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# The EuroSIDA risk score : Separate prediction for AIDS or death

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## INTRODUCTION

The EuroSIDA risk score was published this year (1), and is an online tool for predicting the short term risk of AIDS and death using information routinely collected in clinics. The score was derived using a combined endpoint of AIDS and death, but there may be situations where it is useful to predict either endpoint separately.

## AIMS

To develop the EuroSIDA risk score separately for AIDS and death

## PATIENTS

1956 patients starting cART after 1/1/1999 were included

## STATISTICAL METHODS

Poisson regression was used to investigate factors associated with new AIDS or death.

## RESULTS

Characteristics of the patients are shown in **Table 1**.60 patients developed 67 ADIs and 65 patients died during 4814.9 person-years of follow-up (PYFU). The different ADIs diagnosed are shown in **Figure 1**. The incidence of ADIs was 1.39 per 100 PYFU (95% CI 1.06 – 1.72) and of death was 1.35 per 100 PYFU (95% CI 1.02 – 1.68).

**Figure 2** illustrates the distribution of events and PYFU throughout the follow-up period, stratified by current values of CD4 count, CD4 slope, viral load, anaemia and BMI. For example, 90.6% of the follow-up time was spent on treatment, during which time 56 ADIs occurred and 59 deaths.

**Table 2** presents the EuroSIDA risk score for AIDS and death separately.

For example, a 30 year old patient infected via IDU who started cART before a diagnosis of AIDS, from ARV naïve attending clinic 3 years after starting cART with current CD4 count of 250/mm³, viral load 50 copies/ml, mild anaemia, BMI of 22, a CD4 slope which had increased by 15/mm³ over the past 3 months, currently taking cART and without TCF would have a risk score of:

### AIDS

**0.99** *(CD4 component)* + **0** *(viral load component)* + **1.07** *(mild anaemia)* + **0** *(BMI component)* - **0.0078*30** *(age)* + **0** *(CD4 slope component)* + **0** *(ARV experienced)* + **0** *(on ARVs)* - **0.34** (infected via IDU) + **0** (no prior AIDS) + **0** (no TCF) = **1.49**

### DEATH

**0.12** *(CD4 component)* + **0** *(viral load component)* + **1.38** *(mild anaemia)* + **0** *(BMI component)* + **0.045*30** *(age)* + **0** *(CD4 slope component)* + **0** *(ARV experienced)* + **0** *(on ARVs)* + **0.099** (infected via IDU) + **0** (no prior AIDS) = **2.95**

## CONCLUSIONS

- Consistent factors (low current CD4, anaemia, rapidly decreasing CD4 slope, low BMI) were found when developing a separate EuroSIDA risk-score for AIDS or death.
- Older age and off ARVs were additional predictors of death
- The separate risk-scores will be useful in settings where prediction of each endpoint is needed.

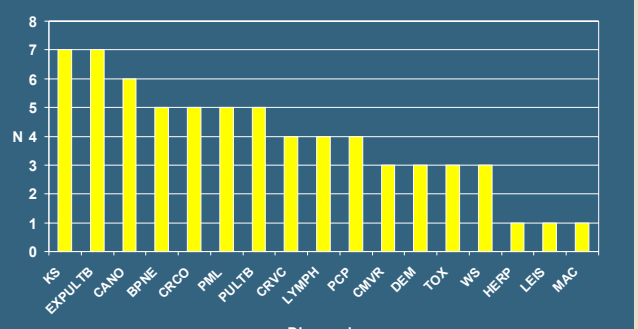
Table 1

### Characteristics of 1956 patients included in analyses

| | | N | % |
|---|---|---|---|
| Gender | Male / Female | 1363 / 593 | 69.7 / 30.3 |
| Ethnic Origin | White / Other | 1720 / 236 | 87.9 / 12.1 |
| Exposure | Hom. / Het. / IDU | 743 / 404 / 678 | 38.0 / 20.7 / 34.7 |
| Prior AIDS | | 75 | 19.2 |
| cART | Single PI | 488 | 25.0 |
| Regimen | RTV-boosted PI | 420 | 21.5 |
| | NNRTI | 960 | 49.1 |
| | Abacavir | 88 | 4.5 |
| ARV naive | | 1408 | 72.0 |
| | | Median | IQR |
| CD4 at cART | | 231 | 120 – 360 |
| VL at cART | | 4.80 | 4.03 – 5.32 |
| Nadir CD4 | | 188 | 90 – 287 |
| Peak VL | | 4.96 | 4.38 – 5.44 |
| Date started cART | | 1/01 | 1/00 – 6/03 |
| Age | | 37.4 | 31.5 – 44.3 |

Figure 1

### ADIs diagnosed during follow-up




KS; Kaposi's sarcoma. EXPULTB; extrapulmonary tuberculosis. CANO; oesophageal candidiasis. BPN; bacterial pneumonia. CRCO; cryptococcosis. PML; progressive multifocal leukoencephalopathy. PULTB; pulmonary tuberulosis. CRVC; cervical cancer. LYMPH; non-hodgkins lymphoma. PCP; pneumocystis jiroveci pneumonia. CMVR; cytomegalovirus retinitis. DEM; AIDS dementia complex. TOX; toxoplasmosis. WS; wasting syndrome HERP; herpes simplex. LEIS; leishmaniasis. MAC; mycobacterium avium complex.

Figure 2

### Distribution of follow-up time and events

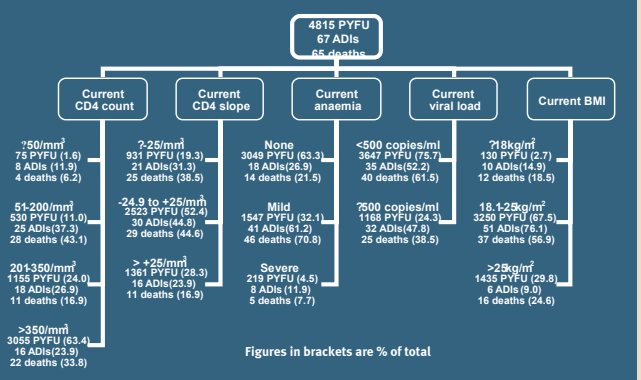



Figure 3

### EuroSIDA risk score : AIDS or death

| | | EuroSIDA risk score for | |
|---|---|---|---|
| | Current value | New ADI | Death |
| CD4* | <50/mm³ | +2.63 (<0.0001) | +1.66 (0.010) |
| | 51-200/mm³ | +1.86 (<0.0001) | +1.39 (0.0002) |
| | 201-350/mm³ | +0.99 (0.0026) | +0.12 (0.75) |
| | >350/mm³ | +0 | +0 |
| Viral load* | < 500 copies/ml | +0 | +0 |
| | ≥ 500 copies/ml | +0.46 (0.12) | +0.98 (0.0078) |
| Anaemia* | None | +0 | +0 |
| | Mild | +1.07 (0.0005) | +1.38 (<0.0001) |
| | Severe | +1.43 (0.0016) | +1.01 (0.065) |
| BMI* | ≤ 18 | +1.06 (0.0004) | +1.38 (0.0002) |
| | 18.1-25 | +0 | +0 |
| | >25 | -1.04 (0.016) | +0.13 (0.69) |
| Age* | Per year in age | -0.0078 (0.57) | +0.045 (<0.0001) |
| CD4 slope* (per 3 mths) | <-25/mm³ | +0.93 (0.0029) | +0.77 (0.013) |
| | -25.0 to +25/mm³ | +0 | +0 |
| | >+25/mm³ | +0.44 (0.21) | -0.083 (0.82) |
| ARV naïve before cART | No | +0 | +0 |
| | Yes | +0.0043 (0.99) | -0.53 (0.041) |
| On ARVs | Yes | +0 | +0 |
| | No | -0.034 (0.93) | +2.05 (<0.0001) |
| AIDS before cART | No | +0 | +0 |
| | Yes | -0.063 (0.82) | +0.16 (0.60) |
| Exposure Group | IDU | -0.34 (0.29) | +0.099 (0.73) |
| | Other | +0 | +0 |
| Triple Class Failure* | No | +0 | +0 |
| | Yes | +0.44 (0.25) | +0.79 (0.054) |

(p-values); * included as time-updated

## REFERENCES

1 Mocroft A et al. Short term clinical disease progression in HIV-1 positive patients taking combination antiretroviral therapy : The EuroSIDA risk score. AIDS 2007;21:1867-1875.

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