Errors in predictions of the incidence and distribution of AIDS

SIR,—In their report for 1993,[1] the US National Research Council concludes that the AIDS epidemic in the USA is concentrated in a few well-defined groups: homosexuals, racial minorities, and intravenous drug users. This is belated recognition of a consistent epidemiological trend. Predictions made on this trend by regression of incidence over time for 1983–92 for the USA and for New York City are accurate to within 10% of registrations of annual and cumulative incidence.[2]

This is also true, though not explicitly admitted, in the UK where annual incidence for 1990–92 and cumulative totals are similarly predictable from regression lines[2] and back projection[3] from registration data[4] for 1983–89. The accuracy of prediction by these methods contrasts with the exaggeration in official predictions by the Cox Committee[5] and a panel of experts[6] convened by the Royal Society (table).

The discrepancies are explained largely by differences in assumptions about transmission. The erroneous predictions are all based on assumptions of heterosexual transmission of HIV in the general population. The lack of accurate or indeed any unbiased data on this in official surveillance means that mathematical models must use hypothetical analogies, sophisticated alternatives in rates, and wide confidence limits in predictions. Regression models succeed because correlation with time is consistent ($p = 0{\cdot}97$, 1983–89, moving average $y = -34{\cdot}7 + 10{\cdot}1x$) and assumption of continuing spread in main risk groups is correct.

Further errors are caused because registrations in the UK and internationally[7] give regional estimates and ignore denominators of relevant subsets of populations in risk groups and real locations. If returns for the UK are re-allocated on this basis, the extent of risk in vulnerable groups becomes apparent. For instance, the risk to homosexual-bisexual males who engage in anal intercourse in the high-risk subset of population in inner London, which accounts for more than 70% of all AIDS cases in the UK, is about 5000 times that of heterosexuals engaging in risk behaviour and about 55 000 times that of any adult or adolescent in the general heterosexual population.[8]

The UK Government is beginning to retreat from its pessimistic certainty[9] about pandemics of heterosexually transmitted AIDS. But the fact remains that policy, budgets, and preventive measures are generally based on these earlier predictions and on pressure from professional and activist groups to maintain or even increase the disproportionate amount of attention and ring-fenced budgets allocated to AIDS. This disparity will continue as long as epidemiologists are content to tolerate faulty data and methodology, and may be much worse in the third world where major confounding variables are ignored in returns compiled by the WHO and other agencies.[7,10] The disservice to the public, nationally and internationally, is twofold: constant exaggeration and alarm to huge majorities who are not at risk, and discounting and danger to minorities who choose or are driven to expose themselves directly and others indirectly to very high risks.

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PREDICTIONS OF NEW CASES AND CUMULATIVE TOTAL OF AIDS IN 1991 AND 1992 IN ENGLAND AND WALES BY DIFFERENT METHODS

Method	Predictions for:		
	1991	1992	1982–92
Pessimistic[1]			
Exponential	6240	10 700	24 640
Wilkie, actuarial A	7454	12 097	28 846
Wilkie, actuarial C	6380	9152	24 341
Day, Weibull	5160	8080	20 582
CDC	6273	10 308	25 618
Middle of range[1]			
US growth model	3950	4800	16 270
Wilkie, actuarial D	3067	3770	13 361
Wilkie, actuarial E	2917	3490	12 811
Anderson A*	3030	3810	12 010
Anderson C*	3940	4950	15 190
Optimistic[1]			
Logistic	1550	1590	8000
Quadratic exponential	2320	2180	10 500
Linear logistic	2120	2320	9900
Day, Weibull optimistic	2080	2400	9330
CDC	2059	2406	10 237
Healy, extrapolation[1]	8474	15 440	34 077
Model for planning (Cox, 1988)[1]	2950	3600	12 750
Royal Society symposium, 1989[6]			
Day et al, back-projection		737–3538	5101–12 103
Wilkie, actuarial		3490–12 097	13 000–27 000
Ishan, quadratic-exponential/linear-logistic		2272–2420	11 794–10 950
PHLS, revised update, 1990[3]	1090–2400	..	..
Stewart, 1989†*			
Linear regression, UK	1254	1457	6540
Estimate, England/Wales only	1160	1370	6200
Total registered cases (UK)	1275	1418	6929‡

*From model based on transmission in homosexual men, proportionally increased to allow for general transmission by other routes. †Rolling average of incidence/time, p = 0·97 (excludes visitors). ‡Including visitors, number unavailable. CDC = Centers for Disease Control. PHLS = Public Health Laboratory Service.

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This paper has never been contradicted but the Lancet has rejected updating and extension to developing countries. It contains some of the data submitted to the Royal Society in 1989, 1992 and 1999 — all by invitation, but all rejected. It has also sent with my Statement of Concern 2003 to the CMO's and they presented of the ~~CDC~~ UK with updates showing that there is NO TRANSMISSION of AIDS by natural heterosexual intercourse in the resident population of the UK – and NYC!