCD), ESCMID

Unmet need in sickness to prevention

Infection following surgery
Infection complications following surgery are common, including surgical site infections, sepsis, urinary tract infections (UTI), acute kidney injury (AKI) and hospital acquired pneumonia (HAP)

Antimicrobial Resistance (AMR)
AMR related deaths may exceed those of cancer by 2050, with associated costs of $100 trillion. Without the antibiotics for post-surgical infections, we enter a post-antibiotic era, where these infections are once again untreatable, and the likelihood of surviving reduced

Sepsis
The UK Sepsis Trust highlights that there are 245,000 cases of sepsis every year with 48,000 deaths, but that relative risk of death decreased by 46.6% if appropriate treatment is given within one hour. Clinical decision making is hampered currently by slow diagnostic methods, such as blood cultures.

Acute Kidney injury AKI)
Acute kidney injury as a sequalae of sepsis is common (50-75%) in critically unwell patients and is associated with adverse outcomes, including chronic kidney disease and increased mortality. Early identification of patients at risk of progression to severe form of AKI or persistent AKI is critical

Chronic Kidney disease (CKD)
A large proportion of severe AKI results in chronic kidney disease. CKD Is estimated to become one of the five top causes of pre-mature death by 2040. Early identification of CKD can reduce progression of disease and enable timely **transplantation**

Urinary tract infection (UTI)
UTI is the commonest infection in kidney transplant recipients. Recurrent UTI is associated with kidney transplant function decline, increased failure, antibiotic resistance and morbidities.

By diagnosing or predicting infections early we can prevent further sickness

Overview of theme 1: Early diagnosis and personalised care

Focus on

- *in vitro* diagnostics which will enable earlier diagnosis and more targeted interventions either as a prelude to or consequence from surgery – Sepsis, UTI, AKI, HAP, CKD and Transplantation
- IVDs which enable equity of access, the freeing up of valuable resources, and capacity e.g. remote monitoring, risk-stratification/prioritisation, or allow more targeted therapy, such as antimicrobial treatments.
- Provide advice and guidance at all stages of the IVD development pathway

Objectives relating to sickness to prevention

Co-Leads:
Dr Andy Lewington
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Co-investigators:
Dr Sunil Daga
Dr Jane Freeman,
Prof Mark Wilcox OBE

Sepsis, UTI, AKI, HAP, CKD
Transplantation

National profile

Build a profile and develop a national group identity for liaison with other national bodies, such as NICE, DHSC, MHRA

Work with other HRCs to develop networks

PPIE/EDI

Embedding PPIE and EDI in all activities.

Prioritised road map of patients likely to benefit from early diagnosis and personalised care, either as precursor to, or secondary to surgery, mapping underserved groups

Building the IVD pipeline

Review the current landscape of IVDs and assess status

Establish programme of IVD development end evaluation

Health economic and health equity studies to support adoption

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THE UK SEPSIS TRUST

KIDNEY RESEARCH YORKSHIRE

Kidney Research UK

Opportunities, challenges and health inequalities

Informatics & Automation
Advances in automation, robotics, and informatics can streamline diagnostic processes, reduce turnaround times and improve workflow, increasing efficiency and speed of diagnostics tests

Connecting diagnostics digitally for greater impact
Connected diagnostics will increase the delivery of results to the where they are needed, in real time, with greater impact on patient treatment pathways, to address health inequalities

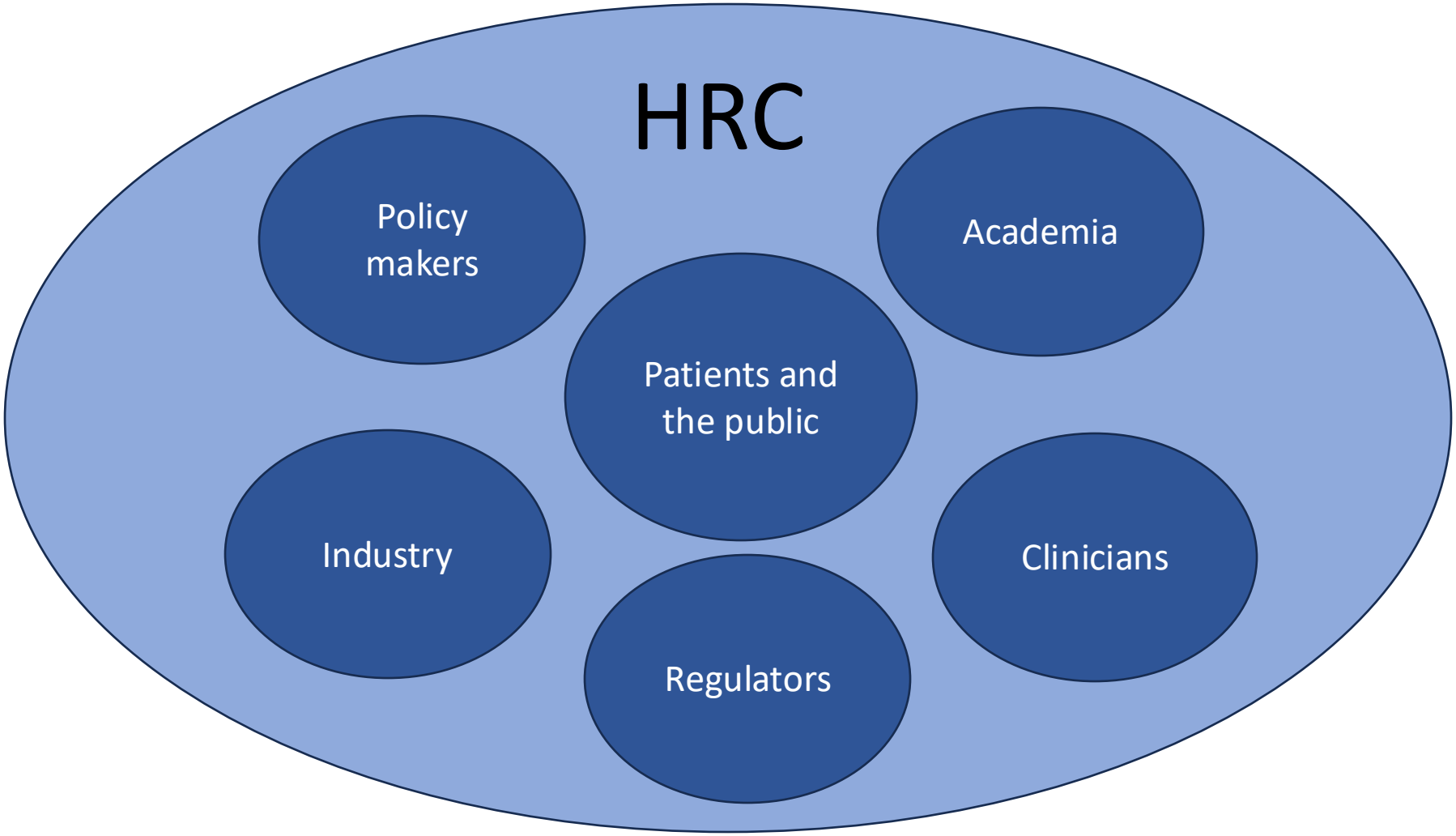
Expanding user friendly testing options, and accessibility
Point-of-care tests (POCT) and LFDs offer the opportunity to use different, and often less invasive sample types, improving patient experience, and taking diagnostics to underserved communities, where there may be higher proportions of disease

Prevention & Early detection
By supporting screening and early detection of disease, innovations can allow opportunities for early intervention, to either increase access to surgical options or prevent surgical sequalae

Accuracy, efficiency & speed of diagnostic tests
Innovations can help improve the accuracy, efficiency and speed of diagnostic tests, enabling the faster detection and prevention, or diagnosis and treatment of clinical conditions, reducing bed stay, and waiting times.

Cost-effectiveness & Resource optimisation
By increasing accurate diagnosis, we will be able to provide interventions earlier reduce overall healthcare costs and optimise the use of health resources.

Collaboration is essential for delivery



Thank you