Assessing care for patients with TB/HIV/STI infections in a rural district in KwaZulu-Natal

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Setting. Despite the prioritisation of TB, HIV and STI programmes in South Africa, service targets are not achieved, have had little effect, and the magnitude of the epidemics continues to escalate.

Objective. To report on a participatory quality improvement intervention designed to evaluate these priority programmes in primary health care (PHC) clinics in a rural district in KwaZulu-Natal.

Methods. A participatory quality improvement intervention with district health managers, PHC supervisors and researchers was used to modify a TB/HIV/STI audit tool for use in a rural area, conduct a district-wide clinic audit, assess performance, set targets and develop plans to address the problems identified.

Results. We highlight weaknesses in training and support of staff at PHC clinics, pharmaceutical and laboratory failures, and inadequate monitoring of patients as contributing to poor TB, HIV and STI service implementation. In the 25 facilities audited, 71% of the clinical staff had received no training in TB diagnosis and management, and 46% of the facilities were visited monthly by a PHC supervisor. Eighty per cent of the facilities experienced non-availability of essential drugs and supplies; polymerase chain reaction (PCR) results were not documented for 54% of specimens assessed, and the mean length of time between eligibility for ART and starting treatment was 47 days.

Conclusion. Through a participatory approach, a TB/HIV/STI audit tool was successfully adapted and implemented in a rural district. It yielded information enabling managers to identify obstacles to TB, HIV and STI service implementation and develop plans to address these. The audit can be used by the district to monitor priority services at a primary level.

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South Africa has a high infectious disease burden with concomitant HIV and TB epidemics and high rates of sexually transmitted infections (STIs). In 2009, KwaZulu-Natal had the highest TB notification rate in the country, with 1 163 cases per 100 000 population, in a setting where 80% of all TB patients are HIV-positive, and the 17% HIV prevalence in 15 - 49-year-olds was among the highest in the world.[1,2]

Expenditure on primary level services in South Africa has increased from investment in infrastructure and human resources, yet the health services have been ineffective in reducing the caseload and incidence of the TB, HIV and STI epidemics.

Between 2002 and 2009, a TB/HIV/STI service evaluation tool was developed in the Western Cape to promote integration between these services and to rationalise supervisory tools in use at a facility level. In an urban area with good infrastructural support, the tool successfully identified problems and, if used regularly, could improve service delivery.[3] It was adapted for rural areas, to account for differences in service delivery operations and priorities.

We describe the adaptation of the urban audit tool to assess and support effective TB/HIV/STI services at primary care level in a rural South African district, and to provide the results of the first audit in which its relevance and usefulness in a rural setting were tested.

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Setting

Primary health care (PHC) services are nurse-driven and, in rural areas where a small population is served, one professional nurse in a small facility may provide the only health care in a vast geographical area with no support from a doctor. Clinic nurses become responsible for diagnosing and managing TB, HIV and STIs, providing acute curative services and attending to chronic conditions such as hypertension.

An economically and infrastructurally poor rural district in KwaZulu-Natal was selected as the setting for adaptation and piloting the tool. The residents are among the most socio-economically deprived in the country, with limited or no access to piped water.[4] Impassable roads in the rainy season and inadequate communication networks result in remote clinics having no communication with the district hospital or district office for weeks. Limited managerial and infrastructural capacity, staff attrition and delays in filling key managerial and clinical posts hinder the performance of public health services. For example, the TB cure rate of 62% falls far short of the national target of 85%.[4] The district is not named as its conditions are similar to those in many rural districts of South Africa.

Methods

The audit tool explores six domains of effective programme delivery: access, availability, capacity, continuity of care, quality and integrated care adapted from a UNAIDS/UNICEF[5] framework evaluating Prevention of Mother to Child Transmission (PMTCT) programmes.[3]

TB/HIV/STI programmes at PHC level comprise HIV counselling and testing (HCT), HIV care prior to the commencement of antiretroviral therapy (pre-ART), ART care, TB management, and evaluation of STI treatment. Facility requirements necessary for HIV/TB/STI programme delivery are assessed. Tracer indicators assess the implementation of the key programme components. Measures of effectiveness allow managers to infer programme performance within conditions.[3]

Data collection tools include a review of routine data, facility manager interview, checklist for equipment and supplies, register reviews and a series of folder reviews. All data collected verbally had to be verified by written documentation.

Factors considered in the adaptation of the rural tool

The local district management team and relevant programme managers participated in adapting the tool for a rural setting by ensuring that: (*i*) the information generated was relevant and addressed the needs of the district, (*ii*) identified indicators were measureable and (*iii*) that the tool could become part of the routine supervision, monitoring and evaluation process of the district.

The functionality of laboratory and pharmaceutical services was highlighted for rural service delivery as they are affected by obstacles such as impassable roads, irregular transport and limited communication. Facility-held laboratory registers and pharmaceutical records were reviewed. Laboratory services were evaluated by calculating turn-around-time (TAT) for certain tests and the percentage of missing test results. TAT is the length of time from the collection of a specimen until the result is given to the patient. Targets agreed to by the National Health Laboratory Service have been set by the TB and HIV programmes.

Functional recall systems which trace defaulters and recall patients with abnormal results are essential in the management of infectious diseases. For the audit, this system needed to meet three criteria: (*i*) responsibility for recall is allocated to a specific person, (*ii*) a patient identification system for those requiring recall that is implemented regularly, and (*iii*) documentation of outcomes of attempts to recall patients.

A single tracer indicator 'adequacy of clinic preparedness' was introduced to represent a summary of different components of infrastructural availability for programme implementation (Table I illustrates this for HIV services). Clinics were considered to be prepared for programme implementation if all components were available daily for the three months prior to the audit. Adequate training for staff was based on attendance of provincial training courses.

The urban tool relied on clinic-based folder reviews to assess quality, continuity and integration of care. In rural areas, patient-held records are often used to ensure continuity of care in a mobile population. Facility-held records are brief and, in the case of assessing STI treatment, the only information available was from the daily attendance register. Only two indicators of quality of STI care could therefore be assessed: the percentages of patients with a specific syndromic diagnosis, and receiving the correct drug regimen. There was no documentation at a facility level of patients attending HCT. However, TB, pre-ART and ART care were documented using folder reviews. Programme register folder numbers were randomly selected from a pre-determined time period and the corresponding patient notes located and reviewed.

The audit process

Given the clinic numbers, distances between them and limited time available, not all clinics in the district were audited. Purposive sampling was used in 20 (80%) of the clinics selected to ensure that all clinics with a high burden of TB/HIV/STI disease or rendering ART services were selected. To ensure each of the sub-districts were equally represented, 5 (20%) clinics were identified using convenience sampling.

District level staff and facility managers forming audit teams were trained to use the evaluation tools. At each clinic, facility managers were interviewed, observations conducted, and the daily attendance register together with 10 HIV, ART and TB folders reviewed. Teams received daily support from 2 local researchers.

Data were checked by the audit team and corrected in discussion with data collectors. Routine data extracted from the District Health Information System (DHIS) supplemented the facility audits. EXCEL (version 3) was used to capture data and generate results. The 6 key domains of effectiveness were used as a framework for the analysis. Missing data were excluded from the analysis.

The audit results were presented to the district management and audit teams, and the process, appropriateness and usefulness of the audit evaluated. Obstacles at a district and facility level were identified, and plans to address these formulated.

Results

Twenty-five clinics (57% of PHC health facilities in the district) were reviewed, 52 consulting rooms and 32 counselling rooms were inspected, and 569 records were sampled.

Accessibility

The PHC utilisation rate measures the average number of visits per person to a PHC facility over a year. This rate per person for the district in 2007/2008 was 1.7; the national average is 2.2 and the national target 2.5.

Twenty-one per cent of the patients initiated on ART had a CD4 count <50. Cornell *et al.* found that 28% of clients had a starting CD4 count <50.6 Neither sample is representative, but both suggest that access to ART is not acceptable. A patient's eligibility for ART depends on their CD4 count. The mean TAT for CD4 counts was 14 days (range 6 - 60), although the national target is 6 days (Table II).

Availability

Effective service delivery in the facilities audited was compromised by inadequate infrastructure (Table I); 80% (20/25) of facilities reported non-availability of key drugs and supplies in the 6 months before the audit, and 64% (16/25) had no stock control mechanisms for essential drugs and supplies.

Capacity

The district had no doctors supporting PHCs. The only facilities visited by doctors were ART sites attached to hospitals where ART was initiated. One remote facility had no professional nurse at the time of the audit. The training of clinical staff (*N*=128) to deliver PHC services and treat patients with TB, HIV or STIs was inadequate (Fig. 1), with only 29% (37/128) and 21% (27/128) of the staff respectively

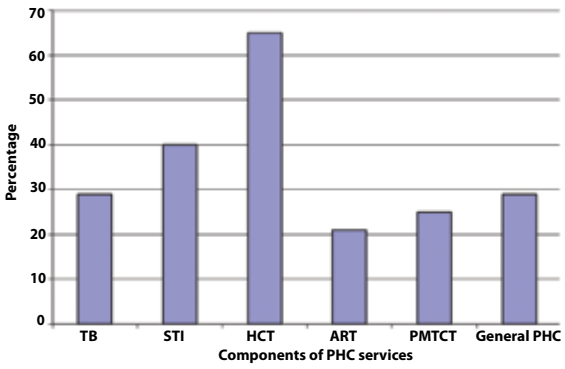
Table I. Percentage of facilities equipped to provide TB/HIV/STI services (*N*=25)

Aspects of preparedness	TB *N* (%)	HCT *N* (%)	HIV/ART *N* (%)	STI *N* (%)
Guidelines	18 (72%)	19 (76%)	13 (52%)	17 (68%)
Stationery	24 (96%)	24 (96%)	18 (72%)	20 (80%)
Equipment	N/A	15 (60%)	5 (20%)	18 (72%)
Stocks	13 (52%)	13 (52%)	6 (24%)	19 (76%)
Drugs	11 (44%)	N/A	4 (16%)	14 (56%)

Table II. Indicators measuring laboratory service support at a district level

Laboratory test	Mean turnaround time (days)	Range (days)	National target (days)	Missing results *N* (%)
Sputum microscopy	5	2 - 14	2	1 197 (10%)
Sputum culture	44	21 - 90	42 - 56	87 (24%)
PCR	32	4 - 90	42	162 (54%)
Elisa	9.3	7 - 21	14	20 (25%)
CD4	14	6 - 60	6	678 (21%)

PCR = polymerase chain reaction.



HCT = HIV counselling and testing; ART = antiretroviral therapy; PMTCT = prevention of mother-to-child transmissions; PHC = primary health care.

Fig. 1. Percentage of clinical staff trained in different components of PHC services.

trained to deliver TB and ART services. In 4 (16%) clinics, no staff were trained in the management of TB and, in a further 3 clinics, no staff were trained in the management of patients with STIs. Staff with appropriate training were not necessarily deployed to an area where this training was utilised. In one sub-district, although 8 professional nurses were trained in ART management, only one was working at an ART site.

Forty-four per cent (11/25) of the facilities were visited monthly by a PHC supervisor; visits by the TB and HIV co-ordinators were less frequent, with none having visited in the previous quarter.

Continuity of care

Three aspects of continuity of care were monitored during the audit: laboratory service support, recall mechanisms, and recording and reporting systems.

Laboratory service support was measured using TAT and missing results. Although the average TATs for the different tests were acceptable for a rural area, for each test there were facilities where the TATs were unacceptable – up to 90 days (Table II). Results were often not documented in folders, e.g. in 54% of the specimens sent for HIV diagnosis using polymerase chain reaction (PCR), results were not noted in either the patient's folder or the register.

Over 50% of facilities had functional recall systems, with 72% (18/25) having systems to recall TB suspects and defaulters, 52% (13/25) with systems for patients with CD4 <200, and 56% (14/25) with systems for HIV-positive infants. In the third of the facilities that had no recall systems, the length of time between diagnosis and the start of treatment was longest and the TB defaulter rate highest.

A functional filing system is a prerequisite for optimal recording and reporting but, in some clinics, up to 15% (7/47) of the folders requested for review could not be retrieved from the filing system.

Quality of care

Quality of care was measured by assessing whether management guidelines were appropriately followed. One hundred and twenty-eight ART folders were reviewed and, although adherence of patients on ART was assessed and addressed in 95% (121/128), only 74% (93/125) had had a CD4 count done in the last 6 months, as specified in the protocol.

To determine the quality of care received by TB patients, 230 folders were reviewed; 96% (221/230) were correctly categorised and 91% (210/230) were started on the correct regimen. However, only 72% (157/217) had their sputum results documented in their folder.

Integration

A review of 205 HIV-positive patients not yet on ART found that 68% (126/185) were screened for STIs, but only 35% (25/72) were then managed according to standard treatment guidelines. Among the patients on ART, 47% (60/127) were screened for STIs over a 3-month period, and 57% (34/60) of these were managed appropriately. Of the TB patients, 18% (34/187) were screened for STIs, but none was managed appropriately. For the 3 months reviewed, the contraceptive needs of 53% (108/205) of the pre-ART patients, 39% (83/214) of the TB patients and 67% (81/121) of the patients on ART were assessed.

Discussion

Published articles have described the key role of health systems in effective primary care service delivery, the impact of dysfunctional health systems on achieving the Millennium Development Goals and the need for health system strengthening across different programmes.[7] A failing health system may worsen an epidemic.[8] This service evaluation, adapted and used in a rural setting, identified key health system factors needing strengthening at district and facility level to improve the effectiveness of TB, HIV and STI services.

The participatory approach and framework used for this study effectively identified obstacles to TB, HIV and STI programmes in a rural South African district. Including district and facility level staff in the audit teams enabled staff to assess their own practice, and exposure to other facilities facilitated a peer review process enabling managers to compare and learn from one another. Similar observations were reported after the development of the STI quality-assessment instrument which informed this study.[9]

Routinely collected data are often underutilised by district and facility level managers as they can be incomplete or inaccurate.[10,11] We used routine information and a facility audit monitored health service effectiveness and informed decisions stimulating staff to improve data quality and completeness.

Without population-based planning and monitoring of services, poor access is often not identified, or is underestimated. A strength

of this evaluation tool is highlighting access to different health service components. PHC utilisation was low and, when patients did present, diagnosis was delayed owing to long TATs and delays in initiating treatment with drugs not always being available – 44% of the facilities had had a stock-out of TB drugs in the last 6 months. This is particularly concerning for TB where rapid case detection and treatment are essential to limit its transmission. Where ART sites do not render TB or STI services but refer to the nearest PHC clinic, access, integration of services and holistic care are undermined.[12] The importance of HIV and TB service integration was highlighted in the December 2009 South African government announcements regarding revisions to HIV treatment. While we recognise the complexity of TB and HIV service delivery, there is an opportunity to rework service delivery, optimise health care delivery and develop quality improvement systems for patients co-infected with TB and HIV.[13] The recent initiative by the Department of Health to 're-engineer PHC services' underlines this opportunity.

In this audit, clinic performance varied and was affected by the sub-district location, the extent of recent staff attrition and training, and the level of supervision. In some facilities, staff were not adequately trained in general PHC and TB/HIV/STI services, a finding similar to a study in another rural KwaZulu-Natal district where less than a third of clinic staff were trained in PMTCT, HIV and infant feeding and 46% in HIV counselling and testing.[11] Owing to the ongoing loss of staff from rural areas, training must be prioritised. In-service training at a facility level is effective.[14] Regular, careful supervision improves the quality of services significantly[15] and, although it is not feasible for TB and HIV co-ordinators to visit every facility in large rural districts, facilities that have a high burden of disease or problems with programme implementation should be supported regularly.

The poor quality of care that we documented has been confirmed by other studies for patients with a disease requiring ongoing treatment.[16] Problems identified – the unavailability of key drugs, equipment and supplies undermining service delivery – reveal inadequacies in facility and district level management skills and priorities. Facility managers supported by the district team have a critical role in addressing these problems and ensuring that quality and continuity of care in their facilities are regularly reviewed and addressed. Innovations such as the audit tool and process are valuable as they engage managers and their staff in a quality improvement process, generate local data for problem analysis and lead to local managerial action.

Inadequate stewardship, leadership and management at all levels of the South African health system affect the implementation of health services.[17] Although TB cure rate is only one indicator, in an equally poor district with an even higher TB/HIV disease burden in the same province, committed leadership and good district management improved programme outcome indicators and resulted in a district 81% TB cure rate.[4]

This study was limited in its assessment of the effectiveness of HIV/TB/STI services as it only assessed the facility component and not the important community-based aspect. It was conducted in one district only and was time-consuming (each facility audit took 4 hours). Other programme components such as non-communicable diseases, women, and maternal and child care could be added to the evaluation. These would increase the efficiency of the process and avoid the inevitable competition for scarce managerial and time resources that separate programme evaluations bring, and so foster health systems strengthening.

Conclusion

The rural evaluation tool developed is feasible and relevant and identifies constraints to effective TB/HIV/STI service delivery that can be addressed at district and facility level. We identified aspects of availability, capacity and continuity of care as hindering effective service delivery: key drugs, stocks and equipment were not available; capacity of staff was compromised by inadequate training and supervision; and continuity of care was hindered by poor laboratory support and no recall system. Strengthening district services is a key component of the 're-engineering of PHC services', and an annual audit is recommended as part of a district quality improvement process to promote effective TB, HIV and STI service delivery.

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