

Dr Laura Benjamin
University of Liverpool

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New HIV cases diagnosed through opt-out testing in hyper-acute stroke: a call to amend national guidelines

Benjamin LA, Hart J, Haddow L, Chandna A, Mattes F, Edwards S, Laurie A, Browning S, Brown M, Waters L, Nastouli E, Simister R



Central and
North West London
NHS Foundation Trust



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Background: Increasing evidence of an association with HIV infection and stroke

- Between 2012-2017: there have been >10 well designed observational studies of stroke risk in HIV populations. These have:
 - Included data from America, Canada, Europe and Sub-Saharan Africa
 - Shown an association with HIV infection and stroke with rate ratios ranging between 1.5-2.5
 - Shown an association with HIV infection and both ischaemic and haemorrhagic stroke
 - Shown that the rates were higher in younger patients
 - Shown that approx. 50% of HIV infected stroke cases were undiagnosed with HIV infection at initial presentation
 - Shown an association with:
 - declining CD4+ T-cell count
 - increasing HIV viral load
 - women

Background – How do people get tested for HIV?

Indicator neurological diseases (2008 BHIVA/BASHH/BIS guidelines)

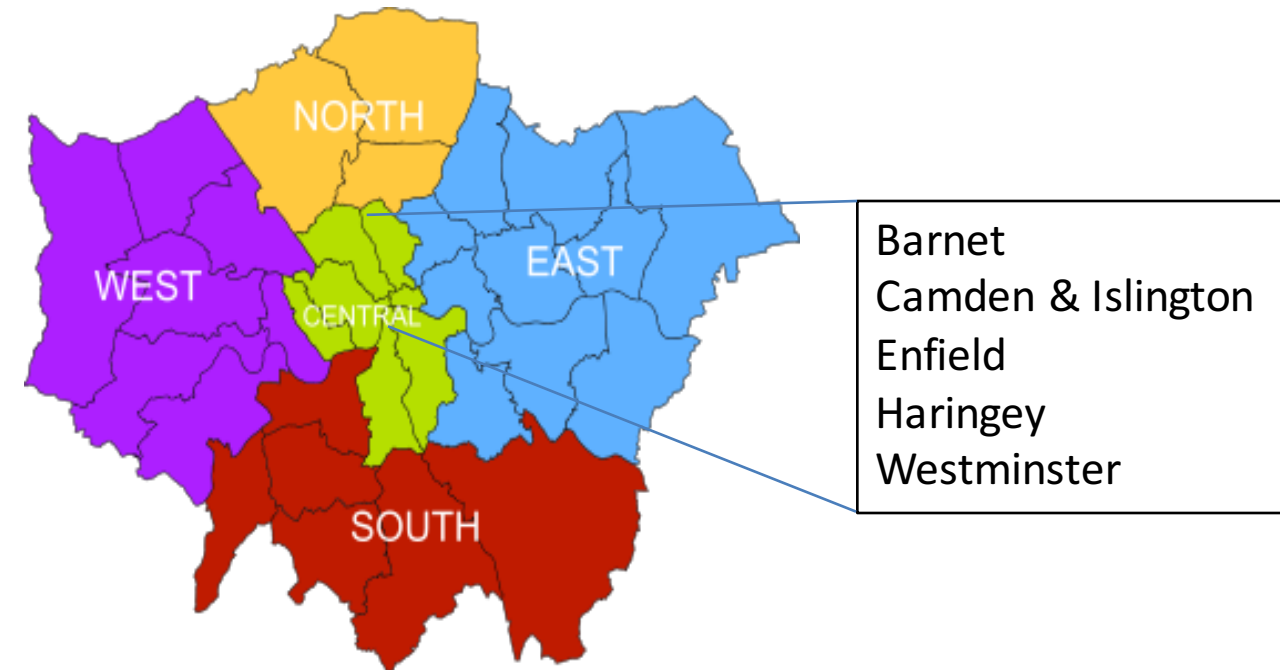
- Cerebral toxoplasmosis Cryptococcosis, Extrapulmonary TB
- Progressive multifocal leukoencephalopathy
- Reactivation of American trypanosomiasis (meningoencephalitis or myocarditis)
- Guillain–Barré syndrome
- Mononeuritis
- Subcortical dementia
- Multiple sclerosis-like disease
- Peripheral neuropathy
- Primary space occupying lesion of the brain

• ~~Stroke~~

Opt-out testing (2016 NICE guidance)

Recommends young people and adults are offered an HIV test when admitted to hospital or attending an emergency department in areas in areas where HIV prevalence exceeded 2 per 1000

UCLH HASU - North Central Thames



Population information for North Central Thames

HIV prevalence: **6.35 in 1000**

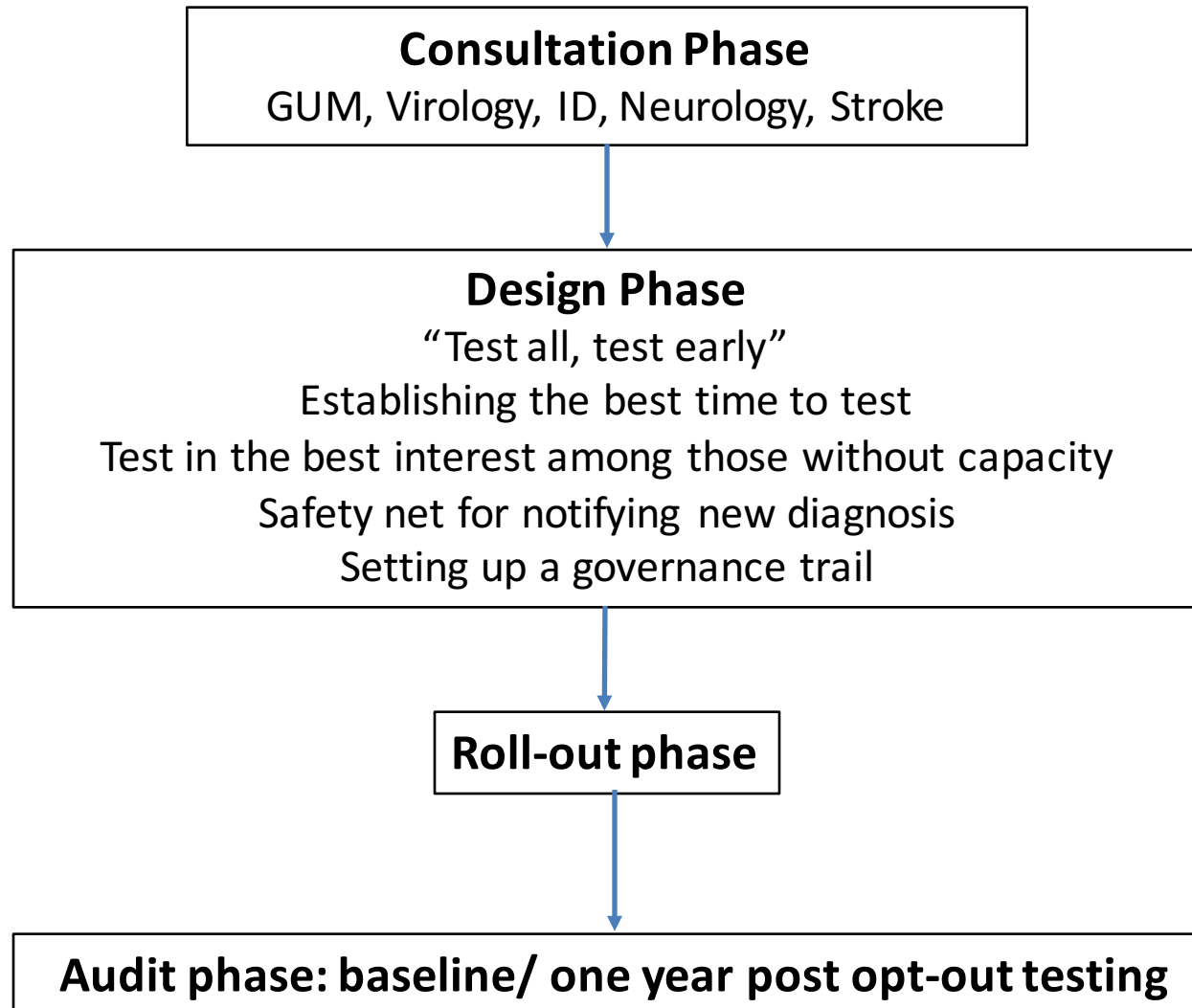
Adult population: **2.4 million**

New HIV diagnosis per year(2016 PHE): **173 per 100000**

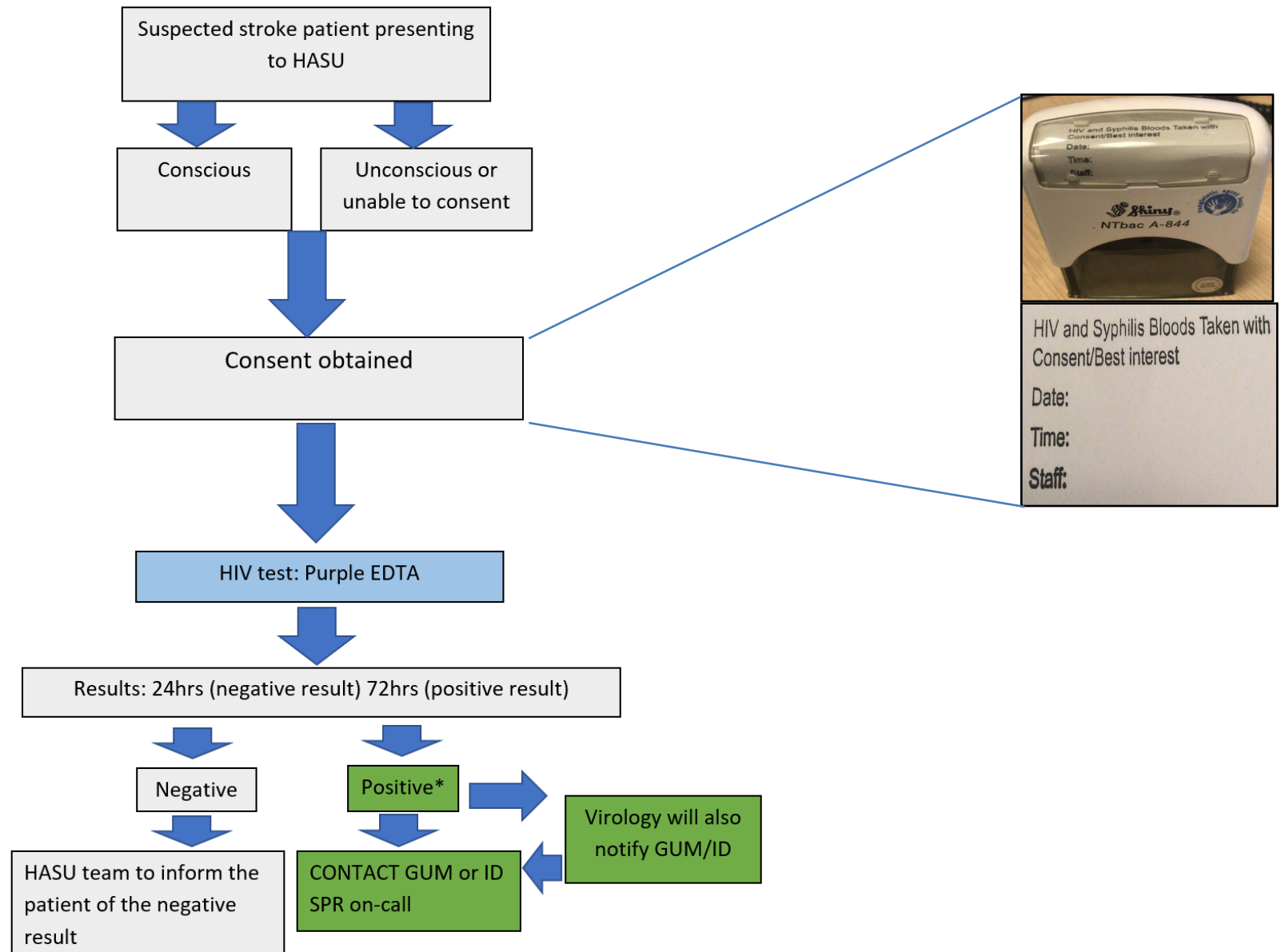
No. of stroke patients per year: **approximately 1200**

HIV testing practice at UCLH – based on **indicator diseases**

Improving the stroke assessment pathway by including opt-out HIV testing



Opt-out HIV testing model



HIV diagnosis and testing: Baseline Oct 2015-Sep 2016

- 1255 confirmed stroke patients between Oct 2015-Sep 2016
- 64 HIV tests (**uptake of 5%**)
 - 0 HIV positive stroke during this period

Audit Results: Oct 2016-Sep 2017

- 1202 confirmed stroke patients between Oct 2016 - Sep 2017
- 1190 HIV tests (**uptake of 99%**)
 - 2 (0.2%) intermediate results
 - 20 (2%) invalid results
 - 6 (0.5%) not done
 - 1156 negative (97%)
 - **6 positive** (0.5%) [3 ART naive]
- HIV positive cases were younger but their mean age was still higher than expected
 - 72.2yrs (SD +/-2.11) HIV negative group versus **61.5yrs** (SD +/-5.17) in the HIV positive group (p=0.0121)
 - No difference in sex (49% HIV- versus 67% HIV+; p=0.877)

HIV positive stroke cases

ID	Sex	Age	Status Known to HASU	Status known to GUM	On ART	Stroke type	Recurrent event/hospital attender	Vascular risk factors	Outcome at 6 months
RN-01	M	62	No	Yes - LTFU	Naive	ICH	Yes	Yes - HTN	Alive
NK-02	F	71	No	No	Naive	IS -large	Yes	Yes – HTN, DM, Chol, pelvic tumour	Died
MH-03	M	56	No	Yes - LTFU	Naive	IS -large	Yes	Yes – HTN and Lung Ca	Died
WN-04	F	58	Yes	Yes	On ART	IS -large	N	Yes – DM, IHD, Smoker	Alive
DW-05	M	61	Yes	Yes	On ART	IS -large	N	Yes – metallic heart Valve	Alive
CA-06	M	61	Yes	Yes	On ART	IS -small	N	Yes – MI, Chol	Alive

Key: LTFU: lost to follow-up, ART: antiretrovirals, ICH: intracerebral haemorrhage, IS: ischaemic stroke, HTN; hypertension, DM: Diabetes Mellitus, Chol: hypercholesterolaemia, MI: Myocardial Infarction

Estimated burden of HIV infection and stroke in North Central Thames

All confirmed stroke				
HIV negative	Incidence rate Per 1000 person years	HIV positive	Incidence rate Per 1000 person years	Incidence rate ratio
1196	0.5	6	0.77	1.54*

“1 in 200 stroke patients are HIV positive, translating to one HIV positive person every two months, of whom half are ART naïve/have a new diagnosis”

*Limitations: PHE HIV population at risk figures are only for ages 15-59, we estimated an undiagnosed HIV positive fraction of 12%, not standardised to age, incomplete ascertainment of stroke patients, imperfect concordance between borough of residence and admitting unit

Challenges

- Discordance of known status to GUM and unknown status to HASU
 - This had an impact on promptly pursuing other potentially treatable diagnosis
 - Increased administrative burden
- Overcoming barriers with the stroke physicians/neurologists to pursue further investigations once a HIV diagnosis was made
 - Lumbar puncture
 - Advanced brain imaging
- We found no major issues with consenting but the main question asked, was about disclosure of a positive diagnosis

Summary and Conclusions

- By providing opt-out testing, we have improved HIV testing uptake from 5→99%
- We identified 6/1202 (0.5%) HIV positive stroke patients, in one year, following the roll out of opt-out HIV testing
- ART naive cases were associated with recurrent stroke/hospital attendance and were more likely to die
- The median age of a HIV positive stroke case was 62yrs, this age group might miss out on testing without an opt-out screening policy, especially as they often have coexisting vascular risk factors
- Without a more strategic approach, uptake of HIV testing is poor in stroke patients
- We faced several challenges, particularly at the early stages but once integrated into the stroke pathway, it became a routine process

Recommendations

- Opt-out HIV testing should be considered in other HASUs especially where HIV prevalence exceeds 2 per 1000
- We call for infection, stroke guidelines and NICE guidance to highlight HIV testing for stroke patients

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