**Table 1. Study outcome derivations**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Outcome** | **Form on which data collected** | **Derivation** |
| **Service Provision** |
| 1 | Number and proportion of outpatient visits related to each chronic disease | Service statistics | Averaged across July-September 2012 and types of facilities |
| **Availability of Guidelines and Supplies** |
| 2 | Availability of guidelines | SARA questionnaire | Guidelines observed in the outpatient clinic or respective specialist clinic for HIV, HTN or DM |
| 3 | Availability of basic diagnostic equipment | SARA questionnaire | HIV: Screening and confirmatory rapid tests available and not expiredHTN: Digital blood pressure apparatus (or manual blood pressure apparatus AND stethoscope) observed and functioning in OPD or HTN clinicDM: Glucometer observed and functioning in OPD or DM clinic, or available and mostly/always functioning in laboratory (with test strips never or only occasionally out of stock) |
| 4 | Availability of first line drug therapy | SARA questionnaire | HIV: At least one first line regimen available and not expired (TDF+3TC or TDF+FTC or AZT+3TC or d4T+3TC AND NVP or EFV)HTN: At least one thiazide diuretic (hydroclorthtiazide or bendrofluazide) available and not expiredDM: Metformin available and not expired |
| **Management and Training Systems** |
| 5 | Training | SARA questionnaire | Any outpatient staff member having received training in the diagnosis and management of HIV, HTN or DM within the last 2 years |
| 6 | Supervision | SARA questionnaire | Having received a monitoring or supervisory visit from a higher level of the health service within last 3 months for HIV, HTN or DM (asked of non-communicable diseases combined and assumed to apply equally to HTN and DM) |
| 7 | Outreach | SARA questionnaire | Clinical outreach periodically carried out specifically to target HIV, HTN or DM |
| **Preparedness of Human Resources** |
| 8 | At least fair knowledge | Self-completed questionnaire | Assessed via a case scenario questionnaires for HIV, HTN and DM, and defined as scoring at least 7/10 |
| 9 | Experienced | Self-completed questionnaire | Having seen >5 patients with each of HIV, HTN or DM in last 3 months |
| 10 | Comfortable | Self-completed questionnaire | Reporting "very comfortable" when asked whether feel comfortable with HIV, HTN or DM and know how to manage |

HTN=hypertension. DM=diabetes mellitus. OPD=outpatient department. TDF=tenofovir. FTC=emtricitabine. 3TC=lamivudine. AZT=zidovudine. d4T=stavudine. NVP=nevirapine. EFV=efavirenz.

**Figure 1. Burden of chronic diseases at 28 health facilities in Uganda: mean number of chronic disease visits per month per facility is displayed to the left of the midline and the proportion of all outpatient visits due to chronic diseases to the right.**



COPD = chronic obstructive pulmonary disease

**Table 2. Burden of chronic diseases at 28 health facilities in Uganda: service statistics for July-September 2012, by health facility type.**

|  | **Hospitals (N=4)** | **Health centers III (N=12)** | **Health centres II (N=12)** |
| --- | --- | --- | --- |
| **All visits/month/facility** | 1876 | 436 | 233 |
| **Hypertension** |  |  |  |
| Patients/month | 89 | 9 | 2 |
| Visits/month (% of all visits) | 94 (5·0%) | 10 (2·3%) | 2 (0·9%) |
| (% of CD visits) | (15.0%) | (16.9%) | (22.2%) |
| **Diabetes mellitus** |  |  |  |
| Patients/month | 19 | <1 | <1 |
| Visits/month (% of all visits) | 19 (1·0%) | <1 (0·1%) | <1 (<0·1%) |
| (% of CD visits) | (3.0%) | (0.7%) | (0.3%) |
| **Heart failure** |  |  |  |
| Patients/month | 2 | <1 | 0 |
| Visits/month (% of all visits) | 2 (0·1%) | <1 (0·1%) | 0 |
| (% of CD visits) | (0.3%) | (0.4%) |  |
| **COPD or asthma** |  |  |  |
| Patients/month | 14 | 3 | 1 |
| Visits/month (% of all visits) | 15 (0·8%) | 3 (0·7%) | 1 (0·4%) |
| (% of CD visits) | (2.4%) | (5.1%) | (11.1%) |
| **Epilepsy** |  |  |  |
| Patients/month | 25 | 2 | <1 |
| Visits/month (% of all visits) | 25 (1·3%) | 2 (0·5%) | <1 (0·4%) |
| (% of CD visits) | (4.0%) | (3.4%) | (9.6%) |
| **HIV infection** |  |  |  |
| Patients/month | 386 | 39 | 5 |
| Visits/month (% of all visits) | 470 (25·1%) | 42 (9·6%) | 5 (2·1%) |
| (% of CD visits) | (75.2%) | (71.2%) | (55.6%) |
| ***Visits for CDs/month/facility*** | *625* | *59* | *9* |

Results represent the mean number of patients and visits per month per facility, and proportion of visits as percentage of all visits made by patients to these facilities, and as a proportion of all visits made for CDs.

COPD=chronic obstructive lung disease.

**Table 3. Availability of guidelines and basic supplies and strength of management, training and reporting systems to ensure quality care for HIV, hypertension and diabetes mellitus at 28 health facilities in Uganda, by health facility level.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Outcome** | **Disease** | **Hospitals and health centres IV (N=4)** | **Health centers III (N=12)** | **Health centres II (N=12)** | **P-value****(comparing facilities)** | **Total****(N=28)** | **P-value (versus HIV)** |
| **Availability of guidelines and basic supplies** |
| **Guidelines** | **HIV** | 4 (100%) | 9 (75%) | 0 (0%) | <0·001 | 13 (42%) | - |
| **HTN** | 4 (100%) | 9 (75%) | 9 (75%) | 0·69 | 22 (79%) | 0.01 |
| **DM** | 4 (100%) | 9 (75%) | 9 (75%) | 0·69 | 22 (79%) | 0.01 |
| **Basic diagnostic equipment** | **HIV** | 4 (100%) | 11 (92%) | 4 (33%) | 0·007 | 19 (68%) | - |
| **HTN** | 4 (100%) | 11 (92%) | 8 (67%) | 0·31 | 23 (82%) | 0.29 |
| **DM** | 4 (100%) | 5 (42%) | 1 (8%) | 0·003 | 10 (36%) | 0.004 |
| **First line therapy** | **HIV** | 4 (100%) | 8 (67%) | 0 (-) | <0·001 | 12 (43%) | - |
| **HTN** | 4 (100%) | 8 (67%) | 1 (8%) | 0·001 | 13 (46%) | >0.99 |
| **DM** | 3 (75%) | 2 (17%) | 0 (-) | 0·006 | 5 (18%) | 0.07 |
| **Strength of management, training and reporting systems** |
| **Training of any HW past 2 years** | **HIV** | 4 (100%) | 8 (67%) | 8 (67%) | 0·63 | 20 (71%) | - |
| **HTN** | 2 (50%) | 0 (0%) | 0 (0%) | 0·02 | 2 (7%) | <0·001 |
| **DM** | 2 (50%) | 0 (0%) | 0 (0%) | 0·02 | 2 (7%) | <0·001 |
| **Supervision received last month** | **HIV** | 4 (100%) | 10 (83%) | 4 (33%) | 0·02 | 18 (64%) | - |
| **HTN** | 1 (25%) | 1 (8%) | 2 (17%) | 0·79 | 4 (14%) | <0·001 |
| **DM** | 1 (25%) | 1 (8%) | 2 (17%) | 0·79 | 4 (14%) | <0·001 |
| **Outreach** | **HIV** | 4 (100%) | 9 (75%) | 9 (75%) | 0.69 | 22 (79%) |  |
| **HTN** | 2 (50%) | 3 (25%) | 3 (25%) | 0.72 | 8 (29%) | <0·001 |
| **DM** | 2 (50%) | 1 (8%) | 1 (8%) | 0.13 | 4 (14%) | <0·001 |

See Table 1 for outcome definitions. HTN=hypertension. DM=diabetes mellitus.

**Table 4. Current level of preparedness of human resources to ensure quality care for HIV, hypertension and diabetes mellitus at 28 health facilities in Uganda, among 222 healthcare workers by: (A) health facility level and (B) healthcare worker cadre.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  **Outcome** | **Disease** | **Hospitals / health centres IV (N=103)** | **Health centers III (N=83)** | **Health** **centres II (N=36)** | **P-value****(comparing facilities)** | **Total (N=222)** | **P-value (versus HIV)** |
| **At least fair knowledge** | **HIV** | 81 ( 79%) | 73 ( 88%) | 30 ( 83%) | 0·28 | 184 ( 83%) | - |
| **HTN** | 75 ( 73%) | 64 ( 77%) | 20 ( 56%) | 0·06 | 159 ( 72%) | <0.001 |
| **DM** | 62 ( 60%) | 42 ( 51%) | 11 ( 31%) | 0·02 | 115 ( 52%) | <0.001 |
| **Experienced** | **HIV** | 89 ( 86%) | 72 ( 87%) | 16 ( 44%) | <0.001 | 177 ( 80%) | - |
| **HTN** | 49 ( 48%) | 23 ( 28%) | 5 ( 14%) | 0·003 | 77 ( 35%) | <0.001 |
| **DM** | 30 ( 29%) | 7 ( 8%) | 0 ( 0%) | 0·02 | 37 ( 17%) | <0.001 |
| **Comfortable** | **HIV** | 28 ( 27%) | 15 ( 18%) | 4 ( 11%) | 0.16 | 47 ( 21%) | - |
| **HTN** | 21 ( 20%) | 5 ( 6%) | 0 ( 0%) | 0.02 | 26 ( 12%) | 0.002 |
| **DM** | 13 ( 13%) | 2 ( 2%) | 1 ( 3%) | 0.02 | 16 ( 7%) | <0.001 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  **Outcome** | **Disease** | **MDs****(N=13)** | **Non-MD clinicians****(N=29)** | **Midwives****(N=34)** | **Nurses****(N=87)** | **Assistants****(N=59)** | **P-value** |
| **At least fair knowledge** | **HIV** | 13 (100%) | 28 ( 97%) | 31 ( 91%) | 74 ( 85%) | 38 ( 64%) | 0·02 |
| **HTN** | 13 (100%) | 29 (100%) | 21 ( 62%) | 70 ( 80%) | 26 ( 44%) | <0·001 |
| **DM** | 13 (100%) | 24 ( 83%) | 10 ( 29%) | 52 ( 60%) | 16 ( 27%) | <0·001 |
| **Experienced** | **HIV** | 12 ( 92%) | 28 ( 97%) | 27 ( 79%) | 70 ( 80%) | 40 ( 68%) | 0·009 |
| **HTN** | 10 ( 77%) | 18 ( 62%) | 6 ( 18%) | 28 ( 32%) | 15 ( 25%) | 0·001 |
| **DM** | 6 ( 46%) | 10 ( 34%) | 0 ( 0%) | 14 ( 16%) | 7 ( 12%) | <0·001 |
| **Comfortable** | **HIV** | 6 ( 46%) | 9 ( 31%) | 3 ( 9%) | 22 ( 25%) | 7 ( 12%) | 0·008 |
| **HTN** | 11 ( 85%) | 5 ( 17%) | 0 ( 0%) | 7 ( 8%) | 3 ( 5%) | <0·001 |
| **DM** | 8 ( 62%) | 3 ( 10%) | 0 ( 0%) | 4 ( 5%) | 1 ( 2%) | <0·001 |

See Table 1 for outcome definitions. HTN=hypertension. DM=diabetes mellitus.

Definition of ‘fair knowledge’: health worker scored 7 of 10 possible points;

Definition of ‘Experienced’: managed at least 5 cases over last 3 months

**Figure 2. Staffing levels at 28 health facilities in Uganda: proportion of facilities having 100% of the recommended staffing levels for each cadre of healthcare worker, by health facility level**



