**Supplemental Materials**

Supplemental Table: Summary of outcome measures across care continuum studies

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| --- | --- | --- |
| **Measures** | **Time Period** | **Citation** |
| *Linkage studies* | | |
| At least 1 CD4 count or other laboratory value | within 91 days with 7 day lag | (1) |
| At least 1 CD4 count or viral load | within 3 months of initial diagnosis | (2) |
| At least 1 CD4 count or other laboratory value | within 6 months | (3) |
| Having received HIV medical care (from a doctor, nurse practitioner, or physician assistant) | past 6 months | (4) |
| “Established care” = at least two viral load or CD4 tests, separated by at least 91 days, among those who had ever initiated care | 12-month period after initial diagnosis | (1) |
| “Engaged in care” = two clinic visits for HIV care after the posttest counseling visit | within 6 months of the initial positive test | (5) |
| No-show rate among new patients | First HIV care visit | (6) |
| Time to first VL or CD4 | N/A | (7) |
| CD4 | Linkage and 1 year following diagnosis | (7) |
| Viral suppression | Linkage and 1 year following diagnosis | (7) |
| Disease stage | Linkage and 1 year following diagnosis | (7) |
| *Retention studies* | | |
| 1+ HIV care visit | 4 weeks | (8) |
| 1+ HIV care visit | 3 months | (8, 9) |
| 1+ HIV care visit | 6 months | (8, 10, 11) |
| 1+ HIV care visit or laboratory test | 6 months | (12) |
| 2+ HIV care visits | 6 months | (13) |
| 2+ CD4 counts | 6 months | (14) |
| 2+ HIV care visits separated by 90+ days | 12 months | (15) |
| 2+ laboratory tests separated by 90+ days | 12 months | (3, 16) |
| 2+ laboratory tests separated by 90+ days, with at least 1 of those tests in each half of the year | 12 months | (17) |
| Engaged in care = 1+ HIV care visit and no missed visits | 3 months | (18) |
| Appropriate medical care = at least 2 HIV care visits and being on indicated ART based on CD4 and viral load | 6 months | (11) |
| # of HIV care visits | Per unit time (6 months, 12 months) | (14, 19-22) |
| # of quarters with HIV care visit | 12 months | (21) |
| Time to first visit following release from prison | N/A | (8) |
| Adequate visit constancy = at least 3 quarters in one year with an HIV care visit in | 12 months | (21) |
| Visit constancy = at least 1 kept HIV care visit in 3 consecutive 4-month intervals | 12 months | (23, 24) |
| % of patients keeping next two HIV care visits | 12 months | (25) |
| % of all HIV care visits kept | Per unit time (12 months, 36 months) | (23, 25, 26) |
| HIV care visit kept | Next visit (within unknown time frame) | (27, 28) |
| % missed HIV care visits | 6 months | (29) |
| Suboptimal follow-up (no arrived HIV care visit for >6 months) | 6 months | (30) |
| # of missed HIV care visits | 6 months | (29, 31) |
| Gap score = 1 point per quarter (0 means no quarter without a visit, 4 means no visits in any quarters) | 12 months | (32) |
| Gap in care = 180+ days with no HIV care visit | 12 months | (21) |
| Gap in care = 4 months without an HIV care appointment | 12 months | (33) |
| Time to Gap in care = 4 months without an HIV care appointment | N/A | (33) |
| ART prescription | Date of interview/most recent visit | (10-12, 15, 34, 35) |
| ART initiation | Within 6 months of eligibility | (36) |
| Time to discontinuation of ART | N/A | (37) |
| Months receiving ART | N/A | (20) |
| Time from eligibility to ART initiation | N/A | (36) |
| Viral load (value) | At most recent VL conducted | (10, 14, 20, 31, 34) |
| Viral suppression | At most recent VL conducted | (3, 10, 12, 14, 15, 17, 22, 31, 34-36) |
| Virally suppressed on at least one VL conducted | 12 months | (16) |
| Durable suppression = 2+ consecutive suppressed VLs at least 2 weeks apart | 12 months | (16) |
| Time from ART eligibility to viral suppression | N/A | (36) |
| Viral rebound = an unsuppressed VL following 2 consecutive suppressed VLs | 12 months | (16) |
| Virologic failure = 2 consecutive unsuppressed VLs or a single unsuppressed VL with no repeat VL | 3 months | (30) |
| CD4 count (value) | At most recent CD4 conducted | (14, 20, 22, 30, 31, 34, 35) |
| *Reengagement studies* | | |
| Relinked to care = first completed medical visit following relinkage attempt | 12 months | (38) |
| Engaged in care = HIV primary care visit | 6 months | (39) |
| Retention in care = 2+ HIV primary care visits at least 2 months apart | 12 months | (39) |
| No HIV care | 6 months | (40) |
| Median Time to Re-linkage | N/A | (38) |
| Viral load (value) | At most recent VL conducted | (39-41) |
| CD4 count (value) | At most recent CD4 conducted | (41) |
| ART Prescription | 6 months | (41) |

Table legend: Outcomes are considered distinct if they measure the same concept but over a different period of time if the concept cannot be converted to a rate (i.e. 1+ visits in x period of time cannot be converted to a rate but # of visits in 6 months can be converted to a rate). Time periods for retention and reengagement refer to the past x months prior to visit. Laboratory tests refer to CD4 count or viral load testing.

Supplemental Figure 1: Flow of studies, electronic searches were performed June 17 2015



Figure Legend: Among 152 included studies, 6 were included in ‘linkage’ alone; 25 in ‘retention’ alone; 4 in ‘reengagement’ alone; 109 on ‘adherence’ alone; 1 in ‘linkage’, ‘retention’, and ‘adherence’; and 7 in ‘retention’ and ‘adherence’. Exclusion Reasons: Intervention = Study did not include an intervention (i.e. described engagement in care without attempting to modify); Comparator = Study did not have a comparator group for the implemented intervention; Outcome = Study did not have a quantifiable outcome (i.e. qualitative results only); Setting = Non-US setting; ART regimens = Studies which exclusively assessed the impact of ART regimen changes (e.g. one pill a day regimens). \*Two adherence studies addressed both efficacy and cost, overall adherence total # studies = 117

APPENDIX 1: Search string for MEDLINE

**HIV & AIDS Terms:**

(Acquired Immunodeficiency Syndrome[MeSH] OR HIV[MeSH] OR human immunodeficiency virus[TW] OR acquired immunodeficiency syndrome[TW] OR HIV[TW] OR AIDS[TW])

**Linkage and Reengagement Terms:**

(link to care[TW] OR linkage to care[TW] OR care linkage[TW] OR treatment initiation\*[TW] OR therapy initiation\*[TW] OR care initiation\*[TW] OR start treatment\*[TW] OR starting treatment\*[TW] OR start therapy[TW] OR starting therapy[TW] OR re-initiat\*[TW] OR re-engag\*[TW] OR re initiat\*[TW] OR re engag\*[TW] OR re-enroll\*[TW] OR reenroll\*[TW] OR re-start\*[tw] OR restart\*[tw] OR "Patient Acceptance of Health Care"[Mesh])

**Retention Terms:**

(retention in care[TW] OR care retention[TW] OR retention in medical care[TW] OR engagement in care[TW] OR care engagement[TW] OR care maint\*[TW] OR ((retention\*[tw] OR retain\*[tw] OR engage\*[tw] OR “loss to followup”[tw] OR “loss to follow-up”[tw] OR dropout\*[tw] OR drop-out\*[tw] OR "Lost to Follow-Up"[Mesh]) AND (antiretroviral\*[tw] OR "Antiretroviral Therapy, Highly Active"[Mesh] OR "Anti-Retroviral Agents"[Mesh] OR anti-retroviral\*[tw] OR treatment[tw] OR therapy[tw] OR care[tw])) OR “patient dropouts”[MeSH] OR “patient dropouts”[tw])

**Adherence Terms:**

(medication adherence[MeSH] OR ((medication[tw] OR treatment[tw] OR drug[tw] OR anti-retroviral[tw] OR antiretroviral[tw]) AND (adheren\*[TW] OR nonadheren\*[TW] OR non-adheren\*[TW] OR compliance\*[TW] OR noncompliance\*[TW] OR non-compliance\*[TW]))

**Care continuum Terms:**

(“care continuum”[tw] OR “care cascade”[tw] OR “continuum of care”[tw] OR “cascade of care”[tw] OR “continuum of HIV care”[tw] OR “cascade of HIV care”[tw] OR treatment cascade[tw] OR treatment continuum[tw])

**Intervention Terms:**

(“Intervention studies”[Mesh] OR “Evaluation Studies as topic”[Mesh] OR “Evaluation studies”[Publication Type] OR intervention\*[tw] OR evaluation\*[tw] OR implement\*[tw] OR program\*[tw] OR ameliorate[TW] OR change[TW] OR changing[TW] OR effectiveness[TW] OR evaluate[TW] OR evaluation[TW] OR evidence[TW] OR gain[TW] OR impact[TW] OR improve[TW] OR improved[TW] OR improving[TW] OR modify[TW] OR modified[TW])

**Country Terms (NOT):**

((“Developing Countries”[Mesh] OR cameroon[MeSH] OR “central African republic”[MeSH] OR chad[MeSH] OR congo[MeSH] OR “Democratic Republic of the Congo”[MeSH] OR “Equatorial Guinea”[MeSH] OR gabon[MeSH] OR burundi[MeSH] OR djibouti[MeSH] OR eritrea[MeSH] OR ethiopia[MeSH] OR kenya[MeSH] OR rwanda[MeSH] OR somalia[MeSH] OR sudan[MeSH] OR tanzania[MeSH] OR uganda[MeSH] OR angola[MeSH] OR botswana[MeSH] OR lesotho[MeSH] OR malawi[MeSH] OR mozambique[MeSH] OR namibia[MeSH] OR “South Africa”[MeSH] OR swaziland[MeSH] OR Zambia[MeSH] OR Zimbabwe[MeSH] OR Benin[MeSH] OR “Burkina Faso”[MeSH] OR “Cape Verde”[MeSH] OR “Cote d’Ivoire”[MeSH] OR gambia[MeSH] OR ghana[MeSH] OR guinea[MeSH] OR “guinea-bissau”[MeSH] OR liberia[MeSH] OR mali[MeSH] OR mauritania[MeSH] OR niger[MeSH] OR nigeria[MeSH] OR senegal[MeSH] OR “Sierra Leone”[MeSH] OR togo[MeSH] OR algeria[MeSH] OR egypt[MeSH] OR libya[MeSH] OR morocco[MeSH] OR tunisia[MeSH] OR cuba[MeSH] OR “Dominican republic”[MeSH] OR haiti[MeSH] OR jamaica[MeSH] OR belize[MeSH] OR “costa rica”[MeSH] OR “el Salvador”[MeSH] OR guatemala[MeSH] OR honduras[MeSH] OR nicaragua[MeSH] OR panama[MeSH] OR canada[MeSH] OR mexico[MeSH] OR argentina[MeSH] OR bolivia[MeSH] OR brazil[MeSH] OR chile[MeSH] OR colombia[MeSH] OR ecuador[MeSH] OR guyana[MeSH] OR paraguay[MeSH] OR peru[MeSH] OR suriname[MeSH] OR uruguay[MeSH] OR venezuela[MeSH] OR kazakhstan[MeSH] OR kyrgyzstan[MeSH] OR tajikistan[MeSH] OR turkmenistan[MeSH] OR uzbekistan[MeSH] OR russia[MeSH] OR cambodia[MeSH] OR indonesia[MeSH] OR laos[MeSH] OR malaysia[MeSH] OR myanmar[MeSH] OR philippines[MeSH] OR singapore[MeSH] OR thailand[MeSH] OR vietnam[MeSH] OR bangladesh[MeSH] OR bhutan[MeSH] OR india[MeSH] OR nepal[MeSH] OR pakistan[MeSH] OR “sri lanka”[MeSH] OR china[MeSH] OR japan[MeSH] OR korea[MeSH] OR mongolia[MeSH] OR taiwan[MeSH] OR australia[MeSH] OR berlin[MeSH] OR london[MeSH] OR moscow[MeSH] OR paris[MeSH] OR rome[MeSH] OR seoul[MeSH] OR tokyo[MeSH] OR austria[MeSH] OR belgium[MeSH] OR albania[MeSH] OR “bosnia-herzegovina”[MeSH] OR bulgaria[MeSH] OR croatia[MeSH] OR “Czech republic”[MeSH] OR hungary[MeSH] OR kosovo[MeSH] OR macedonia[MeSH] OR moldova[MeSH] OR montenegro[MeSH] OR poland[MeSH] OR belarus[MeSH] OR romania[MeSH] OR serbia[MeSH] OR slovakia[MeSH] OR slovenia[MeSH] OR ukraine[MeSH] OR france[MeSH] OR germany[MeSH] OR “great Britain”[MeSH] OR greece[MeSH] OR ireland[MeSH] OR italy[MeSH] OR liechtenstein[MeSH] OR luxembourg[MeSH] OR monaco[MeSH] OR netherlands[MeSH] OR portugal[MeSH] OR denmark[MeSH] OR finland[MeSH] OR iceland[MeSH] OR norway[MeSH] OR sweden[MeSH] OR spain[MeSH] OR switzerland[MeSH] OR armenia[MeSH] OR georgia[MeSH] OR “new Zealand”[MeSH]) NOT “united states”[Mesh])

((“Developing Countries”[Tiab] OR cameroon[Tiab] OR “central African republic”[Tiab] OR chad[Tiab] OR congo[Tiab] OR “Democratic Republic of the Congo”[Tiab] OR “Equatorial Guinea”[Tiab] OR gabon[Tiab] OR burundi[Tiab] OR djibouti[Tiab] OR eritrea[Tiab] OR ethiopia[Tiab] OR kenya[Tiab] OR rwanda[Tiab] OR somalia[Tiab] OR sudan[Tiab] OR tanzania[Tiab] OR uganda[Tiab] OR angola[Tiab] OR botswana[Tiab] OR lesotho[Tiab] OR malawi[Tiab] OR mozambique[Tiab] OR namibia[Tiab] OR “South Africa”[Tiab] OR swaziland[Tiab] OR Zambia[Tiab] OR Zimbabwe[Tiab] OR Benin[Tiab] OR “Burkina Faso”[Tiab] OR “Cape Verde”[Tiab] OR “Cote d’Ivoire”[Tiab] OR gambia[Tiab] OR ghana[Tiab] OR guinea[Tiab] OR “guinea-bissau”[Tiab] OR liberia[Tiab] OR mali[Tiab] OR mauritania[Tiab] OR niger[Tiab] OR nigeria[Tiab] OR senegal[Tiab] OR “Sierra Leone”[Tiab] OR togo[Tiab] OR algeria[Tiab] OR egypt[Tiab] OR libya[Tiab] OR morocco[Tiab] OR tunisia[Tiab] OR cuba[Tiab] OR “Dominican republic”[Tiab] OR haiti[Tiab] OR jamaica[Tiab] OR belize[Tiab] OR “costa rica”[Tiab] OR “el Salvador”[Tiab] OR guatemala[Tiab] OR honduras[Tiab] OR nicaragua[Tiab] OR panama[Tiab] OR canada[Tiab] OR mexico[Tiab] OR argentina[Tiab] OR bolivia[Tiab] OR brazil[Tiab] OR chile[Tiab] OR colombia[Tiab] OR ecuador[Tiab] OR guyana[Tiab] OR paraguay[Tiab] OR peru[Tiab] OR suriname[Tiab] OR uruguay[Tiab] OR venezuela[Tiab] OR kazakhstan[Tiab] OR kyrgyzstan[Tiab] OR tajikistan[Tiab] OR turkmenistan[Tiab] OR uzbekistan[Tiab] OR russia[Tiab] OR cambodia[Tiab] OR indonesia[Tiab] OR laos[Tiab] OR malaysia[Tiab] OR myanmar[Tiab] OR philippines[Tiab] OR singapore[Tiab] OR thailand[Tiab] OR vietnam[Tiab] OR bangladesh[Tiab] OR bhutan[Tiab] OR india[Tiab] OR nepal[Tiab] OR pakistan[Tiab] OR “sri lanka”[Tiab] OR china[Tiab] OR japan[Tiab] OR korea[Tiab] OR mongolia[Tiab] OR taiwan[Tiab] OR australia[Tiab] OR berlin[Tiab] OR london[Tiab] OR moscow[Tiab] OR paris[Tiab] OR rome[Tiab] OR seoul[Tiab] OR tokyo[Tiab] OR austria[Tiab] OR belgium[Tiab] OR albania[Tiab] OR “bosnia-herzegovina”[Tiab] OR bulgaria[Tiab] OR croatia[Tiab] OR “Czech republic”[Tiab] OR hungary[Tiab] OR kosovo[Tiab] OR macedonia[Tiab] OR moldova[Tiab] OR montenegro[Tiab] OR poland[Tiab] OR belarus[Tiab] OR romania[Tiab] OR serbia[Tiab] OR slovakia[Tiab] OR slovenia[Tiab] OR ukraine[Tiab] OR france[Tiab] OR germany[Tiab] OR “great Britain”[Tiab] OR greece[Tiab] OR ireland[Tiab] OR italy[Tiab] OR liechtenstein[Tiab] OR luxembourg[Tiab] OR monaco[Tiab] OR netherlands[Tiab] OR portugal[Tiab] OR denmark[Tiab] OR finland[Tiab] OR iceland[Tiab] OR norway[Tiab] OR sweden[Tiab] OR spain[Tiab] OR switzerland[Tiab] OR armenia[Tiab] OR georgia[Tiab] OR “new Zealand”[Tiab]) NOT “united states”[Tiab])

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