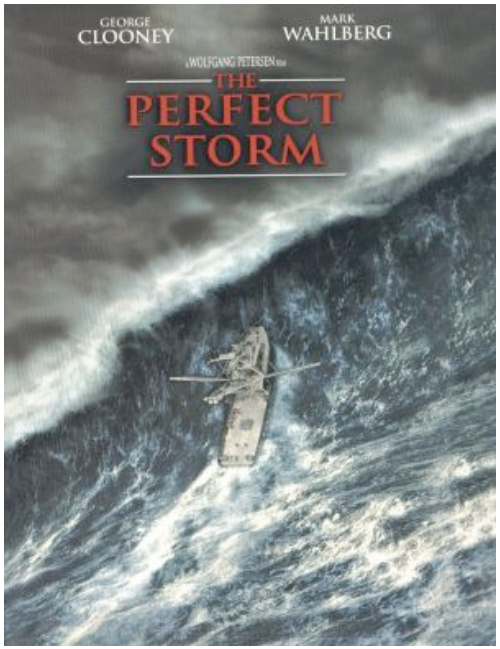
NIHR Diagnostic Evidence Co-operative - Oxford

Dr Matthew Thompson
Clinical Director, NIHR DEC Oxford
Nuffield Department of Primary Care Health Sciences, University of Oxford
Oxford Health NHS Foundation Trust
www.nihr-dec.medsci.ox.ac.uk

General Practice– the “perfect storm” for innovation in diagnostic tests

- ‘Front door” to NHS – diagnosis, screening, referral, gatekeeping
- Multiple, repeated, more frequent lab tests
- Aging population, multimorbidity
- Chronic disease management
- Cost-containment – reducing unnecessary referrals
- Misdiagnosis… malpractice
- Little current use of IVDs



Current mismatch impedes clinical practice & innovation in primary care

Available IVDs & technical capabilities. Accuracy/ease/ size/ speed/range/bundling

Current clinical practice.

Minimal test dissemination and adoption in primary care

Vision: Primary care diagnostic technology centre of excellence for the NHS & UK Diagnostics Industry

- Design, test and implement methods and strategies to increase evidence for implementation of in-vitro diagnostics in primary care
- National/International leaders in primary care & diagnostics
- Innovative NHS partners in delivery and laboratory medicine
- Research strategy across 5 main themes

Partners

- Oxford Health Foundation NHS Trust
- University of Oxford Department of Primary Care Health Sciences
  - Centre for Monitoring & Diagnosis
  - Centre for Evidence Based Medicine
  - Patient Experiences Research Group
  - Statistics Group
- Oxford Clinical Commissioning Group
- Oxford Radcliffe Trust Department of Laboratory Medicine & Microbiology
- Oxford Academic Health Science Networks

Theme 1: Identify new and emerging diagnostic technologies

Leads: Annette Pluddeman, Carl Heneghan, Chris Price, Matthew Thompson, Jane Wolstenholme

Aim: Identify and prioritise new diagnostic IVD technologies

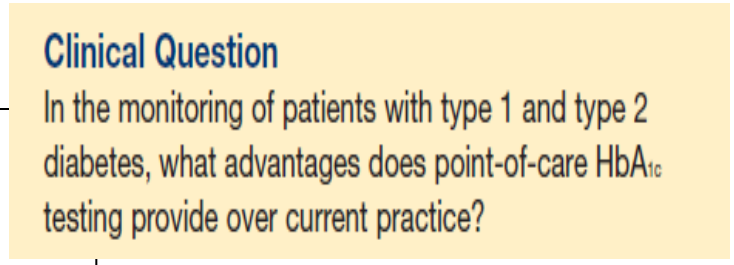
- Horizon-scanning process to identify, prioritise and produce diagnostic evidence reports for IVDs
- Highlight research and implementation gaps - 'next steps'
- 130 different tests across 30+ clinical areas (funded by NIHR programme grant)
- Dissemination – HTA, NICE, commissioners, industry, primary care

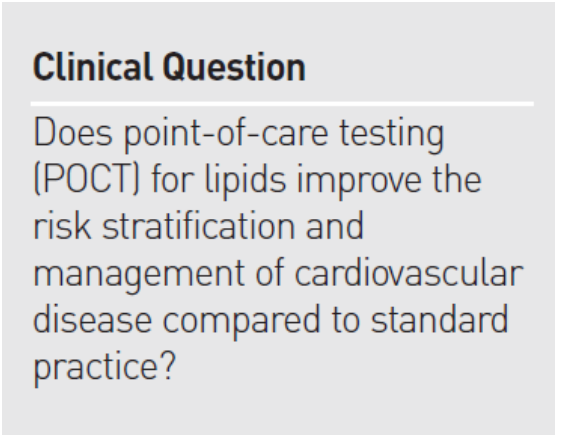
31 point of care test areas evaluated (approx 140 different diagnostic tests)

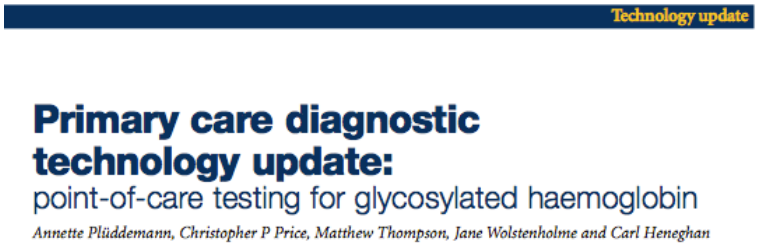
- Point of care tests (15), e.g.
  - Point of care CRP test for antibiotic targetting
  - Point of care D dimer test for ruling out deep vein thrombosis
  - Point of care test for HbA1c
  - Point of care test for INR
  - Point of care test for blood ketones
- Electronic tests (11), e.g.
  - Handheld ECG monitor for detecing atrial fibrillation
  - Handheld electronic nose for diagnosis of cancer, asthma, infection
  - Pulse oximetry
  - Handheld spirometry for diagnosis and monitoring of COP
  - Transcutaneous bilirubin measurement
- Others
  - Urine sample techniques in older individuals
  - Frailty screening tools

‘Rapid’ evidence reports

- **Clearly defined clinical question**
- What diagnostic devices are available?
  - Details
  - Potential advantages over existing technology
- Current practice, Patient group, importance
- Previous research
  - Accuracy vs. existing tests
  - Impact vs existing tests
  - Cost effectiveness
- What research still needs to be done?
- What is the suggested next step?
- **Bottom line**







Theme 2: Identify unmet diagnostic testing needs in primary care

Leads: Ann Van den Bruel, Jeremy Howick, Caroline Jones

Aim: needs assessment of primary care clinicians for diagnostics

- UK & International (NL, BE, Australia, USA) surveys of primary care doctors' current use and needs for IVDs
- Expand needs assessment to other 'front line' clinicians
- Process for rapid needs assessment of diagnostic testing

International survey of GP/Family Physician current use and desired use of point of care tests. Howick J, et al

Country		UK	Netherlands	Belgium	Australia	USA
Sampling method		Randomly sampled, stratified according to age, length of time in practice, specialty, and location	All GPs in three regionally distributed GP networks approached	Existing mailinglist of GP plus GP groups of the region contacted	GPs in SA &QLD GPs (total 2933). AMA membership list with addition of data from other sources. (approximately 80% GP coverage)	AAFP National Research network and Doctors.net
Type of survey (electronic, paper based)		Electronic	Electronic	Electronic	Electronic and paper	Electronic
Number of respondents (response rate%)		1109 (68%)	639 (30%)	319 (not available)	298 (10%)	405 (74%)
Location of practice*	Rural or Semirural	377 (34%)	280 (43.8%)	176 (55%)	280 (43,8%)	102 (25%)
	Urban or Suburban	293 (26%)	359 (56.2%)	143 (45)	359 (56,2%)	303 (75%)
Kilometres to nearest hospital (average)		11.2km	8.6km	7,1km	n/a	7.9km

	United Kingdom (*n*=1109)	Netherlands (*n*=639)	Belgium (*n*=319)	Australia (*n*=298)	United States (*n*=405)	Total (*n*=2770)
D-dimer	73%(811)	70%(448)	83%(265)	41%(121)	62%(251)	68%(1896)
Troponin	69%(765)	65%(418)	85%(271)	43%(129)	59%(238)	66%(1821)
Chlamydia	65%(721)	60%(382)	67%(212)	49%(145)	66%(267)	62%(1727)
BNP	66%(734)	62%(398)	51%(164)	28%(82)	60%(244)	59%(1622)
CRP	61%(682)	47%(302)	75%(238)	38%(114)	45%(181)	55%(1517)
Gonorrhoea	58%(645)	51%(326)	56%(180)	34%(100)	65%(262)	55%(1513)
HbA1c	61%(679)	37%(239)	61%(195)	52%(156)	50%(202)	53%(1471)
White cell count	60%(661)	40%(256)	67%(212)	43%(127)	52%(212)	53%(1468)
Haemoglobin	72%(793)	26%(168)	47%(150)	47%(139)	39%(159)	51%(1409)
Potassium	61%(679)	33%(210)	47%(150)	33%(97)	57%(232)	49%(1368)
INR	47%(517)	54%(347)	77%(244)	21%(63)	43%(176)	49%(1347)
Nose/throat swab for influenza	55%(609)	36%(231)	59%(187)	43%(128)	33%(134)	47%(1289)
ESR	58%(645)	29%(183)	40%(128)	29%(86)	48%(194)	45%(1236)
Quantitative Beta HCG	53%(586)	23%(149)	56%(177)	40%(120)	46%(187)	44%(1219)
Creatinine	53%(593)	28%(177)	41%(130)	34%(102)	53%(214)	44%(1216)
TSH	53%(586)	27%(171)	33%(105)	32%(95)	62%(253)	44%(1210)
Throat swab Group A Streptococci	53%(588)	33%(208)	60%(190)	35%(103)	11%(45)	41%(1134)
Uric Acid	50%(549)	26%(167)	30%(94)	28%(82)	51%(205)	40%(1097)
Sodium	51%(571)	19%(122)	21%(66)	30%(88)	42%(172)	37%(1019)

Theme 3: Integrating IVDs in primary care with laboratory services

Leads: Jonathan Kay, Chris Price, Dan Lasserson

Aim: determine barriers and facilitators to point of care test implementation

- Identify new methods and technologies to seamlessly link POCT in primary care with labs/ medical records, within regulatory and EQA frameworks
- Use Abingdon community hospital Emergency Medical Unit as exemplar

Theme 4: Patient, carer & professional attitudes to implementing IVDs in primary care

Leads: Caroline Jones, Louise Locock

Aim: Understand impact and interaction of IVDs on patients, carers and professionals

- Qualitative studies of IVD acceptability and feasibility
  - CRP test children in out of hours setting
  - BNP/CKD adults
- Secondary analysis of existing Health Experience Research Group patient interviews
- Develop rapid qualitative assessment service for industry

Theme 5: Improved methods for deriving and translating evidence for diagnostic tests

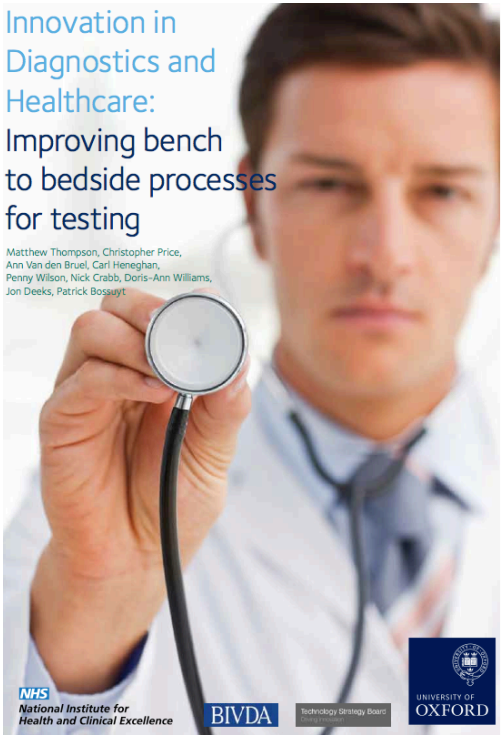
Leads: Dr Rafael Perera, Richard Stevens, Beth Shinkins, Ann Van den Bruel

Aim: develop new methods for translate evidence from IVDs from secondary to primary care

- Where do diagnostic technologies ‘fall down’ along the evidence pathway, and how can these be predicted and avoided?
- How can existing diagnostic accuracy evidence from secondary care settings inform primary care
- Barriers to calibrating test characteristics across settings.
- Further examining patient centered outcomes of diagnostic tests

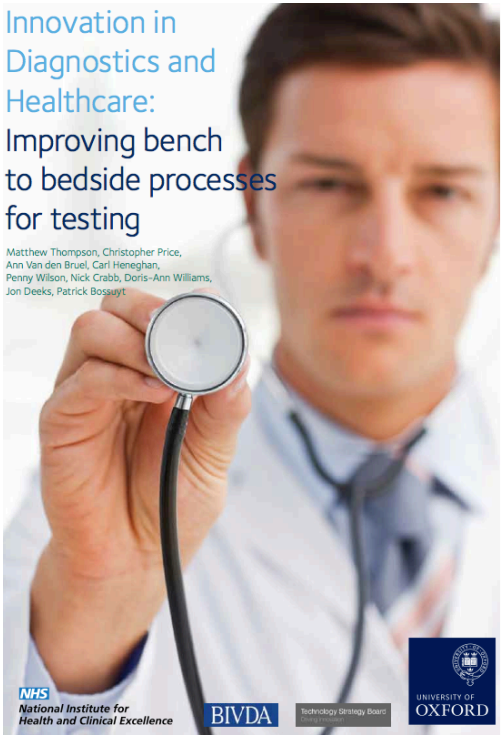
Joint DEC-Industry applications

- Experience with Industry-funded research across number clinical areas (e.g., heart failure, POCT, infection) and settings (e.g., primary care, out of hours, hospital)
- Large portfolio of NIHR/HTA/BRC-funded research
- UK Diagnostics Forums (2011, 2013, 2014)



Joint DEC-Industry applications

- EU 2020 grant applications March 2014
  - Large multinational
  - SME
- NIHR Programme grant
  - SME
- Joint applications in process:
  - SME
  - 2 multinationals
  - Exploring UK, European, NIH funding



Thank you

Matthew.thompson@phc.ox.ac.uk

	United Kingdom (*n*=1109)	Netherlands (*n*=639)	Belgium (*n*=319)	Australia (*n*=298)	United States (*n*=405)	Total (*n*=2770)
Urine pregnancy test	80%(887)	94%(603)	61%(193)	68%(203)	86%(350)	81%(2236)
Urine leucocytes or nitrite	90%(993)	96%(611)	87%(275)		88%(355)	81%(2234)
Blood glucose	69%(760)	96%(616)	87%(278)	74%(221)	82%(334)	80%(2209)
INR	43%(476)	1%(6)	12%(37)	48%(144)	47%(189)	31%(852)
Haemoglobin	16%(174)	58%(371)	3%(8)	10%(29)	50%(202)	28%(784)
Faecal occult blood	13%(143)	2%(14)	18%(56)	6%(19)	83%(335)	20%(567)
Throat swab for Group A Streptococci	15%(164)	1%(4)	4%(12)	6%(19)	86%(348)	20%(547)
CRP (C-reactive protein)	15%(163)	48%(305)	3%(10)	3%(8)	10%(42)	19%(528)
HbA1c	17%(183)	6%(38)	2%(6)	6%(17)	40%(162)	15%(406)
Nose/throat swab for influenza	6%(61)	0%(2)	1%(3)	7%(20)	60%(242)	12%(328)