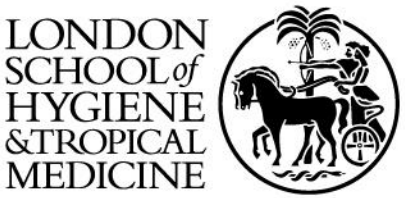
Cost-effectiveness of Hepatitis B case-finding interventions in the UK

Jack Williams, Alec Miners, Peter Vickerman, Natasha Martin, Matthew Hickman

Main funding provided by NIHR Health Protection Research Units (HPRU)



Outline

- Why perform economic evaluations for case finding?
- Cost-effectiveness of HBV case-finding in migrants living in the UK

  (*completed project*)
- Cost-effectiveness of A&E opt-out screening for HBV (*ongoing project*)
- Conclusions and considerations

Economic evaluations of case-finding interventions

- Why perform economic evaluations of case-finding interventions?
  - To help allocate limited resources efficiently
  - To compare the costs and effects of different interventions

- We can use economic models to predict the lifetime impact of interventions….
  - But we can also consider which scenarios an intervention might be cost-effectiveness

Basics of cost-effectiveness analyses

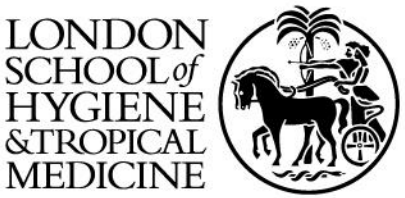
- Includes incremental costs:
  - Cost of intervention (testing) and cost of treatment
  - Reduced costs relating to disease progression

- Outcomes captured as quality adjusted life years (QALYs):
  - Capture increased length of life, weighted by quality
    - 1 QALY is a year in perfect health
  - ↑ health benefits associated with reduced disease progression

- UK cost-effectiveness threshold (set by NICE) between £20-30,000 per QALY

An Economic Evaluation of case-finding HBV in UK migrant populations

Alec Miners, Anjan Ghosh, Natasha Martin, Peter Vickerman and Matthew Hickman



Rationale

- Universal infant vaccination in the UK began in 2017, but few transmissions are thought to occur in the UK

- 80-90% of new diagnoses in the UK are amongst migrants from intermediate or high prevalence countries (≥2% prevalence)[1]
  - However, testing is low in this population (one study reported 12% tested for HBV[2])

- One-time HBV screening in migrant populations found to be cost-effective in the Netherlands[3]

1) Hahne *et al.,* J Clin Virol, 2004. 29(4): p211 2) Cochrane *et al.,* J Clin Virol, 2015. 68: p79
3) Veldhuijzen *et al.,* Gastroenterology, 2010. 138(2): p522

Intervention

- A one-time test for hepatitis B for individuals from countries with intermediate or high HBV prevalence (≥2% prevalence)
- Patients written to and invited to opt-out of HBV testing, and those not opting out were contacted for an appointment
  - Results based on an uncontrolled pilot study
- After one-time intervention, testing rates returned to current levels (estimated 2.6% per year[1])

1) Health Protection Agency, Sentinel Surveillance of Hepatitis Testing in England - Hepatitis B and D 2010 Report. 2011: Collindale, UK.

Key parameters for model

Intervention costs

- Assumed £4 intervention cost per eligible individuals (i.e. all contacted)
  - Cost of identification and invitation to test
- £10 HBsAg test

Cascade of care

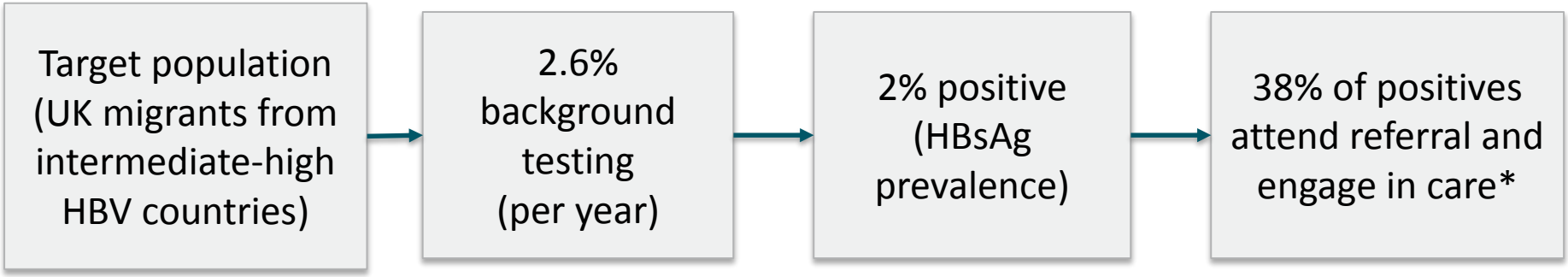
- 2% prevalence (assumption/scenario)
- 19.7% uptake of opt-out testing (pilot study, London)[1]
- 38% of HBsAg+ referred, attend referral, and engage in care (assumption, based on HCV data)[2]

Model structure, disease progression, utility (quality of life)

- Mostly from previous HTA in HBV[3] and other published clinical data

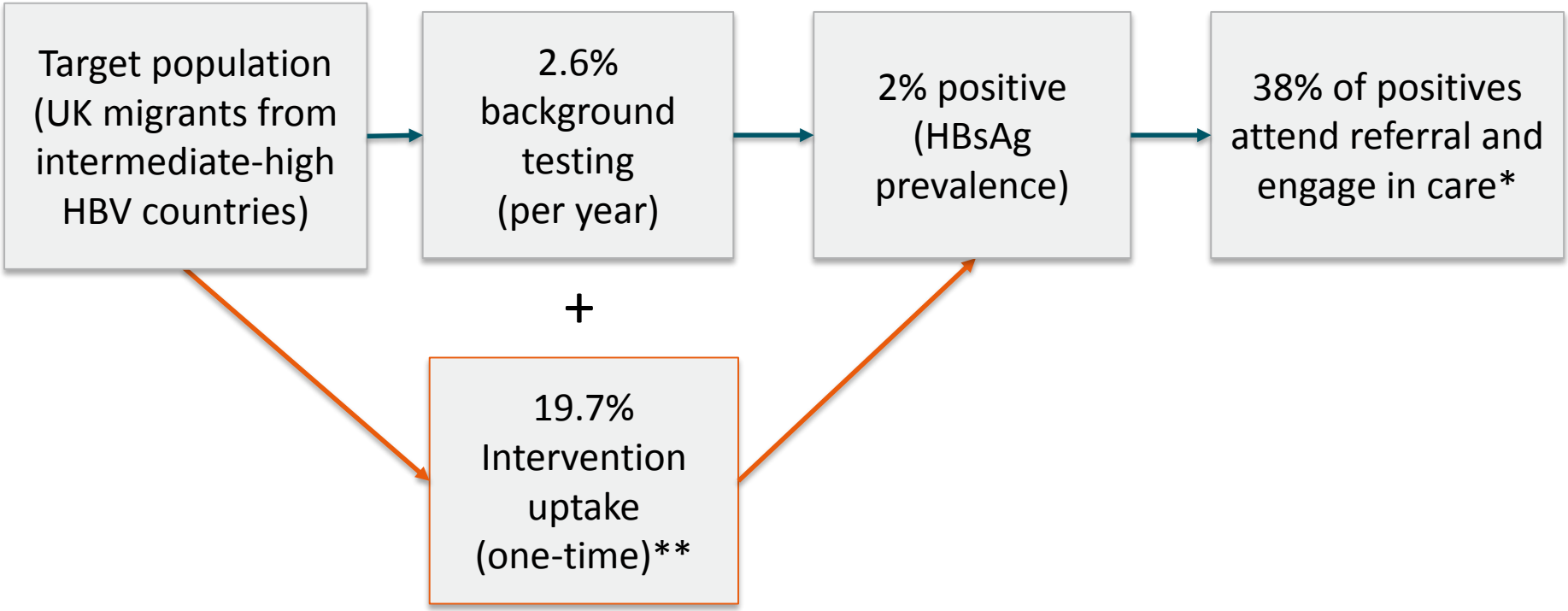
1) Lewis *et al.,* Gut, 2011. 60(Suppl 2): pA26. 2) Irving *et al.,* Journal of viral hepatitis, 2006. 13(4): p264. 3) Shepherd *et al.,* Health Technology Assessment, 2006. 10(28)

Comparator (background testing only)



*Patients engaged in care receive treatment if indicated

Intervention effect (then background testing)



*Patients engaged in care receive treatment if indicated

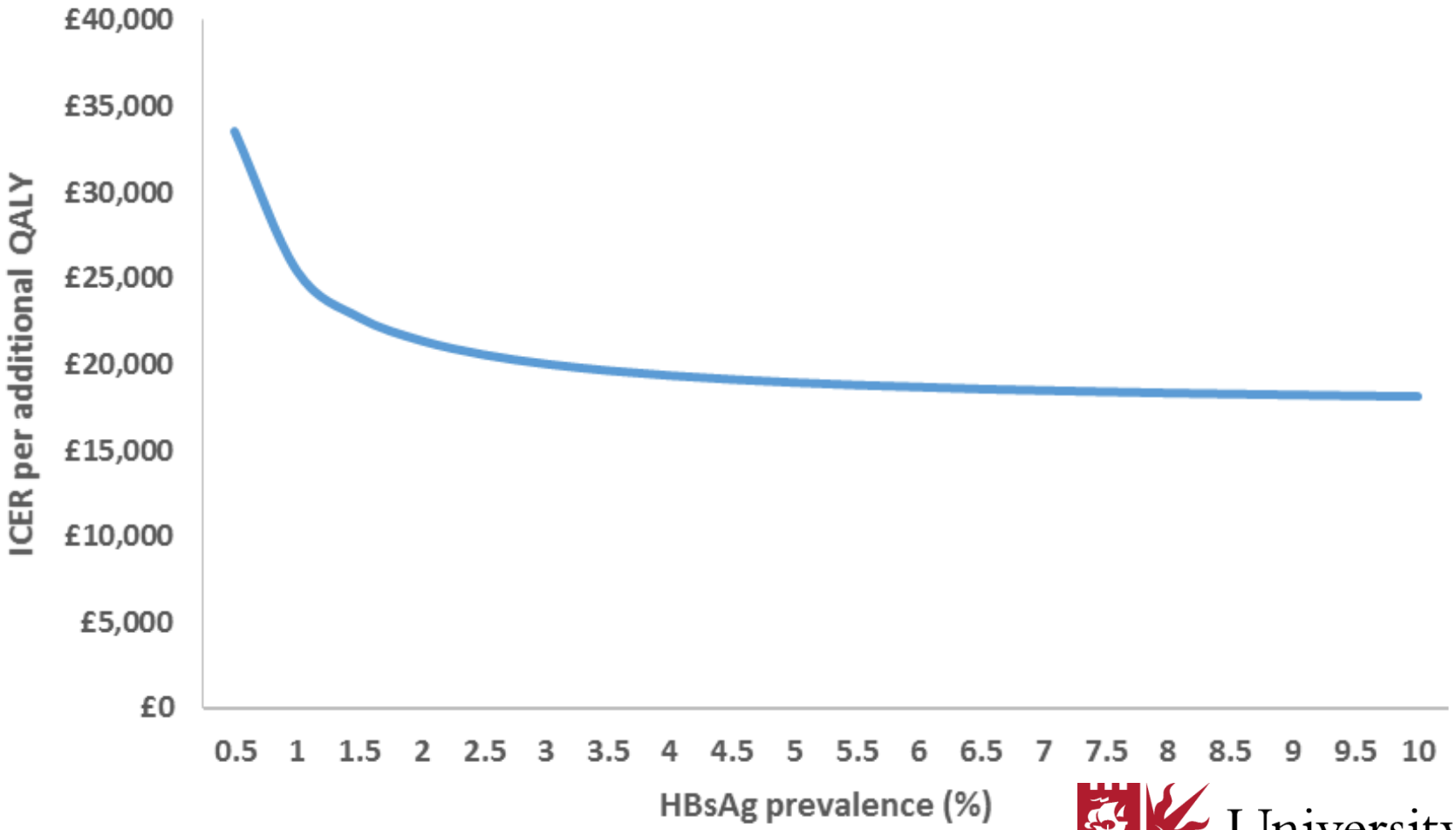
**After one-time intervention, testing returns to background rate per year (2.6%)

Results

- At 2% prevalence:
  - ICER: £21,400/QALY
- At 1% prevalence
  - ICER: £25,400 /QALY
- Sensitivity analyses show results most sensitive to:
  - Intervention cost
  - Intervention uptake
  - Subsequent care pathway (% engaging following positive test)

ICER: Incremental cost-effectiveness ratio

ICER at prevalence thresholds



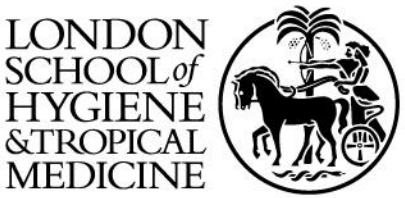
Conclusions

- There is uncertainty around the cost and effect of the intervention…
  - Data derived from uncontrolled pilot study
- However, in many sensitivity analyses the intervention remained cost-effective at 2% prevalence
- In the base case results, testing in populations with 1% prevalence also likely to be cost-effective
  - Results more sensitive to parameter changes

Cost-effectiveness of routine HBV (and HCV) testing in A&E departments in the UK

Jack Williams, Alec Miners, Peter Vickerman,
Sam Douthwaite, Gaia Nebbia, Laura Hunter

Funding provided by NIHR HPRU and Gilead

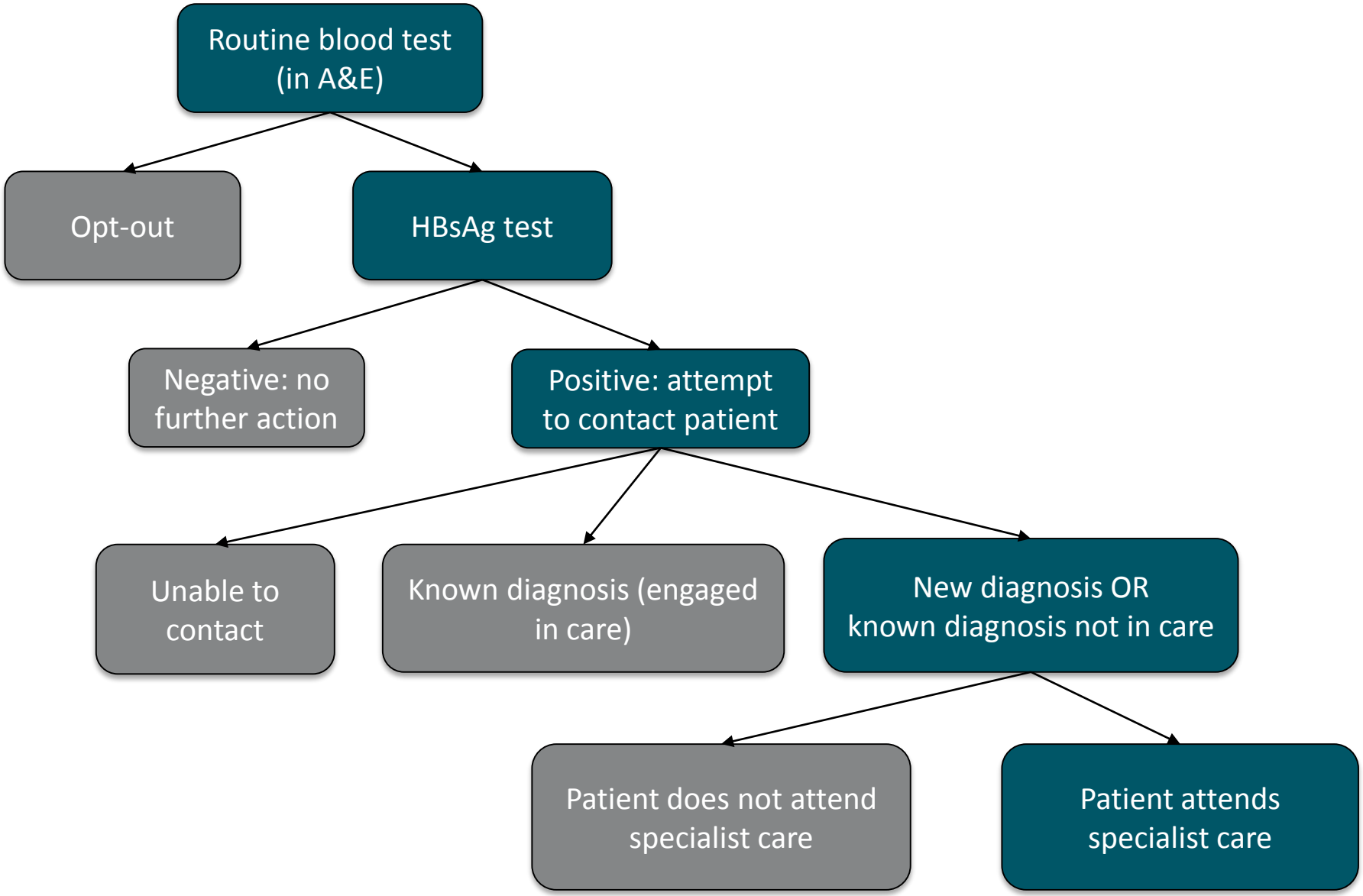


BBV testing in A&E departments

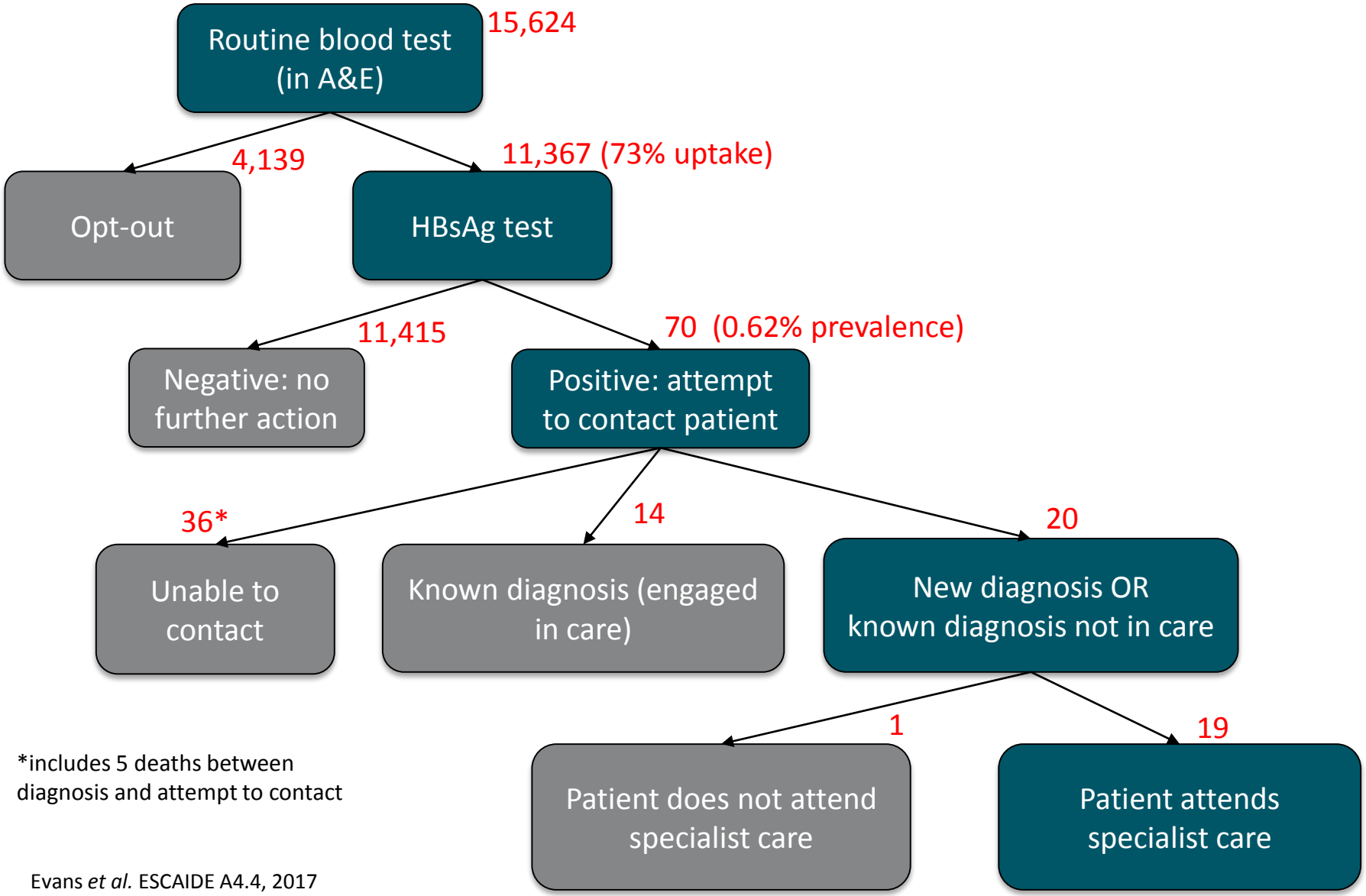
- Opt-out HBV and HCV* tests performed on routine blood tests taken in A&E departments
- If HBsAg+, patient contacted by phone (multiple attempts to contact performed)
- If contact is successful, patients encouraged to attend assessment with hepatologist (and/or infectious disease specialist) and engage in care

*Hepatitis B surface antigen test, Hepatitis C IgG antibody test

Care pathway for HBV testing in A&E



Care pathway (interim phase II results)



*includes 5 deaths between diagnosis and attempt to contact

Evans *et al.* ESCAIDE A4.4, 2017

Early thoughts for A&E case-finding

- Cost-effectiveness results expected late 2018
  - Prevalence thresholds will indicate geographical areas or target populations where A&E testing may be cost-effective
- Dedicated linkage to care coordinator likely required to contact patients and organise follow up
  - Prompt patient contact increases engagement
- Most recent results (phase III) suggest:
  - Automated text messages (with phone number to call back) improves contact rates
  - Appropriate IT database facilitates linkage to care
  - Established processes with homeless improves contact rates

Overall conclusions for case-finding interventions

- One-time testing in migrant populations recommended (PH guidelines)
  - Uncertainty in scale up
  - Other settings currently being evaluated

- Cost-effectiveness of case-finding depends on both prevalence and subsequent cascade of care
  - Other studies looking to improve case management (cascade of care)
  - Combining case-finding and improved case management likely to complement each other

- Multiple case-finding interventions are likely to overlap
  - General models required to evaluate many interventions concurrently

Thank you

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