Supplementary appendix

This appendix formed part of the original submission and has been peer reviewed. We post it as supplied by the authors.

Supplement to: The Antiretroviral Therapy Cohort Collaboration. Survival of HIV-positive patients starting antiretroviral therapy between 1996 and 2013: a collaborative analysis of cohort studies. *Lancet HIV* 2017; published online May 10. http://dx.doi.org/10.1016/S2352-3018(17)30066-8.
Web Appendix

Webtable 1: Adjusted* all-cause mortality hazard ratios by period of starting ART (vs. 2000-03) in subgroups of patients defined by their characteristics at the time of starting ART: (i) first year of ART (upper panel) (ii) 2nd and 3rd years after starting ART (lower panel).

| 1<sup>st</sup> year of follow-up | Period of starting ART | Per period |
|-------------------------------|-----------------------|------------|
|                               | 1996-99               | 2000-3     | 2004-7    | 2008-10   |
| All                           | 1.02 (0.91,1.14)      | 1.07 (0.84,1.36) | 1.07 (0.84,1.36) | 1.05 (0.84,1.36) |
| Age 16-29 (years)             | 1.19 (0.78,1.83)      | 1.05 (0.83,1.32) | 1.10 (0.60,2.01) | 0.89 (0.74,1.08) |
| Age 30-39                      | 1.12 (0.92,1.37)      | 1.05 (0.83,1.32) | 0.63 (0.44,0.91) | 0.89 (0.82,0.98) |
| Age 40-49                      | 0.89 (0.75,1.10)      | 0.91 (0.71,1.13) | 0.62 (0.46,0.84) | 0.87 (0.80,0.96) |
| Age 50-59                      | 1.00 (0.79,1.27)      | 0.90 (0.71,1.13) | 0.71 (0.49,1.03) | 0.93 (0.83,1.05) |
| Age ≥ 60                       | 0.96 (0.69,1.35)      | 1.05 (0.77,1.42) | 0.71 (0.49,1.03) | 0.93 (0.83,1.05) |
| CD4 < 100 cells/mL             | 1.00 (0.86,1.15)      | 1.05 (0.90,1.22) | 0.82 (0.66,1.01) | 0.97 (0.91,1.03) |
| CD4 100-199 cells/mL           | 1.00 (0.78,1.27)      | 0.92 (0.72,1.16) | 0.49 (0.33,0.71) | 0.86 (0.78,0.94) |
| CD4 200-349 cells/mL           | 1.09 (0.81,1.47)      | 0.82 (0.61,1.09) | 0.60 (0.42,0.85) | 0.83 (0.74,0.92) |
| CD4 ≥ 350 cells/mL             | 1.12 (0.75,1.68)      | 1.07 (0.67,1.69) | 1.09 (0.69,1.71) | 0.99 (0.86,1.14) |
| N. America                     | 0.99 (0.82,1.18)      | 0.96 (0.80,1.16) | 0.62 (0.49,0.79) | 0.89 (0.83,0.96) |
| Europe                        | 1.02 (0.88,1.17)      | 0.95 (0.83,1.09) | 0.75 (0.62,0.91) | 0.93 (0.88,0.98) |
| Male PWID                      | 1.00 (0.73,1.38)      | 1.25 (0.89,1.77) | 0.89 (0.51,1.55) | 1.04 (0.90,1.20) |
| Female PWID                    | 0.94 (0.43,2.06)      | 1.16 (0.52,2.56) | 1.93 (0.22,1.53) | 1.23 (0.90,1.69) |
| MSM                           | 0.83 (0.63,1.08)      | 0.89 (0.69,1.17) | 0.69 (0.49,0.97) | 0.96 (0.87,1.06) |
| Heterosexual Male             | 0.87 (0.65,1.16)      | 1.00 (0.77,1.30) | 0.60 (0.40,0.91) | 0.95 (0.85,1.06) |
| Heterosexual Female           | 1.78 (1.21,2.64)      | 1.22 (0.82,1.81) | 1.10 (0.65,1.87) | 0.89 (0.51,1.54) |

| 2<sup>nd</sup>/3<sup>rd</sup> years of follow-up | Period of starting ART | Per period |
|-----------------------------------------------|-----------------------|------------|
| All                                           | 1.21 (1.10,1.45)      | 0.79 (0.71,0.89) | 0.57 (0.49,0.67) | 0.78 (0.75,0.82) |
| Age 16-29 (years)                             | 1.41 (0.98,2.03)      | 0.74 (0.47,1.16) | 0.44 (0.21,0.93) | 0.70 (0.59,0.84) |
| Age 30-39                                      | 1.15 (0.96,1.37)      | 0.77 (0.61,0.96) | 0.48 (0.34,0.68) | 0.79 (0.72,0.86) |
| Age 40-49                                      | 1.26 (1.06,1.50)      | 0.70 (0.57,0.86) | 0.56 (0.43,0.74) | 0.76 (0.70,0.82) |
| Age 50-59                                      | 1.34 (1.06,1.68)      | 0.99 (0.78,1.25) | 0.65 (0.47,0.88) | 0.82 (0.75,0.89) |
| Age ≥ 60                                       | 0.92 (0.65,1.29)      | 0.77 (0.55,1.06) | 0.54 (0.37,0.78) | 0.84 (0.74,0.94) |
| CD4 < 100 cells/mL                             | 1.18 (1.02,1.37)      | 0.77 (0.64,0.91) | 0.63 (0.49,0.81) | 0.81 (0.76,0.87) |
| CD4 100-199 cells/mL                          | 1.18 (0.96,1.46)      | 0.63 (0.50,0.80) | 0.41 (0.28,0.59) | 0.72 (0.65,0.79) |
| CD4 200-349 cells/mL                          | 1.51 (1.19,1.92)      | 1.07 (0.84,1.36) | 0.72 (0.53,0.97) | 0.81 (0.74,0.89) |
| CD4 ≥ 350 cells/mL                            | 1.03 (0.77,1.36)      | 0.87 (0.62,1.22) | 0.48 (0.32,0.74) | 0.82 (0.73,0.92) |
| N. America                                    | 1.31 (1.12,1.53)      | 0.70 (0.58,0.85) | 0.62 (0.50,0.78) | 0.76 (0.71,0.82) |
| Europe                                       | 1.13 (0.99,1.29)      | 0.83 (0.72,0.96) | 0.51 (0.41,0.64) | 0.81 (0.77,0.86) |
| Male PWID                                    | 0.86 (0.67,1.11)      | 0.74 (0.54,1.00) | 0.54 (0.33,0.90) | 0.90 (0.80,1.02) |
| Female PWID                                   | 0.65 (0.40,1.06)      | 0.74 (0.43,1.25) | 0.37 (0.13,1.05) | 0.95 (0.76,1.20) |
| MSM                                           | 1.19 (0.90,1.55)      | 0.78 (0.58,1.05) | 0.54 (0.37,0.81) | 0.79 (0.71,0.88) |
| Heterosexual Male                            | 1.76 (1.31,2.35)      | 1.12 (0.82,1.52) | 0.61 (0.37,1.00) | 0.76 (0.67,0.86) |
| Heterosexual Female                          | 1.27 (0.85,1.91)      | 1.07 (0.72,1.57) | 0.73 (0.40,1.32) | 0.88 (0.74,1.04) |

*All models mutually adjusted for sex, age, PWID, AIDS status, CD4 and viral load as appropriate and stratified by cohort.
Webtable 2: Adjusted* hazard ratios (95% CI) with numbers of events for (i) regimen failure – defined as switching regimen within 6 months of a viral load measurement >1000 copies/mL (ii) death following regimen failure

| Period of starting ART | Regimen failure | Per period |
|------------------------|-----------------|-----------|
| 1996-99                | N: 3,852 (16%)  | 1.23 (1.18, 1.29) |
|                        | N: 3,369 (13%)  | 1.00 (0.79, 1.27)  |
| 2000-03                | N: 2,079 (9%)   | 0.69 (0.65, 0.73)  |
|                        | N: 792 (6%)     | 0.45 (0.42, 0.49)  |
| 2004-07                | N: 143 (4%)     | 0.86 (0.65, 1.15)  |
|                        | N: 146 (4%)     | 0.73 (0.72, 0.75)  |
| 2008-10                | N: 70 (3%)      | 1.07 (0.71, 1.60)  |
|                        | N: 29 (4%)      | 0.98 (0.87, 1.09)  |

*mutually adjusted for age, sex, CD4, viral load, AIDS and PWID transmission risk, and stratified by cohort.

Webtable 3: Expected age at death for PLWH starting ART aged 20 years (years) (95% CI), for men and women by calendar period of starting ART, estimated at exact age 20 years old, for (i) all cohorts; (ii) North American cohorts; and (iii) European cohorts.

| Period of starting ART | Men | Women |
|------------------------|-----|-------|
| 1996-99                |     |       |
| All patients           | 54.4 (53.0, 55.7) | 58.0 (56.8, 59.3) |
| Patients in North America | 47.6 (46.1, 49.1) | 46.2 (44.5, 48.0) |
| Patients in Europe     | 58.1 (56.8, 59.4) | 59.4 (38.2, 60.7) |
| All patients           | 55.0 (53.6, 56.3) | 60.8 (59.7, 62.0) |
| Patients in North America | 48.7 (47.2, 50.1) | 47.6 (45.9, 49.3) |
| Patients in Europe     | 58.4 (57.1, 59.8) | 62.4 (61.4, 63.5) |
| All patients           | 58.8 (57.6, 60.1) | 62.3 (61.2, 63.4) |
| Patients in North America | 52.6 (51.2, 54.0) | 48.1 (46.4, 49.8) |
| Patients in Europe     | 61.6 (60.3, 62.8) | 64.4 (63.4, 65.4) |
| All patients           | 64.0 (63.1, 65.0) | 66.6 (65.8, 67.4) |
| Patients in North America | 57.2 (56.0, 58.4) | 58.1 (56.9, 69.4) |
| Patients in Europe     | 67.6 (66.7, 68.5) | 67.9 (67.2, 68.7) |
| All patients           | 3.3 (0.2, 6.5)   | 2.8 (1.1, 4.4)    |
| Patients in North America | 3.3 (0.8, 5.8)   | 3.6 (-3.1, 10.4)  |
| Patients in Europe     | 3.2 (-0.7, 7.1)  | 2.8 (1.8, 3.8)    |

Based on mortality rates during the 1st 3 years of ART

| Period of starting ART | Men | Women |
|------------------------|-----|-------|
| 1996-99                |     |       |
| All patients           | 62.5 (61.3, 63.6) | 67.1 (66.0, 68.2) |
| Patients in North America | 56.1 (54.9, 57.4) | 51.5 (49.8, 53.3) |
| Patients in Europe     | 67.8 (66.6, 68.9) | 69.4 (68.4, 70.4) |
| All patients           | 64.5 (63.4, 65.6) | 69.7 (68.7, 70.6) |
| Patients in North America | 58.6 (57.3, 59.8) | 57.5 (56.0, 58.9) |
| Patients in Europe     | 73.1 (72.5, 73.8) | 71.5 (70.6, 72.4) |
| All patients           | 69.5 (68.6, 70.4) | 71.5 (70.6, 72.4) |
| Patients in North America | 64.0 (63.0, 65.0) | 55.4 (53.8, 57.0) |
| Patients in Europe     | 73.1 (72.5, 73.8) | 71.5 (70.6, 72.4) |
| All patients           | 73.1 (72.5, 73.8) | 71.5 (70.6, 72.4) |
| Patients in North America | 65.9 (65.0, 66.8) | 63.2 (62.2, 64.3) |
| Patients in Europe     | 79.0 (78.4, 79.5) | 78.3 (77.9, 78.8) |
| All patients           | 3.7 (2.2, 5.3)   | 2.9 (1.2, 4.6)    |
| Patients in North America | 3.5 (1.4, 5.6)   | 3.3 (-2.3, 8.9)   |
| Patients in Europe     | 3.8 (1.5, 6.1)   | 3.0 (1.4, 4.6)    |

Based on mortality rates during the 2nd and 3rd years of ART