**Impact of CD4 count and viral load response to antiretroviral therapy on life expectancy:**

**UK Collaborative HIV Cohort (UK CHIC) Study**

Supplemental Data File

Supplementary table 4: Crude mortality rate (MR) (95% confidence interval) per 1000 person years for men of all ages and between ages 20-44 years stratified by viral suppression and attained CD4 count at 1, 2, 3, 4 and 5 years after start of ART.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **HIV-1 RNA (copies/mL) ≤ 400** | | |  | **HIV-1 RNA (copies/mL) > 400** | | |  | **All men** |
| **From start of ART** | **CD4 < 200** | **CD4 200-349** | **CD4 ≥ 350** |  | **CD4 < 200** | **CD4 200-349** | **CD4 ≥ 350** |  |  |
| No. deaths/patients (%) |  |  |  |  |  |  |  |  | 686/14742 (5.0) |
| MR Overall |  |  |  |  |  |  |  |  | 9.0 (8.4, 9.7) |
| MR ages 20-44 years |  |  |  |  |  |  |  |  | 6.9 (6.2, 7.7) |
| **From 1 year after ART start** | |  |  |  |  |  |  |  |  |
| No. deaths/patients (%) | 75/1308 (5.7) | 85/2955 (2.9) | 125/6383 (2.0) |  | 44/342 (12.9) | 24/388 (6.2) | 24/545 (4.4) |  | 377/11921 (3.2) |
| MR Overall | 11.2 (8.9,14.0) | 6.1 (4.9, 7.5) | 5.1 (4.3, 6.0) |  | 25.2 (18.8,33.9) | 11.0 (7.4,16.5) | 8.4 (5.6,12.5) |  | 7.2 (6.5, 8.0) |
| MR ages 20-44 years | 7.9 (5.5,11.3) | 3.9 (2.8, 5.5) | 3.6 (2.8, 4.7) |  | 26.6 (18.6,38.0) | 7.4 (4.1,13.3) | 6.8 (4.0,11.4) |  | 5.4 (4.6, 6.2) |
| **From 2 years after ART start** | |  |  |  |  |  |  |  |  |
| No. deaths/patients (%) | 36/617 (5.8) | 56/2112 (2.7) | 111/6711 (1.7) |  | 53/322 (16.5) | 20/463 (4.3) | 19/742 (2.6) |  | 295/10967 (2.7) |
| MR Overall | 12.5 (9.0,17.3) | 6.2 (4.7, 8.0) | 4.6 (3.8, 5.5) |  | 34.7 (26.5,45.5) | 8.6 (5.5,13.3) | 5.4 (3.4, 8.4) |  | 6.8 (6.0, 7.6) |
| MR ages 20-44 years | 8.0 (4.4,14.4) | 3.7 (2.3, 5.8) | 2.8 (2.0, 3.7) |  | 29.9 (20.9,42.8) | 5.7 (3.0,10.9) | 5.2 (3.0, 8.9) |  | 4.6 (3.9, 5.5) |
| **From 3 years after ART start** | |  |  |  |  |  |  |  |  |
| No. deaths/patients (%) | 38/251 (15.1) | 22/373 (5.9) | 16/655 (2.4) |  | 21/337 (6.2) | 39/1526 (2.6) | 102/6056 (1.7) |  | 238/9198 (2.6) |
| MR Overall | 15.3 (10.0,23.4) | 6.2 (4.6, 8.5) | 4.9 (4.0, 6.0) |  | 34.9 (25.4,47.9) | 12.4 (8.2,18.9) | 5.8 (3.5, 9.4) |  | 7.0 (6.2, 7.9) |
| MR ages 20-44 years | 10.4 (4.7,23.2) | 3.9 (2.3, 6.8) | 2.5 (1.7, 3.6) |  | 32.6 (21.7,49.1) | 11.8 (7.0,19.9) | 5.4 (2.9,10.1) |  | 4.9 (4.0, 6.0) |
| **From 4 years after ART start** | |  |  |  |  |  |  |  |  |
| No. deaths/patients (%) | 15/220 (6.8) | 35/1112 (3.1) | 82/5300 (1.5) |  | 28/179 (15.6) | 7/250 (2.8) | 12/523 (2.3) |  | 179/7584 (2.4) |
| MR Overall | 17.2 (10.4,28.6) | 8.7 (6.3,12.1) | 4.7 (3.8, 5.9) |  | 38.8 (26.8,56.2) | 7.1 (3.4,14.8) | 5.9 (3.3,10.3) |  | 6.9 (5.9, 8.0) |
| MR ages 20-44 years | 17.4 (7.8,38.7) | 5.2 (2.8, 9.6) | 2.3 (1.5, 3.5) |  | 32.7 (19.7,54.3) | 3.4 (0.8,13.5) | 3.6 (1.5, 8.7) |  | 4.2 (3.3, 5.4) |
| **From 5 years after ART start** | |  |  |  |  |  |  |  |  |
| No. deaths/patients (%) (%) | 9/152 (5.9) | 18/829 (2.2) | 69/4464 (1.5) |  | 18/140 (12.9) | 9/204 (4.4) | 16/413 (3.9) |  | 139/6202 (2.2) |
| MR Overall | 17.6 (9.2,33.9) | 6.6 (4.1,10.4) | 5.2 (4.1, 6.6) |  | 39.9 (25.2,63.4) | 11.3 (5.9,21.7) | 11.1 (6.8,18.1) |  | 7.2 (6.1, 8.5) |
| MR ages 20-44 years | 20.2 (7.6,53.8) | 1.6 (0.4, 6.6) | 2.7 (1.7, 4.3) |  | 38.1 (21.1,68.9) | 6.2 (2.0,19.3) | 7.6 (3.6,15.9) |  | 4.6 (3.4, 6.1) |

Supplementary table 5: Crude mortality rate (MR) (95% confidence interval) per 1000 pyears for women of all ages and between ages 20-44 years stratified by viral suppression and attained CD4 count at 1, 2, 3, 4 and 5 years after start of ART.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **HIV-1 RNA (copies/mL) ≤ 400** | | |  | **HIV-1 RNA (copies/mL) > 400** | | |  |  |
| **From start of ART** | **CD4 < 200** | **CD4 200-349** | **CD4 ≥ 350** |  | **CD4 < 200** | **CD4 200-349** | **CD4 ≥ 350** |  | **All women** |
| No. deaths/patients (%) |  |  |  |  |  |  |  |  | 275/6646 (4.1) |
| MR Overall |  |  |  |  |  |  |  |  | 7.9 ( 7.0, 8.9) |
| MR ages 20-44 years |  |  |  |  |  |  |  |  | 6.9 ( 6.0, 7.9) |
| **From 1 year after ART start** | |  |  |  |  |  |  |  |  |
| No. deaths/patients (%) | 32/635 (5.0) | 26/1281 (2.0) | 23/1929 (1.2) |  | 28/226 (12.4) | 14/315 (4.4) | 12/487 (2.5) |  | 135/4873 (2.8) |
| MR Overall | 9.6 ( 6.8,13.6) | 4.2 ( 2.9, 6.2) | 2.8 ( 1.9, 4.3) |  | 25.5 (17.6,36.9) | 9.3 ( 5.5,15.8) | 5.5 ( 3.1, 9.7) |  | 6.0 (5.1,7.1) |
| MR ages 20-44 years | 8.2 ( 5.2,12.9) | 3.5 ( 2.2, 5.8) | 2.7 ( 1.7, 4.3) |  | 19.9 (12.5,31.6) | 7.1 ( 3.7,13.6) | 5.9 ( 3.4,10.5) |  | 5.2 ( 4.3, 6.4) |
| **From 2 years after ART start** | |  |  |  |  |  |  |  |  |
| No. deaths/patients (%) | 11/221 (5.0) | 17/887 (1.9) | 22/2304 (0.9) |  | 27/228 (11.8) | 17/323 (5.3) | 17/764 (2.5) |  | 111/4637 (2.4) |
| MR Overall | 10.1 ( 5.6,18.2) | 4.2 ( 2.6, 6.8) | 2.4 ( 1.6, 3.6) |  | 26.2 (17.9,38.1) | 11.6 ( 7.2,18.7) | 6.1 ( 3.8, 9.8) |  | 5.7 ( 4.7, 6.8) |
| MR ages 20-44 years | 5.9 ( 2.2,15.7) | 3.2 ( 1.6, 6.1) | 2.4 ( 1.4, 3.8) |  | 25.1 (16.4,38.5) | 9.1 ( 5.0,16.4) | 5.6 ( 3.3, 9.5) |  | 5.0 ( 4.0, 6.3) |
| **From 3 years after ART start** | |  |  |  |  |  |  |  |  |
| No. deaths/patients (%) | 22/151 (14.6) | 9/299 (3.0) | 9/502 (1.8) |  | 8/113 (7.1) | 9/557 (1.6) | 30/2403 (1.2) |  | 87/4025 (2.2) |
| MR Overall | 15.7 ( 7.9,31.4) | 3.7 ( 1.9, 7.2) | 3.4 ( 2.4, 4.9) |  | 35.0 (23.0,53.2) | 7.1 ( 3.7,13.6) | 4.9 ( 2.6, 9.4) |  | 5.6 ( 4.6, 7.0) |
| MR ages 20-44 years | 12.4 ( 4.7,33.1) | 1.9 ( 0.6, 5.9) | 2.4 ( 1.4, 3.9) |  | 30.9 (19.0,50.5) | 6.6 ( 3.1,13.7) | 5.6 ( 2.9,10.7) |  | 4.7 ( 3.6, 6.1) |
| **From 4 years after ART start** | |  |  |  |  |  |  |  |  |
| No. deaths/patients (%) | 4/74 (5.4) | 6/403 (1.5) | 22/2250 (1.0) |  | 16/103 (15.5) | 9/202 (4.5) | 5/416 (1.2) |  | 62/3448 (1.8) |
| MR Overall | 15.0 ( 5.6,39.9) | 3.9 ( 1.7, 8.6) | 2.9 ( 1.9, 4.4) |  | 40.9 (25.1,66.8) | 11.0 ( 5.7,21.1) | 3.8 ( 1.6, 9.2) |  | 5.2 ( 4.1, 6.7) |
| MR ages 20-44 years | 6.0 ( 0.8,42.6) | 3.0 ( 1.0, 9.2) | 2.1 ( 1.1, 3.7) |  | 41.0 (23.8,70.6) | 9.0 ( 4.1,20.1) | 2.6 ( 0.8, 8.1) |  | 4.3 ( 3.1, 5.9) |
| **From 5 years after ART start** | |  |  |  |  |  |  |  |  |
| No. deaths/patients (%) | 1/50 (2.0) | 6/271 (2.2) | 14/2013 (0.7) |  | 10/86 (11.6) | 5/171 (2.9) | 5/333 (1.5) |  | 41/2924 (1.4) |
| MR Overall | 5.3 ( 0.7,37.7) | 6.7 ( 3.0,14.8) | 2.3 ( 1.4, 4.0) |  | 39.8 (21.4,74.0) | 8.5 ( 3.5,20.3) | 5.3 ( 2.2,12.7) |  | 4.6 ( 3.4, 6.3) |
| MR ages 20-44 years | 7.4 ( 1.0,52.6) | 3.5 ( 0.9,14.1) | 2.0 ( 1.0, 4.0) |  | 36.0 (17.2,75.5) | 6.2 ( 2.0,19.3) | 4.8 ( 1.8,12.9) |  | 4.0 ( 2.7, 6.0) |

Supplementary table 6: Expected age at death (EAD) (95% CI) of men overall and stratified by viral suppression at 1, 2, 3, 4 and 5 years after start of ART.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **HIV-1 RNA (copies/mL)** | | |  | |
| **From start of ART** | **≤ 400** | **> 400** | | **All men** | |
| No. deaths/patients (%) |  | |  | | 686/14742 (4.6) |
| EAD at exact age 20 years |  | |  | | 68 (66-71) |
| 35 years |  | |  | | 73 (71-76) |
| 50 years |  | |  | | 77 (75-80) |
| **From 1 year after ART** |  | |  | |  |
| No. deaths/patients (%) | 285/10646 (2.7) | | 92/1275 (7.2) | | 377/11921 (3.2) |
| EAD at exact age 20 years | 73 (69-77) | | 62 (54-69) | | 71 (67-75) |
| 35 years | 77 (74-80) | | 68 (64-72) | | 75 (72-78) |
| 50 years | 80 (77-83) | | 74 (69-79) | | 79 (76-82) |
| **From 2 years after ART** start |  | |  | |  |
| No. deaths/patients (%) | 203/9440 (2.2) | | 92/1527 (6.0) | | 295/10967 (2.7) |
| EAD at exact age 20 years | 74 (70-79) | | 62 (55-70) | | 72 (68-77) |
| 35 years | 78 (74-81) | | 69 (64-73) | | 76 (73-79) |
| 50 years | 80 (77-84) | | 74 (68-79) | | 79 (76-82) |
| **From 3 years after ART** start |  | |  | |  |
| No. deaths/patients (%) | 162/7919 (2.0) | | 76/1279 (5.9) | | 238/9198 (2.6) |
| EAD at exact age 20 years | 75 (70-79) | | 62 (54-69) | | 72 (67-76) |
| 35 years | 78 (75-81) | | 68 (63-73) | | 76 (73-79) |
| 50 years | 81 (77-84) | | 74 (68-80) | | 79 (76-82) |
| **From 4 years after ART start** |  | |  | |  |
| No. deaths/patients (%) | 132/6632 (2.0) | | 47/952 (4.9) | | 179/7584 (2.4) |
| EAD at exact age 20 years | 74 (70-79) | | 63 (54-71) | | 72 (67-77) |
| 35 years | 78 (75-81) | | 69 (64-74) | | 76 (73-80) |
| 50 years | 81 (77-84) | | 74 (68-80) | | 80 (76-83) |
| **From 5 years after ART** start |  | |  | |  |
| No. deaths/patients (%) | 96/5445 (1.8) | | 43/757 (5.7) | | 139/6202 (2.2) |
| EAD at exact age 20 years | 75 (70-80) | | 59 (50-68) | | 72 (67-78) |
| 35 years | 79 (75-82) | | 66 (61-71) | | 77 (73-80) |
| 50 years | 81 (78-85) | | 73 (67-78) | | 80 (76-84) |

EAD expected age at death

Supplementary table 7: Expected age at death (EAD) (95% CI) of men stratified by attained CD4 count at start of ART and 1, 2, 3, 4 and 5 years after start of ART.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **CD4 count (cells/mm3)** | | |
| **From start of ART** | **CD4 < 200** | **CD4 200-349** | **CD4 ≥ 350** |
| No. deaths/patients (%) | 370/5507 (6.7) | 136/4769 (2.9) | 69/2386 (2.9) |
| EAD at exact age 20 years | 65 (61-68) | 74 (69-79) | 72 (67-77) |
| 35 years | 71 (68-73) | 78 (74-82) | 77 (72-81) |
| 50 years | 76 (73-79) | 81 (77-86) | 80 (76-85) |
| **From 1 year after ART** |  |  |  |
| No. deaths/patients (%) | 119/1650 (7.2) | 109/3343 (3.3) | 149/6928 (2.2) |
| EAD at exact age 20 years | 63 (56-70) | 73 (67-79) | 76 (72-81) |
| 35 years | 69 (66-73) | 77 (74-81) | 80 (76-84) |
| 50 years | 75 (71-78) | 81 (77-85) | 83 (78-87) |
| **From 2 years after ART** start |  |  |  |
| No. deaths/patients (%) | 89/939 (9.5) | 76/2575 (3.0) | 130/7453 (1.7) |
| EAD at exact age 20 years | 56 (48-64) | 73 (68-79) | 77 (72-82) |
| 35 years | 64 (61-68) | 77 (73-81) | 80 (76-84) |
| 50 years | 71 (67-75) | 80 (76-84) | 83 (79-87) |
| **From 3 years after ART** start |  |  |  |
| No. deaths/patients (%) | 59/588 (10.0) | 61/1899 (3.2) | 118/6711 (1.8) |
| EAD at exact age 20 years | 53 (44-62) | 72 (65-79) | 76 (72-81) |
| 35 years | 62 (58-65) | 76 (72-80) | 79 (76-83) |
| 50 years | 70 (65-74) | 79 (75-84) | 82 (78-86) |
| **From 4 years after ART start** |  |  |  |
| No. deaths/patients (%) | 43/399 (10.8) | 42/1362 (3.1) | 94/5823 (1.6) |
| EAD at exact age 20 years | 52 (41-63) | 71 (64-79) | 78 (73-84) |
| 35 years | 61 (56-67) | 76 (71-81) | 82 (77-86) |
| 50 years | 70 (64-75) | 80 (75-85) | 84 (80-89) |
| **From 5 years after ART** start |  |  |  |
| No. deaths/patients (%) | 27/292 (9.3) | 27/1033 (2.6) | 85/4877 (1.7) |
| EAD at exact age 20 years | 50 (38-63) | 72 (64-79) | 75 (70-81) |
| 35 years | 60 (54-66) | 76 (71-81) | 79 (75-83) |
| 50 years | 68 (61-75) | 80 (75-84) | 82 (78-86) |

EAD expected age at death

**Supplementary figure 1:** Change in median (inter-quartile range) CD4 count (cells/mm3) with duration of ART stratified by viral suppression (HIV-1 RNA viral load ≤ 400 versus > 400 copies/mL).



VL viral load

**Supplementary figure 2:** Evolution of proportion of patients in each CD4 count category with time on ART

