Data assessment tools to monitor and improve data quality and patient care

Owenga E.[1,2], Kibaara C.[1,2], Blat C.[1,3], Mutegi E.[1,2], Armes MN.[1,3], Wafula E.[1,2], Jelagat J.[1,2], Ahomo M.[4], Shade S.[1,3], Lewis-Kulzer J.[1,3]

1. Family AIDS Care and Education Services (FACES), Kisumu, Kenya, 2. Research Care and Training Program, Center for Microbiology Research, Kenya Medical Research Institute (KEMRI), Kisumu, Kenya
3. Department of Obstetrics, Gynecology and Reproductive Sciences, University of California San Francisco, CA, USA 4. Ministry of Health, Kenya

Introduction

o Family AIDS Care and Education Services (FACES) is a comprehensive HIV prevention, care and treatment program primarily based in Nyanza Province, Kenya.

o Ensuring that medical records are completed well and data is entered accurately is critical to data integrity and health outcomes monitoring.

o This study aimed to evaluate the effectiveness of interventions to improve data quality at FACES sites where clinical encounter data is entered into an electronic medical records system (EMR sites) and sites without EMR data capture (non-EMR sites).
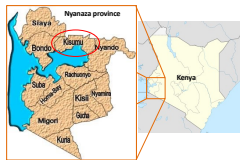
Figure 1: Map of Nyanza province, highlighting the Kisumu region.

Methods

o Between September 2011 and September 2012, FACES introduced three assessments to improve medical records data quality:

1. Database queries of twelve key encounter form fields related to good patient care, including last CD4 count, WHO disease stage, and referral source, pooling data from all EMR sites.
   o Baseline [first month of intervention]: September 2011

2. On-site file audits of 10 MoH257 HIV Blue Cards sampled per site from both EMR and non-EMR sites
   o Baseline: September 2012

3. Data entry accuracy audits of 20 forms entered per data clerk per month, comparing electronic information to clinical notes (considered "gold standard").
   o Baseline: September 2012

o Performance feedback from completeness assessments were given to sites monthly in the form of recognition for satisfactory completion (≥95%) and targeted reinforcement of proper completion protocols with clinical staff. Summary data accuracy statistics were shared with data clerks during weekly departmental meetings.

o Baseline and six month findings were compared to evaluate impact.

Results

At EMR sites, database queries of key variables found that,
At baseline:

- Anti-retroviral (ARV) plan (response options: not on ARVs, eligible for ARVs, initiate, stop, substitute, continue or restart ARVs) was documented on 95.9% of encounters
- ARV regimen was documented on 97.0% of encounters for patients on ARVs
- Last CD4 count and WHO stage were documented on 67.5% and 86.9% of encounters, respectively.
- Referral source was completed for 94.2% of enrollments
- Discontinuation reason was completed for 88.9% of discontinuations.
- **Mean completion of all key variables was 87.0%**

After six months:

- Documentation of ARV plan rose to 99.1% (+3%)
- Documentation of ARV regimen rose to 98.5% (+1%)
- Documentation of last CD4 count rose to 96.1% (+29%) and WHO stage rose to 96.1% (+9%)
- Documentation of referral source rose to 99.0% (+5%)
- Documentation of Discontinuation reason rose to 96.2% (+7%)
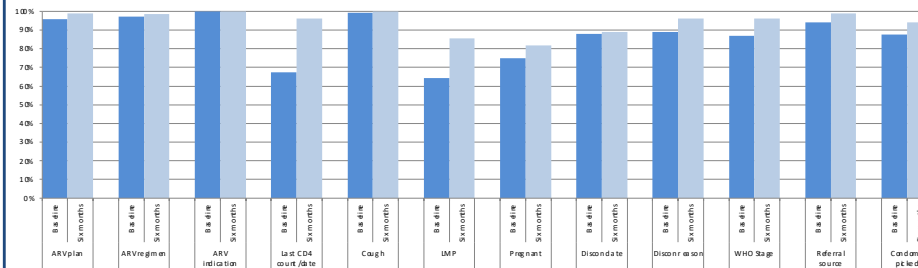- **Mean completion of all key variables rose to 94.6% (+8%)**

Figure 2. Key variable completion at FACES EMR sites, September 2011 (baseline) vs. February 2012 (six month follow-up).
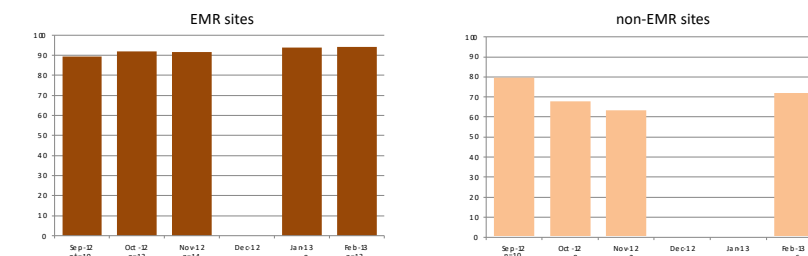

Figure 3: Completion findings from on-site audits of MoH257 Blue Cards for September 2012 (baseline) through February 2013 at EMR and non-EMR sites.
†n's indicate number of sites audited; blanks reflect months when audits were not conducted

Results (continued)

- On-site audits of sampled MoH257 Blue Cards found overall form completeness among EMR sites was 89.4% at baseline, rising to 94.1%(+5%) six months later.
- At non-EMR sites, MoH257 Blue Card completion declined from 79.5% at baseline to 72.0% (-7.5%) after six months.
- Encounter forms were entered with 99.6% accuracy at baseline. Accuracy rose to 99.9% after six months.

Table 1. EMR data entry error rates*‡, by district.

District (n clerks†)	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13
Migori (n=4)	0.005	0.005	0.003		0.002	0.003
Nyatike (n=8)	0.000	0.001	0.000		0.000	0.000
Rongo (n=5)	0.007	0.007	0.003		0.006	0.003
Kisumu (n=13)	0.006	0.002	0.001		0.001	0.001
Suba (n=7)	0.002	0.001	0.001		0.000	0.000
Nairobi (n=2)	0.002		0.008			
Total (n=38)	0.004	0.003	0.002		0.002	0.001

*Error rates reflect averaged per-clerk rates, where the clerk rate was calculated as number of fields in error as a proportion of number of fields on form multiplied by number of forms assessed
†Number of data clerks in the district
‡Blanks reflect districts or months when audits were not conducted

Conclusion

Medical record completion improved at EMR sites and data accuracy remained high. Medical record completion declined at non-EMR sites. Additional strategies are needed to facilitate better form completion at non-EMR sites.

Acknowledgements

Bibliography

1. Castelnuovo B, Kiragga A, Afayo V, Ncube M, Orama R, Magero S, et al. Implementation of provider-based electronic medical records and improvement of the quality of data in a large HIV program in sub-saharan africa. PLoS One. 2012;7(12):e51631.
2. Amoroso CL, Akimana B, Wise B, Fraser HS. Using electronic medical records for HIV care in rural rwanda. Stud Health Technol Inform. 2010;160(Pt 1):337-41.
3. Mphatswe W, Mate KS, Bennett B, Ngidi H, Reddy J, Barker PM, et al. Improving public health information: A data quality intervention in KwaZulu-natal, south africa. Bull World Health Organ. 2012 Mar 1;90(3):176-82.