

# The UK Collaborative HIV Cohort (CHIC) Study

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# Background

- Information on HIV infection in the UK comes from a variety of sources; these are often limited in scope
- Many clinical centres routinely collect information about patients with HIV infection when they attend:
  - Provides an ideal opportunity to study HIV-infected individuals in their clinical setting
  - Can use existing infrastructure for data collection
  - Can include patients from a wide variety of clinics so that the cohort becomes more representative of individuals with HIV infection in the UK

# UK CHIC: Objectives

The UK Collaborative HIV Cohort (UK CHIC) was initiated in 2001 to collate routinely collected data from HIV-infected individuals attending some of the largest clinical centres in the UK since 1<sup>st</sup> January 1996

Specific aims are:

- To describe the characteristics of patients with HIV under care
- To provide information on exposure to combination antiretroviral therapy (cART) and changes to the immunological and virological status of patients over time
- To monitor the frequency of AIDS and survival over time



# UK CHIC: Inclusion criteria

## ***Patients***

- Aged  $\geq 16$  years
- Seen at any of the centres since 1/1/1996

## ***Centres***

- Electronic data already available
- Able to provide data on an annual basis

# UK CHIC: Participating clinics

## **Clinical centres**

Brighton and Sussex University Hospitals NHS Trust

Barts and the London NHS Trust

Chelsea & Westminster NHS Trust

Mortimer Market Centre, RF&UC Medical School

Homerton University Hospital NHS Trust

Kings College Hospital

The Lothian University Hospitals NHS Trust

The Royal Free NHS Trust

North Middlesex University Hospital NHS Trust

St Mary's NHS Trust

North Bristol NHS Trust

Leicester Royal Infirmary

## **Other centres**

Research Dept. of Infection and Population Health, UCL

Medical Research Council Clinical Trials Unit

Health Protection Agency – Centre for Infections (HPA-CfI)



# UK CHIC: Funding

- Study funded by MRC since 2001
- Funding provides:
  - Some database programming support
  - Project co-ordination
  - Statistical support
  - Limited funding for clinics for provision of data
- Database physically located at MRC CTU – centrally located and ‘independent’ of all clinical centres
- Project co-ordinator and principal investigator based at UCL (Royal Free campus)

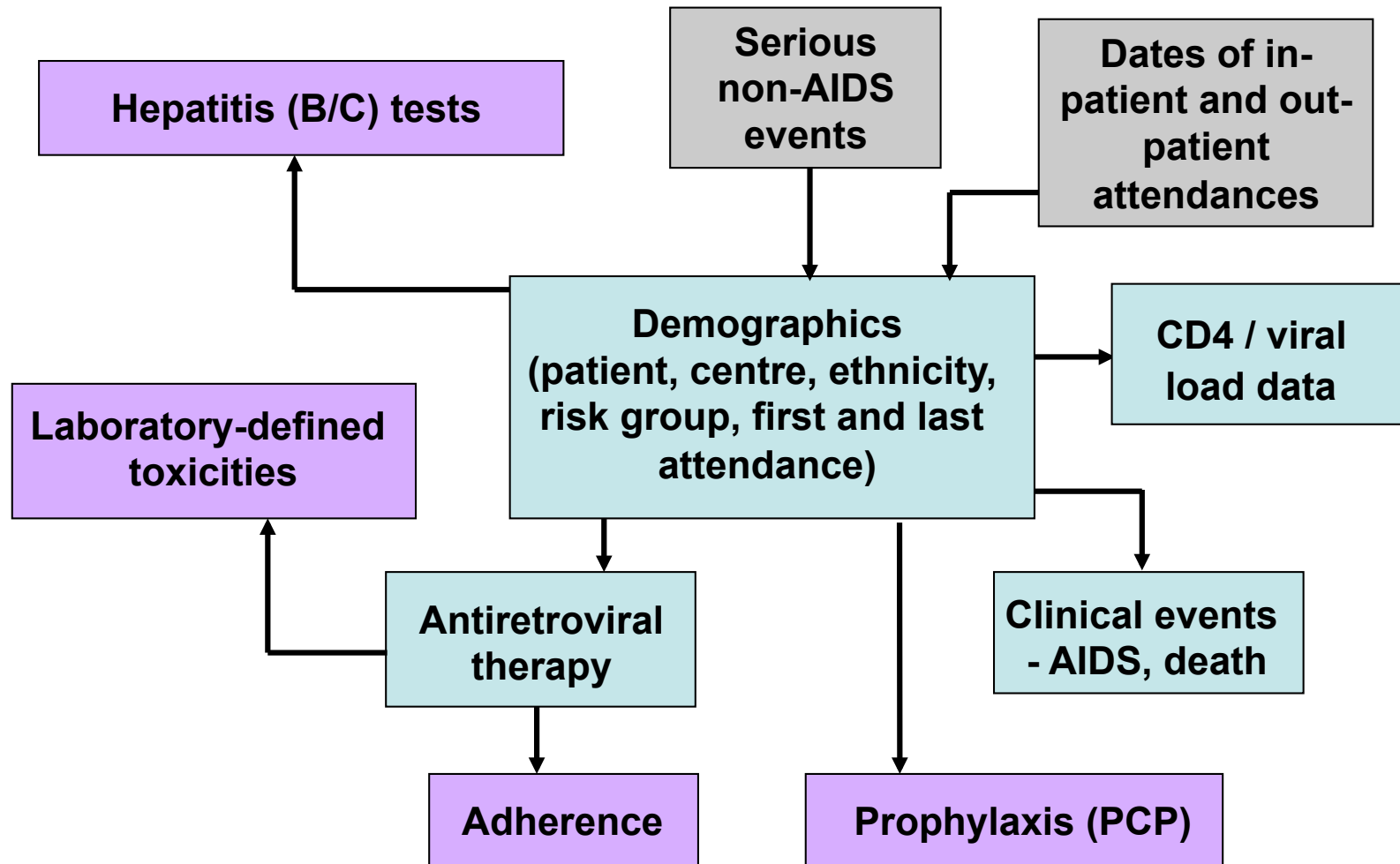


# UK CHIC: Processes

- Centres provide data on all patients seen at their centre since 1<sup>st</sup> January 1996
- Data sent in pre-agreed electronic format so that they can be easily merged at co-ordinating centre
- Includes historic data on each patient prior to 1996 if patient was under follow-up at that time
- Data requested on all patients seen at centre, even if not seen since 1/1/96 (to improve de-duplication process)



# UK CHIC: Datasets



# Characteristics of patients in UK CHIC

| Centre                                 | Number of patients |
|--|--------------------|
| Brighton                               | 2,772              |
| Mortimer Market/Archway                | 5,904              |
| St. Mary's                             | 5,188              |
| Kings                                  | 3,461              |
| Chelsea and Westminster                | 10,286             |
| Barts and the London                   | 3,717              |
| Royal Free                             | 4,150              |
| Edinburgh Western General              | 1,012              |
| Homerton                               | 1,247              |
| North Middlesex                        | 1,494              |
| Bristol                                | 1,026              |
| Leicester                              | 625                |
| Number of patients included in dataset |                    |
| - Before de-duplication                | 40,882             |
| - After de-duplication                 | 35,377             |

# Characteristics of patients in UK CHIC

|  |                 | n     | %     |
|--|-----------------|-------|-------|
| Total number of patients                             |                 | 35377 | 100.0 |
| Sex:   | Female          | 8659  | 24.5  |
| Risk group:  | Homo/bisexual   | 17984 | 50.8  |
|  | IDU             | 1396  | 4.0   |
|  | Heterosexual    | 11149 | 31.5  |
|  | Other/not known | 4848  | 13.7  |
| Ethnicity:   | White           | 19912 | 56.3  |
|  | Black African   | 8543  | 24.2  |
|  | Other           | 4711  | 13.3  |
|  | Not known       | 2211  | 6.3   |
| Median (IQR) age at first entry into cohort (years): |                 | 30    | 24-36 |

# Non-uptake of cART

(Kate Cober, Martin Fisher, Margaret Johnson)

- Current BHIVA guidelines recommend that all patients with a CD4 count  $<350$  cells/mm<sup>3</sup> should be offered cART
- Previous analyses of UK CHIC dataset suggested that only 10-15% of patients with a CD4 count of 200-350 cells/mm<sup>3</sup> initiated cART in the next six months
- Re-visited question by identifying all patients with confirmed CD4 count  $<350$  cells/mm<sup>3</sup> who had not initiated cART by time of last clinic visit in 2007-2009

# Non-uptake of cART

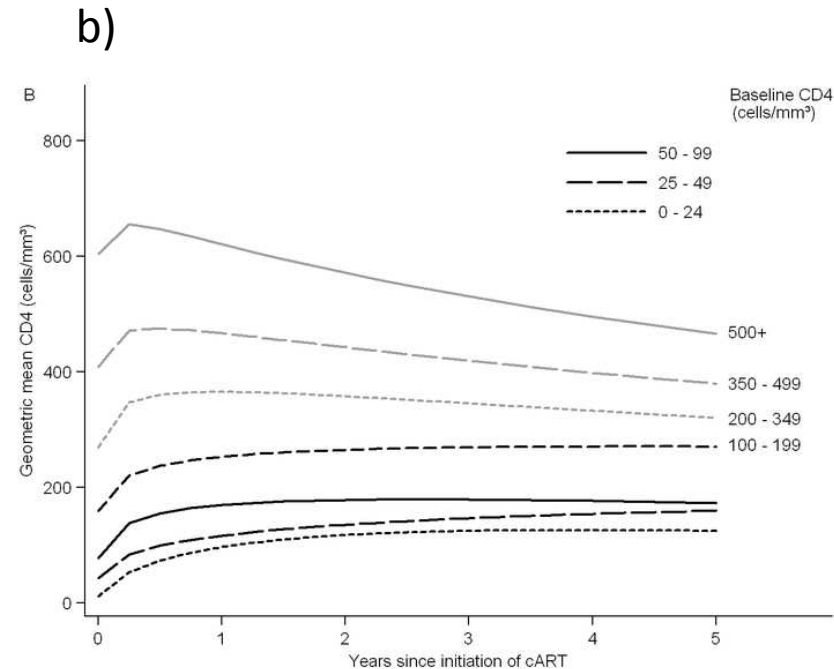
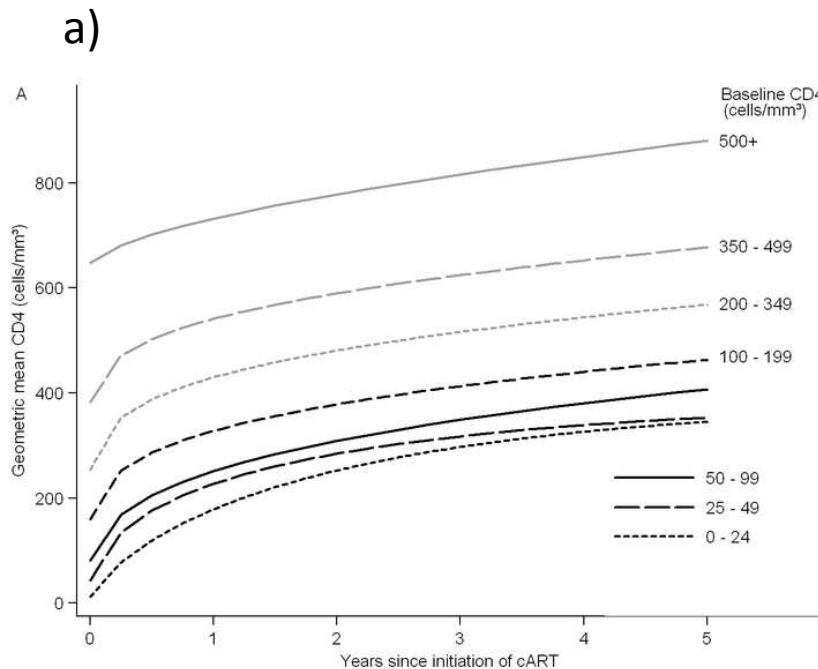
(Kate Cober, Martin Fisher, Margaret Johnson)

- 534/5613 (9.5%) of patients with confirmed CD4 count  $<350$  cells/mm<sup>3</sup> had not started cART
- From multivariable analyses, those starting HAART were older, less likely to be IDU, less likely to be of black African ethnicity, and had their low CD4 count measured in more recent years, BUT tended to have a more rapidly *declining* CD4 count
- Thus, whilst there is a small cohort of patients who remain untreated despite having had a low CD4 count, these patients probably have counts that are hovering around the 350 cells/mm<sup>3</sup> mark

# Long-term trends in CD4 count on cART

(Rachael Hughes, Jonathan Sterne)

Modelled geometric mean CD4 trajectories among patients with a) all HIV VL $\leq$ 1000 copies/ml or b) at least one HIV VL >1000 copies/ml six-months post-cART



# Long-term trends in CD4 count on cART

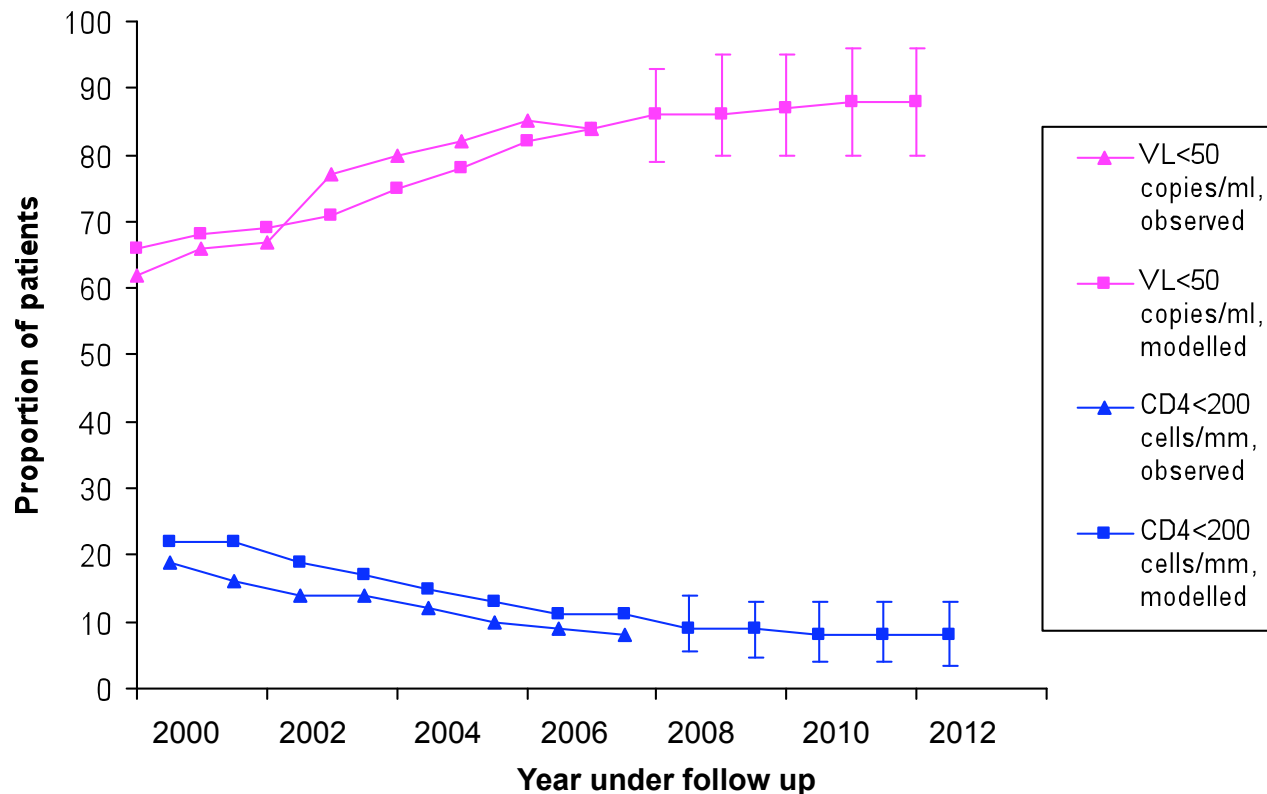
(Rachael Hughes, Jonathan Sterne)

- The greatest impact of virological failure on subsequent CD4 counts occurred in the first 44 days after a VL>1000 copies/ml
- VLs >10,000 copies/ml had a greater impact on future CD4 trends than VLs of 1000-10,000 copies/ml
- Although the impact on subsequent CD4 counts decreased as time since virological failure increased, the effect continues to persist beyond one year

# Time trends

(Loveleen Banshi, Andrew Phillips)

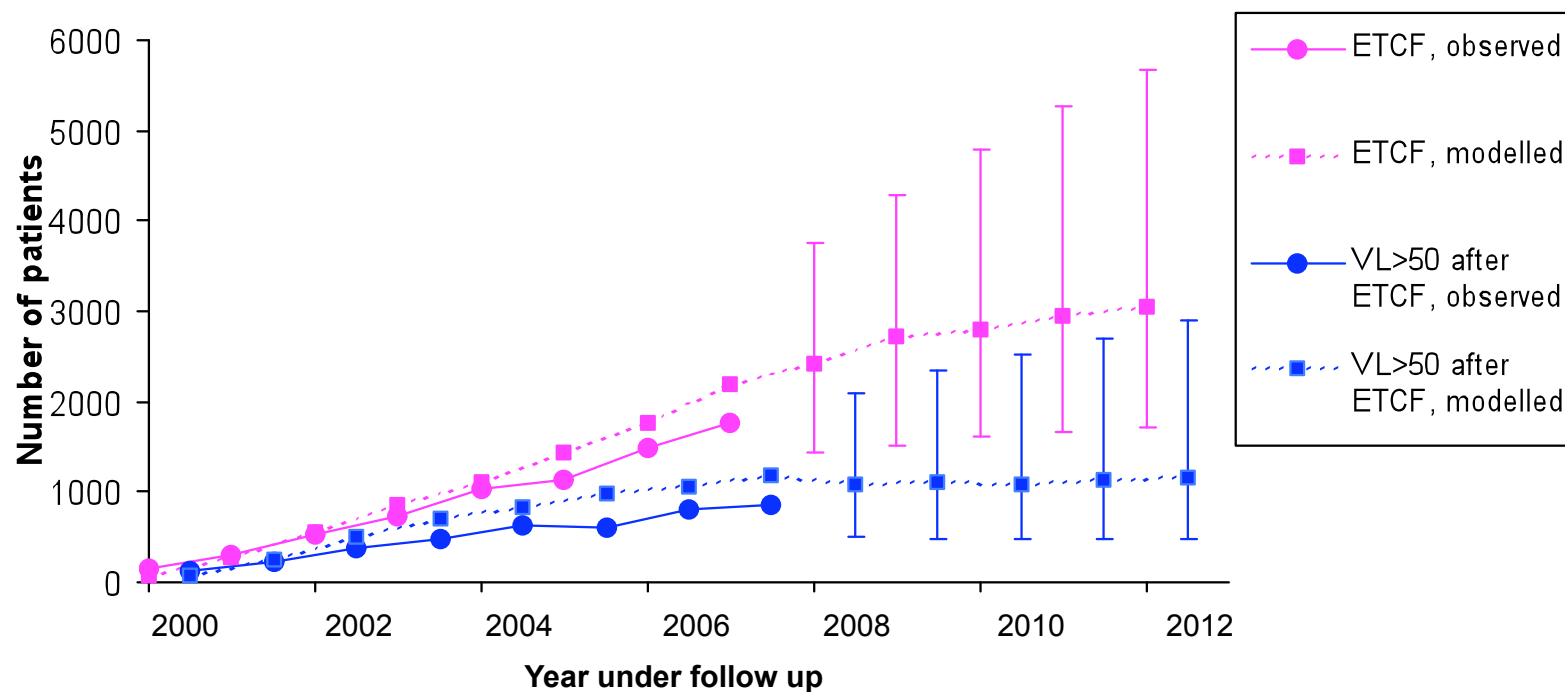
Observed and projected (with uncertainty bounds) proportion of patients with current CD4 <200 cells/mm<sup>3</sup> and proportion of patients on ART with viral load <50 copies/mL with uncertainty bounds in the UK



# Time trends

(Loveleen Banshi, Andrew Phillips)

Observed and projected (with uncertainty bounds) number of patients with ETCF in the UK and the number of patients with current VL > 50 copies/mL after ETCF



# UK CHIC: How do we protect your data?

- Adhere to extensive confidentiality policy
- Covers entire process from initial specification of datasets to management of datasets post-publication
- Policy developed and maintained by UK CHIC Data Protection sub-group, with input from:
  - London Caldicott guardians
  - Staff at Medical Research Council Head Office
  - Health Protection Agency
  - Community (Simon Collins)
  - British Medical Association (BMA)



# UK CHIC: How do we protect your data?

- All data pseudonymised prior to submission; cannot identify individuals from submitted datasets
- Data files encrypted then transferred to MRC website using secure web-based transfer (ftp) - NO DATAFILES TRANSFERRED VIA MEMORY STICKS!
- All data checks performed at MRC CTU; any communication with local data managers performed using secure transfer and/or encrypted files
- All paper records kept in locked files and destroyed when no longer required



# UK CHIC: How do we protect your data?

- De-duplication/linkage performed using pre-defined algorithm without need for personal information
- Date of birth required for de-duplication, but removed from final dataset prior to distribution
- Dataset distributed to those performing analyses after official approval of a project proposal by the UK CHIC Steering Committee; only the minimum dataset required for each analysis is distributed
- Datasets provided to external 'collaborations' (e.g. COHERE, PLATO studies) are further blinded



# Summary

- Routinely collected clinical data offers opportunities for conducting clinical research at a fraction of the cost of equivalently-sized epidemiological studies
- Able to monitor adherence to guidelines and identify areas where clinical management could be improved
- Study findings cited in national (BHIVA) and international (EACS, US DHSS, IAS) treatment guidelines, and frequently discussed in community literature – thus, findings from study have contributed directly to improvements in patient care

# UK CHIC: Acknowledgements

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