Testing Strategies for HIV and HCV: similarities and differences

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Disclosures

I have received honoraria for lectures and for advisory boards.

I have received educational grants, travel scholarships and research grants from Gilead, Abbvie , Merck Sharp and Dome , Bristol Myers Squibb, ViiV, Janssen, Boehringer Ingelheim, Abbott and GlaxoSmithKline

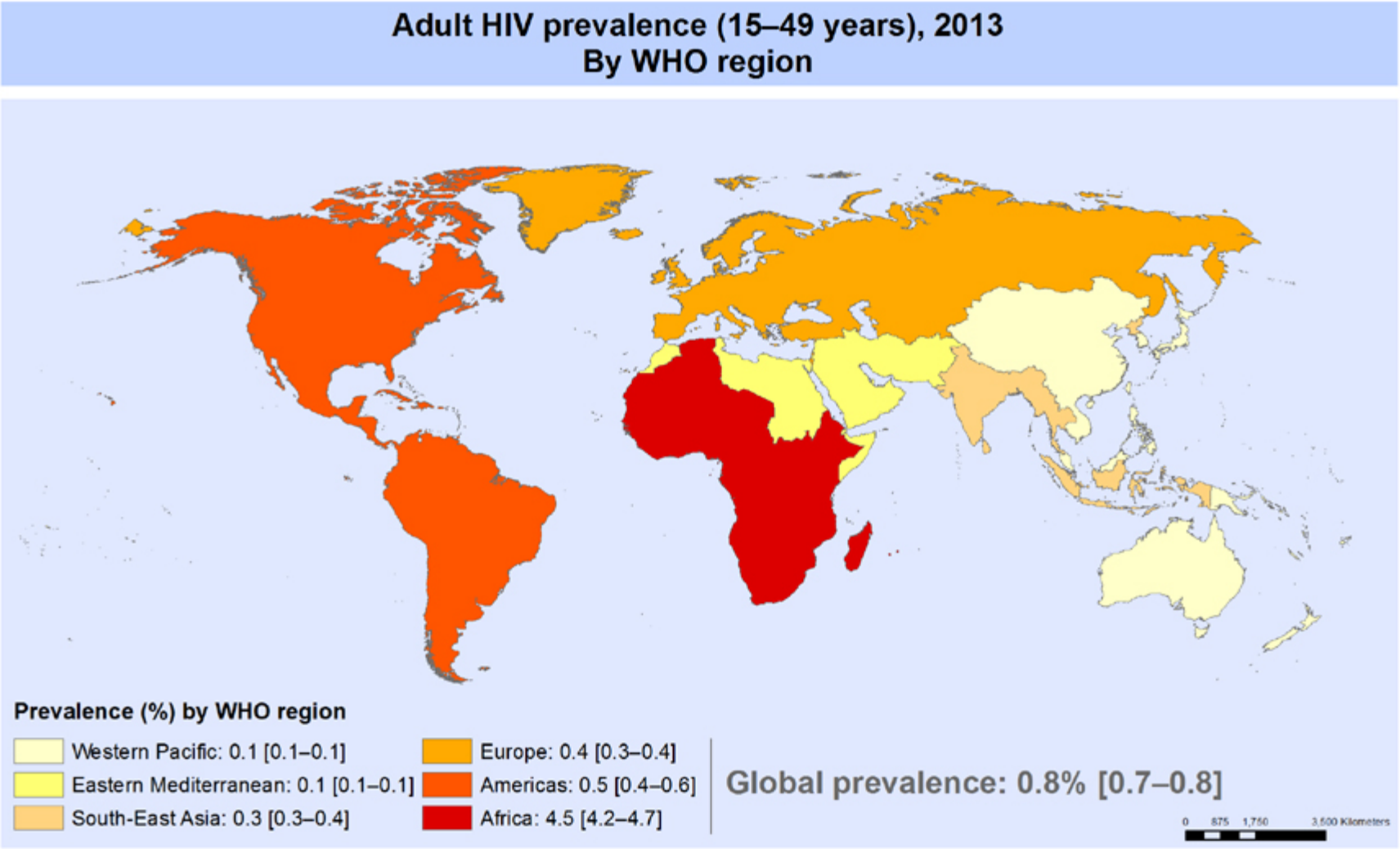
Objectives

- Compare cascades of care
- What has been done so far?
- Universal vs. targeted testing
- HIV & HCV screening in the UK
  - Where to test
- How will testing affect the epidemic?

HIV

HCV

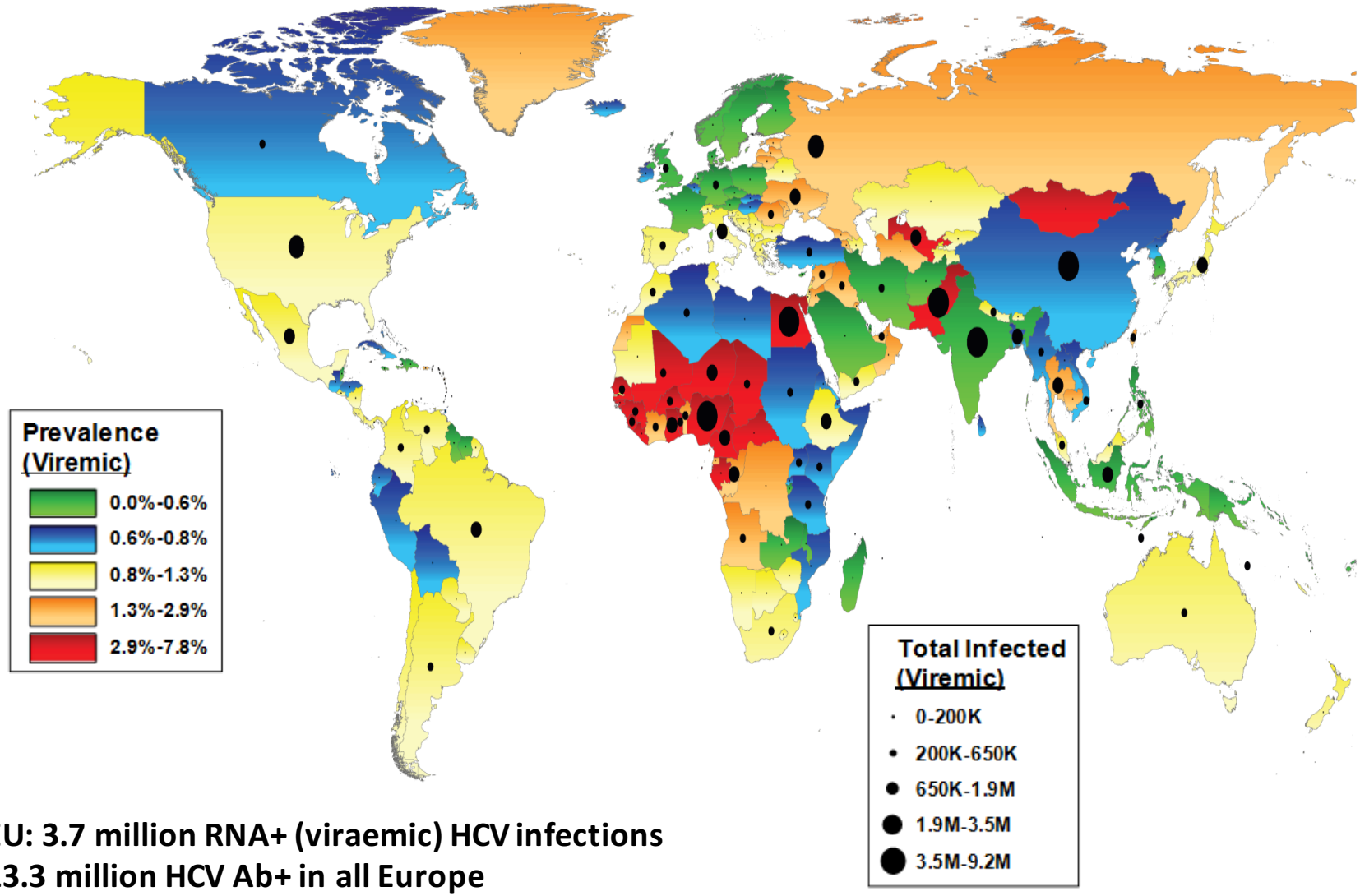
35.0 million living with HIV/AIDS worldwide **1.5 million deaths**



Data Source: World Health Organization
Map Production: Health Statistics and Information Systems (HSI)
World Health Organization

World Health Organization

130–150 million people globally have chronic HCV infection, and 350,000 to 500,000 people die each year

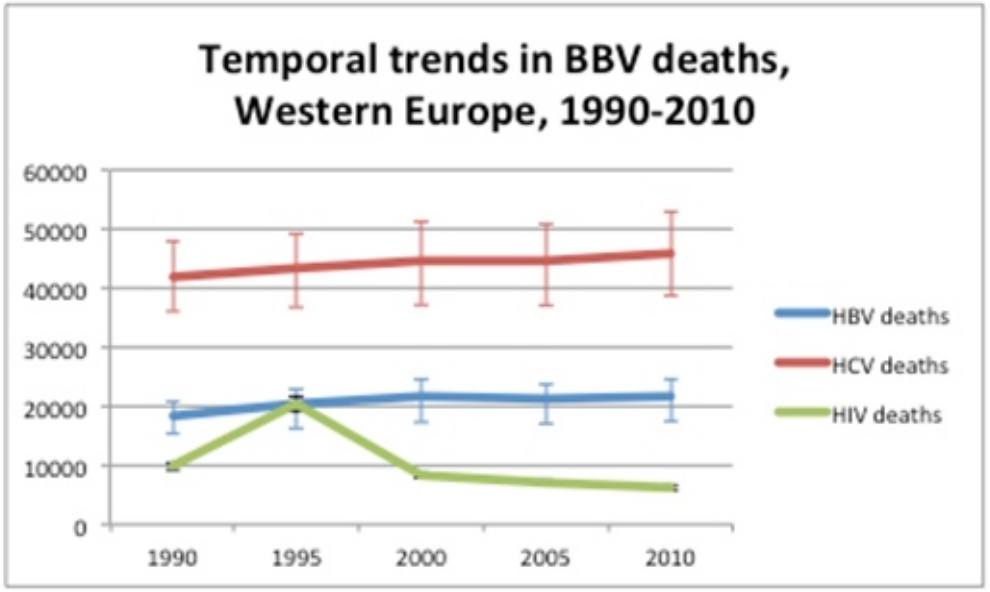


EU: 3.7 million RNA+ (viraemic) HCV infections
13.3 million HCV Ab+ in all Europe

Razavi H, Gower E, Estes C, Hindman S. Global HCV Genotypes. AASLD 2013; 2013 Nov 1-5; Washington, DC, United States.

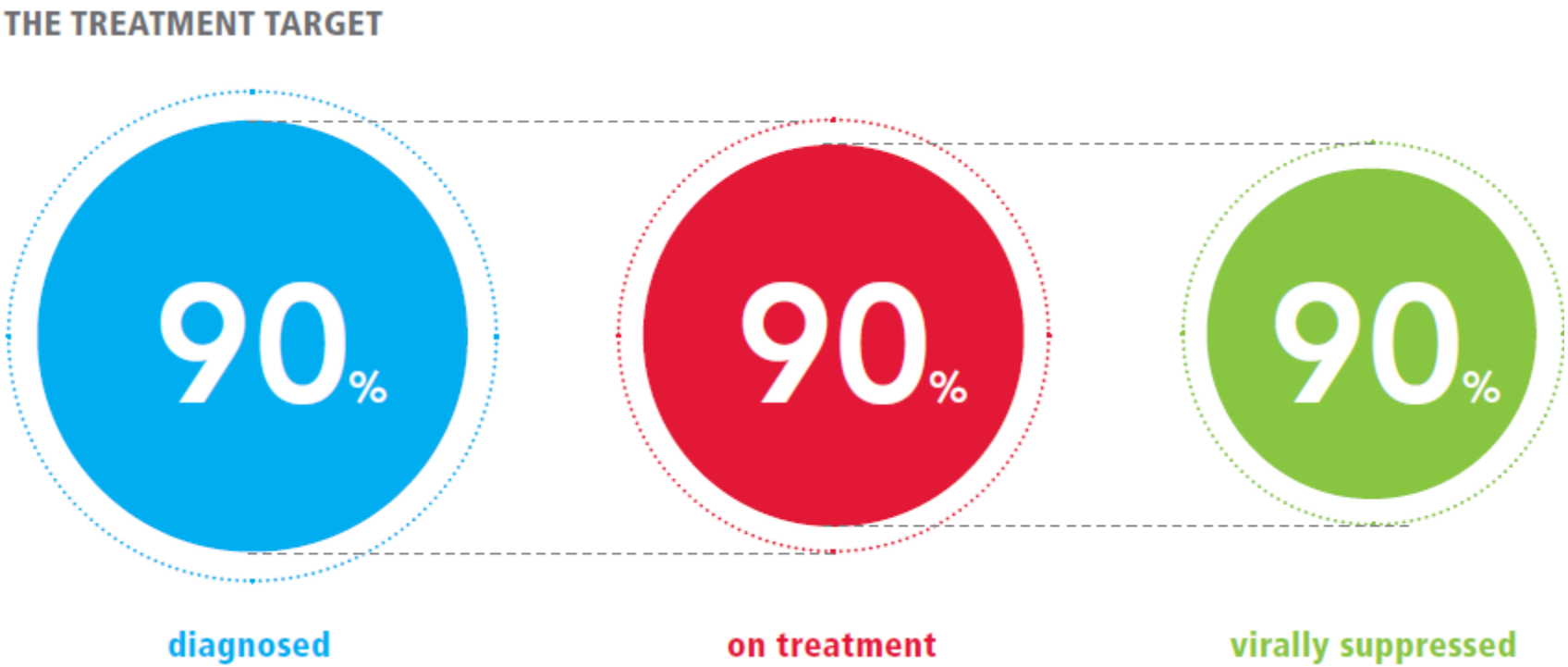
Deaths attributable to HIV and Hepatitis in Western Europe

-A relatively higher burden of HIV-related mortality until 1995
-HIV mortality declines from 2000 onwards
-HCV deaths increasing



Global Burden of Disease Study: Cowie et al J Hep 2014 ;60 (Suppl 1):O86

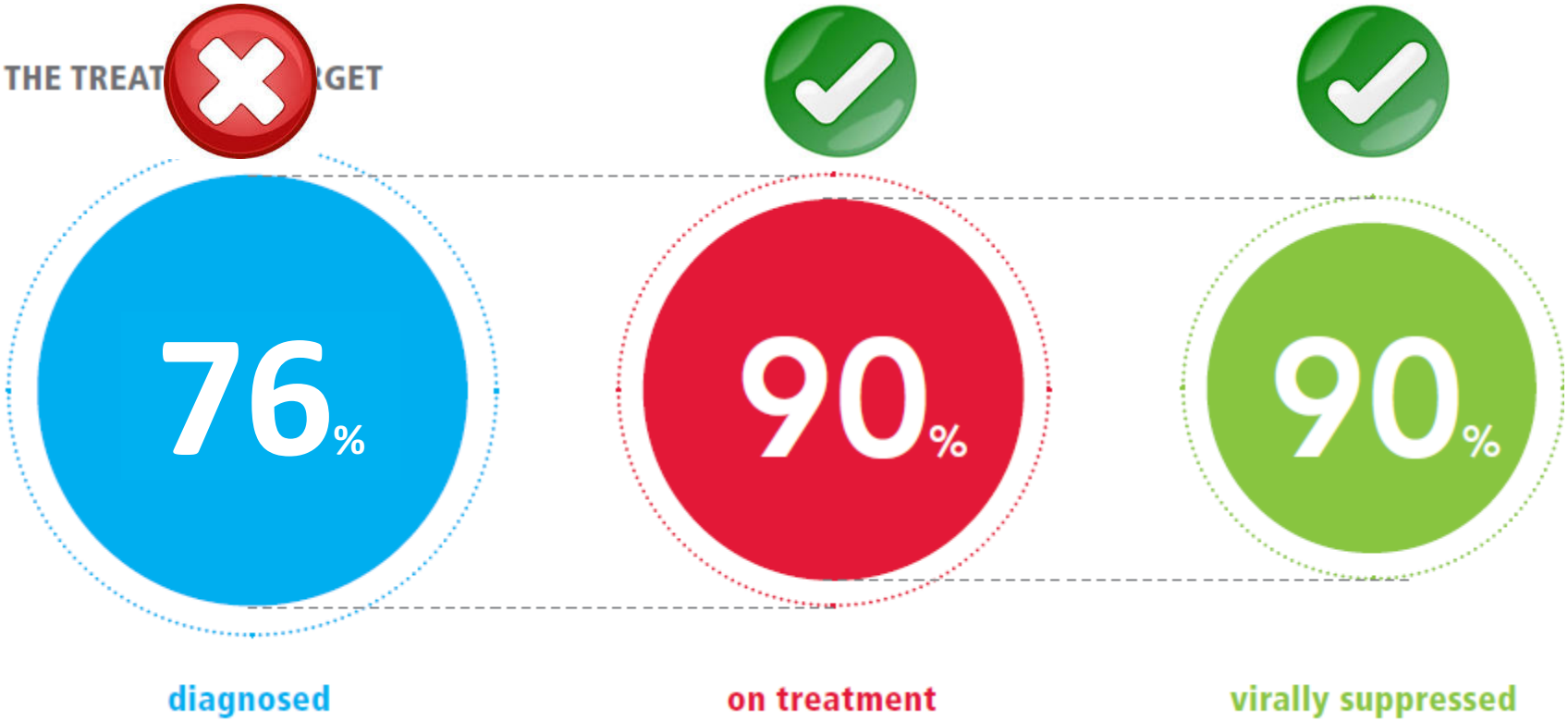
HIV care cascade - WHO target



World Health Organization

WHO consolidated guidelines on HIV testing services. July 2015.

HIV care cascade - UK

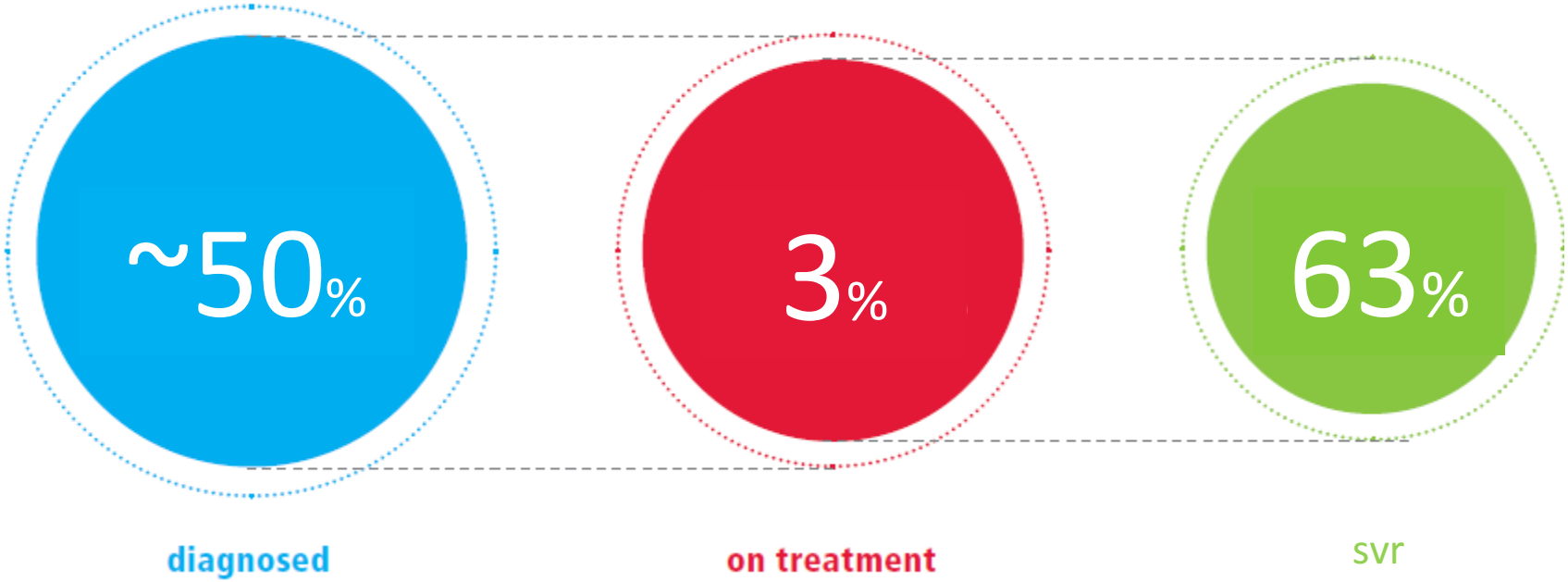


World Health Organization

Public Health England. HIV in the United Kingdom 2014 report. November 2014.

HCV care cascade in the UK

'The great unknown'



214,000 with HCV[1]
~100,000 diagnosed

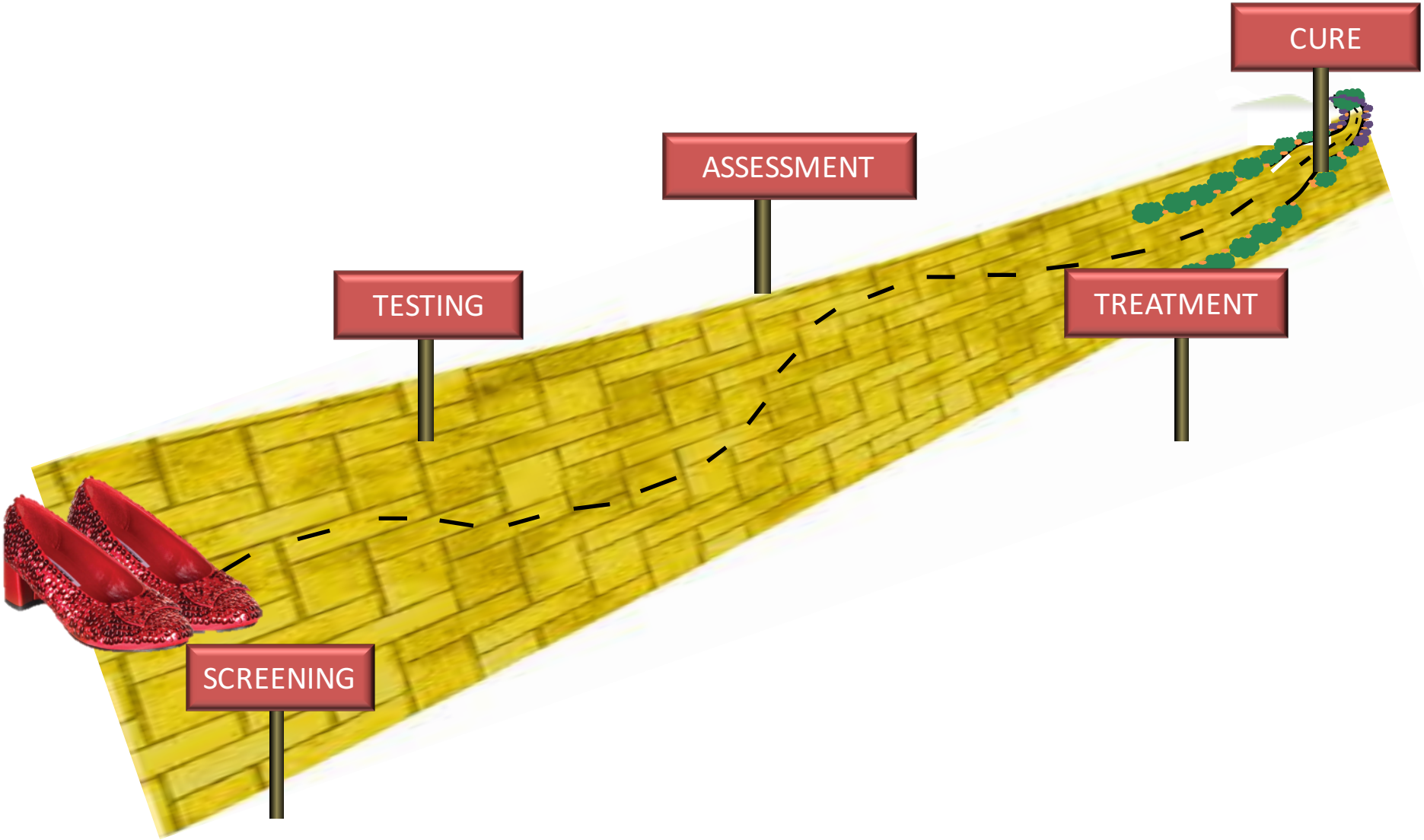
6000 per year[2]

World Health Organization

1. Public Health England. Hepatitis C in the UK 2015 report. July 2015.
2. Harris RJ et al. J Hepatol 2014;61:530–7.

HIV/HCV cascades: failing to diagnosed 90%

…. screening is the first step…



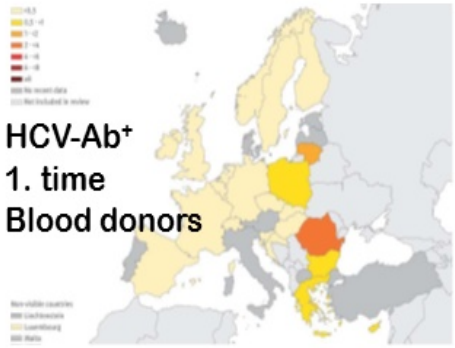
HIV - where does testing happen in the UK ?

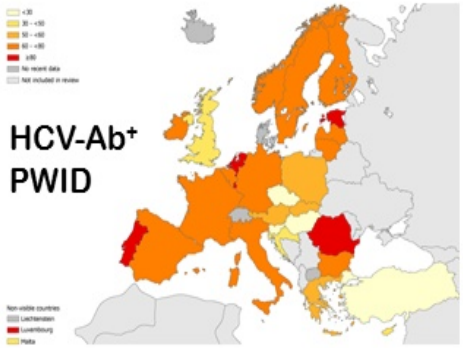
UK HIV testing summary

- HIV seroprevalence data underpins testing strategies
- HIV testing occurring (hospital/community)
- Tailor testing methods to the setting: oral swabs /rapid tests in outreach/STI vs. serology in ante-natal or the ED
- De-exceptionalising HIV testing is important in non-traditional settings
- Staff perceptions affect successful implementation
- Sustainability is a key challenge in non-traditional settings such as the ED/MAU/ITU
- HIV testing has moved beyond non-traditional settings into 'DIY' testing

HCV screening in Europe

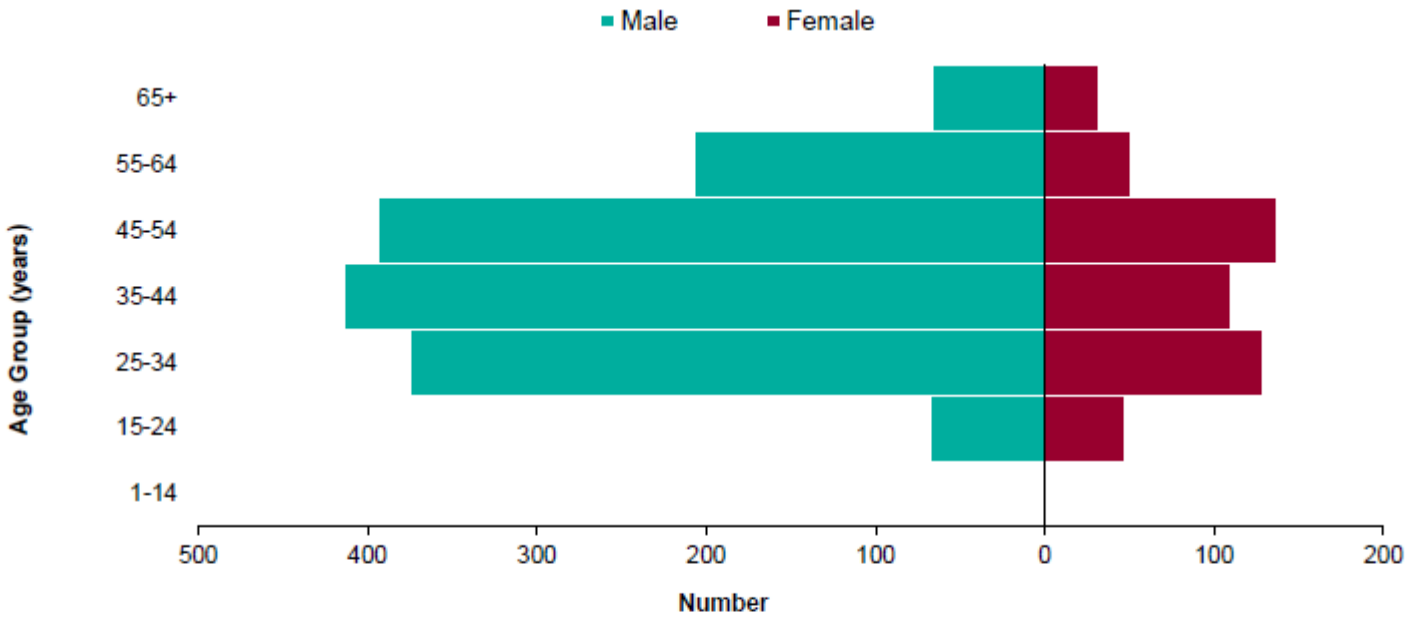
- Literature review
- HCV AB+ in Europe 0.4-5.2%
- Populations:
  - General population
  - First time blood donors
  - Pregnant women
  - PWID's
  - MSM
  - Migrants
- HCV Ab screening is cost effective
  - PWIDS (ICER/QALY 3000-42000)





Hahne et al , BMC Infectious Dis 2013; 13:181

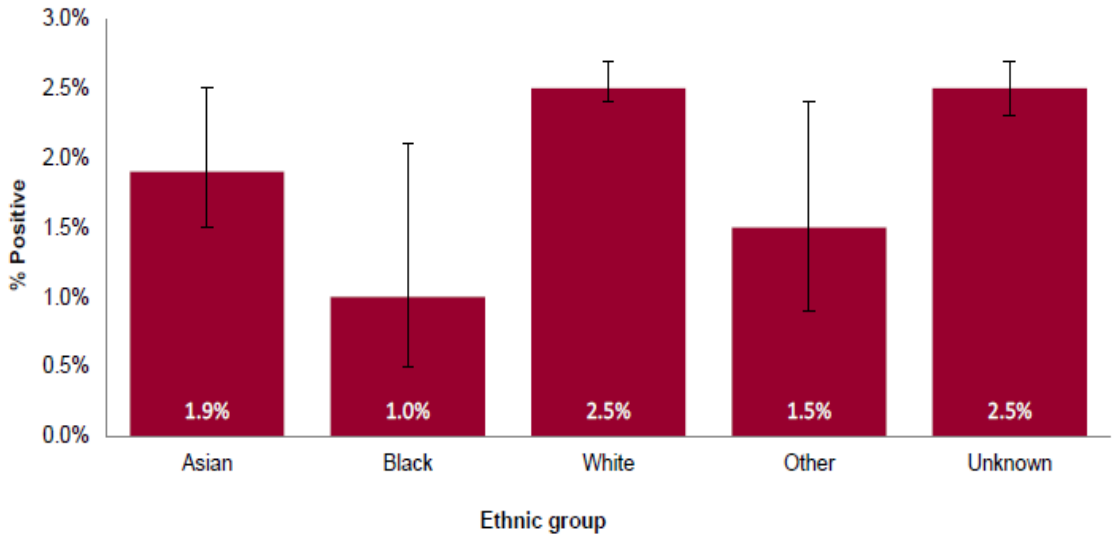
HCV Epidemic UK : gender



1. Cosgrove P. Public health England Report: Hepatitis Epidemiology in the South East

UK Epidemic: Ethnicity

Proportion testing positive for HCV-Ab by ethnicity in sentinel laboratories in the South East , 2010-2014



1. Cosgrove P. Public health England Report: Hepatitis Epidemiology in the South East

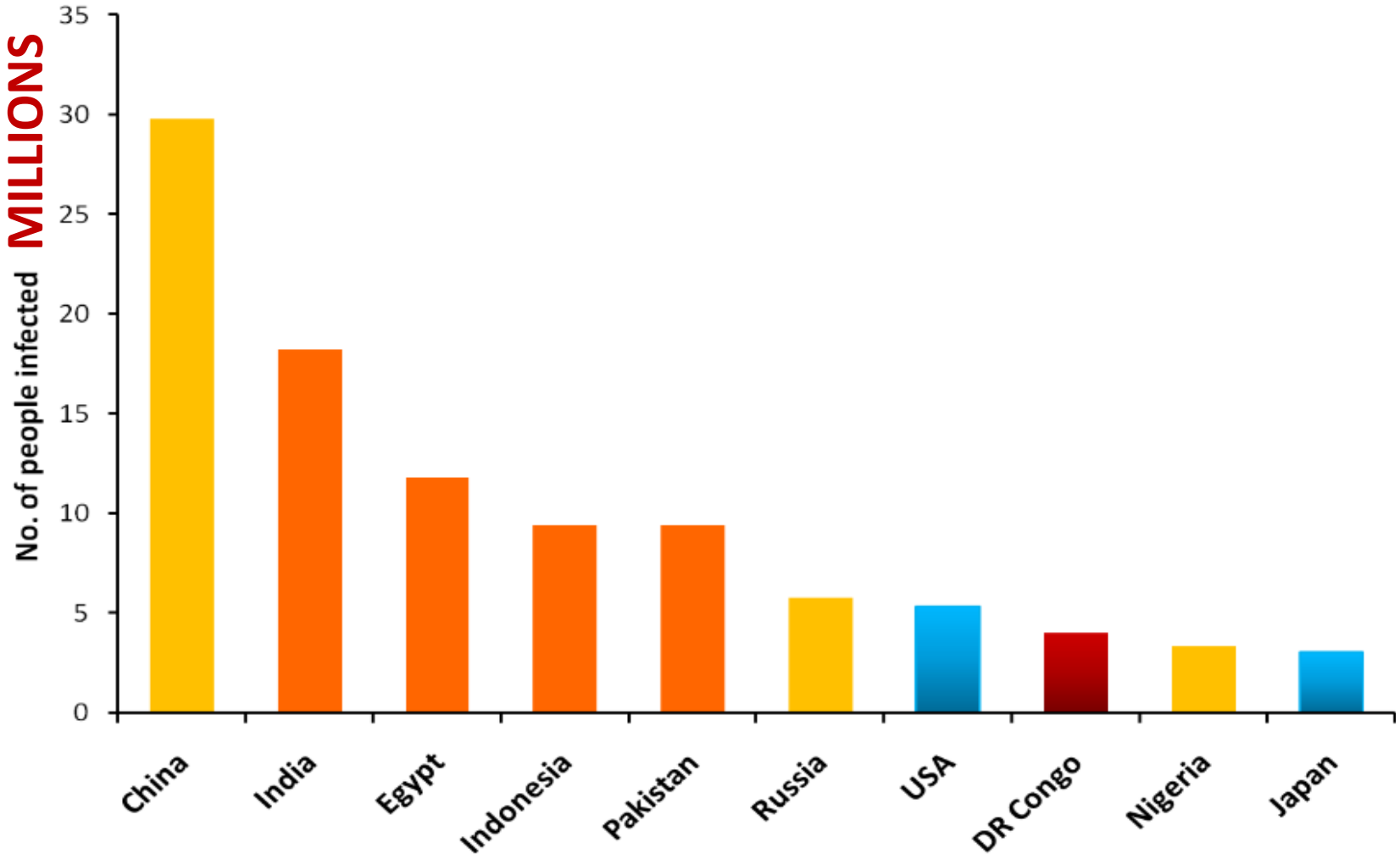
UK Guidelines HCV Testing = targeted testing

At-risk populations:

- PWID (about 90% being tested [1])
- Prisons (8% of receptions tested within 30 days[1])
- Immigration centres
- 'Promote' in GUM to those at high risk

1. Cosgrove P. Public health England Report: Hepatitis Epidemiology in the South East

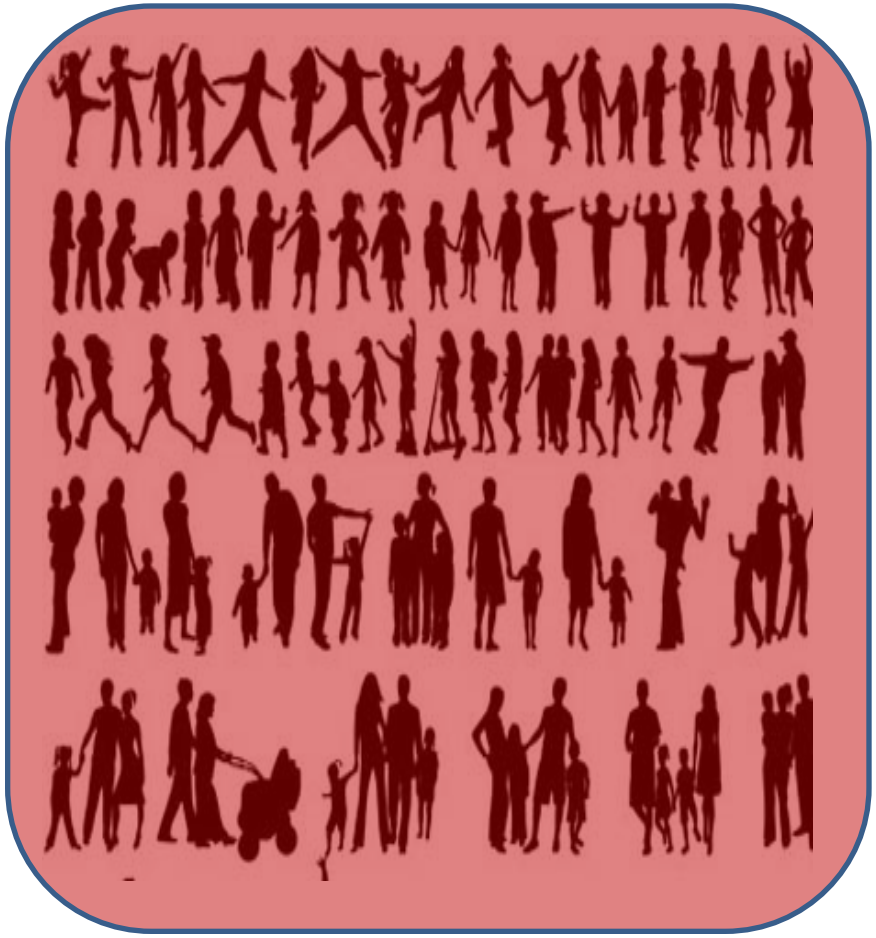
Global prevalence of HCV



Hill A and Khoo S. AASLD 2013. Poster 1097.
Lavanchy D. Clin Microbiol Infect 2010;17:107–15.

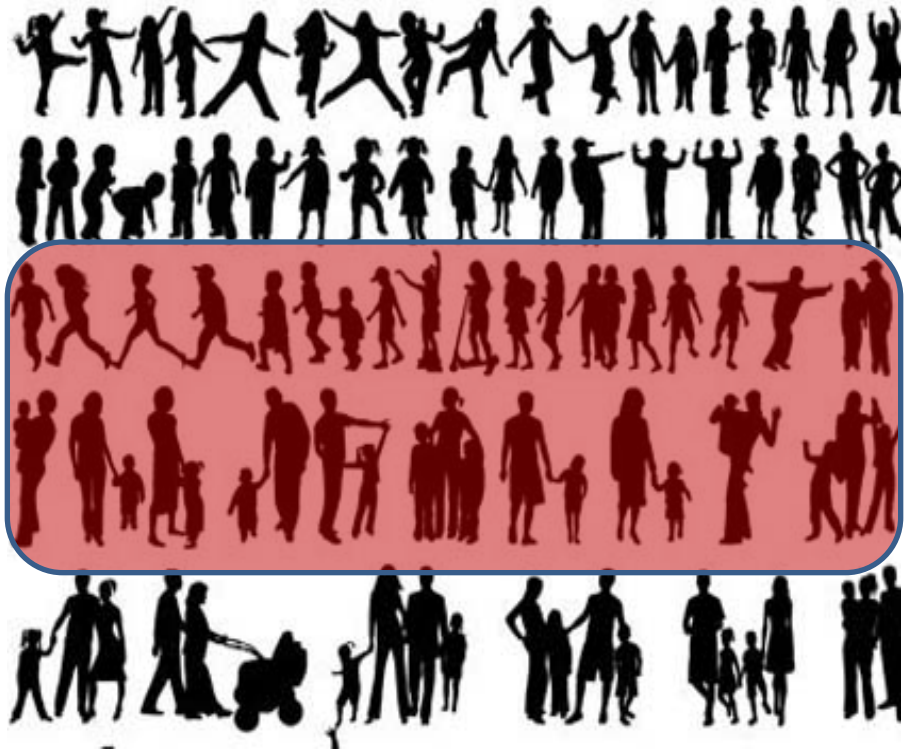
Generalised epidemic= universal screening

- Targeted testing not helpful
- Universal approach



US HCV: screening amongst ‘baby-boomers’

- Prevalence in this cohort > 3%
- One time ‘birth cohort’ screening if born 1945–65
- Highly cost-effective

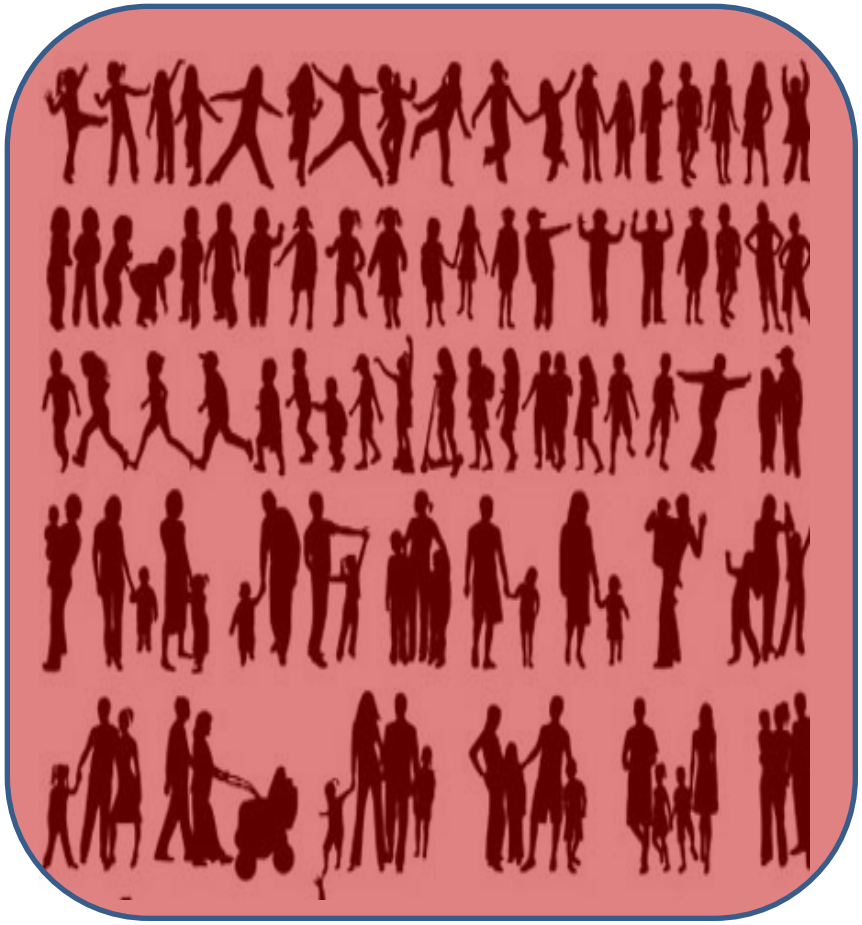


Centers for Disease Control and Prevention. MMWR 2012;61:1–33.
Centers for Disease Control and Prevention. MMWR 1998;47:1–39.
Smith BD et al. AASLD 2011. Abstract 394.

Differences in testing in the UK

HCV

HIV



Are we missing HCV cases?

Sero-prevalence surveys are helpful

HCV in the US ED

- Disproportionately affected HCV populations identified:
  - People of colour
  - Medicaid recipients
  - uninsured

- Same populations are known to be disproportionate users of ED care

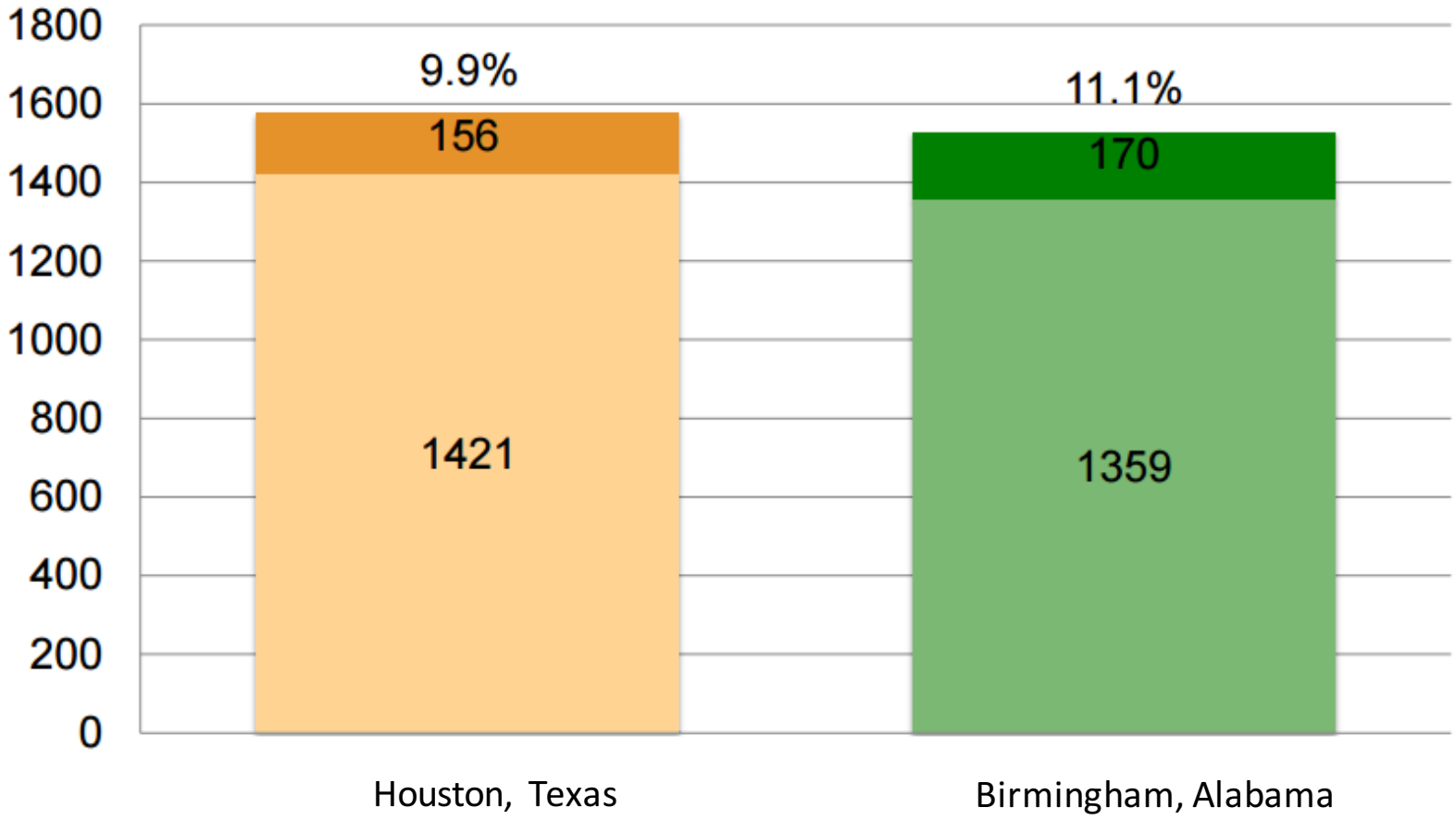
Table 2 Relative odds for visit being HCV-related (vs. non-HCV) associated with race and Medicaid status*

Covariate	1997–1999	2000–2002	2003–2005
White	Ref	Ref	Ref
Non-white	1.04 (0.58, 1.87)	1.43 (0.87, 2.34)	2.49 (1.60, 3.86)
Non-Medicaid	Ref	Ref	Ref
Medicaid	1.49 (0.80, 2.80)	3.54 (2.44, 5.14)	3.49 (1.79, 6.80)

* Results from the logistic regression were adjusted for age and sex

Tsui JI et al. Dig Dis Sci 2009;54:2694–98.

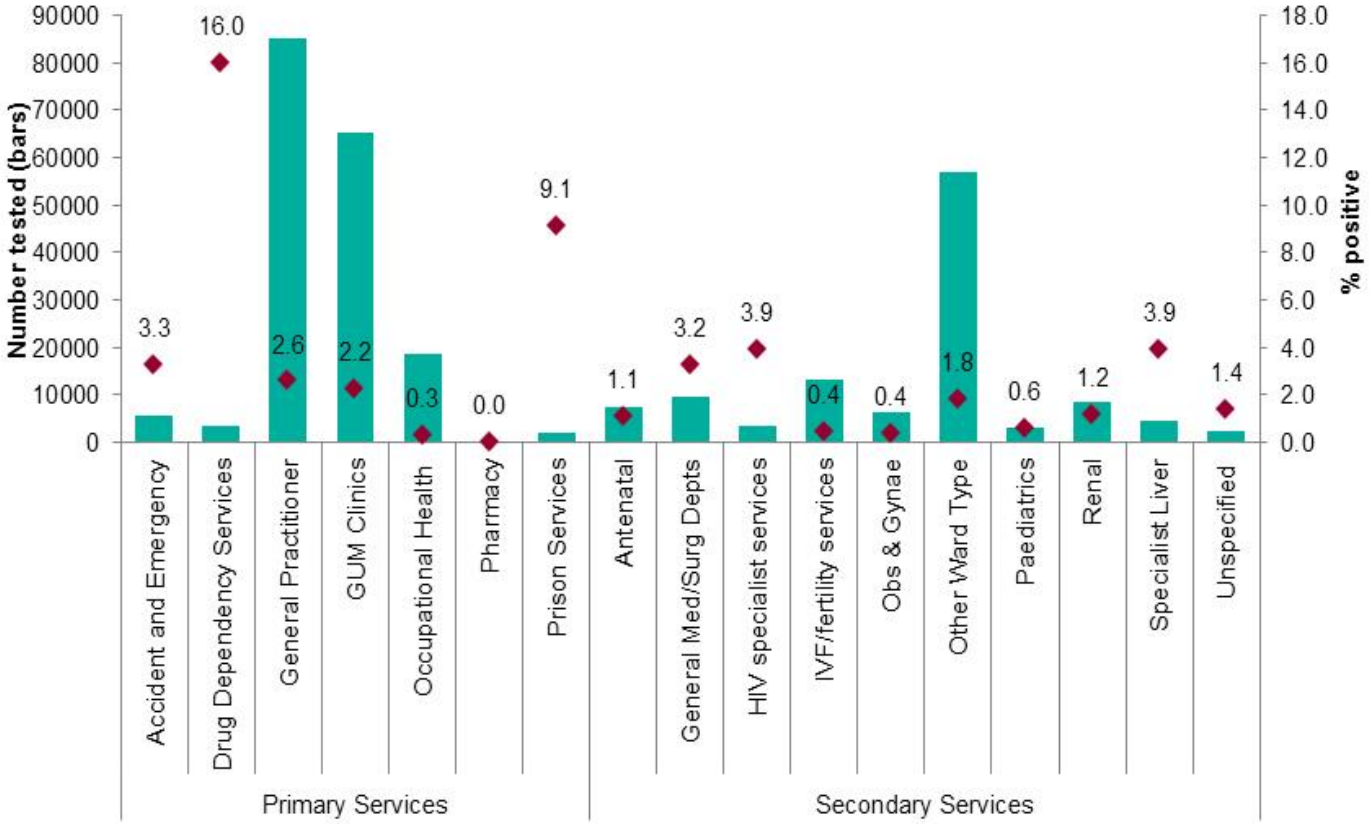
US: birth cohort screening in two busy EDs >60,000 attendances/year
HCV Ab prevalence by site



Galbraith JW et al. Presented at AASLD 2014.

Numbers tested for HCV-Ab and proportion positive by service type in London

- **Sentinel laboratories in London, 2009 to 2013** (do not represent all tests across London.)



 Source: Public Health England. Sentinel Surveillance of Blood-borne Virus Testing

UK

High prevalence of HCV viraemia in London ED : Should we be screening for HCV in ED attendees?

Aim:

- To estimate the HCV prevalence in ED attendees.

Methods:

- Retrospective unlinked anonymised HCV testing on 997 ED –derived residual biochemistry samples

Results:

- HCV Ab prevalence: 2.6% (26/997)
- HCV RNA + 1.2% (12/997)
- 75% (9/12) RNA+ were aged 25-54yr
- 4.8% (3/63) HCV RNA+ males 35-44 yrs
- 58% of HCV RNA+ white British (1/3 of attendees were white British)

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Orkin C et al. Epidemiol Infect 2015;12:1–4

Is antenatal screening for hepatitis C virus cost-effective? A decade's experience at a London centre

Background:

- Current UK guidelines do not support routine antenatal screening for HCV

Methods:

- Review ANC HCV testing (2003-13).

Results:

35,455 ANC ♀

HCV Ab+ : 136 (0.38%) (44 HCV RNA+)

34 Known	44 New	58 Cleared

- **3 vertical transmissions Ab+ (6.8%) in newly diagnosed mothers**
- **Intervention cost-effective on MONARCH**

[< 20-30,000 NICE willingness-to-pay cut-off]

Selvapatt N et al. J Hepatol. Oct 2015.

HIV vs. HCV testing

BBV testing in UK & Irish EDs

- Dublin ED
- Going Viral : 9 UK ED testing week

1 in 4 people attend ED in England annually, 13% of attendees have bloods taken, making it a good place to test

1. O'Connell S et al. AASLD 2014. Poster 1585.
2. Orkin C et al. IAS 2015. Poster WEPEC671.

A universal testing programme for blood borne viruses in an urban ED – a call for more widespread ED testing in Ireland

Methods:

- Opt out BBV (HIV Ab, Hep BsAg, HCV Ab) screening as routine care
- Targets for uptake set for each month
- 5299 patients were screened over 20 weeks and analysed

Results:

- Target of 50% was achieved

1. Number of Diagnoses

	Total	New diagnoses	Previously known	Prevalence rate of new diagnoses (per 1000)
HIV	63	6	57	1.13
HBV	25	12	13	2.25
HCV	287	44	243	8.3

O'Connell S et al. AASLD 2014. Abstract 1585.

ICORN

THE GUIDE CLINIC ST JAMES'S HOSPITAL

Linkage to care

.**Linkage to Care subsequent to diagnosis (New and previously known patients)**

	Known	New	Now linked
HIV	57	6	62 (98.4%)
HBV	13	12	24 (96%)
HCV	243	44	227 (79%)

- The majority (79%) of patients with known Hepatitis C are now re-linked to care as a result of the study team intervention.
- Those with newly diagnosed Hepatitis C are being actively followed up on an ongoing basis.

O'Connell S et al. AASLD 2014. Poster 1585.

Conclusions

- 50% uptake achieved
- Unexpectedly high rates of new diagnoses for both HCV and HBV
- Overall prevalence
  - HIV 11.9/1000
  - HBV 4.7/1000
  - HCV 54.2/1000
- Linkage to care rates >79%
- Recommend roll-out 'to widespread ED testing in urban areas and General practice' .
- This roll-out has begun

O'Connell S et al. AASLD 2014. Poster 1585.

Going Viral
Universal testing for HIV/Hep B/Hep C

The first BBV testing week
Routine HIV/HBV/HCV testing in 9 UK ED's 13-19 October 2014

Methods:

- 16 EDs high HIV prevalence EDs approached, 9 took part
- Routine testing for > 18 yrs ED attendees having bloods as part of routine care
- HIV Ab, HBV S Ag & HCV Ab were tested -confirmed by neutralisation and PCR
- Excluded: lacking capacity/ language barrier/ already positive

Consent : like ANC No written consent needed

"As you're having a blood test to look at how your liver and kidneys are working, this week we are also screening for infections including HIV and Hepatitis. Is that ok?"

Orkin C et al. HIV Medicine March 2016.

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Going Viral
Universal testing for HIV/Hep B/Hep C

RESULTS

7,807 patients had bloods taken

2,128 had BBV testing
Uptake rate 27%

71 BBV +

HCV 39
(15 new)

HBV 15
(11 new)

HIV 17
(11 new)

Linkage to care rate 73-100%

Those aged 25-54 had the highest prevalence: HCV 2.46%, HIV 1.36% and HBV 1.09%

Going Viral
Universal testing for HIV/Hep B/Hep C

Conclusions and roll-out

- Universal testing in the ED identified 32 new infections over seven days
- Testing for HIV alone would have missed 54 viral Hepatitis diagnosis (45% new).
- This week-long pilot supports further evaluation of routine BBV testing in UK EDs
- BBV testing at RLH ED since 20/11/2015 with RNA confirmation (Gilead fellowship grant)

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Orkin C et al. IAS 2015. Poster WEPEC671.

NHS
National Institute for Health Research

HepFree

- Controlled randomised cross-sectional cluster trial to assess the impact of
  - Identifying
  - Screening
  - treating immigrants with viral hepatitis
- Based in East London, South London, Bradford

- "Elevator Pitch"
  - How do we get GPs to test ethnic minorities for viral hepatitis?
  - How do we treat & engage patients who test positive?

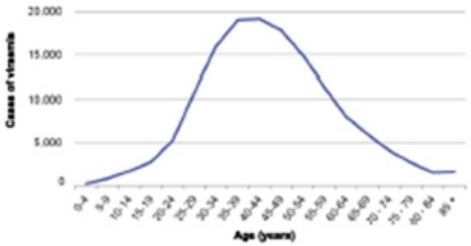
Foster , G.R Principal Investigator

Queen Mary University of London
Barts Health NHS Trust
NHS

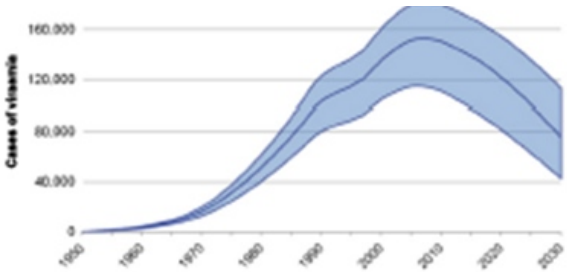
Impact of screening: Modelling

0.3% HCV viraemic, 90% IVDU after 1996

Age-Distribution2013



HCV Viraemic Individuals 1950-2030



Modelling (CDC, Colorado)

- Base Case Scenario 2013
- Stepwise ⇧ in Treatment
- ≥ F2 until 2016, F1 in 2018

Inputs	2013 (Base)	2014	2016	2018 and after
Age	15 - 64	15 - 64	15 - 69	15 - 74
Eligibility	60%	60% - 80%	80%	95%
Treated	5430	8150 [F2]	10190 [F2]	11710 [F1]
Diagnosed	5600	8400	13430	13430

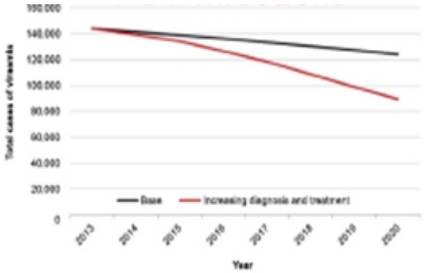
Cramp et al, BMC GE 2014;14:37

Impact of screening: Modelling

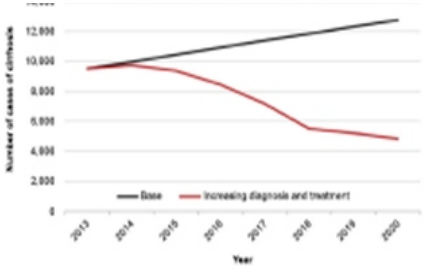
Main Messages:

- If treatment continues as it did, liver-related mortality would ⇧ by 90% in 2030
- Treatment Stepwise ⇧ in Treatment with DAA's by 115% until 2018: a 50% in liver-related mortality by 2020
- **Would require an ⇧ in diagnosis by 140% by 2018**

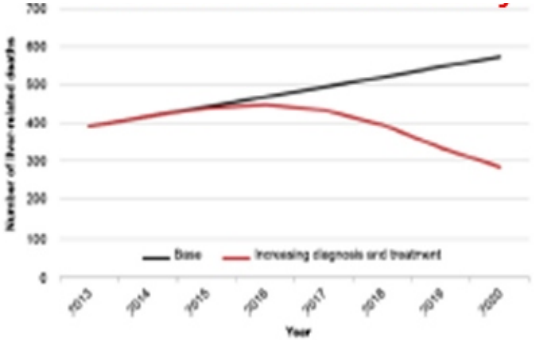
HCV Infections



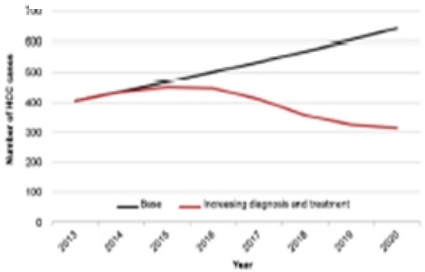
HCV Cirrhotics



HCV Liver-related mortality



HCV associated HCC



Cramp et al, BMC GE 2014;14:37

? HCV treatment as prevention evaluation
Potential Goal of Eradication

Potential Populations

- Community-based PWID
- Prisoners
- HIV+/HCV+ co-infected
- Antenatal
- Hospitalised

HCV treatment as prevention in HIV/HCV

Primary objective

- To evaluate the impact of a rapid scale-up of DAA HCV treatment on HCV transmission in HIV+

Primary endpoint

- Change in HCV incidence from pre- to post- scale-up of IFN-free HCV treatment

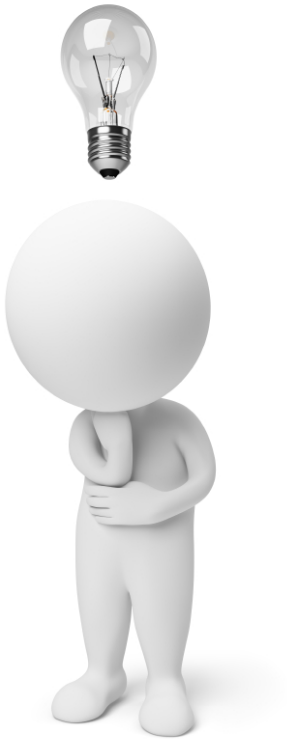
Study progress / feasibility

- Observational database of HIV/HCV patients commenced (n=180/1,000)
- Education programs developed for HIV primary care prescribers
- Broad and targeted HCV treatment strategies in development
- Surveillance systems and HCV reinfection cohort plans in development

Dore G. Antiviral prevention treatment. Presented at the International HIV/Viral Hepatitis Co-Infection Meeting. July 2015.
PBAC positive recommendations. March 2015.

Is HCV testing in the ED cost-effective?

Need more data on who the positives are and whether they are viraemic



Blood-borne viruses, better together

Blood-borne viruses, better together

HBV

Thanks

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