Supplemental Digital Content 1 – Table

Estimated Average Annual Personnel Effort Spent per Patient by Region

	Average Time Spent per Patient (minutes)			
Clinic Staff Role	**West Uganda**	**East Uganda**	**Kenya**	**Total**
Clinical Officer	4.6	10.5	12.3	9.7
Nurse	15.5	24.6	8.6	15.3
Laboratory Technician	11.0	10.2	11.5	11.0
Pharmacy Technician	--	--	2.4	1.0
Peer Educator	--	3.2	24.7	11.1
Data/Information Officer	0.2	15.8	19.1	12.6
Other[A]	5.0	4.1	25.5	13.2
Total	**36.3**	**68.4**	**103.6**	**73.4**

A: Other staff included Community and Community Health Assistants (Uganda), as well as reception staff and HIV testing counselors/trackers (Kenya)

Appendix. Calculation of Annual Per Person Cost of Streamlined HIV Care Delivery

For each SEARCH Study clinic, we computed the per-person per-year cost of streamlined HIV care/ART delivery as the sum of five cost components, as follows:

Annual per person streamlined care cost (for clinic j) = $\boldsymbol{A_j + B_j + C_j + D_j + E_j}$

where:

1. Personnel cost component: $$\boldsymbol{A_j} = \left(\frac{\sum_{ij=1}^{n_{ij}} \left(S_{ij} \times \frac{T_{sij}}{T_{tij}} \right)}{26} \div V_{oj} \right) \times \left(\frac{V_{tk}}{N_k} \right)$$

where: i = clinic staff member

j = clinic

k = community

n_j = total number of staff members in clinic j who supported streamlined care

S_i = staff member's salary and benefits during two week observation period

T_{si} = total time spent on streamlined care in clinic j during two week observation period

T_{ti} = total time spent on all duties in clinic j during two week observation period

V_{oj} = total number of streamlined care visits in clinic j during two week observation period

V_{tk} = total number of streamlined care visits in community k during year

N_k = total number of streamlined care patients in community k during year

Staff member salaries and associated benefits were obtained through administrative records review, augmented by interviews with SEARCH Coordinators, Assistant Coordinators and health facility managers. Proportion of effort of on-site staff toward streamlined care was captured through the time-and-motion study (described in methods section). Proportion of effort of off-site staff (e.g. supervisors)

toward streamlined care was estimated during staff interviews. We estimated the number of minutes staff dedicated to streamlined care by excluding time associated with: (1) non-communicable disease care, (2) care delivered to individuals coming from outside SEARCH communities, (3) time spent on SEARCH Study research (i.e., non-clinical) activities, and (4) non-productive work time (e.g., time spent waiting for a patient, idle or on a scheduled break). This figure was divided by the total productive work time (total time minus time spent waiting, idle or on break) to obtain the proportion of time spent supporting streamlined care.

We computed the sum of each staff member's annual salary multiplied by their proportional allocation of time spent on streamlined care (observed in time and motion studies). This sum of proportional salary components was divided by 26, yielding personnel costs for a two-week period, then divided by the number of patient visits during the two week observation period, yielding personnel costs per visit. This was then multiplied by the total number of visits observed in the clinic in one year, divided by the total number of patients served with streamlined care in one year, yielding the personnel component cost for one year of streamlined ART delivery to one person.

2. ART medication costs: $\boldsymbol{B_j}$

The annual per person cost of antiretroviral medications in each region was obtained from SEARCH Study administrative records. We assumed all patients received ART without gaps in administration.

3. VL testing costs: $\boldsymbol{C_j} = \frac{(VL_{mat}(j)+VL_{trans}(j))}{V_{oj}} + 2(VL_{test})$

where: $VL_{mat}(j)$ = materials costs in clinic j during two week observation period

$VL_{trans}(j)$ = transport costs in clinic j during two week observation period

VL_{test} = cost per VL test

VL testing costs were estimated through review of administrative records and interviews with SEARCH Coordinators and Assistant Coordinators. We reviewed on-site administrative records to obtain information on VL testing supplies consumed during the two week observation period. Unit material costs and processing costs for VL specimens were obtained from SEARCH Study administrative records. The estimated cost of transporting specimens from each health facility to the central laboratory was estimated through interviews with SEARCH Coordinators and Assistant Coordinators. This estimate was multiplied by the number days per week that VL specimens were transported. To estimate the per person per year costs associated with VL testing, we divided the cost of VL testing supplies and transport of specimens by the number of patient visits during the two week observation period and then added the cost of two VL tests per year provided to study patients (i.e., $110 per patient per year).

4. Recurrent cost component: $\boldsymbol{D_j} = \left(R_j \div V_{oj}\right) \times \left(\frac{V_{tk}}{N_k}\right)$

where: R_j = recurrent costs tallied during two week observation period

V_{oj}, V_{tk}, N_k = as above

Costs of other recurring goods and services for the two-week observation period included other medications (i.e., those apart from ART), other laboratory tests (i.e., apart from VL tests), utilities (including electricity, water, and generator expenses), and communications (mobile phone usage and cellular-based internet services). These costs were collected through review of administrative records and interviews with health facility managers. We tallied costs accrued during the two week observation period and divided by patient visits in that health facility during the observation period, yielding cost per visit. This was multiplied by average number of patient visits per year in that community to obtain the per-person per-year estimate for other recurrent goods and services.

5. Fixed cost component: $\boldsymbol{E_j} = \left(F_j \div V_{oj}\right) \times \left(\frac{V_{tk}}{N_k}\right)$

where: F_j = fixed costs tallied during two week observation period

V_{oj}, V_{tk}, N_k = as above

Fixed capital and facility costs for the two-week observation period were estimated through interviews with health facility managers. Capital goods included equipment needed for patient care (e.g. laboratory equipment including a centrifuge, basic furniture including exam tables and chairs, computers, and vehicles [e.g., transport motor bikes]). These costs were amortized on a straight-line basis over 3 years for laboratory equipment and 5 years for furniture, vehicles and computers, assuming no salvage value. Facility costs were estimated using local prevailing rates and amortized based on the lifespan of the building and to what degree space was shared between SEARCH streamlined care provision and other activities in the health facility. Fixed costs were divided by the number of patient visits in that health facility during the two week observation period and then multiplied by the average number of visits per person per year in that community to obtain the per-person per-year estimate for fixed capital and facility costs.

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