

Projected lifetime healthcare costs associated with HIV infection



Fumiyo Nakagawa¹, Alec Miners², Colette Smith¹, Ruth Smith^{1,3}, Rebecca Lodwick¹, Valentina Cambiano¹, Jens Lundgren^{4,5}, Valerie Delpech⁶ and Andrew Phillips¹

1. University College London, UK 2. London School of Hygiene & Tropical Medicine, UK 3. Medical Research Council - Clinical Trials Unit, UK 4. University of Copenhagen, Denmark 5. Copenhagen University Hospital, Denmark 6. Health Protection Agency, UK

Fumiyo Nakagawa
Research Department of Infection & Population Health
UCL Medical School, Royal Free Campus
Rowland Hill Street, London, NW3 2PF, UK
f.nakagawa@ucl.ac.uk

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Background

There are more than 3,500 new diagnoses of UK-acquired HIV infections every year, of which 2,700 are in MSM alone. The total number of people living with HIV has been estimated to surpass 100,000 by the end of 2012.

While HIV can now generally be successfully treated, it represents a burden for the infected individual and a major cost for the NHS.

Building on an exercise to model lifetime outcomes and life expectancy¹, this study estimated the projected lifetime HIV-related healthcare cost for an individual with HIV infection, in order to provide an estimate of the costs that could be averted by preventing a single case of HIV.

Methods

A stochastic computer simulation model (HIV Synthesis Progression model V5) of HIV and the effect of antiretroviral therapy (ART) was used to determine the distribution of potential lifetime outcomes and hence costs, of an MSM who becomes HIV-positive in 2010 aged 30 years.

Lifetime cost was estimated based on the assumption that individuals were diagnosed at the approximate rate currently observed for MSM in the UK (median CD4 count at diagnosis: 413 cells/mm³) and healthcare management and associated costs remain as now. The presented lifetime costs include costs of non-AIDS diseases in situations where the individual is seen in the same hospital for these conditions as for their HIV care. All costs were obtained from published sources²⁻⁴ and results are shown in 2010 UK pounds.

Results

The estimated mean lifetime cost was £360,777 based on a predicted median age at death of 75.0 years. With discounting at 3.5% per annum, the lifetime cost estimate was £179,057. 62% of the projected lifetime healthcare cost was attributed to ART costs.

These figures are probably an overestimate as we have made the strong assumption that the cost of someone who is undiagnosed is the same as that of someone who is diagnosed but with a CD4 count >200 cells/mm³, on the basis that HIV infection itself raises the risk of common clinical conditions such as cardiovascular diseases and non-AIDS cancers. Without this assumption, the estimated mean lifetime cost was £351,344.

Table 1: Mean (SD) number of events or mean time spent in lifetime and total lifetime costs for various aspects of HIV care.

Variable		Unit Cost	Cost per 3 months	Mean time spent, years	Mean costs, 2010 UK£	Mean discounted costs, 2010 UK£
CD4 assay		£34 ^a	-	-	£6,034	£3,023
HIV RNA assay		£63 ^a	-	-	£10,004	£5,012
Resistance test		£219 ^b	-	-	£551	£340
On ART (any line)		-	Regimen specific	31.7	£225,715	£108,824
Use of hospital services (inpatient, outpatient and day ward)	Undiagnosed	-	£630 ^c	6.2	£9,433	£8,519
	Diagnosed and CD4 ≤200cells/mm ³	-	£1430 ^c	2.2	£24,499	£10,321
	Diagnosed and CD4 >200cells/mm ³	-	£630 ^c	33.9	£84,538	£43,016
Total lifetime cost		-	-	-	£360,777	£179,057

a) CD4 and HIV RNA assays were assumed to be assessed 3 monthly, before and after start of ART. b) resistance tests were assumed to be performed when virologic failure occurs. c) these costs were derived using weighted averages from original costs found in ref (2)

Figure 1: Total costs (and proportions) spent in an average lifetime

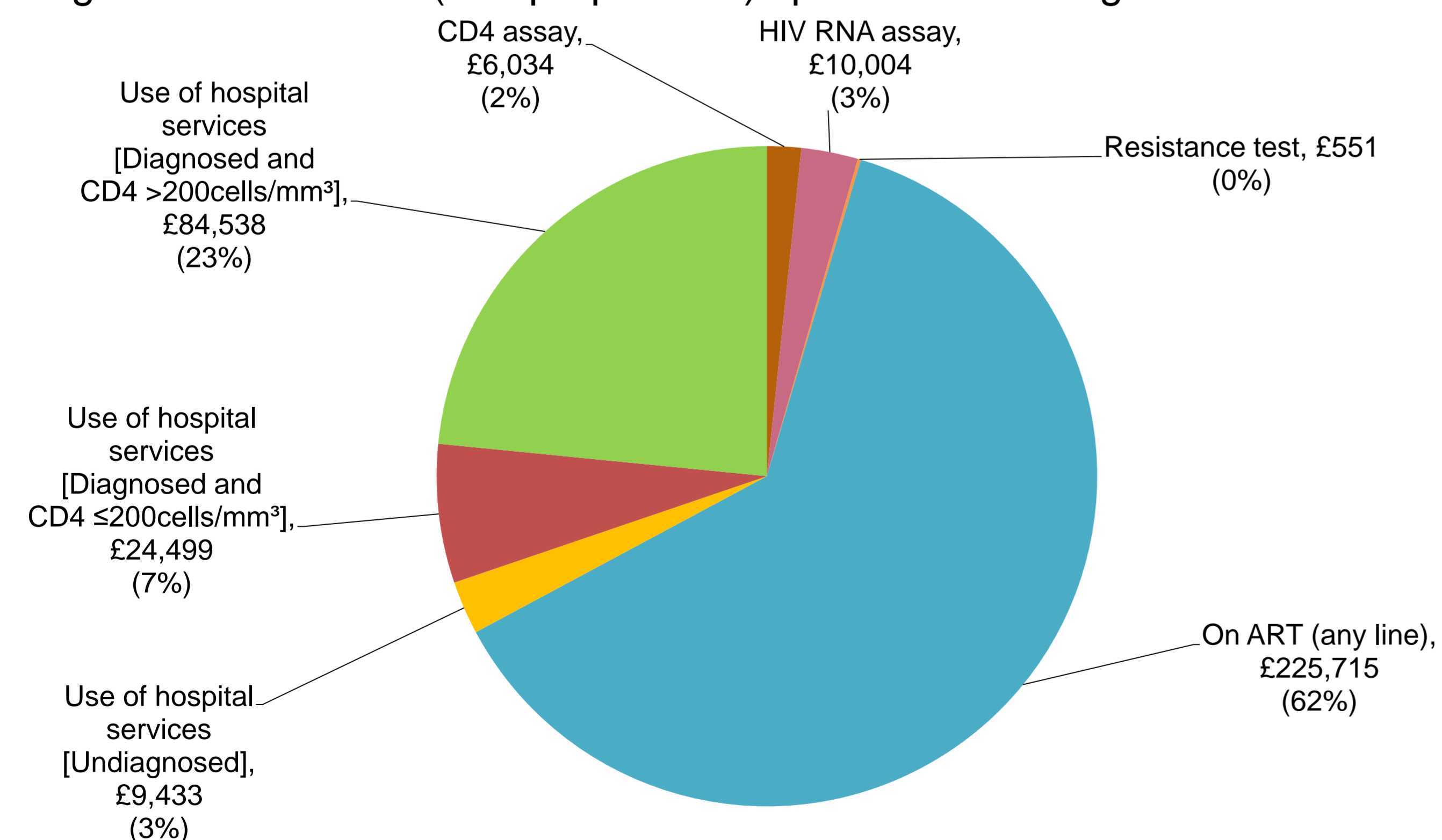
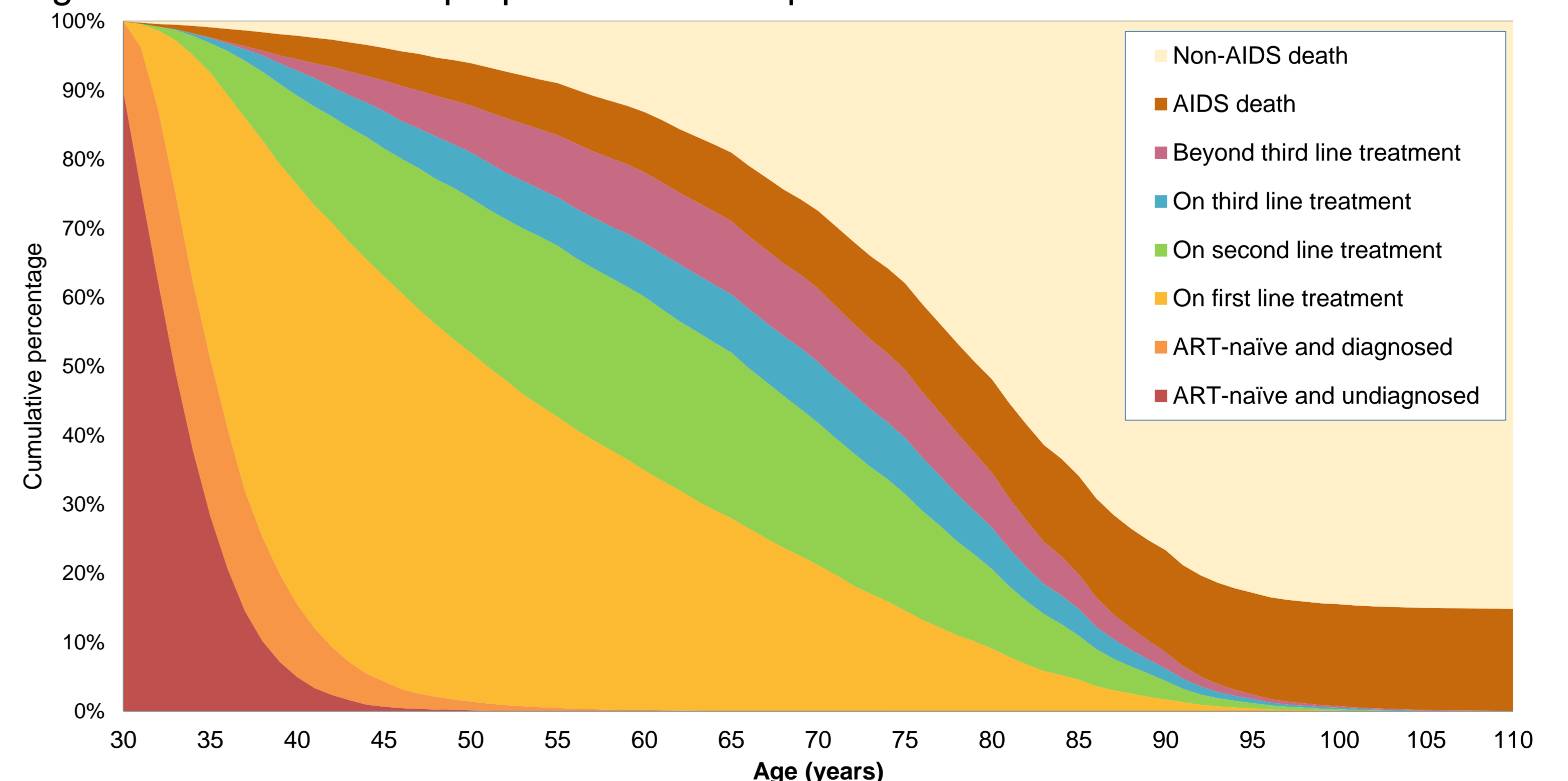


Figure 2: Breakdown of proportion of time spent on different treatment lines



Conclusion

Based on continuing low rates of virologic failure in treated patients, predicted life expectancy in people with HIV is high in settings with access to good healthcare. If we assume costs will be similar for other risk groups, the future healthcare cost of 3,500 people being infected and diagnosed in one year is predicted to be in excess of £1 billion. Although future reductions in drug prices could reduce this significantly, these results emphasise the continued need to invest in prevention.

References: (1) Nakagawa F, Lodwick RK, Smith CJ, et al. Projected life expectancy of people with HIV according to timing of diagnosis. *AIDS* 2012 ;26(3):335-43. (2) Beck EJ, Mandalia S, Sangha R, et al. The Cost-Effectiveness of Early Access to HIV Services and Starting cART in the UK 1996–2008. *PLoS ONE* 6(12): e27830. (3) DH Gateway Reference 15869: HIV Adult Outpatient Services Financial Data Analysis (2009/10) (4) British National Formulary. MedicinesComplete. [Accessed on 20/11/2011 at <http://www.medicinescomplete.com/mc/bnf/current/>]

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