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Dying of AIDS in the era of ART
A national audit

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Introduction

- Dramatic declines in mortality since effective ART
- Mortality rates among HIV-infected persons are now approaching those of the general population
- However in the UK ≥ 500 HIV-infected persons continue to die each year
- The UK's national HIV surveillance systems matched to the ONS provide details for all persons who have died including date and causes of death

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Key Aims of the study

- Describe national mortality trends among HIV infected individuals and the distribution of AIDS related mortality since ART
- Identify risk factors for dying of AIDS

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Study Methods

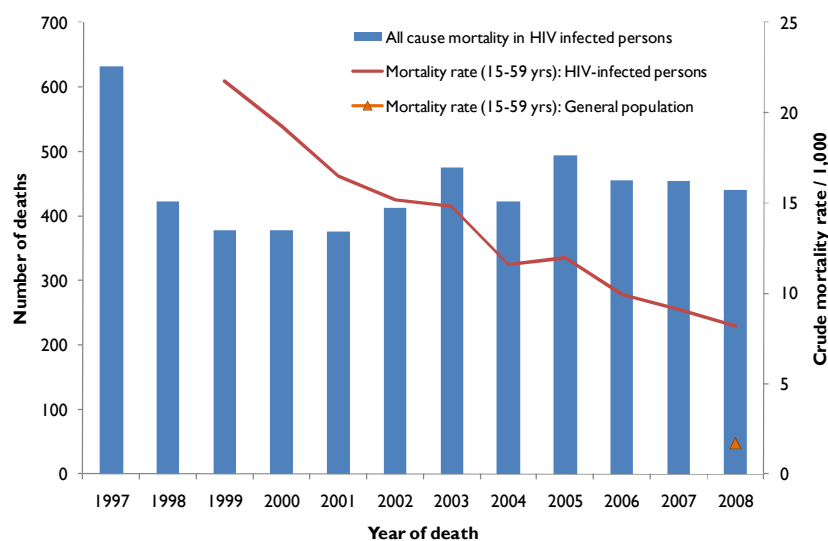
Data sources: national HIV surveillance data matched to the Office of National Statistics

- Age specific (15-59 years) all cause mortality calculated using SOPHID as denominator
- Review of all death records between 1997-2008 and identification of all AIDS deaths
- Predictors of an AIDS death using a case-control multivariate analysis
 - **Case:** reported to have died of AIDS by 2008.
 - **Control:** Alive in 2008. Randomly selected and matched on date and age at diagnosis. (4 controls per case)

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All cause mortality among HIV-infected individuals: E&W 1997-2008



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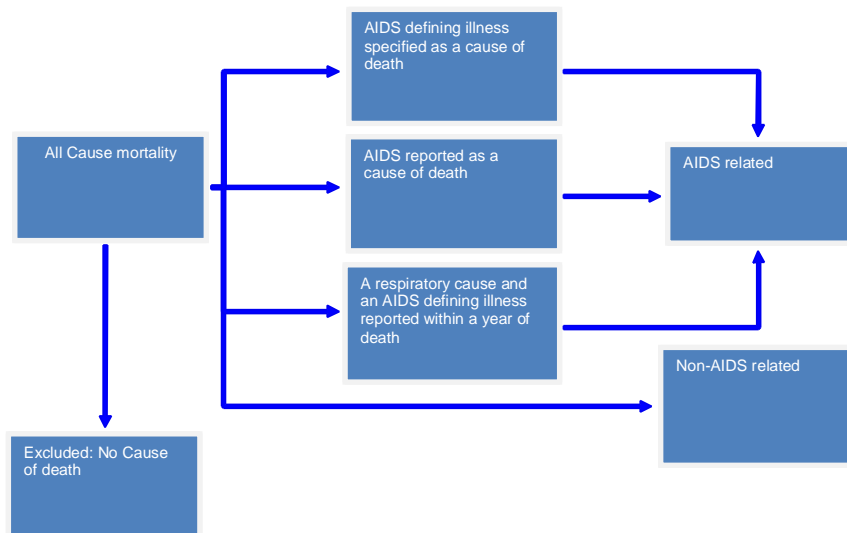
Patient characteristics of all cause mortality: E&W 1997-2008

Variable	Category		All cause mortality
Age at death N = 5,649	15-29		467 (8.3%)
	30-49		3,853 (68%)
	≥50		1,329 (24%)
Sex N = 5,649	Female		1,343 (24%)
	Male		4,306 (76%)
Infection Route N = 5,272	Sex between men		2,426 (46%)
	Heterosexual contact	In Africa	1,532 (29%)
		In the UK	272 (5.2%)
		Abroad (excluding Africa)	291 (5.5%)
		Country not reported	99 (1.9%)
	Injecting drug use		461 (8.7%)
	Other		191 (3.6%)
Late diagnosis (CD4 within 91 days of diagnosis) N = 3,071	CD4 <350		2,423 (78%)
	CD4 ≥350		648 (21%)

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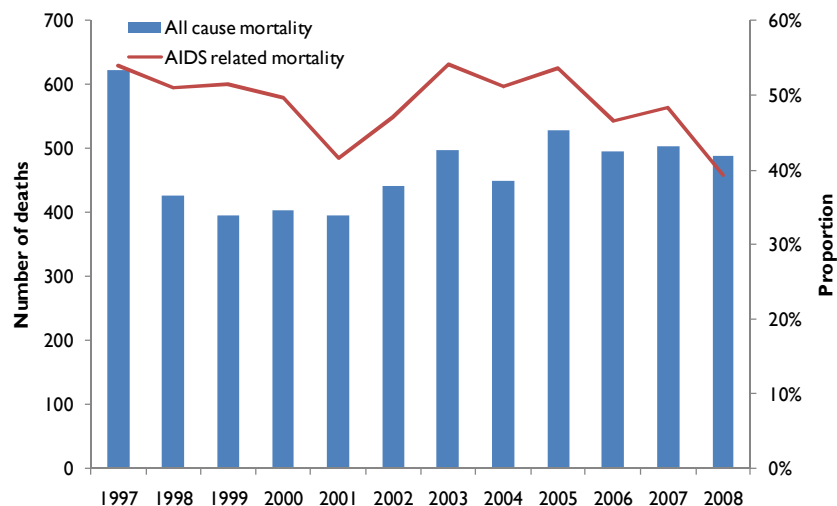
Definition of an AIDS death



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All cause mortality among HIV-infected persons and proportion due to AIDS: E&W 1997-2008



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Factors associated with AIDS-related mortality: E&W 1997-2008

Men OR 1.31 (1.11-1.55)

Compared to MSM

Heterosexual contact regardless of probable country of infection

- in Africa: OR 1.40 (1.18-1.67)
- in the UK: OR 1.51 (1.14-2.00)
- Abroad (excluding Africa): OR 1.42 (1.10-1.83)

Injecting drug use OR 3.02 (2.08-4.38)

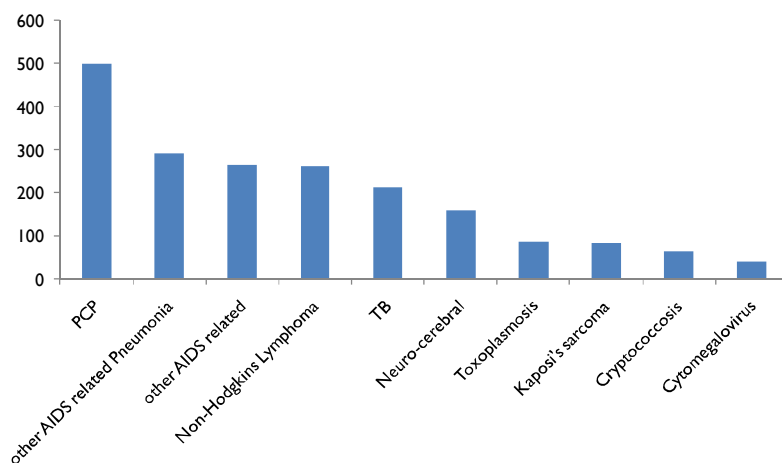
Diagnosed late OR 6.09 (4.94-7.51)

- Estimate that 74% of AIDS related deaths were attributable to late diagnosis
- 51% died within 3 months of diagnosis
- 76% died within 1 year of diagnosis

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AIDS related mortality by cause of death: E&W 1997 -2008



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Limitations

- Under-reporting of deaths
- Under-reporting of AIDS as a cause of death
- Misclassification of AIDS
- **Future work:**
 - Impact of treatment
 - Further investigation into AIDS related deaths
 - Non-AIDS related deaths
 - Better classification of cause of death

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Conclusions

- **Monitoring and auditing deaths among HIV infected persons remains a core public health surveillance function**
- **Death rates among HIV infected persons continue to decline in the ART era but remain 5 times greater than the general population.**
- **AIDS account for about half of all deaths, with the following risk factors:**
 - Late diagnosis
 - Heterosexual contact regardless of country of acquisition
 - Injecting drug use
 - Men
- **Earlier diagnosis and treatment could eliminate three out of four AIDS death, and two-thirds of those among persons who probably acquired their infection in the UK.**

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Acknowledgements

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