

REPUBLIC OF KENYA



MINISTRY OF HEALTH

DATA QUALITY ASSESSMENT REPORT

— 2019 —



**NATIONAL TUBERCULOSIS, LEPROSY
AND LUNG DISEASE PROGRAM**

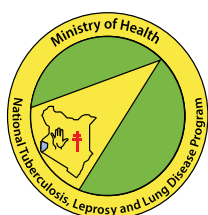
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ABSTRACT

Introduction: Data quality assessment (DQA) is carried out to assess; consistency, accuracy, completeness, integrity, validity and timeliness of the reported program data. This is carried out once every year after the annual reports have been finalized and all the basic reporting units have submitted their reports. This particular DQA was necessitated by loss of data in TIBU servers in November 2018. The program carried out a data restoration exercise and hence the need to check if what was restored reflects the data in the health facilities. Kenya has been using an electronic case based surveillance system since 2012, which is in line with WHO guidelines of reporting and case definitions. Kenya has a close to 300 basic reporting units otherwise known as TB control zones with coordinators who have been trained on TIBU use and have tablets for reporting. As per 2018 report there were about 4,500 facilities offering TB treatment.

The main objective of this DQA was to determine the consistency of 2017/2018 data and data elements in facility registers, patient record cards and TIBU.

Methodology: A total of 37 sub counties in 25 counties were assessed for data quality where all facilities with notified people with TB in 2017 and 2018 were assessed. This assessment covered; DSTB, DR TB, Leprosy and IPT including an assessment of M&E system covering training and availability of recording and reporting tools. Total aggregated data across patient record card, TB4 register and TIBU was compared to determine the level of agreement and a sample of 5 records in quarter 1 in 2018 were sampled for comparison of selected data elements. The assessment used a modified electronic DQA tool for data collection.

Data was then uploaded into a central server then exported to EXCEL and STATA for cleaning which involves checking for duplicates and missing variables. The data analysis involved creating tables and graphs. Kappa score was used to measure consistency and completeness of the data in the facility register and electronic surveillance system (TIBU).

Results: The overall level of agreement between TIBU and facility register for all the sub counties visited was at 93% in 2018 compared to 96% in 2017 for all forms of TB while for bacteriologically confirmed it was 94.6% in 2017 and 91.9% in 2018. The level of agreement between the patient record cards went up from 51% in 2017 to 59% in 2018 for all forms of TB. Nationally in 2017, the level of agreement in the aggregate numbers for all forms of DRTB between the patient log books and registers was 100%, and 116% between registers and TIBU. Leprosy data had 100% level of agreement in 2017 and 111% in 2018.

Recommendations: The program should; create an offsite back up, review recording and reporting to capture all variables, develop an orientation package for new TB clinic staff, put emphasis on the use of patient record cards and involve health managers especially the county directors in data quality assurance processes.

ACKNOWLEDGEMENT

The Ministry of Health through the Head of National Tuberculosis Program wishes to thank USAID (TB ARC II Activity implemented in collaboration with CHS) for its financial support for DQA field visits and report writing. We also thank all the county directors of the 25 counties visited together with the county and sub county TB coordinators for their facilitation during field visits.

Finally, all the NTLD-P staff who participated both in the field visits and writing of the activities are acknowledged for their tireless efforts and contribution.

ABBREVIATIONS

| | |
|---------------|---|
| CTLCS | County TB and Leprosy Coordinators |
| DQA | Data Quality Assessment |
| DRTB | Drug resistant TB |
| DSTB | Drug sensitive TB |
| HIV | Human Immunodeficiency Virus |
| ICF | Intensive Case Finding |
| IPT | Isoniazid Preventive Therapy |
| LTFU | Lost to Follow up |
| NTLD-P | National Tuberculosis, leprosy & Lung Disease program |
| SCTLCS | Sub County TB and Leprosy Coordinators |
| TB | Tuberculosis |
| TC | Treatment completed |
| TO | Transfer out |
| WHO | World Health Organisation |

CHAPTER ONE

Introduction

1.1 Background Information

TB is one of the top ten causes of death and the leading cause from a single infectious agent globally. In 2017, they were an estimated ten million incident cases of which approximately 9% were co-infected with HIV. Amongst all incident cases 1 million were children and TB accounted for 1.6 million deaths (WHO Global TB Report 2018). According to WHO Report 2018, Africa and Asia still bear the highest brunt contributing to over 80% of these cases. There were 558,000 estimated cases of Drug Resistant Tuberculosis in 2017. There has been a rise of DR TB cases in the recent past partly attributed to increased transmission and /or better diagnosis.ⁱ

In Kenya, TB prevalence survey 2016 indicated that there are 169,000 incident cases of which approximately 50% were undetected. In 2018, a total of 96,487 DS TB cases of which 26% were TB/HIV co-infected and 10% were children. 669 DR TB cases were notified representing only a quarter of the estimated incident cases. IPT uptake still continues to be a challenge with a paltry 14.5% of eligible pediatric cases (contacts of bacteriologically confirmed) identified and initiated on treatment. The country though in the post elimination stage still has a few pocket areas for leprosy and in 2018, 109 cases were notified which is a slight drop from 2017 (NTLD-P Annual Report 2018)ⁱⁱ.

Good data helps programs to generate evidence which acts as the backbone for decision making and robust policy formulation. It is therefore imperative to ensure that appropriate back checks are conducted routinely to assure the same. Provision of updated recording and reporting tools; which are in conformity with WHO standards, is vital for capturing essential data elements. Further, routine supervision, continuous capacity building and mentorship is necessary to ensure proper usage and fidelity of outcomes.



Dimensions of data quality are:

Accuracy – data measures what they are intended to measure

Completeness – data that has sufficient details

Timeliness –available within the stipulated period

Consistency – repeatability and replicability

Integrity – no deliberate bias or manipulation

Validity - the extent to which a measurement is well-founded and corresponds accurately to the real world.

ⁱ World Health Organization. Global Tuberculosis Report 2018. Geneva, Switzerland; 2018.

ⁱⁱ National Tuberculosis Leprosy and Lung Disease Program. Annual report 2018. Nairobi, Kenya; 2019

Data Quality Assessment (DQA) is periodic verification of data reported to check its consistency with the source documents and hence confer its reliability for use in decision making.

1.2 Problem Statement

Kenya is divided into 47 counties and 301 TB control zones. TB control activities in the control zones are coordinated by Sub County TB and Leprosy Coordinators (SCTLCs), who are responsible for notifying TB cases (through TIBU) from health facilities in their control zones. TIBU is an electronic case-based surveillance system that allows real time reporting and is hosted in the cloud server. Since inception in 2012, TIBU has made notification of TB patients very timely and instant report generation. Whilst this has been the hallmark of electronic recording and reporting, it has encountered some challenges. In November 2018, challenges with the cloud service provider resulted in the erroneous deletion of the TIBU cloud resource hence massive data loss.

Following the data loss, the IT Team instituted a recovery plan to restore the data. This process (re-entry of data from source documents, recovery from tablet backups and customized xls uploads) resulted in significant progress. However, it was hampered in areas where SCTLCs had lost their tablets without replacement hence data gaps.

1.3 Justification for the DQA

Following the data restoration exercise, there was need to cross check the entire process to ensure data held in TIBU matches what is in the facility records. This had to be done in a systematic manner hence the need to conduct an ad hoc DQA. This DQA focused on control zones that had data gaps where all facilities which reported patients during the period of interest (2017 & 2018) were visited. TIBU (the surveillance system) provides a framework for measuring the performance of control activities in addressing the burden of disease and achieving the set targets. DQA ensures that the data provided to all stakeholders is of good quality and establishes the performance of the TB surveillance system over time.

1.4 General objective

To determine the consistency of 2017/2018 data and data elements in facility registers, patient record cards and TIBU.

1.5 Specific objectives

1. To evaluate the consistency of aggregate and case based data for DS TB and DR TB in facility registers, patient record cards and TIBU
2. To determine the completeness of data on DS TB and DR TB in facility registers, patient record cards and TIBU.
3. To assess the availability of recording and reporting tools.

CHAPTER TWO

METHODOLOGY

2.1 Study site



2.2 Study design

A retrospective assessment was carried out in 37 TB Control zones that were purposively selected. A total of 448 health facilities that notified case(s) of DS TB, DR TB, leprosy or IPT (under five) during the period of interest were visited.

2.3 Study period

The assessment was conducted between 15th July and 31st July 2019. The DQA teams comprised of national program officers, officers from Centre for Health Solution (CHS) and CTLCs/SCTLCs.

Aggregate data from the facility registers, patient record cards and TIBU for the period of interest was reviewed. For case based data, five records were randomly sampled for quarter one 2018 (DSTB) and 2018(DR TB).

2.4 Study population

Patients notified in selected TB control zones in Kenya.

2.4.1 Inclusion criteria

TB Control zones in Kenya that had data inconsistencies before and after the data loss following comparison of reports based on;

1. Aggregate counts in TIBU for TB, DR TB and IPT
2. Diagnostic results/follow up work up and
3. Treatment outcomes

All health facilities within the selected TB control zones who notified or reported any of the following in the period of interest were included

1. DS TB cases,
2. DR TB cases,
3. Children under 5 who were contacts of bacteriological confirmed (BC) TB and initiated on IPT
4. Leprosy cases.

Facilities visited are annexed in the report.

2.4.2 Patient records

All records of patients (patient record cards, log books, treatment registers) who were notified for DS TB, DR TB and leprosy in the period of interest

IPT for children under 5 years who are contact of Bacteriologically confirmed TB in the period of interest

2.4.3 Exclusion criteria

Patients documented as transferred in (TI).

Selected Sites

| No. | Counties | TB control zones |
|-----|---------------|----------------------------|
| 1. | Busia | Samia, Nambale |
| 2. | Homabay | Kaispul |
| 3. | Isiolo | Merti, Isiolo |
| 4 | Baringo | Baringo Central, Mogotio |
| 5 | Bomet | Sotik |
| 6 | Bungoma | Mt. Elgon |
| 7 | Garissa | Garissa, Refugee Camps |
| 8 | Kajiado | Kajiado North |
| 9 | Kiambu | Ruiru, Thika |
| 10 | Kisumu | Kisumu East,Nyando |
| 11 | Kitui | Kitui Central, Kitui south |
| 12 | Lamu | Lamu West |
| 13 | Machakos | Yatta |
| 14 | Makueni | Kibwezi East |
| 15 | Migori | Rongo |
| 16 | Mombasa | Ganjoni, Mvita |
| 17 | Nakuru | Naivasha, Njoro |
| 18 | Nyeri | Othaya-mukurweini, Tetu |
| 19 | West Pokot | West Pokot, Pokot North |
| 20 | Siaya | Bondo |
| 21 | Tana River | Tana Delta |
| 22 | Tharaka Nithi | Chuka-Igambang'ombe, Maara |
| 23 | Turkana | Loima |
| 24 | Uashin Gishu | MTRH, Turbo |

2.5 Sampling procedure

A two-stage sampling criteria was adopted, where 37 out of 301 TB control zones were selected purposively. Subsequently, a census of all the facilities in each of the TB control zones was conducted.

For case based records, 5 patients from the facility registers were systematically sampled in Q1 2018 (DS TB) and 2018 all year (DR TB). In instances where there were five or less, all were abstracted.

2.6 Data collection

2.6.1 Preparation

Teams were constituted with appropriate skill-mix comprising of a clinician, laboratory personnel,

Monitoring and evaluation officer and a driver.

The team leader organized day to day activities which involves planning of the facilities to be visited and ensured all logistics for the teams were in place.

2.6.2 Actual data collection

Upon entry to a county, each team made a courtesy call to the County Health Management Team where the purpose of the DQA mission was explained and the facilities to be visited. The team was accompanied by the CTLC(s) and respective SCTL(s) to the health facilities where a courtesy call was made.

TB source documents were reviewed and TB clinic staff were interviewed. Data was abstracted from TIBU and facility records.

The DQA tool generated a summary which acted as a guide during feedback clearly highlighting strengths, best practices and areas of improvement.

2.6.3 Data Assessment Tool

An online tool was customized to include core indicators being tracked by the TB program.

It was a web-based tool (with offline functionality) designed using xls forms with ODK syntax and data was relayed to the central server at NTLD-P.

2.6.4 Source of Data

The source documents for the data were:

- Patient record cards
- TB facility registers
- DR TB registers
- DR TB log books
- IPT registers
- ICF cards
- IPT record cards
- Electronic surveillance system (TIBU)

2.6.5 Indicators assessed

The assessment focused on the following TB, leprosy, IPT and diagnosis indicators across all the data recording and reporting tools;

- Number of DSTB cases (all forms) registered
- Proportion of TB cases who have been notified
- Number of bacteriologically confirmed TB cases (AFB, Xpert)
- Number of bacteriologically confirmed TB cases who are successfully treated
- Number of TB cases with a cured outcome who had two negative smears
- Number of DRTB cases registered
- Number of DR TB cases who have been correctly classified
- Number of IPT (under 5) cases registered
- Number of exposed bacteriologically confirmed TB (under 5) enrolled on IPT
- Number of IPT (under 5) cases that completed therapy
- Number of TB cases with a cured outcome
- Proportion of health facilities with correct M&E structure, functions and capabilities
- Proportion of health facilities where all relevant staff have received training on the data management processes and tools

2.7 Data management and analysis

Data entry was done directly to the DQA tool at the health facility. Before leaving a health facility, the team checked the data for completeness and comparison in patients record cards, register and TIBU.

Upon completion of the exercise, the entire data set was uploaded to central server downloaded and exported to Excel and STATA for cleaning and analysis. This involved checking for duplicates and missing data. Data was summarized in Tables, bar graphs and box plots. Kappa score was used to measure consistency and completeness of the data in the facility register and electronic surveillance system (TIBU).

Data was backed up daily in a secondary location in a cloud server.

Kappa interpretation score was used

| kappa | Agreement |
|-----------|----------------------------|
| < 0 | Less than chance agreement |
| 0.01-0.20 | Slight Agreement |
| 0.21-0.40 | Fair Agreement |
| 0.41-0.60 | Moderate Agreement |
| 0.61-0.80 | Substantial Agreement |
| 0.81-0.99 | Almost perfect agreement |

2.8 Limitation of the assessment

- Missing facility records
- The study focused on facility that had data gaps in the selected period.

2.9 Ethical considerations

Consent and permission was obtained from the County health department(s) before start of the exercise. Team members ensured that the records were reviewed in an area where confidentiality was maintained; and on completion of the process, the records were handed back to the facility staff for safe-keeping.

CHAPTER THREE

Results and Discussion

3.1 Aggregate DS TB data

All forms of TB (Table 1)

Table 1: Levels of agreement for aggregated data for All forms of TB in Patient record cards and TIBU data in comparison to TB4 facility registers

| County | Sub Counties | 2017 | | | | | 2018 | | | | |
|----------|-----------------|---------------|---------------|------|-------------------------------|------------------------|---------------|---------------|------|-------------------------------|------------------------|
| | | Patient Cards | TB4 registers | TIBU | Agreement TB 4 Vs Record Card | Agreement TB 4 Vs TIBU | Patient Cards | TB4 registers | TIBU | Agreement TB 4 Vs Record Card | Agreement TB 4 Vs TIBU |
| Baringo | | 79 | 186 | 166 | 42.5% | 89.2% | 167 | 255 | 236 | 65.5% | 92.5% |
| | Baringo Central | 61 | 136 | 125 | 44.9% | 91.9% | 103 | 170 | 162 | 60.6% | 95.3% |
| | Mogotio | 18 | 50 | 41 | 36.0% | 82.0% | 64 | 85 | 74 | 75.3% | 87.1% |
| Bomet | | 183 | 289 | 264 | 63.3% | 91.3% | 298 | 310 | 272 | 96.1% | 87.7% |
| | Sotik | 183 | 289 | 264 | 63.3% | 91.3% | 298 | 310 | 272 | 96.1% | 87.7% |
| Bungoma | | 38 | 66 | 71 | 57.6% | 107.6% | 85 | 100 | 96 | 85.0% | 96.0% |
| | Mt Elgon | 38 | 66 | 71 | 57.6% | 107.6% | 85 | 100 | 96 | 85.0% | 96.0% |
| Busia | | 212 | 259 | 265 | 81.9% | 102.3% | 195 | 211 | 200 | 92.4% | 94.8% |
| | Nambale | 65 | 70 | 70 | 92.9% | 100.0% | 70 | 70 | 65 | 100.0% | 92.9% |
| | Samia | 147 | 189 | 195 | 77.8% | 103.2% | 125 | 141 | 135 | 88.7% | 95.7% |
| Garissa | | 540 | 781 | 767 | 69.1% | 98.2% | 587 | 1001 | 914 | 58.6% | 91.3% |
| | Garissa | 261 | 478 | 460 | 54.6% | 96.2% | 336 | 740 | 655 | 45.4% | 88.5% |
| | Refugee camps | 279 | 303 | 307 | 92.1% | 101.3% | 251 | 261 | 259 | 96.2% | 99.2% |
| Homa Bay | | 83 | 228 | 240 | 36.4% | 105.3% | 116 | 205 | 196 | 56.6% | 95.6% |
| | Kasipul | 83 | 228 | 240 | 36.4% | 105.3% | 116 | 205 | 196 | 56.6% | 95.6% |
| Isiolo | | 466 | 613 | 558 | 76.0% | 91.0% | 544 | 756 | 660 | 72.0% | 87.3% |
| | Isiolo | 426 | 563 | 506 | 75.7% | 89.9% | 491 | 691 | 594 | 71.1% | 86.0% |
| | Merti | 40 | 50 | 52 | 80.0% | 104.0% | 53 | 65 | 66 | 81.5% | 101.5% |
| Kajiado | | 284 | 415 | 427 | 68.4% | 102.9% | 347 | 474 | 457 | 73.2% | 96.4% |
| | Kajiado North | 284 | 415 | 427 | 68.4% | 102.9% | 347 | 474 | 457 | 73.2% | 96.4% |
| Kiambu | | 542 | 1336 | 1198 | 40.6% | 89.7% | 749 | 1520 | 1293 | 49.3% | 85.1% |
| | Ruiru | 152 | 505 | 477 | 30.1% | 94.5% | 303 | 516 | 468 | 58.7% | 90.7% |
| | Thika | 390 | 831 | 721 | 46.9% | 86.8% | 446 | 1004 | 825 | 44.4% | 82.2% |
| Kisumu | | 415 | 933 | 1082 | 44.5% | 116.0% | 478 | 976 | 931 | 49.0% | 95.4% |
| | Kisumu East_A | 271 | 725 | 883 | 37.4% | 121.8% | 308 | 724 | 712 | 42.5% | 98.3% |
| | Nyando | 144 | 208 | 199 | 69.2% | 95.7% | 170 | 252 | 219 | 67.5% | 86.9% |

| | | 2017 | | | | | 2018 | | | | |
|---------------|----------------------|---------------|---------------|-------|------------------------------|-----------------------|---------------|---------------|-------|-------------------------------|------------------------|
| County | Sub Counties | Patient Cards | TB4 registers | TIBU | AgreementTB 4 Vs Record Card | AgreementTB 4 Vs TIBU | Patient Cards | TB4 registers | TIBU | Agreement TB 4 Vs Record Card | Agreement TB 4 Vs TIBU |
| Kitui | | 259 | 941 | 820 | 27.5% | 87.1% | 462 | 1276 | 1079 | 36.2% | 84.6% |
| | Kitui Central | 121 | 567 | 525 | 21.3% | 92.6% | 227 | 858 | 750 | 26.5% | 87.4% |
| | Kitui South | 138 | 374 | 295 | 36.9% | 78.9% | 235 | 418 | 329 | 56.2% | 78.7% |
| Lamu | | 143 | 149 | 153 | 96.0% | 102.7% | 164 | 168 | 160 | 97.6% | 95.2% |
| | Lamu West | 143 | 149 | 153 | 96.0% | 102.7% | 164 | 168 | 160 | 97.6% | 95.2% |
| Machakos | | 267 | 366 | 363 | 73.0% | 99.2% | 354 | 428 | 603 | 82.7% | 140.9% |
| | Yatta | 267 | 366 | 363 | 73.0% | 99.2% | 354 | 428 | 603 | 82.7% | 140.9% |
| Makueni | | 136 | 301 | 290 | 45.2% | 96.3% | 282 | 475 | 422 | 59.4% | 88.8% |
| | Kibwezi East | 136 | 301 | 290 | 45.2% | 96.3% | 282 | 475 | 422 | 59.4% | 88.8% |
| Migori | | 111 | 156 | 151 | 71.2% | 96.8% | 90 | 142 | 144 | 63.4% | 101.4% |
| | Rongo | 111 | 156 | 151 | 71.2% | 96.8% | 90 | 142 | 144 | 63.4% | 101.4% |
| Mombasa | | 429 | 941 | 854 | 45.6% | 90.8% | 598 | 1157 | 1024 | 51.7% | 88.5% |
| | Ganjoni | 111 | 141 | 144 | 78.7% | 102.1% | 96 | 141 | 131 | 68.1% | 92.9% |
| | Mvita | 318 | 800 | 710 | 39.8% | 88.8% | 502 | 1016 | 893 | 49.4% | 87.9% |
| Nakuru | | 522 | 717 | 701 | 72.8% | 97.8% | 596 | 783 | 732 | 76.1% | 93.5% |
| | Naivasha | 274 | 419 | 404 | 65.4% | 96.4% | 318 | 426 | 406 | 74.6% | 95.3% |
| | Njoro | 248 | 298 | 297 | 83.2% | 99.7% | 278 | 357 | 326 | 77.9% | 91.3% |
| Nyeri | | 289 | 367 | 342 | 78.7% | 93.2% | 412 | 480 | 446 | 85.8% | 92.9% |
| | Othaya Mukurweini | 209 | 281 | 258 | 74.4% | 91.8% | 289 | 354 | 328 | 81.6% | 92.7% |
| | Tetu | 80 | 86 | 84 | 93.0% | 97.7% | 123 | 126 | 118 | 97.6% | 93.7% |
| Pokot | | 442 | 962 | 919 | 45.9% | 95.5% | 564 | 1336 | 1276 | 42.2% | 95.5% |
| | Pokot North | 231 | 414 | 380 | 55.8% | 91.8% | 303 | 447 | 409 | 67.8% | 91.5% |
| | West Pokot | 211 | 548 | 539 | 38.5% | 98.4% | 261 | 889 | 867 | 29.4% | 97.5% |
| Siaya | | 203 | 313 | 317 | 64.9% | 101.3% | 280 | 395 | 388 | 70.9% | 98.2% |
| | Bondo | 203 | 313 | 317 | 64.9% | 101.3% | 280 | 395 | 388 | 70.9% | 98.2% |
| Tana River | | 131 | 140 | 130 | 93.6% | 92.9% | 191 | 191 | 199 | 100.0% | 104.2% |
| | Tana Delta | 131 | 140 | 130 | 93.6% | 92.9% | 191 | 191 | 199 | 100.0% | 104.2% |
| Tharaka Nithi | | 122 | 981 | 908 | 12.4% | 92.6% | 830 | 1264 | 1168 | 65.7% | 92.4% |
| | Chuka Igamba Ng'ombe | 36 | 449 | 393 | 8.0% | 87.5% | 445 | 712 | 634 | 62.5% | 89.0% |
| | Maara | 86 | 532 | 515 | 16.2% | 96.8% | 385 | 552 | 534 | 69.7% | 96.7% |
| Turkana | | 18 | 94 | 95 | 19.1% | 101.1% | 19 | 60 | 84 | 31.7% | 140.0% |
| | Loima | 18 | 94 | 95 | 19.1% | 101.1% | 19 | 60 | 84 | 31.7% | 140.0% |
| Uasin Gishu | | 479 | 901 | 870 | 53.2% | 96.6% | 460 | 963 | 938 | 47.8% | 97.4% |
| | Eldoret MTRH | 223 | 626 | 611 | 35.6% | 97.6% | 199 | 672 | 684 | 29.6% | 101.8% |
| | Turbo | 256 | 275 | 259 | 93.1% | 94.2% | 261 | 291 | 254 | 89.7% | 87.3% |
| Grand Total | | 6393 | 12435 | 11951 | 51.4% | 96.1% | 8868 | 14926 | 13918 | 59.4% | 93.2% |

The overall level of agreement between TIBU and facility register for all the sub counties visited was at 93% in 2018 compared to 96% in 2017. This could be explained by either under reporting by the sub counties or missing data in TIBU. There was an improvement in the level of agreement between patient record cards and TB4 registers in 2018 of 59% up from 51% in 2017.

Nambale Sub County in Busia County showed a consistent level of agreement between TIBU and TB4 registers of 100% for the two years under review. Mogotio Sub County had the lowest level in 2017 of 82%, while in 2018, Thika had the lowest level of agreement of 82.2% down from 86.8% in 2017. Other sub counties had abnormally high level of agreement above the (+)5% of 100%.The notable ones were; Yatta (140.9%) in 2018, Loima (140%) in 2017 and Kisumu east sub county (121.8%) in 2017.

Nambale sub county still maintained good performance as far as use of patient record cards is concerned. The level of agreement between the patient record card and TB4 register was 92.9% in 2017 and improved to 100% in 2018. The other sub counties that are showing good performance are; Lamu (96%) in 2017 and 97.6% in 2018, Tana River 93.6% in 2017 and 100% in 2018. Sotik Sub County showed improvement from 63.3% in 2017 to 96.1% in 2018. Turbo went down from 93.1% to 89.7%

Bacteriologically confirmed and clinically-diagnosed TB (Table 2a and 2b)

Table 2a: Levels of agreement for aggregated data for Bacteriological Confirmed TB in Patient record cards and TIBU data in comparison to TB4 facility registers

| County | Sub Counties | 2017 | | | | | 2018 | | | | |
|-----------------|-----------------|---------------|---------------|------------|------------------------------|-----------------------|---------------|---------------|------------|------------------------------|-----------------------|
| | | Patient Cards | TB4 registers | TIBU | Agreement TB4 vs Record Card | Agreement TB4 vs TIBU | Patient Cards | TB4 registers | TIBU | Agreement TB4 vs Record Card | Agreement TB4 vs TIBU |
| Baringo | | 54 | 135 | 104 | 40.0% | 77.0% | 73 | 173 | 155 | 42.2% | 89.6% |
| | Baringo Central | 41 | 105 | 88 | 39.0% | 83.8% | 41 | 130 | 117 | 31.5% | 90.0% |
| | Mogotio | 13 | 30 | 16 | 43.3% | 53.3% | 32 | 43 | 38 | 74.4% | 88.4% |
| Bomet | | 104 | 156 | 140 | 66.7% | 89.7% | 151 | 155 | 128 | 97.4% | 82.6% |
| | Sotik | 104 | 156 | 140 | 66.7% | 89.7% | 151 | 155 | 128 | 97.4% | 82.6% |
| Bungoma | | 12 | 30 | 32 | 40.0% | 106.7% | 24 | 51 | 49 | 47.1% | 96.1% |
| | Mt Elgon | 12 | 30 | 32 | 40.0% | 106.7% | 24 | 51 | 49 | 47.1% | 96.1% |
| Busia | | 102 | 124 | 127 | 82.3% | 102.4% | 84 | 96 | 90 | 87.5% | 93.8% |
| | Nambale | 40 | 50 | 48 | 80.0% | 96.0% | 36 | 42 | 39 | 85.7% | 92.9% |
| | Samia | 62 | 74 | 79 | 83.8% | 106.8% | 48 | 54 | 51 | 88.9% | 94.4% |
| Garissa | | 218 | 312 | 321 | 69.9% | 102.9% | 261 | 452 | 416 | 57.7% | 92.0% |
| | Garissa | 110 | 192 | 199 | 57.3% | 103.6% | 161 | 346 | 310 | 46.5% | 89.6% |
| | Refugee camps | 108 | 120 | 122 | 90.0% | 101.7% | 100 | 106 | 106 | 94.3% | 100.0% |
| Homa Bay | | 37 | 111 | 126 | 33.3% | 113.5% | 59 | 106 | 103 | 55.7% | 97.2% |
| | Kasipul | 37 | 111 | 126 | 33.3% | 113.5% | 59 | 106 | 103 | 55.7% | 97.2% |
| Isiolo | | 182 | 267 | 249 | 68.2% | 93.3% | 213 | 293 | 252 | 72.7% | 86.0% |
| | Isiolo | 169 | 247 | 233 | 68.4% | 94.3% | 187 | 263 | 223 | 71.1% | 84.8% |
| | Merti | 13 | 20 | 16 | 65.0% | 80.0% | 26 | 30 | 29 | 86.7% | 96.7% |
| Kajiado | | 105 | 212 | 201 | 49.5% | 94.8% | 136 | 218 | 201 | 62.4% | 92.2% |
| | Kajiado North | 105 | 212 | 201 | 49.5% | 94.8% | 136 | 218 | 201 | 62.4% | 92.2% |

| | | 2017 | | | | | 2018 | | | | |
|---------------|----------------------|---------------|---------------|------|------------------------------|-----------------------|---------------|---------------|------|------------------------------|-----------------------|
| County | Sub Counties | Patient Cards | TB4 registers | TIBU | Agreement TB4 vs Record Card | Agreement TB4 vs TIBU | Patient Cards | TB4 registers | TIBU | Agreement TB4 vs Record Card | Agreement TB4 vs TIBU |
| Kiambu | | 288 | 839 | 759 | 34.3% | 90.5% | 333 | 804 | 694 | 41.4% | 86.3% |
| | Ruiru | 91 | 316 | 301 | 28.8% | 95.3% | 153 | 253 | 241 | 60.5% | 95.3% |
| | Thika | 197 | 523 | 458 | 37.7% | 87.6% | 180 | 551 | 453 | 32.7% | 82.2% |
| Kisumu | | 232 | 532 | 478 | 43.6% | 89.8% | 268 | 505 | 456 | 53.1% | 90.3% |
| | Kisumu East_A | 159 | 397 | 355 | 40.1% | 89.4% | 169 | 351 | 319 | 48.1% | 90.9% |
| | Nyando | 73 | 135 | 123 | 54.1% | 91.1% | 99 | 154 | 137 | 64.3% | 89.0% |
| Kitui | | 190 | 615 | 563 | 30.9% | 91.5% | 276 | 625 | 520 | 44.2% | 83.2% |
| | Kitui Central | 88 | 367 | 365 | 24.0% | 99.5% | 133 | 371 | 330 | 35.8% | 88.9% |
| | Kitui South | 102 | 248 | 198 | 41.1% | 79.8% | 143 | 254 | 190 | 56.3% | 74.8% |
| Lamu | | 83 | 83 | 86 | 100.0% | 103.6% | 82 | 87 | 81 | 94.3% | 93.1% |
| | Lamu West | 83 | 83 | 86 | 100.0% | 103.6% | 82 | 87 | 81 | 94.3% | 93.1% |
| Machakos | | 178 | 236 | 231 | 75.4% | 97.9% | 209 | 256 | 386 | 81.6% | 150.8% |
| | Yatta | 178 | 236 | 231 | 75.4% | 97.9% | 209 | 256 | 386 | 81.6% | 150.8% |
| Makueni | | 109 | 219 | 189 | 49.8% | 86.3% | 140 | 244 | 223 | 57.4% | 91.4% |
| | Kibwezi East | 109 | 219 | 189 | 49.8% | 86.3% | 140 | 244 | 223 | 57.4% | 91.4% |
| Migori | | 65 | 99 | 90 | 65.7% | 90.9% | 60 | 81 | 89 | 74.1% | 109.9% |
| | Rongo | 65 | 99 | 90 | 65.7% | 90.9% | 60 | 81 | 89 | 74.1% | 109.9% |
| Mombasa | | 258 | 538 | 475 | 48.0% | 88.3% | 368 | 638 | 539 | 57.7% | 84.5% |
| | Ganjoni | 82 | 79 | 83 | 103.8% | 105.1% | 80 | 95 | 86 | 84.2% | 90.5% |
| | Mvita | 176 | 459 | 392 | 38.3% | 85.4% | 288 | 543 | 453 | 53.0% | 83.4% |
| Nakuru | | 299 | 460 | 448 | 65.0% | 97.4% | 364 | 487 | 451 | 74.7% | 92.6% |
| | Naivasha | 143 | 277 | 264 | 51.6% | 95.3% | 183 | 263 | 261 | 69.6% | 99.2% |
| | Njoro | 156 | 183 | 184 | 85.2% | 100.5% | 181 | 224 | 190 | 80.8% | 84.8% |
| Nyeri | | 153 | 201 | 198 | 76.1% | 98.5% | 189 | 228 | 205 | 82.9% | 89.9% |
| | Othaya Mukurweini | 114 | 157 | 147 | 72.6% | 93.6% | 142 | 179 | 159 | 79.3% | 88.8% |
| | Tetu | 39 | 44 | 51 | 88.6% | 115.9% | 47 | 49 | 46 | 95.9% | 93.9% |
| Pokot | | 282 | 539 | 564 | 52.3% | 104.6% | 310 | 667 | 654 | 46.5% | 98.1% |
| | Pokot North | 136 | 229 | 219 | 59.4% | 95.6% | 166 | 227 | 199 | 73.1% | 87.7% |
| | West Pokot | 146 | 310 | 345 | 47.1% | 111.3% | 144 | 440 | 455 | 32.7% | 103.4% |
| Siaya | | 112 | 177 | 181 | 63.3% | 102.3% | 132 | 198 | 199 | 66.7% | 100.5% |
| | Bondo | 112 | 177 | 181 | 63.3% | 102.3% | 132 | 198 | 199 | 66.7% | 100.5% |
| Tana River | | 58 | 64 | 59 | 90.6% | 92.2% | 61 | 62 | 59 | 98.4% | 95.2% |
| | Tana Delta | 58 | 64 | 59 | 90.6% | 92.2% | 61 | 62 | 59 | 98.4% | 95.2% |
| Tharaka Nithi | | 75 | 470 | 451 | 16.0% | 96.0% | 317 | 489 | 433 | 64.8% | 88.5% |
| | Chuka Igamba Ng'ombe | 18 | 204 | 191 | 8.8% | 93.6% | 150 | 232 | 199 | 64.7% | 85.8% |
| | Maara | 57 | 266 | 260 | 21.4% | 97.7% | 167 | 257 | 234 | 65.0% | 91.1% |
| Turkana | | 9 | 43 | 46 | 20.9% | 107.0% | 7 | 32 | 40 | 21.9% | 125.0% |
| | Loima | 9 | 43 | 46 | 20.9% | 107.0% | 7 | 32 | 40 | 21.9% | 125.0% |
| Uasin Gishu | | 235 | 511 | 481 | 46.0% | 94.1% | 248 | 562 | 479 | 44.1% | 85.2% |
| | Eldoret MTRH | 66 | 338 | 317 | 19.5% | 93.8% | 73 | 372 | 317 | 19.6% | 85.2% |
| | Turbo | 169 | 173 | 164 | 97.7% | 94.8% | 175 | 190 | 162 | 92.1% | 85.3% |
| Grand Total | | 3440 | 6973 | 6599 | 49.3% | 94.6% | 4365 | 7509 | 6902 | 58.1% | 91.9% |

Table 2b: Levels of agreement for aggregated data for Clinically Diagnosed TB in Patient record cards and TIBU data in comparison to TB4 facility registers

| County | Sub Counties | 2017 | | | | | 2018 | | | | |
|-----------------|-----------------|---------------|---------------|------------|------------------------------|-----------------------|---------------|---------------|------------|------------------------------|-----------------------|
| | | Patient Cards | TB4 registers | TIBU | Agreement TB4 vs Record Card | Agreement TB4 vs TIBU | Patient Cards | TB4 registers | TIBU | Agreement TB4 vs Record Card | Agreement TB4 vs TIBU |
| Baringo | | 25 | 46 | 63 | 54.3% | 137.0% | 84 | 83 | 81 | 101.2% | 97.6% |
| | Baringo Central | 20 | 27 | 38 | 74.1% | 140.7% | 60 | 41 | 45 | 146.3% | 109.8% |
| | Mogotio | 5 | 19 | 25 | 26.3% | 131.6% | 24 | 42 | 36 | 57.1% | 85.7% |
| Bomet | | 41 | 88 | 73 | 46.6% | 83.0% | 112 | 118 | 109 | 94.9% | 92.4% |
| | Sotik | 41 | 88 | 73 | 46.6% | 83.0% | 112 | 118 | 109 | 94.9% | 92.4% |
| Bungoma | | 13 | 42 | 25 | 31.0% | 59.5% | 14 | 41 | 41 | 34.1% | 100.0% |
| | Mt Elgon | 13 | 42 | 25 | 31.0% | 59.5% | 14 | 41 | 41 | 34.1% | 100.0% |
| Busia | | 78 | 107 | 111 | 72.9% | 103.7% | 83 | 92 | 89 | 90.2% | 96.7% |
| | Nambale | 12 | 14 | 15 | 85.7% | 107.1% | 23 | 22 | 21 | 104.5% | 95.5% |
| | Samia | 66 | 93 | 96 | 71.0% | 103.2% | 60 | 70 | 68 | 85.7% | 97.1% |
| Garissa | | 207 | 279 | 261 | 74.2% | 93.5% | 231 | 302 | 303 | 76.5% | 100.3% |
| | Garissa | 86 | 155 | 130 | 55.5% | 83.9% | 114 | 195 | 194 | 58.5% | 99.5% |
| | Refugee camps | 121 | 124 | 131 | 97.6% | 105.6% | 117 | 107 | 109 | 109.3% | 101.9% |
| Homa Bay | | 24 | 79 | 78 | 30.4% | 98.7% | 43 | 69 | 70 | 62.3% | 101.4% |
| | Kasipul | 24 | 79 | 78 | 30.4% | 98.7% | 43 | 69 | 70 | 62.3% | 101.4% |
| Isiolo | | 152 | 192 | 170 | 79.2% | 88.5% | 301 | 391 | 359 | 77.0% | 91.8% |
| | Isiolo | 133 | 165 | 146 | 80.6% | 88.5% | 277 | 366 | 328 | 75.7% | 89.6% |
| | Merti | 19 | 27 | 24 | 70.4% | 88.9% | 24 | 25 | 31 | 96.0% | 124.0% |
| Kajiado | | 116 | 136 | 163 | 85.3% | 119.9% | 148 | 174 | 188 | 85.1% | 108.0% |
| | Kajiado North | 116 | 136 | 163 | 85.3% | 119.9% | 148 | 174 | 188 | 85.1% | 108.0% |
| Kiambu | | 144 | 308 | 280 | 46.8% | 90.9% | 248 | 463 | 398 | 53.6% | 86.0% |
| | Ruiru | 38 | 125 | 118 | 30.4% | 94.4% | 107 | 192 | 165 | 55.7% | 85.9% |
| | Thika | 106 | 183 | 162 | 57.9% | 88.5% | 141 | 271 | 233 | 52.0% | 86.0% |
| Kisumu | | 149 | 341 | 531 | 43.7% | 155.7% | 143 | 404 | 411 | 35.4% | 101.7% |
| | Kisumu East_A | 91 | 282 | 472 | 32.3% | 167.4% | 93 | 316 | 346 | 29.4% | 109.5% |
| | Nyando | 58 | 59 | 59 | 98.3% | 100.0% | 50 | 88 | 65 | 56.8% | 73.9% |
| Kitui | | 65 | 318 | 247 | 20.4% | 77.7% | 159 | 649 | 555 | 24.5% | 85.5% |
| | Kitui Central | 32 | 192 | 160 | 16.7% | 83.3% | 83 | 487 | 420 | 17.0% | 86.2% |
| | Kitui South | 33 | 126 | 87 | 26.2% | 69.0% | 76 | 162 | 135 | 46.9% | 83.3% |
| Lamu | | 39 | 44 | 44 | 88.6% | 100.0% | 65 | 59 | 61 | 110.2% | 103.4% |
| | Lamu West | 39 | 44 | 44 | 88.6% | 100.0% | 65 | 59 | 61 | 110.2% | 103.4% |
| Machakos | | 52 | 72 | 84 | 72.2% | 116.7% | 106 | 101 | 152 | 105.0% | 150.5% |
| | Yatta | 52 | 72 | 84 | 72.2% | 116.7% | 106 | 101 | 152 | 105.0% | 150.5% |
| Makueni | | 25 | 60 | 86 | 41.7% | 143.3% | 136 | 206 | 180 | 66.0% | 87.4% |
| | Kibwezi East | 25 | 60 | 86 | 41.7% | 143.3% | 136 | 206 | 180 | 66.0% | 87.4% |
| Migori | | 18 | 32 | 27 | 56.3% | 84.4% | 16 | 45 | 39 | 35.6% | 86.7% |
| | Rongo | 18 | 32 | 27 | 56.3% | 84.4% | 16 | 45 | 39 | 35.6% | 86.7% |
| Mombasa | | 97 | 261 | 157 | 37.2% | 60.2% | 182 | 421 | 265 | 43.2% | 62.9% |
| | Ganjoni | 9 | 28 | 28 | 32.1% | 100.0% | 9 | 27 | 29 | 33.3% | 107.4% |
| | Mvita | 88 | 233 | 129 | 37.8% | 55.4% | 173 | 394 | 236 | 43.9% | 59.9% |

| County | Sub Counties | 2017 | | | | | 2018 | | | | |
|---------------|----------------------|---------------|---------------|------|------------------------------|-----------------------|---------------|---------------|------|------------------------------|-----------------------|
| | | Patient Cards | TB4 registers | TIBU | Agreement TB4 vs Record Card | Agreement TB4 vs TIBU | Patient Cards | TB4 registers | TIBU | Agreement TB4 vs Record Card | Agreement TB4 vs TIBU |
| Nakuru | | 126 | 252 | 258 | 50.0% | 102.4% | 166 | 295 | 253 | 56.3% | 85.8% |
| | Naivasha | 32 | 140 | 146 | 22.9% | 104.3% | 71 | 159 | 143 | 44.7% | 89.9% |
| | Njoro | 94 | 112 | 112 | 83.9% | 100.0% | 95 | 136 | 110 | 69.9% | 80.9% |
| Nyeri | | 109 | 134 | 132 | 81.3% | 98.5% | 195 | 213 | 243 | 91.5% | 114.1% |
| | Othaya Mukurweini | 78 | 102 | 109 | 76.5% | 106.9% | 129 | 147 | 179 | 87.8% | 121.8% |
| | Tetu | 31 | 32 | 23 | 96.9% | 71.9% | 66 | 66 | 64 | 100.0% | 97.0% |
| Pokot | | 120 | 301 | 278 | 39.9% | 92.4% | 145 | 451 | 435 | 32.2% | 96.5% |
| | Pokot North | 63 | 64 | 83 | 98.4% | 129.7% | 78 | 128 | 133 | 60.9% | 103.9% |
| | West Pokot | 57 | 237 | 195 | 24.1% | 82.3% | 67 | 323 | 302 | 20.7% | 93.5% |
| Siaya | | 53 | 96 | 110 | 55.2% | 114.6% | 90 | 153 | 164 | 58.8% | 107.2% |
| | Bondo | 53 | 96 | 110 | 55.2% | 114.6% | 90 | 153 | 164 | 58.8% | 107.2% |
| Tana River | | 59 | 58 | 56 | 101.7% | 96.6% | 107 | 99 | 114 | 108.1% | 115.2% |
| | Tana Delta | 59 | 58 | 56 | 101.7% | 96.6% | 107 | 99 | 114 | 108.1% | 115.2% |
| Tharaka Nithi | | 37 | 445 | 262 | 8.3% | 58.9% | 375 | 691 | 581 | 54.3% | 84.1% |
| | Chuka Igamba Ng'ombe | 17 | 202 | 179 | 8.4% | 88.6% | 250 | 463 | 390 | 54.0% | 84.2% |
| | Maara | 20 | 243 | 83 | 8.2% | 34.2% | 125 | 228 | 191 | 54.8% | 83.8% |
| Turkana | | 7 | 44 | 45 | 15.9% | 102.3% | 10 | 20 | 36 | 50.0% | 180.0% |
| | Loima | 7 | 44 | 45 | 15.9% | 102.3% | 10 | 20 | 36 | 50.0% | 180.0% |
| Uasin Gishu | | 114 | 211 | 232 | 54.0% | 110.0% | 149 | 221 | 281 | 67.4% | 127.1% |
| | Eldoret MTRH | 75 | 157 | 173 | 47.8% | 110.2% | 102 | 166 | 227 | 61.4% | 136.7% |
| | Turbo | 39 | 54 | 59 | 72.2% | 109.3% | 47 | 55 | 54 | 85.5% | 98.2% |
| Grand Total | | 1870 | 3946 | 3773 | 47.4% | 95.6% | 3308 | 5761 | 5408 | 57.4% | 93.9% |

The level of agreement between TIBU data with facility registers for bacteriologically-confirmed (BC) TB in 2017 was 94.6% and it reduced to 91.9% in 2018. Comparing patient record cards and facility registers, the level of agreement was 49.3% in 2017 and 58.1% in 2018. Only 12 (32%) and 9 (24%) of the 37 sub counties sampled had acceptable levels of agreement (100% +/- 5%) for aggregate numbers of BC patients between TIBU and facility registers in 2017 and 2018, respectively.

The level of agreement between TIBU data with facility registers for clinically-diagnosed (CD) TB in 2017 was 95.6% and 93.9% in 2018. Comparing patient record cards and facility registers, the level of agreement was 47.4% in 2017 and 57.4% in 2018. Only 9 (24%) and 10 (27%) of the 37 sub counties sampled had acceptable levels of agreement for aggregate numbers of CD patients between TIBU and facility registers in 2017 and 2018, respectively.

Overall, compared to TB4 registers, the levels of agreement with TIBU data was much higher as compared to patient record cards; these levels of agreement were also similar between BC and CD data. While levels of agreements were consistently >90% for TIBU data, these were just about 50% for patient record cards. Generally, levels of agreements for patient record cards increased by about 10% between 2017 and 2018 while they reduced by 2-3% between TIBU and

TB4 registers data. Also, less than half of sub counties had acceptable levels of agreements between TIBU and TB4 registers.

Though the results indicate an increased use of patient record cards between 2017 and 2018 (likely due to sensitization and availability), the use was still way below acceptable limits, considering that these are the primary patient record tools. Such factors affected BC and CD data equally and were in multiple sub counties indicating that they are system-related factors. Of note also that levels of agreements between TIBU data reduced in 2018, likely due to inadequate restoration of the 2018 data post the loss.

Extra-pulmonary TB (Table 3)

Table 3: Levels of agreement for aggregated data for Extra Pulmonary TB in Patient record cards and TIBU data in comparison to TB4 facility registers

| County | Sub Counties | 2017 | | | | | 2018 | | | | |
|----------|-----------------|---------------|---------------|------|------------------------------|-----------------------|---------------|---------------|------|------------------------------|-----------------------|
| | | Patient Cards | TB4 registers | TIBU | Agreement TB4 vs Record Card | Agreement TB4 vs TIBU | Patient Cards | TB4 registers | TIBU | Agreement TB4 vs Record Card | Agreement TB4 vs TIBU |
| Baringo | | 3 | 20 | 22 | 15.0% | 110.0% | 8 | 23 | 15 | 34.8% | 65.2% |
| | Baringo Central | 1 | 9 | 10 | 11.1% | 111.1% | 1 | 14 | 10 | 7.1% | 71.4% |
| | Mogotio | 2 | 11 | 12 | 18.2% | 109.1% | 7 | 9 | 5 | 77.8% | 55.6% |
| Bomet | | 33 | 45 | 47 | 73.3% | 104.4% | 34 | 37 | 30 | 91.9% | 81.1% |
| | Sotik | 33 | 45 | 47 | 73.3% | 104.4% | 34 | 37 | 30 | 91.9% | 81.1% |
| Bungoma | | 9 | 11 | 14 | 81.8% | 127.3% | 10 | 8 | 6 | 125.0% | 75.0% |
| | Mt Elgon | 9 | 11 | 14 | 81.8% | 127.3% | 10 | 8 | 6 | 125.0% | 75.0% |
| Busia | | 24 | 28 | 27 | 85.7% | 96.4% | 19 | 23 | 20 | 82.6% | 87.0% |
| | Nambale | 6 | 6 | 7 | 100.0% | 116.7% | 8 | 6 | 5 | 133.3% | 83.3% |
| | Samia | 18 | 22 | 20 | 81.8% | 90.9% | 11 | 17 | 15 | 64.7% | 88.2% |
| Garissa | | 113 | 184 | 184 | 61.4% | 100.0% | 99 | 259 | 198 | 38.2% | 76.4% |
| | Garissa | 64 | 126 | 130 | 50.8% | 103.2% | 63 | 212 | 154 | 29.7% | 72.6% |
| | Refugee camps | 49 | 58 | 54 | 84.5% | 93.1% | 36 | 47 | 44 | 76.6% | 93.6% |
| Homa Bay | | 10 | 36 | 35 | 27.8% | 97.2% | 14 | 30 | 24 | 46.7% | 80.0% |
| | Kasipul | 10 | 36 | 35 | 27.8% | 97.2% | 14 | 30 | 24 | 46.7% | 80.0% |
| Isiolo | | 103 | 158 | 136 | 65.2% | 86.1% | 31 | 72 | 49 | 43.1% | 68.1% |
| | Isiolo | 98 | 151 | 131 | 64.9% | 86.8% | 27 | 62 | 43 | 43.5% | 69.4% |
| | Merti | 5 | 7 | 5 | 71.4% | 71.4% | 4 | 10 | 6 | 40.0% | 60.0% |
| Kajiado | | 63 | 67 | 63 | 94.0% | 94.0% | 63 | 82 | 68 | 76.8% | 82.9% |
| | Kajiado North | 63 | 67 | 63 | 94.0% | 94.0% | 63 | 82 | 68 | 76.8% | 82.9% |
| Kiambu | | 69 | 189 | 159 | 36.5% | 84.1% | 98 | 252 | 200 | 38.9% | 79.4% |
| | Ruiru | 19 | 64 | 58 | 29.7% | 90.6% | 34 | 70 | 61 | 48.6% | 87.1% |
| | Thika | 50 | 125 | 101 | 40.0% | 80.8% | 64 | 182 | 139 | 35.2% | 76.4% |
| Kisumu | | 33 | 61 | 73 | 54.1% | 119.7% | 26 | 75 | 67 | 34.7% | 89.3% |
| | Kisumu East_A | 21 | 49 | 56 | 42.9% | 114.3% | 11 | 64 | 50 | 17.2% | 78.1% |
| | Nyando | 12 | 12 | 17 | 100.0% | 141.7% | 15 | 11 | 17 | 136.4% | 154.5% |
| Kitui | | 30 | 156 | 142 | 19.2% | 91.0% | 63 | 305 | 268 | 20.7% | 87.9% |
| | Kitui Central | 20 | 124 | 118 | 16.1% | 95.2% | 51 | 280 | 249 | 18.2% | 88.9% |

| | | 2017 | | | | | 2018 | | | | |
|---------------|----------------------|---------------|---------------|------|------------------------------|-----------------------|---------------|---------------|------|------------------------------|-----------------------|
| County | Sub Counties | Patient Cards | TB4 registers | TIBU | Agreement TB4 vs Record Card | Agreement TB4 vs TIBU | Patient Cards | TB4 registers | TIBU | Agreement TB4 vs Record Card | Agreement TB4 vs TIBU |
| | Kitui South | 10 | 32 | 24 | 31.3% | 75.0% | 12 | 25 | 19 | 48.0% | 76.0% |
| Lamu | | 21 | 23 | 23 | 91.3% | 100.0% | 16 | 22 | 18 | 72.7% | 81.8% |
| | Lamu West | 21 | 23 | 23 | 91.3% | 100.0% | 16 | 22 | 18 | 72.7% | 81.8% |
| Machakos | | 34 | 58 | 48 | 58.6% | 82.8% | 41 | 61 | 65 | 67.2% | 106.6% |
| | Yatta | 34 | 58 | 48 | 58.6% | 82.8% | 41 | 61 | 65 | 67.2% | 106.6% |
| Makueni | | 2 | 22 | 15 | 9.1% | 68.2% | 7 | 25 | 19 | 28.0% | 76.0% |
| | Kibwezi East | 2 | 22 | 15 | 9.1% | 68.2% | 7 | 25 | 19 | 28.0% | 76.0% |
| Migori | | 10 | 25 | 29 | 40.0% | 116.0% | 10 | 15 | 15 | 66.7% | 100.0% |
| | Rongo | 10 | 25 | 29 | 40.0% | 116.0% | 10 | 15 | 15 | 66.7% | 100.0% |
| Mombasa | | 61 | 213 | 203 | 28.6% | 95.3% | 61 | 214 | 186 | 28.5% | 86.9% |
| | Ganjoni | 11 | 34 | 26 | 32.4% | 76.5% | 4 | 20 | 14 | 20.0% | 70.0% |
| | Mvita | 50 | 179 | 177 | 27.9% | 98.9% | 57 | 194 | 172 | 29.4% | 88.7% |
| Nakuru | | 77 | 130 | 120 | 59.2% | 92.3% | 86 | 106 | 92 | 81.1% | 86.8% |
| | Naivasha | 38 | 79 | 77 | 48.1% | 97.5% | 41 | 57 | 57 | 71.9% | 100.0% |
| | Njoro | 39 | 51 | 43 | 76.5% | 84.3% | 45 | 49 | 35 | 91.8% | 71.4% |
| Nyeri | | 29 | 40 | 35 | 72.5% | 87.5% | 28 | 46 | 36 | 60.9% | 78.3% |
| | Othaya Mukurweini | 17 | 28 | 24 | 60.7% | 85.7% | 17 | 35 | 25 | 48.6% | 71.4% |
| | Tetu | 12 | 12 | 11 | 100.0% | 91.7% | 11 | 11 | 11 | 100.0% | 100.0% |
| Pokot | | 36 | 181 | 141 | 19.9% | 77.9% | 71 | 244 | 186 | 29.1% | 76.2% |
| | Pokot North | 23 | 121 | 86 | 19.0% | 71.1% | 52 | 92 | 76 | 56.5% | 82.6% |
| | West Pokot | 13 | 60 | 55 | 21.7% | 91.7% | 19 | 152 | 110 | 12.5% | 72.4% |
| Siaya | | 35 | 41 | 56 | 85.4% | 136.6% | 41 | 41 | 41 | 100.0% | 100.0% |
| | Bondo | 35 | 41 | 56 | 85.4% | 136.6% | 41 | 41 | 41 | 100.0% | 100.0% |
| Tana River | | 12 | 18 | 15 | 66.7% | 83.3% | 24 | 30 | 26 | 80.0% | 86.7% |
| | Tana Delta | 12 | 18 | 15 | 66.7% | 83.3% | 24 | 30 | 26 | 80.0% | 86.7% |
| Tharaka Nithi | | 15 | 234 | 195 | 6.4% | 83.3% | 84 | 183 | 156 | 45.9% | 85.2% |
| | Chuka Igamba Ng'ombe | 2 | 36 | 23 | 5.6% | 63.9% | 33 | 56 | 45 | 58.9% | 80.4% |
| | Maara | 13 | 198 | 172 | 6.6% | 86.9% | 51 | 127 | 111 | 40.2% | 87.4% |
| Turkana | | 2 | 7 | 5 | 28.6% | 71.4% | 0 | 8 | 8 | 0.0% | 100.0% |
| | Loima | 2 | 7 | 5 | 28.6% | 71.4% | 0 | 8 | 8 | 0.0% | 100.0% |
| Uasin Gishu | | 108 | 169 | 157 | 63.9% | 92.9% | 63 | 190 | 178 | 33.2% | 93.7% |
| | Eldoret MTRH | 66 | 131 | 121 | 50.4% | 92.4% | 24 | 144 | 140 | 16.7% | 97.2% |
| | Turbo | 42 | 38 | 36 | 110.5% | 94.7% | 39 | 46 | 38 | 84.8% | 82.6% |
| Grand Total | | 932 | 2116 | 1944 | 44.0% | 91.9% | 997 | 2351 | 1971 | 42.4% | 83.8% |

The overall level of agreement between TIBU and facility registers decreased from 91.9% in 2017 to 83.8% in 2018. The level of agreement in the two periods under review is masked by the fact that most of the sub counties had either very high or very low level of agreement far from the desirable 100%. In 2017, a number of sub counties had level of agreement above 105% namely; Nyando (141.7%), Mt. Elgon (127.3%), Nambale (116.7%), Kisumu East A (114.3%), Rongo (116%) and Bondo (136%). Those that reported lowest level of agreement during the same period were; Chuka Igamba Ng'ombe (63.9%), Kibwezi (68.2%) and Merti (71.4%).

Aggregated patient outcomes (Table 4a-c)

Outcome Cured (Table 4a)

Table 4a-c: Levels of agreement for aggregated treatment outcomes data for Cured (Table 4a), Treatment complete (Table 4b) and Died (Table 4c) in Patient record cards and TIBU data in comparison to TB4 facility registers (2017 cohort)

| Table 4a: Outcome Cured | | | | | | |
|--------------------------------|-----------------|---------------|---------------|------|------------------------|------------------------|
| County | Sub Counties | Patient Cards | TB4 registers | TIBU | Agreement TB 4 vs Card | Agreement TB 4 vs TIBU |
| Baringo | | 0 | 58 | 41 | 0.0% | 70.7% |
| | Baringo Central | 0 | 45 | 32 | 0.0% | 71.1% |
| | Mogotio | 0 | 13 | 9 | 0.0% | 69.2% |
| Bomet | | 21 | 39 | 39 | 53.8% | 100.0% |
| | Sotik | 21 | 39 | 39 | 53.8% | 100.0% |
| Bungoma | | 6 | 23 | 28 | 26.1% | 121.7% |
| | Mt Elgon | 6 | 23 | 28 | 26.1% | 121.7% |
| Busia | | 9 | 89 | 88 | 10.1% | 98.9% |
| | Nambale | 4 | 30 | 33 | 13.3% | 110.0% |
| | Samia | 5 | 59 | 55 | 8.5% | 93.2% |
| Garissa | | 44 | 199 | 202 | 22.1% | 101.5% |
| | Garissa | 26 | 98 | 90 | 26.5% | 91.8% |
| | Refugee camps | 18 | 101 | 112 | 17.8% | 110.9% |
| Homa Bay | | 14 | 85 | 114 | 16.5% | 134.1% |
| | Kasipul | 14 | 85 | 114 | 16.5% | 134.1% |
| Isiolo | | 6 | 116 | 191 | 5.2% | 164.7% |
| | Isiolo | 0 | 111 | 187 | 0.0% | 168.5% |
| | Merti | 6 | 5 | 4 | 120.0% | 80.0% |
| Kajiado | | 7 | 120 | 155 | 5.8% | 129.2% |
| | Kajiado North | 7 | 120 | 155 | 5.8% | 129.2% |
| Kiambu | | 116 | 508 | 508 | 22.8% | 100.0% |
| | Ruiru | 4 | 185 | 207 | 2.2% | 111.9% |
| | Thika | 112 | 323 | 301 | 34.7% | 93.2% |
| Kisumu | | 78 | 346 | 385 | 22.5% | 111.3% |
| | Kisumu East_A | 42 | 263 | 304 | 16.0% | 115.6% |
| | Nyando | 36 | 83 | 81 | 43.4% | 97.6% |
| Kitui | | 58 | 386 | 411 | 15.0% | 106.5% |
| | Kitui Central | 30 | 202 | 266 | 14.9% | 131.7% |
| | Kitui South | 28 | 184 | 145 | 15.2% | 78.8% |
| Lamu | | 55 | 72 | 75 | 76.4% | 104.2% |
| | Lamu West | 55 | 72 | 75 | 76.4% | 104.2% |
| Machakos | | 121 | 181 | 88 | 66.9% | 48.6% |
| | Yatta | 121 | 181 | 88 | 66.9% | 48.6% |
| Makueni | | 24 | 145 | 146 | 16.6% | 100.7% |
| | Kibwezi East | 24 | 145 | 146 | 16.6% | 100.7% |
| Migori | | 6 | 59 | 74 | 10.2% | 125.4% |
| | Rongo | 6 | 59 | 74 | 10.2% | 125.4% |

| | | | | | | |
|----------------------|----------------------|-------------|-------------|-------------|---------------|---------------|
| Mombasa | | 109 | 358 | 356 | 30.4% | 99.4% |
| | Ganjoni | 0 | 66 | 60 | 0.0% | 90.9% |
| | Mvita | 109 | 292 | 296 | 37.3% | 101.4% |
| Nakuru | | 167 | 273 | 312 | 61.2% | 114.3% |
| | Naivasha | 89 | 157 | 181 | 56.7% | 115.3% |
| | Njoro | 78 | 116 | 131 | 67.2% | 112.9% |
| Nyeri | | 77 | 125 | 131 | 61.6% | 104.8% |
| | Othaya Mukurweini | 59 | 104 | 107 | 56.7% | 102.9% |
| | Tetu | 18 | 21 | 24 | 85.7% | 114.3% |
| Pokot | | 38 | 289 | 316 | 13.1% | 109.3% |
| | Pokot North | 5 | 85 | 120 | 5.9% | 141.2% |
| | West Pokot | 33 | 204 | 196 | 16.2% | 96.1% |
| Siaya | | 36 | 132 | 147 | 27.3% | 111.4% |
| | Bondo | 36 | 132 | 147 | 27.3% | 111.4% |
| Tana River | | 45 | 44 | 46 | 102.3% | 104.5% |
| | Tana Delta | 45 | 44 | 46 | 102.3% | 104.5% |
| Tharaka Nithi | | 12 | 333 | 295 | 3.6% | 88.6% |
| | Chuka Igamba Ng'ombe | 7 | 114 | 56 | 6.1% | 49.1% |
| | Maara | 5 | 219 | 239 | 2.3% | 109.1% |
| Turkana | | 0 | 6 | 3 | 0.0% | 50.0% |
| | Loima | 0 | 6 | 3 | 0.0% | 50.0% |
| Uasin Gishu | | 81 | 235 | 366 | 34.5% | 155.7% |
| | Eldoret MTRH | 0 | 141 | 247 | 0.0% | 175.2% |
| | Turbo | 81 | 94 | 119 | 86.2% | 126.6% |
| Grand Total | | 1130 | 4221 | 4517 | 26.8% | 107.0% |

The outcome cured (C) is given to pulmonary TB cases that were bacteriologically confirmed either through a smear microscopy test or GeneXpert. However, the outcome is determined by follow up smears.

The aggregate level of agreement between the record cards and TB4 facility register was 26.8%. This would be explained by the fact that the record cards which are the primary source of patient data in the facility were not being utilized. In some sub counties, the level of agreement was 0% because the cards were never updated with the outcomes. These sub counties include; Baringo Central and Mogotio, Isiolo, Ganjoni, Loima and Eldoret MTRH.

Merti and Tana Delta were the only two Sub Counties that had an over reporting which were recorded as 120% and 102.3% respectively. This can be as a result of managing patients in the record cards only and not having them registered in the TB4 register or, updating the record cards with outcomes and not doing the same in the TB4 register.

The level of agreement between TB4 register and TIBU was reported at 107.0% This was over reporting which could be explained by the fact that the SCTLCs are more concerned with updating the cured outcomes in TIBU but do not ensure uniformity by updating the registers as well. This updates are mainly done during QRM meetings when data cleaning is done. Only Bomet Sub County posted 100% level of agreement between TB4 register and TIBU. This means that all the patients in the TB4 register who had an outcome of cured were all updated in TIBU with the same outcome.

Outcome Treatment completed (Table 4b)

| Table 4b: Outcome Treatment Completed | | | | | | |
|--|-----------------|---------------|---------------|------------|------------------------|------------------------|
| County | Sub Counties | Patient Cards | TB4 registers | TIBU | Agreement TB 4 vs Card | Agreement TB 4 vs TIBU |
| Baringo | | 0 | 72 | 89 | 0.0% | 123.6% |
| | Baringo Central | 0 | 51 | 67 | 0.0% | 131.4% |
| | Mogotio | 0 | 21 | 22 | 0.0% | 104.8% |
| Bomet | | 0 | 83 | 60 | 0.0% | 72.3% |
| | Sotik | 0 | 83 | 60 | 0.0% | 72.3% |
| Bungoma | | 0 | 34 | 37 | 0.0% | 108.8% |
| | Mt Elgon | 0 | 34 | 37 | 0.0% | 108.8% |
| Busia | | 0 | 126 | 133 | 0.0% | 105.6% |
| | Nambale | 0 | 26 | 27 | 0.0% | 103.8% |
| | Samia | 0 | 100 | 106 | 0.0% | 106.0% |
| Garissa | | 0 | 382 | 471 | 0.0% | 123.3% |
| | Garissa | 0 | 219 | 291 | 0.0% | 132.9% |
| | Refugee camps | 0 | 163 | 180 | 0.0% | 110.4% |
| Homa Bay | | 0 | 97 | 84 | 0.0% | 86.6% |
| | Kasipul | 0 | 97 | 84 | 0.0% | 86.6% |
| Isiolo | | 0 | 290 | 316 | 0.0% | 109.0% |
| | Isiolo | 0 | 247 | 271 | 0.0% | 109.7% |
| | Merti | 0 | 43 | 45 | 0.0% | 104.7% |
| Kajiado | | 0 | 197 | 225 | 0.0% | 114.2% |
| | Kajiado North | 0 | 197 | 225 | 0.0% | 114.2% |
| Kiambu | | 0 | 553 | 537 | 0.0% | 97.1% |
| | Ruiru | 0 | 186 | 203 | 0.0% | 109.1% |
| | Thika | 0 | 367 | 334 | 0.0% | 91.0% |
| Kisumu | | 0 | 314 | 498 | 0.0% | 158.6% |
| | Kisumu East_A | 0 | 253 | 429 | 0.0% | 169.6% |
| | Nyando | 0 | 61 | 69 | 0.0% | 113.1% |
| Kitui | | 6 | 307 | 300 | 2.0% | 97.7% |
| | Kitui Central | 0 | 165 | 183 | 0.0% | 110.9% |
| | Kitui South | 6 | 142 | 117 | 4.2% | 82.4% |
| Lamu | | 0 | 62 | 63 | 0.0% | 101.6% |
| | Lamu West | 0 | 62 | 63 | 0.0% | 101.6% |
| Machakos | | 0 | 106 | 44 | 0.0% | 41.5% |
| | Yatta | 0 | 106 | 44 | 0.0% | 41.5% |
| Makueni | | 29 | 52 | 39 | 55.8% | 75.0% |
| | Kibwezi East | 29 | 52 | 39 | 55.8% | 75.0% |
| Migori | | 0 | 95 | 95 | 0.0% | 100.0% |
| | Rongo | 0 | 95 | 95 | 0.0% | 100.0% |
| Mombasa | | 0 | 313 | 369 | 0.0% | 117.9% |
| | Ganjoni | 0 | 53 | 65 | 0.0% | 122.6% |
| | Mvita | 0 | 260 | 304 | 0.0% | 116.9% |
| Nakuru | | 23 | 219 | 274 | 10.5% | 125.1% |
| | Naivasha | 23 | 134 | 152 | 17.2% | 113.4% |

| | | | | | | |
|----------------------|----------------------|------------|-------------|-------------|--------------|---------------|
| | Njoro | 0 | 85 | 122 | 0.0% | 143.5% |
| Nyeri | | 0 | 148 | 141 | 0.0% | 95.3% |
| | Othaya Mukurweini | 0 | 106 | 100 | 0.0% | 94.3% |
| | Tetu | 0 | 42 | 41 | 0.0% | 97.6% |
| Pokot | | 15 | 372 | 398 | 4.0% | 107.0% |
| | Pokot North | 15 | 205 | 186 | 7.3% | 90.7% |
| | West Pokot | 0 | 167 | 212 | 0.0% | 126.9% |
| Siaya | | 1 | 89 | 107 | 1.1% | 120.2% |
| | Bondo | 1 | 89 | 107 | 1.1% | 120.2% |
| Tana River | | 37 | 78 | 71 | 47.4% | 91.0% |
| | Tana Delta | 37 | 78 | 71 | 47.4% | 91.0% |
| Tharaka Nithi | | 0 | 452 | 511 | 0.0% | 113.1% |
| | Chuka Igamba Ng'ombe | 0 | 237 | 284 | 0.0% | 119.8% |
| | Maara | 0 | 215 | 227 | 0.0% | 105.6% |
| Turkana | | 0 | 57 | 74 | 0.0% | 129.8% |
| | Loima | 0 | 57 | 74 | 0.0% | 129.8% |
| Uasin Gishu | | 37 | 259 | 352 | 14.3% | 135.9% |
| | Eldoret MTRH | 0 | 163 | 250 | 0.0% | 153.4% |
| | Turbo | 37 | 96 | 102 | 38.5% | 106.3% |
| Grand Total | | 148 | 4757 | 5288 | 3.1% | 111.2% |

The outcome treatment completed (TC) is given to TB cases that are bacteriologically confirmed either through a smear microscopy test or GeneXpert but did not have all the follow up smears done or recorded. It is also given to the clinically-diagnosed patients who successfully complete treatment.

A total of 4757 patients in 2017 were given an outcome of TC in the TB4 register according to the sub counties visited. Out of this, only 148 patients had these outcomes recorded in their patient record cards, translating to only 3.1% as the level of agreement between the TB4 and the patient record cards. This is a clear indication that the patient record cards are not being utilized thus not updated with outcomes, with most Sub Counties registering a 0% level of agreement.

The level of agreement between TB4 and TIBU was reported at 111.2% which was an over reporting. This is a clear indication that majority of the sub counties visited had more of their outcome updated in TIBU and not in the TB4 register for the patients with an outcome of treatment completed. This again show updating of TIBU during data cleaning sessions and failing to update the same data in the registers. Only Rongo Sub County registered a 100% agreement.

Outcome Died (Table 4c)

| Table 4c: Outcome Died | | | | | | |
|-------------------------------|-----------------|---------------|---------------|-----------|------------------------|------------------------|
| County | Sub Counties | Patient Cards | TB4 registers | TIBU | Agreement TB 4 vs Card | Agreement TB 4 vs TIBU |
| Baringo | | 0 | 14 | 13 | 0.0% | 92.9% |
| | Baringo Central | 0 | 11 | 10 | 0.0% | 90.9% |
| | Mogotio | 0 | 3 | 3 | 0.0% | 100.0% |
| Bomet | | 2 | 11 | 5 | 18.2% | 45.5% |
| | Sotik | 2 | 11 | 5 | 18.2% | 45.5% |
| Bungoma | | 1 | 3 | 5 | 33.3% | 166.7% |
| | Mt Elgon | 1 | 3 | 5 | 33.3% | 166.7% |
| Busia | | 3 | 21 | 12 | 14.3% | 57.1% |
| | Nambale | 1 | 6 | 1 | 16.7% | 16.7% |
| | Samia | 2 | 15 | 11 | 13.3% | 73.3% |
| Garissa | | 6 | 26 | 20 | 23.1% | 76.9% |
| | Garissa | 2 | 12 | 11 | 16.7% | 91.7% |
| | Refugee camps | 4 | 14 | 9 | 28.6% | 64.3% |
| Homa Bay | | 5 | 26 | 26 | 19.2% | 100.0% |
| | Kasipul | 5 | 26 | 26 | 19.2% | 100.0% |
| Isiolo | | 0 | 15 | 12 | 0.0% | 80.0% |
| | Isiolo | 0 | 15 | 12 | 0.0% | 80.0% |
| | Merti | 0 | 0 | 0 | | |
| Kajiado | | 0 | 17 | 14 | 0.0% | 82.4% |
| | Kajiado North | 0 | 17 | 14 | 0.0% | 82.4% |
| Kiambu | | 18 | 67 | 66 | 26.9% | 98.5% |
| | Ruiru | 1 | 28 | 29 | 3.6% | 103.6% |
| | Thika | 17 | 39 | 37 | 43.6% | 94.9% |
| Kisumu | | 29 | 82 | 82 | 35.4% | 100.0% |
| | Kisumu East_A | 17 | 51 | 49 | 33.3% | 96.1% |
| | Nyando | 12 | 31 | 33 | 38.7% | 106.5% |
| Kitui | | 5 | 40 | 40 | 12.5% | 100.0% |
| | Kitui Central | 3 | 24 | 23 | 12.5% | 95.8% |
| | Kitui South | 2 | 16 | 17 | 12.5% | 106.3% |
| Lamu | | 7 | 8 | 7 | 87.5% | 87.5% |
| | Lamu West | 7 | 8 | 7 | 87.5% | 87.5% |
| Machakos | | 2 | 15 | 16 | 13.3% | 106.7% |
| | Yatta | 2 | 15 | 16 | 13.3% | 106.7% |
| Makueni | | 1 | 23 | 20 | 4.3% | 87.0% |
| | Kibwezi East | 1 | 23 | 20 | 4.3% | 87.0% |
| Migori | | 0 | 21 | 19 | 0.0% | 90.5% |
| | Rongo | 0 | 21 | 19 | 0.0% | 90.5% |
| Mombasa | | 6 | 54 | 27 | 11.1% | 50.0% |
| | Ganjoni | 0 | 1 | 2 | 0.0% | 200.0% |
| | Mvita | 6 | 53 | 25 | 11.3% | 47.2% |
| Nakuru | | 14 | 22 | 32 | 63.6% | 145.5% |
| | Naivasha | 6 | 14 | 20 | 42.9% | 142.9% |

| | | | | | | |
|----------------------|----------------------|------------|------------|------------|--------------|---------------|
| | Njoro | 8 | 8 | 12 | 100.0% | 150.0% |
| Nyeri | | 22 | 34 | 33 | 64.7% | 97.1% |
| | Othaya Mukurweini | 11 | 22 | 22 | 50.0% | 100.0% |
| | Tetu | 11 | 12 | 11 | 91.7% | 91.7% |
| Pokot | | 9 | 31 | 31 | 29.0% | 100.0% |
| | Pokot North | 6 | 14 | 16 | 42.9% | 114.3% |
| | West Pokot | 3 | 17 | 15 | 17.6% | 88.2% |
| Siaya | | 9 | 35 | 37 | 25.7% | 105.7% |
| | Bondo | 9 | 35 | 37 | 25.7% | 105.7% |
| Tana River | | 9 | 11 | 10 | 81.8% | 90.9% |
| | Tana Delta | 9 | 11 | 10 | 81.8% | 90.9% |
| Tharaka Nithi | | 1 | 40 | 34 | 2.5% | 85.0% |
| | Chuka Igamba Ng'ombe | 0 | 17 | 14 | 0.0% | 82.4% |
| | Maara | 1 | 23 | 20 | 4.3% | 87.0% |
| Turkana | | 0 | 3 | 2 | 0.0% | 66.7% |
| | Loima | 0 | 3 | 2 | 0.0% | 66.7% |
| Uasin Gishu | | 13 | 34 | 42 | 38.2% | 123.5% |
| | Eldoret MTRH | 10 | 26 | 31 | 38.5% | 119.2% |
| | Turbo | 3 | 8 | 11 | 37.5% | 137.5% |
| Grand Total | | 162 | 653 | 605 | 24.8% | 92.6% |

The outcome died (D) is given to TB patients who die out of any occurrence. The health care workers are encouraged to do a mortality audit and document the results of the audit in the patient record card, TB4 register and TIBU.

The level of agreement between the patient record cards and TB4 registers was reported at a low 24.8%, representing 162 patients out of the total 653 who had an outcome of died. Njoro was the only sub county that reported 100% agreement. This means that all their 8 patients with an outcome of died had patient record cards that were updated with this information. A number of sub counties reported 0% agreement, illustrating inadequate use of the record cards where they were not updated.

The level of agreement between TIBU and TB4 register was 92.6%. Majority of the sub counties registered an agreement that was less than 100%. This shows that the TB4 registers had more information on the outcomes as compared to TIBU. However, we still had several sub counties recording an over reporting with Ganjoni recording 200% agreement. This means that TIBU was more updated with outcomes as compared to TB4 register.

Case-based DS TB data

Availability of patient documents (Table 5a)

| County | Subcounty | Numbers | | | Agreement | |
|--------------------|----------------------|----------------------|---------------|------------|-------------------------------|-----------------------|
| | | Patient Record cards | TB4 registers | TIBU | TB4 registers vs Record cards | TB4 registers vs TIBU |
| Baringo | Baringo Central | 7 | 26 | 21 | 26.9% | 80.8% |
| | Mogotio | 12 | 15 | 15 | 80.0% | 100.0% |
| Bomet | Sotik | 8 | 8 | 8 | 100.0% | 100.0% |
| Bungoma | Mt Elgon | 10 | 12 | 8 | 83.3% | 66.7% |
| Busia | Nambale | 10 | 10 | 10 | 100.0% | 100.0% |
| | Samia | 14 | 15 | 14 | 93.3% | 93.3% |
| Garissa | Garissa | 25 | 40 | 35 | 62.5% | 87.5% |
| | Refugee Camps | 15 | 17 | 17 | 88.2% | 100.0% |
| Homa Bay | Kasipul | 11 | 14 | 11 | 78.6% | 78.6% |
| Isiolo | Isiolo | 31 | 50 | 48 | 62.0% | 96.0% |
| | Merti | 15 | 24 | 24 | 62.5% | 100.0% |
| Kajiado | Kajiado North | 18 | 23 | 23 | 78.3% | 100.0% |
| Kiambu | Ruiru | 14 | 34 | 32 | 41.2% | 94.1% |
| | Thika | 39 | 68 | 67 | 57.4% | 98.5% |
| Kisumu | Kisumu East A | 33 | 69 | 63 | 47.8% | 91.3% |
| | Nyando | 32 | 38 | 35 | 84.2% | 92.1% |
| Kitui | Kitui Central | 13 | 28 | 28 | 46.4% | 100.0% |
| | Kitui South | 36 | 45 | 45 | 80.0% | 100.0% |
| Lamu | Lamu West | 14 | 15 | 13 | 93.3% | 86.7% |
| Machakos | Yatta | 28 | 36 | 35 | 77.8% | 97.2% |
| Makueni | Kibwezi East | 20 | 34 | 33 | 58.8% | 97.1% |
| Migori | Rongo | 9 | 12 | 12 | 75.0% | 100.0% |
| Mombasa | Ganjoni | 10 | 10 | 10 | 100.0% | 100.0% |
| | Mvita | 46 | 46 | 39 | 100.0% | 84.8% |
| Nakuru | Naivasha | 16 | 16 | 16 | 100.0% | 100.0% |
| | Njoro | 43 | 43 | 43 | 100.0% | 100.0% |
| Nyeri | Othaya Mukurweini | 34 | 35 | 35 | 97.1% | 100.0% |
| | Tetu | 18 | 18 | 18 | 100.0% | 100.0% |
| Pokot | Pokot North | 14 | 31 | 31 | 45.2% | 100.0% |
| | West Pokot | 7 | 46 | 45 | 15.2% | 97.8% |
| Siaya | Bondo | 17 | 20 | 17 | 85.0% | 85.0% |
| Tana River | Tana Delta | 24 | 24 | 24 | 100.0% | 100.0% |
| Tharaka Nithi | Chuka Igamba Ng'ombe | 24 | 52 | 37 | 46.2% | 71.2% |
| | Maara | 21 | 33 | 30 | 63.6% | 90.9% |
| Turkana | Loima | 1 | 17 | 16 | 5.9% | 94.1% |
| Uasin Gishu | Eldoret Mtrh | 5 | 5 | 5 | 100.0% | 100.0% |
| | Turbo | 6 | 6 | 6 | 100.0% | 100.0% |
| Grand Total | | 700 | 1035 | 969 | 67.6% | 93.6% |

Out of a total 1035 patients sampled, 93.6% (969) of them had been notified through TIBU and only 67.6% (700) had patient record cards. The performance across sub counties was varied with Sotik, Nambale, Ganjoni, Naivasha, Njoro, Tetu, Tana Delta, MTRH and Turbo reporting 100% level of agreement across the three documents. Consequently, the uptake of record cards was low in a number of sub counties; Loima (5.9%), West Pokot (15.2%), Baringo Central (26.9%), Ruiru (41.2%), Pokot North (45.2%) and Chuka Igamba Ng'ombe (46.2%). This points to a glaring gap in the use of patient record cards as the source document; this is consistent with the findings from previous assessments (DQA Report 2018). Previous DQAs had pointed out a gap in physical availability of the record cards in most facilities which has spurred fast tracking of the procurement and distribution process. Subsequently, continued capacity building and mentorship is crucial for a mind shift amongst the health staff on adoption of patient record cards as source document.

Sub County registration number (Table 5b)

Table 5b: Levels of agreement on Sub-county registration numbers in Patient record cards and TB4 facility registers in comparison to TIBU data (case-based data)

| | | Number | | | | Agreement | |
|----------|-----------------|--|------------------------------|---------------------------------|----------------------------------|----------------------|-----------------------|
| County | Subcounty | Matched Patient Record cards with TIBU | Total Record cards available | Matched TB4 registers with TIBU | Total available in TB4 registers | TIBU vs Record cards | TIBU vs TB4 registers |
| Baringo | Baringo Central | 2 | 7 | 10 | 21 | 28.6% | 47.6% |
| | Mogotio | 0 | 12 | 0 | 15 | 0.0% | 0.0% |
| Bomet | Sotik | 8 | 8 | 8 | 8 | 100.0% | 100.0% |
| Bungoma | Mt Elgon | 6 | 10 | 7 | 8 | 60.0% | 87.5% |
| Busia | Nambale | 0 | 10 | 1 | 10 | 0.0% | 10.0% |
| | Samia | 0 | 14 | 1 | 14 | 0.0% | 7.1% |
| Garissa | Garissa | 13 | 25 | 28 | 35 | 52.0% | 80.0% |
| | Refugee Camps | 15 | 15 | 17 | 17 | 100.0% | 100.0% |
| Homa Bay | Kasipul | 6 | 11 | 10 | 11 | 54.5% | 90.9% |
| Isiolo | Isiolo | 7 | 31 | 42 | 48 | 22.6% | 87.5% |
| | Merti | 15 | 15 | 22 | 24 | 100.0% | 91.7% |
| Kajiado | Kajiado North | 0 | 18 | 23 | 23 | 0.0% | 100.0% |
| Kiambu | Ruiru | 2 | 14 | 6 | 32 | 14.3% | 18.8% |
| | Thika | 21 | 39 | 57 | 67 | 53.8% | 85.1% |
| Kisumu | Kisumu East A | 3 | 33 | 35 | 63 | 9.1% | 55.6% |
| | Nyando | 21 | 32 | 31 | 35 | 65.6% | 88.6% |
| Kitui | Kitui Central | 6 | 13 | 26 | 28 | 46.2% | 92.9% |
| | Kitui South | 34 | 36 | 44 | 45 | 94.4% | 97.8% |
| Lamu | Lamu West | 12 | 14 | 12 | 13 | 85.7% | 92.3% |
| Machakos | Yatta | 22 | 28 | 33 | 35 | 78.6% | 94.3% |
| Makueni | Kibwezi East | 5 | 20 | 26 | 33 | 25.0% | 78.8% |
| Migori | Rongo | 2 | 9 | 9 | 12 | 22.2% | 75.0% |
| Mombasa | Ganjoni | 4 | 10 | 10 | 10 | 40.0% | 100.0% |
| | Mvita | 20 | 46 | 35 | 39 | 43.5% | 89.7% |
| Nakuru | Naivasha | 6 | 16 | 14 | 16 | 37.5% | 87.5% |
| | Njoro | 37 | 43 | 41 | 43 | 86.0% | 95.3% |

| | | | | | | | |
|----------------------|----------------------|------------|------------|------------|------------|--------------|--------------|
| Nyeri | Othaya Mukurweini | 29 | 34 | 30 | 35 | 85.3% | 85.7% |
| | Tetu | 16 | 18 | 16 | 18 | 88.9% | 88.9% |
| Pokot | Pokot North | 11 | 14 | 29 | 31 | 78.6% | 93.5% |
| | West Pokot | 5 | 7 | 40 | 45 | 71.4% | 88.9% |
| Siaya | Bondo | 4 | 17 | 14 | 17 | 23.5% | 82.4% |
| Tana River | Tana Delta | 20 | 24 | 20 | 24 | 83.3% | 83.3% |
| Tharaka Nithi | Chuka Igamba Ng'ombe | 12 | 24 | 36 | 37 | 50.0% | 97.3% |
| | Maara | 11 | 21 | 28 | 30 | 52.4% | 93.3% |
| Turkana | Loima | 0 | 1 | 2 | 16 | 0.0% | 12.5% |
| Uasin Gishu | Eldoret Mtrh | 0 | 5 | 0 | 5 | 0.0% | 0.0% |
| | Turbo | 4 | 6 | 0 | 6 | 66.7% | 0.0% |
| Grand Total | | 379 | 700 | 763 | 969 | 54.1% | 78.7% |

Out of the 700 record cards available, only 54.1% (379) of the patient record cards had the sub county registration number correctly indicated; while in TB4 registers the proportion was 78.7%. This clearly indicates that there might be omission and distortion of data during transcription. As a mitigation measure, the facility staff should be sensitized on the importance of having the correct registration number across the patient records and the need for SCTLCs to check such details during subsequent visits. Further, discrepant data in TIBU could be attributed to double registration of patients in some facilities hence the need to flag them out for possible deletion after proper verification.

A case in point are transfer-ins who might have been registered as new patients. To avert such occurrences in the future, the SCTLCs are encouraged to mentor facility staff on proper documentation.

Registration date (Table 5c)

Table 5c: Levels of agreement on Registration dates in TB4 facility registers in comparison to TIBU data (case-based data)

| County | Subcounty | Numbers | | Agreement |
|-----------------|-----------------|---------------|------|-----------------------|
| | | TB4 registers | TIBU | TIBU vs TB4 registers |
| Baringo | Baringo Central | 1 | 20 | 5.0% |
| | Mogotio | 10 | 14 | 71.4% |
| Bomet | Sotik | 2 | 7 | 28.6% |
| Bungoma | Mt Elgon | 6 | 9 | 66.7% |
| Busia | Nambale | 1 | 9 | 11.1% |
| | Samia | 13 | 14 | 92.9% |
| Garissa | Garissa | 23 | 39 | 59.0% |
| | Refugee Camps | 16 | 17 | 94.1% |
| Homa Bay | Kasipul | 8 | 13 | 61.5% |
| Isiolo | Isiolo | 6 | 37 | 16.2% |
| | Merti | 9 | 24 | 37.5% |

| | | | | |
|--------------------|----------------------|------------|------------|--------------|
| Kajiado | Kajiado North | 23 | 23 | 100.0% |
| Kiambu | Ruiru | 6 | 34 | 17.6% |
| | Thika | 24 | 63 | 38.1% |
| Kisumu | Kisumu East A | 58 | 67 | 86.6% |
| | Nyando | 17 | 35 | 48.6% |
| Kitui | Kitui Central | 18 | 27 | 66.7% |
| | Kitui South | 33 | 45 | 73.3% |
| Lamu | Lamu West | 11 | 15 | 73.3% |
| Machakos | Yatta | 33 | 36 | 91.7% |
| Makueni | Kibwezi East | 5 | 28 | 17.9% |
| Migori | Rongo | 2 | 11 | 18.2% |
| Mombasa | Ganjoni | 10 | 10 | 100.0% |
| | Mvita | 27 | 41 | 65.9% |
| Nakuru | Naivasha | 4 | 10 | 40.0% |
| | Njoro | 5 | 42 | 11.9% |
| Nyeri | Othaya Mukurweini | 19 | 33 | 57.6% |
| | Tetu | 10 | 17 | 58.8% |
| Pokot | Pokot North | 10 | 30 | 33.3% |
| | West Pokot | 22 | 44 | 50.0% |
| Siaya | Bondo | 11 | 19 | 57.9% |
| Tana River | Tana Delta | 23 | 24 | 95.8% |
| Tharaka Nithi | Chuka Igamba Ng'ombe | 5 | 38 | 13.2% |
| | Maara | 18 | 33 | 54.5% |
| Turkana | Loima | 3 | 17 | 17.6% |
| Uasin Gishu | Eldoret Mtrh | 3 | 5 | 60.0% |
| | Turbo | 5 | 6 | 83.3% |
| Grand Total | | 500 | 956 | 52.3% |

Out of the 956 available records, 500 records in TB4 had the date of registration documented giving 52.3% level of agreement of dates of registration between TB4 register and TIBU. Ganjoni and Kajiado North sub counties had 100% level of agreement. The sub counties with the lowest levels of agreement on the date of registration included, Baringo central (5%), Nambale (11.1%) and Njoro (11.9%).

The date of registration is the date showing when the patient was notified into the national surveillance system (TIBU) by the SCTLIC. This same date is required to be indicated in the TB4 register. It is expected that the SCTLIC does the notification during his visits to the health facility, these dates must be consistent in both TIBU and TB4. The findings showed low level of agreement in most of the facilities between the two tools. This could be due to failure of the SCTLIC to document in the register after notification in TIBU or the HCW indicating the date in TB4 before notification is done. The implication of having different dates in TB4 and TIBU is that during data cleaning one may not ascertain if it is the same patient especially when tracing double registration, transfers in and transfer out. TB being a notifiable disease globally, the timeliness of notification is one of the measures of the efficiency of every TB surveillance system. There was no comparison between the record cards since there is no provision for documenting this date in the card.

Type of patient (Table 5d)

Table 5d: Levels of agreement on Type of patient in Patient record cards and TIBU data in comparison to TB4 facility registers (case-based data)

| County | Subcounty | Numbers | | | | Agreement | |
|--------------------|----------------------|---|------------------------------|---------------------------------|-------------------------|------------------------------|-----------------------|
| | | Matched Patient Record cards with TB4 registers | Total Record cards available | Matched TIBU with TB4 registers | Total available in TIBU | TB4 registers vs Record card | TB4 registers vs TIBU |
| Baringo | Baringo Central | 5 | 7 | 21 | 21 | 71.4% | 100.0% |
| | Mogotio | 3 | 12 | 15 | 15 | 25.0% | 100.0% |
| Bomet | Sotik | 1 | 8 | 7 | 8 | 12.5% | 87.5% |
| Bungoma | Mt Elgon | 3 | 10 | 8 | 8 | 30.0% | 100.0% |
| Busia | Nambale | 1 | 10 | 10 | 10 | 10.0% | 100.0% |
| | Samia | 0 | 14 | 14 | 14 | 0.0% | 100.0% |
| Garissa | Garissa | 25 | 25 | 33 | 35 | 100.0% | 94.3% |
| | Refugee Camps | 15 | 15 | 17 | 17 | 100.0% | 100.0% |
| Homa Bay | Kasipul | 9 | 11 | 9 | 11 | 81.8% | 81.8% |
| Isiolo | Isiolo | 5 | 31 | 43 | 48 | 16.1% | 89.6% |
| | Merti | 10 | 15 | 23 | 24 | 66.7% | 95.8% |
| Kajiado | Kajiado North | 12 | 18 | 21 | 23 | 66.7% | 91.3% |
| Kiambu | Ruiru | 2 | 14 | 28 | 32 | 14.3% | 87.5% |
| | Thika | 4 | 39 | 53 | 67 | 10.3% | 79.1% |
| Kisumu | Kisumu East A | 8 | 33 | 62 | 63 | 24.2% | 98.4% |
| | Nyando | 16 | 32 | 32 | 35 | 50.0% | 91.4% |
| Kitui | Kitui Central | 8 | 13 | 28 | 28 | 61.5% | 100.0% |
| | Kitui South | 5 | 36 | 43 | 45 | 13.9% | 95.6% |
| Lamu | Lamu West | 6 | 14 | 12 | 13 | 42.9% | 92.3% |
| Machakos | Yatta | 17 | 28 | 35 | 35 | 60.7% | 100.0% |
| Makueni | Kibwezi East | 8 | 20 | 32 | 33 | 40.0% | 97.0% |
| Migori | Rongo | 1 | 9 | 11 | 12 | 11.1% | 91.7% |
| Mombasa | Ganjoni | 4 | 10 | 7 | 10 | 40.0% | 70.0% |
| | Mvita | 8 | 46 | 31 | 39 | 17.4% | 79.5% |
| Nakuru | Naivasha | 3 | 16 | 16 | 16 | 18.8% | 100.0% |
| | Njoro | 5 | 43 | 39 | 43 | 11.6% | 90.7% |
| Nyeri | Othaya Mukurweini | 16 | 34 | 34 | 35 | 47.1% | 97.1% |
| | Tetu | 7 | 18 | 17 | 18 | 38.9% | 94.4% |
| Pokot | Pokot North | 7 | 14 | 27 | 31 | 50.0% | 87.1% |
| | West Pokot | 2 | 7 | 43 | 45 | 28.6% | 95.6% |
| Siaya | Bondo | 11 | 17 | 14 | 17 | 64.7% | 82.4% |
| Tana River | Tana Delta | 0 | 24 | 23 | 24 | 0.0% | 95.8% |
| Tharaka Nithi | Chuka Igamba Ng'ombe | 6 | 24 | 35 | 37 | 25.0% | 94.6% |
| | Maara | 2 | 21 | 30 | 30 | 9.5% | 100.0% |
| Turkana | Loima | 1 | 1 | 15 | 16 | 100.0% | 93.8% |
| Uasin Gishu | Eldoret Mtrh | 3 | 5 | 5 | 5 | 60.0% | 100.0% |
| | Turbo | 1 | 6 | 6 | 6 | 16.7% | 100.0% |
| Grand Total | | 240 | 700 | 899 | 969 | 34.3% | 92.8% |

Out of the 700 (67.6%) patient record cards available, only 34.3% had a matching type of patient. There was 100% level of agreement between the documented patient type in Loima, refugee camps and Garissa sub counties. This therefore calls for harmonization of existing tools and retrieval of obsolete ones.

Of the 969 available records in TIBU 92.8% had a matching patient type with the TB4 registers. Tana delta and Samia had no record cards giving zero agreement levels for the type of patients. In TIBU, 12 sub counties recorded 100% level of agreement. Ganjoni Sub County had the lowest level of agreement at 70% between TIBU and TB4 for the type of patient.

The findings revealed low agreement of the type of patient in the card and TB4 register and also between TB4 and TIBU. One of the reasons for the discordance in the record cards is the poor quality of the patient history taken by the clinicians during diagnosis with very scanty information documented. Another reason is that some old version of the cards still in use at the health facilities lack space to document type of patient unlike newer versions. The discrepancy in TIBU indicates that the SCTLC does not use the information recorded on the TB4 while notifying patients. The type of patient is a key indicator which helps the country determine the incidence of TB and also guides in the drug resistance surveillance. Lack of identifying the patient correctly in any of the tool means that there will be gaps in performing necessary initial tests to the patient before start of treatment hampering DRTB surveillance hence poor outcomes.

TB treatment start date (Table 5e)

Table 5e: Levels of agreement on Treatment start dates in Patient record cards and TIBU data in comparison to TB4 facility registers (case-based data)

| County | Subcounty | Numbers | | | | Agreement | |
|----------|-----------------|--|------------------------------|---------------------------------|-------------------------|------------------------------|-----------------------|
| | | Matched Patient Record cards with TB4 register | Total Record cards available | Matched TIBU with TB4 registers | Total available in TIBU | TB4 registers vs Record card | TB4 registers vs TIBU |
| Baringo | Baringo Central | 5 | 7 | 10 | 21 | 71.4% | 47.6% |
| | Mogotio | 7 | 12 | 12 | 15 | 58.3% | 80.0% |
| Bomet | Sotik | 7 | 8 | 5 | 8 | 87.5% | 62.5% |
| Bungoma | Mt Elgon | 7 | 10 | 6 | 8 | 70.0% | 75.0% |
| Busia | Nambale | 8 | 10 | 3 | 10 | 80.0% | 30.0% |
| | Samia | 13 | 14 | 12 | 14 | 92.9% | 85.7% |
| Garissa | Garissa | 20 | 25 | 24 | 35 | 80.0% | 68.6% |
| | Refugee Camps | 14 | 15 | 17 | 17 | 93.3% | 100.0% |
| Homa Bay | Kasipul | 11 | 11 | 10 | 11 | 100.0% | 90.9% |
| Isiolo | Isiolo | 25 | 31 | 32 | 48 | 80.6% | 66.7% |
| | Merti | 14 | 15 | 20 | 24 | 93.3% | 83.3% |
| Kajiado | Kajiado North | 14 | 18 | 20 | 23 | 77.8% | 87.0% |
| Kiambu | Ruiru | 8 | 14 | 24 | 32 | 57.1% | 75.0% |
| | Thika | 33 | 39 | 51 | 67 | 84.6% | 76.1% |
| Kisumu | Kisumu East A | 29 | 33 | 57 | 63 | 87.9% | 90.5% |
| | Nyando | 30 | 32 | 31 | 35 | 93.8% | 88.6% |
| Kitui | Kitui Central | 11 | 13 | 22 | 28 | 84.6% | 78.6% |
| | Kitui South | 34 | 36 | 39 | 45 | 94.4% | 86.7% |
| Lamu | Lamu West | 12 | 14 | 11 | 13 | 85.7% | 84.6% |

| | | | | | | | |
|----------------------|----------------------|------------|------------|------------|------------|--------------|--------------|
| Machakos | Yatta | 25 | 28 | 30 | 35 | 89.3% | 85.7% |
| Makueni | Kibwezi East | 18 | 20 | 27 | 33 | 90.0% | 81.8% |
| Migori | Rongo | 3 | 9 | 7 | 12 | 33.3% | 58.3% |
| Mombasa | Ganjoni | 9 | 10 | 10 | 10 | 90.0% | 100.0% |
| | Mvita | 38 | 46 | 33 | 39 | 82.6% | 84.6% |
| Nakuru | Naivasha | 15 | 16 | 13 | 16 | 93.8% | 81.3% |
| | Njoro | 37 | 43 | 36 | 43 | 86.0% | 83.7% |
| Nyeri | Othaya Mukurweini | 33 | 34 | 34 | 35 | 97.1% | 97.1% |
| | Tetu | 16 | 18 | 15 | 18 | 88.9% | 83.3% |
| Pokot | Pokot North | 11 | 14 | 19 | 31 | 78.6% | 61.3% |
| | West Pokot | 6 | 7 | 34 | 45 | 85.7% | 75.6% |
| Siaya | Bondo | 14 | 17 | 15 | 17 | 82.4% | 88.2% |
| Tana River | Tana Delta | 22 | 24 | 22 | 24 | 91.7% | 91.7% |
| Tharaka Nithi | Chuka Igamba Ng'ombe | 22 | 24 | 30 | 37 | 91.7% | 81.1% |
| | Maara | 16 | 21 | 27 | 30 | 76.2% | 90.0% |
| Turkana | Loima | 1 | 1 | 11 | 16 | 100.0% | 68.8% |
| Uasin Gishu | Eldoret Mtrh | 2 | 5 | 4 | 5 | 40.0% | 80.0% |
| | Turbo | 6 | 6 | 6 | 6 | 100.0% | 100.0% |
| Grand Total | | 596 | 700 | 779 | 969 | 85.1% | 80.4% |

A total of 700 patient record cards were available in the various TB control zones that were sampled. Among these, 85.1% had a matching treatment start date. It was noted that, Kasipul, Loima and Turbo had 100% agreement between patient record card and facility TB4 register. The lowest sub county was Rongo at 33%.

Amongst the 969 patients who were available in TIBU, 80.4% had a matching treatment start date with facility TB4 register. A discrepancy of 14.9% between TB4 register and Record cards and 19.6% between TB4 and TIBU were observed. Three TB control zones namely Refugee Camps, Ganjoni and Turbo had 100% agreement between TIBU and TB4 register. It was noted that, Nambale, Baringo Central and Rongo were low at 30%, 47.6% and 58.3% respectively.

Gene Xpert results (Table 5f)

Table 5f: Levels of agreement on Gene Xpert results in Patient record cards and TIBU data in comparison to TB4 facility registers (case-based data)

| County | Subcounty | Numbers | | | | Agreement | |
|----------------|-----------------|---|------------------------------|---------------------------------|-------------------------|-------------------------------|-----------------------|
| | | Matched Patient Record cards with TB4 registers | Total Record cards available | Matched TIBU with TB4 registers | Total available in TIBU | TB4 registers vs Record cards | TB4 registers vs TIBU |
| Baringo | Baringo Central | 7 | 7 | 10 | 21 | 100.0% | 47.6% |
| | Mogotio | 8 | 12 | 6 | 15 | 66.7% | 40.0% |
| Bomet | Sotik | 8 | 8 | 8 | 8 | 100.0% | 100.0% |

| | | | | | | | |
|--------------------|-------------------------|------------|------------|------------|------------|--------------|--------------|
| Bungoma | Mt Elgon | 1 | 10 | 0 | 8 | 10.0% | 0.0% |
| Busia | Nambale | 6 | 10 | 4 | 10 | 60.0% | 40.0% |
| | Samia | 12 | 14 | 12 | 14 | 85.7% | 85.7% |
| Garissa | Garissa | 19 | 25 | 31 | 35 | 76.0% | 88.6% |
| | Refugee Camps | 15 | 15 | 13 | 17 | 100.0% | 76.5% |
| Homa Bay | Kasipul | 9 | 11 | 6 | 11 | 81.8% | 54.5% |
| Isiolo | Isiolo | 23 | 31 | 42 | 48 | 74.2% | 87.5% |
| | Merti | 13 | 15 | 24 | 24 | 86.7% | 100.0% |
| Kajiado | Kajiado North | 10 | 18 | 20 | 23 | 55.6% | 87.0% |
| Kiambu | Ruiru | 8 | 14 | 26 | 32 | 57.1% | 81.3% |
| | Thika | 31 | 39 | 58 | 67 | 79.5% | 86.6% |
| Kisumu | Kisumu East A | 29 | 33 | 60 | 63 | 87.9% | 95.2% |
| | Nyando | 26 | 32 | 29 | 35 | 81.3% | 82.9% |
| Kitui | Kitui Central | 9 | 13 | 25 | 28 | 69.2% | 89.3% |
| | Kitui South | 33 | 36 | 45 | 45 | 91.7% | 100.0% |
| Lamu | Lamu West | 13 | 14 | 12 | 13 | 92.9% | 92.3% |
| Machakos | Yatta | 28 | 28 | 34 | 35 | 100.0% | 97.1% |
| Makueni | Kibwezi East | 9 | 20 | 26 | 33 | 45.0% | 78.8% |
| Migori | Rongo | 5 | 9 | 10 | 12 | 55.6% | 83.3% |
| Mombasa | Ganjoni | 8 | 10 | 10 | 10 | 80.0% | 100.0% |
| | Mvita | 40 | 46 | 38 | 39 | 87.0% | 97.4% |
| Nakuru | Naivasha | 8 | 16 | 16 | 16 | 50.0% | 100.0% |
| | Njoro | 41 | 43 | 39 | 43 | 95.3% | 90.7% |
| Nyeri | Othaya Mukurweini | 31 | 34 | 28 | 35 | 91.2% | 80.0% |
| | Tetu | 16 | 18 | 16 | 18 | 88.9% | 88.9% |
| Pokot | Pokot North | 10 | 14 | 27 | 31 | 71.4% | 87.1% |
| | West Pokot | 4 | 7 | 29 | 45 | 57.1% | 64.4% |
| Siaya | Bondo | 13 | 17 | 17 | 17 | 76.5% | 100.0% |
| Tana River | Tana Delta | 13 | 24 | 8 | 24 | 54.2% | 33.3% |
| Tharaka Nithi | Chuka Igamba Ng'ombe | 22 | 24 | 33 | 37 | 91.7% | 89.2% |
| | Maara | 18 | 21 | 30 | 30 | 85.7% | 100.0% |
| Turkana | Loima | 0 | 1 | 13 | 16 | 0.0% | 81.3% |
| Uasin Gishu | Eldoret Mtrh | 3 | 5 | 4 | 5 | 60.0% | 80.0% |
| | Turbo | 4 | 6 | 5 | 6 | 66.7% | 83.3% |
| Grand Total | | 553 | 700 | 814 | 969 | 79.0% | 84.0% |

A total of 700 patient record cards were available in the TB control zones sampled for DQA. Among this, 553 (79.0%) had a matching GeneXpert result between TB4 register and record cards.

Amongst the 969 record cards that were available in TIBU, 814(84.0%) had a matching GeneXpert result between TB4 register and TIBU. A discrepancy of 21.0% between TB4 register and Record cards and 16.0% between TB4 and TIBU were observed. This could be attributed to staff turnover and lack of OJT to new staff.

Four Control Zones namely Baringo central, Sotik, Refugee Camp and Yatta had 100% level of agreement on GeneXpert result in TB4 register and record cards.

Seven control zones namely Sotik, Merti, Kitui South, Maara, Ganjoni, Naivasha and Bondo had 100% level of agreement on GeneXpert result between TB4 register and TIBU.

Loima and Mt Elgon posted 0% level of agreement across the all reporting tools.

In Kenya, GeneXpert is the first line of TB diagnosis where available. As of June 2019, a total of 226 GeneXpert machines have been procured and distributed across the 47 counties. This coupled with robust sample networking enhances prompt diagnosis. The importance of having correct information recorded enhances timely start of treatment which ultimately halts transmission.

Month 2 follow-up smear results (Table 5g)

Table 5g: Levels of agreement on Month 2 follow-up smear results in Patient record cards and TIBU data in comparison to TB4 facility registers (case-based data)

| County | Subcounty | Numbers | | | | Agreement | |
|----------|-----------------|---|------------------------------|---------------------------------|-------------------------|-------------------------------|-----------------------|
| | | Matched Patient Record cards with TB4 registers | Total Record cards available | Matched TIBU with TB4 registers | Total available in TIBU | TB4 registers vs Record cards | TB4 registers vs TIBU |
| Baringo | Baringo Central | 4 | 7 | 20 | 21 | 57.1% | 95.2% |
| | Mogotio | 7 | 12 | 10 | 15 | 58.3% | 66.7% |
| Bomet | Sotik | 6 | 8 | 8 | 8 | 75.0% | 100.0% |
| Bungoma | Mt Elgon | 2 | 10 | 6 | 8 | 20.0% | 75.0% |
| Busia | Nambale | 7 | 10 | 2 | 10 | 70.0% | 20.0% |
| | Samia | 9 | 14 | 11 | 14 | 64.3% | 78.6% |
| Garissa | Garissa | 21 | 25 | 30 | 35 | 84.0% | 85.7% |
| | Refugee Camps | 14 | 15 | 15 | 17 | 93.3% | 88.2% |
| Homa Bay | Kasipul | 10 | 11 | 9 | 11 | 90.9% | 81.8% |
| Isiolo | Isiolo | 26 | 31 | 46 | 48 | 83.9% | 95.8% |
| | Merti | 14 | 15 | 23 | 24 | 93.3% | 95.8% |
| Kajiado | Kajiado North | 12 | 18 | 20 | 23 | 66.7% | 87.0% |
| Kiambu | Ruiru | 8 | 14 | 28 | 32 | 57.1% | 87.5% |
| | Thika | 27 | 39 | 63 | 67 | 69.2% | 94.0% |
| Kisumu | Kisumu East A | 22 | 33 | 61 | 63 | 66.7% | 96.8% |
| | Nyando | 21 | 32 | 33 | 35 | 65.6% | 94.3% |
| Kitui | Kitui Central | 11 | 13 | 27 | 28 | 84.6% | 96.4% |
| | Kitui South | 32 | 36 | 45 | 45 | 88.9% | 100.0% |
| Lamu | Lamu West | 12 | 14 | 10 | 13 | 85.7% | 76.9% |
| Machakos | Yatta | 26 | 28 | 33 | 35 | 92.9% | 94.3% |
| Makueni | Kibwezi East | 9 | 20 | 26 | 33 | 45.0% | 78.8% |
| Migori | Rongo | 4 | 9 | 11 | 12 | 44.4% | 91.7% |
| Mombasa | Ganjoni | 8 | 10 | 10 | 10 | 80.0% | 100.0% |
| | Mvita | 39 | 46 | 38 | 39 | 84.8% | 97.4% |
| Nakuru | Naivasha | 13 | 16 | 14 | 16 | 81.3% | 87.5% |
| | Njoro | 38 | 43 | 42 | 43 | 88.4% | 97.7% |

| | | | | | | | |
|----------------------|----------------------|------------|------------|------------|------------|--------------|--------------|
| Nyeri | Othaya Mukurweini | 31 | 34 | 34 | 35 | 91.2% | 97.1% |
| | Tetu | 16 | 18 | 16 | 18 | 88.9% | 88.9% |
| Pokot | Pokot North | 10 | 14 | 21 | 31 | 71.4% | 67.7% |
| | West Pokot | 3 | 7 | 37 | 45 | 42.9% | 82.2% |
| Siaya | Bondo | 9 | 17 | 16 | 17 | 52.9% | 94.1% |
| Tana River | Tana Delta | 19 | 24 | 14 | 24 | 79.2% | 58.3% |
| Tharaka Nithi | Chuka Igamba Ng'ombe | 21 | 24 | 33 | 37 | 87.5% | 89.2% |
| | Maara | 15 | 21 | 26 | 30 | 71.4% | 86.7% |
| Turkana | Loima | 0 | 1 | 16 | 16 | 0.0% | 100.0% |
| Uasin Gishu | Eldoret Mtrh | 1 | 5 | 2 | 5 | 20.0% | 40.0% |
| | Turbo | 5 | 6 | 5 | 6 | 83.3% | 83.3% |
| Grand Total | | 532 | 700 | 861 | 969 | 76.0% | 88.9% |

Out of the 700 available record cards, 76% had the month two smear results matching with the facility registers. The performance varied across sub counties: Loima (0%), Eldoret MTRH (20%), Mt Elgon (20%), West Pokot (42.9%), Rongo (44%) and Kibwezi East (45%). In TIBU, 88.9% of the records were correctly matched with the facility registers with peak level of agreements of 100% witnessed in Sotik, Kitui South and Loima sub counties.

Month 2 smears are an important step in determining quality of care for TB patients as they guide the decision to transition a patient from intensive to continuous phase. Proper documentation of the same across the core documents also lays basis for assigning of proper outcomes at the end of treatment. Whilst some sub counties have recorded acceptable levels of agreements, the importance of continuous mentorship cannot be underscored.

Treatment outcomes and outcome date (Table 5h1 and 5h2)

Table 5h₁: Levels of agreement on TB Treatment outcomes in Patient record cards and TIBU data in comparison to TB4 facility registers (case-based data)

| County | Subcounty | Numbers | | | | Agreement | |
|-----------------|-----------------|---|------------------------------|---------------------------------|-------------------------|-------------------------------|-----------------------|
| | | Matched Patient Record cards with TB4 registers | Total Record cards available | Matched TIBU with TB4 registers | Total available in TIBU | TB4 registers vs Record cards | TB4 registers vs TIBU |
| Baringo | Baringo Central | 2 | 7 | 15 | 21 | 28.6% | 71.4% |
| | Mogotio | 1 | 12 | 10 | 15 | 8.3% | 66.7% |
| Bomet | Sotik | 7 | 8 | 7 | 8 | 87.5% | 87.5% |
| Bungoma | Mt Elgon | 3 | 10 | 7 | 8 | 30.0% | 87.5% |
| Busia | Nambale | 4 | 10 | 6 | 10 | 40.0% | 60.0% |
| | Samia | 5 | 14 | 13 | 14 | 35.7% | 92.9% |
| Garissa | Garissa | 18 | 25 | 29 | 35 | 72.0% | 82.9% |
| | Refugee Camps | 14 | 15 | 17 | 17 | 93.3% | 100.0% |
| Homa Bay | Kasipul | 11 | 11 | 8 | 11 | 100.0% | 72.7% |
| Isiolo | Isiolo | 4 | 31 | 31 | 48 | 12.9% | 64.6% |

| | | | | | | | |
|--------------------------|-------------------------|------------|------------|------------|------------|--------------|--------------|
| | Merti | 8 | 15 | 22 | 24 | 53.3% | 91.7% |
| Kajiado | Kajiado North | 0 | 18 | 16 | 23 | 0.0% | 69.6% |
| Kiambu | Ruiru | 3 | 14 | 29 | 32 | 21.4% | 90.6% |
| | Thika | 23 | 39 | 60 | 67 | 59.0% | 89.6% |
| Kisumu | Kisumu East A | 12 | 33 | 52 | 63 | 36.4% | 82.5% |
| | Nyando | 19 | 32 | 34 | 35 | 59.4% | 97.1% |
| Kitui | Kitui Central | 9 | 13 | 27 | 28 | 69.2% | 96.4% |
| | Kitui South | 27 | 36 | 43 | 45 | 75.0% | 95.6% |
| Lamu | Lamu West | 13 | 14 | 13 | 13 | 92.9% | 100.0% |
| Machakos | Yatta | 23 | 28 | 35 | 35 | 82.1% | 100.0% |
| Makueni | Kibwezi East | 4 | 20 | 29 | 33 | 20.0% | 87.9% |
| Migori | Rongo | 1 | 9 | 7 | 12 | 11.1% | 58.3% |
| Mombasa | Ganjoni | 3 | 10 | 8 | 10 | 30.0% | 80.0% |
| | Mvita | 18 | 46 | 34 | 39 | 39.1% | 87.2% |
| Nakuru | Naivasha | 11 | 16 | 12 | 16 | 68.8% | 75.0% |
| | Njoro | 32 | 43 | 36 | 43 | 74.4% | 83.7% |
| Nyeri | Othaya Mukurweini | 30 | 34 | 34 | 35 | 88.2% | 97.1% |
| | Tetu | 18 | 18 | 17 | 18 | 100.0% | 94.4% |
| Pokot | Pokot North | 7 | 14 | 22 | 31 | 50.0% | 71.0% |
| | West Pokot | 5 | 7 | 28 | 45 | 71.4% | 62.2% |
| Siaya | Bondo | 7 | 17 | 15 | 17 | 41.2% | 88.2% |
| Tana River | Tana Delta | 17 | 24 | 20 | 24 | 70.8% | 83.3% |
| Tharaka Nithi | Chuka Igamba Ng'ombe | 16 | 24 | 32 | 37 | 66.7% | 86.5% |
| | Maara | 7 | 21 | 26 | 30 | 33.3% | 86.7% |
| Turkana | Loima | 0 | 1 | 12 | 16 | 0.0% | 75.0% |
| Uasin Gishu | Eldoret Mtrh | 2 | 5 | 5 | 5 | 40.0% | 100.0% |
| | Turbo | 6 | 6 | 6 | 6 | 100.0% | 100.0% |
| Grand Total | | 390 | 700 | 817 | 969 | 55.7% | 84.3% |

Table 5h₁ represents the findings of the outcomes of the case-based sampling that was done from all the facilities visited. Sampling was done to check for consistency in recording of outcomes across the patient record cards, TB 4 registers and TIBU.

The level of consistency between the patient record cards and TB 4 register was 55.7%. This was a clear indication that there were transcription errors in recording between the two documents. Out of all the sub counties visited, only Kasipul, Tetu and Turbo reported 100% consistency in reporting, indicating that recording of outcomes between the record cards and TB 4 registers were properly done. Loima and Kajiado North sub counties posted 0% level of consistency out of their patients in TB 4 registers, none of them had the right outcomes recorded in the records cards.

A total of 969 sampled patients had their outcomes recorded in TIBU but only 817 of them had the same outcomes recorded in the TB 4 registers, resulting into only 84.3% level of agreement. This was an under reporting in terms of consistency which could be as a result of lack of outcomes in the TB 4 registers or as a result of transcription errors between the two tools. Consistency

should be at 100% of which only Refugee camps, Lamu West, Yatta, Eldoret MTRH and Turbo sub counties attained.

Table 5h2: Levels of agreement on TB Treatment outcomes dates in Patient record cards and TIBU data in comparison to TB4 facility registers (case-based data)

| County | Subcounty | Numbers | | | | Agreement | |
|---------------|----------------------|---|------------------------------|---------------------------------|-------------------------|-------------------------------|-----------------------|
| | | Matched Patient Record cards with TB4 registers | Total Record cards available | Matched TIBU with TB4 registers | Total available in TIBU | TB4 registers vs Record cards | TB4 registers vs TIBU |
| Baringo | Baringo Central | 1 | 7 | 9 | 21 | 14.3% | 42.9% |
| | Mogotio | 6 | 12 | 7 | 15 | 50.0% | 46.7% |
| Bomet | Sotik | 6 | 8 | 3 | 8 | 75.0% | 37.5% |
| Bungoma | Mt Elgon | 3 | 10 | 2 | 8 | 30.0% | 25.0% |
| Busia | Nambale | 2 | 10 | 5 | 10 | 20.0% | 50.0% |
| | Samia | 6 | 14 | 10 | 14 | 42.9% | 71.4% |
| Garissa | Garissa | 17 | 25 | 24 | 35 | 68.0% | 68.6% |
| | Refugee Camps | 11 | 15 | 6 | 17 | 73.3% | 35.3% |
| Homa Bay | Kasipul | 8 | 11 | 7 | 11 | 72.7% | 63.6% |
| Isiolo | Isiolo | 7 | 31 | 33 | 48 | 22.6% | 68.8% |
| | Merti | 10 | 15 | 21 | 24 | 66.7% | 87.5% |
| Kajiado | Kajiado North | 2 | 18 | 16 | 23 | 11.1% | 69.6% |
| Kiambu | Ruiru | 5 | 14 | 20 | 32 | 35.7% | 62.5% |
| | Thika | 16 | 39 | 41 | 67 | 41.0% | 61.2% |
| Kisumu | Kisumu East A | 15 | 33 | 45 | 63 | 45.5% | 71.4% |
| | Nyando | 16 | 32 | 24 | 35 | 50.0% | 68.6% |
| Kitui | Kitui Central | 10 | 13 | 27 | 28 | 76.9% | 96.4% |
| | Kitui South | 26 | 36 | 43 | 45 | 72.2% | 95.6% |
| Lamu | Lamu West | 12 | 14 | 11 | 13 | 85.7% | 84.6% |
| Machakos | Yatta | 22 | 28 | 32 | 35 | 78.6% | 91.4% |
| Makueni | Kibwezi East | 5 | 20 | 18 | 33 | 25.0% | 54.5% |
| Migori | Rongo | 1 | 9 | 2 | 12 | 11.1% | 16.7% |
| Mombasa | Ganjoni | 4 | 10 | 8 | 10 | 40.0% | 80.0% |
| | Mvita | 23 | 46 | 33 | 39 | 50.0% | 84.6% |
| Nakuru | Naivasha | 12 | 16 | 9 | 16 | 75.0% | 56.3% |
| | Njoro | 34 | 43 | 32 | 43 | 79.1% | 74.4% |
| Nyeri | Othaya Mukurweini | 31 | 34 | 30 | 35 | 91.2% | 85.7% |
| | Tetu | 12 | 18 | 18 | 18 | 66.7% | 100.0% |
| Pokot | Pokot North | 8 | 14 | 19 | 31 | 57.1% | 61.3% |
| | West Pokot | 4 | 7 | 19 | 45 | 57.1% | 42.2% |
| Siaya | Bondo | 5 | 17 | 13 | 17 | 29.4% | 76.5% |
| Tana River | Tana Delta | 17 | 24 | 23 | 24 | 70.8% | 95.8% |
| Tharaka Nithi | Chuka Igamba Ng'ombe | 15 | 24 | 25 | 37 | 62.5% | 67.6% |
| | Maara | 13 | 21 | 26 | 30 | 61.9% | 86.7% |
| Turkana | Loima | 1 | 1 | 9 | 16 | 100.0% | 56.3% |

| | | | | | | | |
|--------------------|--------------|------------|------------|------------|------------|--------------|--------------|
| Uasin Gishu | Eldoret Mtrh | 2 | 5 | 3 | 5 | 40.0% | 60.0% |
| | Turbo | 5 | 6 | 5 | 6 | 83.3% | 83.3% |
| Grand Total | | 393 | 700 | 678 | 969 | 56.1% | 70.0% |

Table 5h₂ illustrates consistency in recording and reporting of treatment outcome dates across the three reporting levels. This indicator posted among the worst results in terms of level of agreement. The level of agreement between the patient record cards and the TB 4 register was 56.1% while it was 70.0% between TIBU data and the TB 4 registers. This was a clear indication that the health care workers and SCTLCS did not pay much attention to the dates of outcomes

Among all the sub counties that reported, only Loima and Tetu had 100% levels of agreement between patient records and TB 4 registers and TIBU data and TB 4 registers, respectively.

Median time to notification

Table 6: Median times to notification of patients

| Median time to patient Notification within TB4 registers, TIBU and between TB4 registers and TIBU | | | | |
|---|-----|--------------------|---------------------|-------|
| Variable | n | Median time (days) | Confidence Interval | |
| | | | lower | upper |
| Time to registration within TB4 registers | 961 | 6 | 4 | 7 |
| Time to registration within TIBU | 934 | 16 | 14 | 18 |
| Time to registration between TB4 Register and TIBU | 938 | 16 | 14 | 18 |

The variables TB treatment start date and date of registration were used to determine the time difference in each recording tool (TB 4 register and TIBU) independently. A cross analysis was also done to determine the time difference between treatment start date in the TB 4 register and date of registration in TIBU. The median time to notification is higher in TIBU (16 days) than the facility register (6 days). This discrepant duration points to two possible reasons: entry of date of registration by health care staff which should be done by SCTLCS and/or wrong transcription of data from the facility register by SCTLCS. This therefore provides an opportunity for continued mentorship of HCWs and random internal DQAs.

Figure 1: Time to notification (from start of TB treatment)

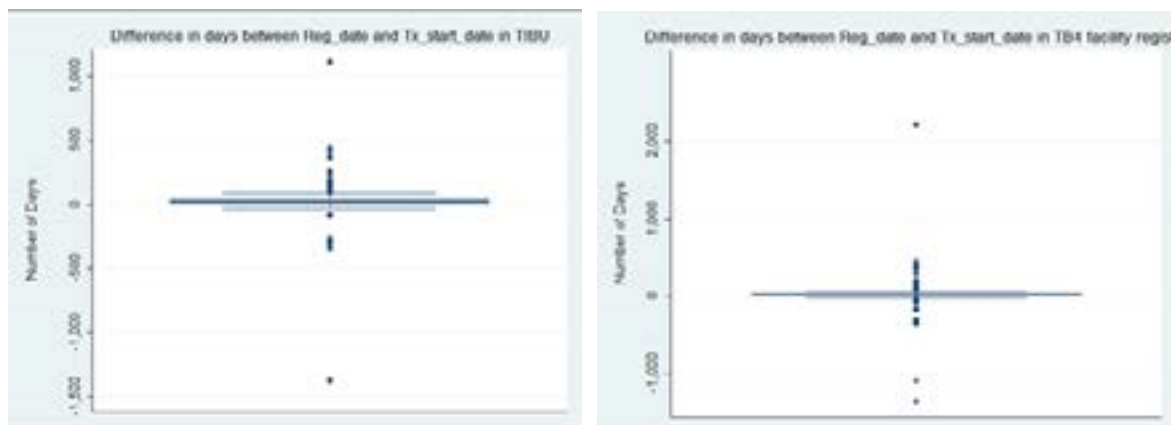


Figure 1 depict that some patients were registered before starting treatment in both the facility registers and TIBU, which is in contravention of the TB guidelines which outline that start of TB treatment precedes notification. This could directly be attributed to transcription errors mostly in areas where the duration difference is in excess of three years. Further, transfer of patients to continue treatment in other sites might lead to such data distortions if referral forms are missed.

Levels of agreement using Kappa statistics

Table 7: Levels of agreement between TB4 facility registers and TIBU data

| Agreement between TB4 Register and TIBU | |
|---|--------|
| Variable | Kappa |
| Genexpert Results | 0.7416 |
| Month 2 smear results | 0.7184 |
| Type of Patient | 0.6198 |
| Treatment Outcome | 0.7656 |

Using Kappa statistics, there is substantial agreement between the TB4 facility registers and TIBU data on Gene Xpert results, month 2 smear results and treatment outcomes, and moderate agreement on type of patient. Whilst, this portrays minimal data discrepancies, there is need for internal DQAs to reduce the data inconsistencies and identify mitigation measures.

3.2 DR TB: RESULTS, DISCUSSION AND RECOMMENDATION

ALL FORMS DR TB

Nationally in 2017, the level of agreement in the aggregate numbers for all forms of DR TB between the patient log books and registers was 100%, and 116% between records from the registers and TIBU. In 2018, the level of agreement between the logbook and the register occurred in 62 (95%) and 70 (108%) from the register to TIBU. The discrepancies may be attributed to transcription errors, absence of patient log books or registers, or the use of registers as the primary source document.

Table 1: ALL FORMS OF DR TB 2017 and 2018

| All forms -- Found in 37 Facilities (2017) and in 48 Facilities (2018) | | | | | | | | | | |
|--|---------|-----------|------|--------------------------------|-----------------------------|---------|----------|------|---------------------------------|-----------------------------|
| | 2017 | | | | | 2018 | | | | |
| County/ Sub County | Logbook | DR TB Reg | TIBU | AgreementLog book vs DR TB reg | Agreement TIBU vs DR TB Reg | Logbook | DRTB Reg | TIBU | Agreement Log book vs DR TB reg | Agreement TIBU vs DR TB Reg |
| Baringo | 3 | 3 | 3 | 100.0% | 100.0% | 3 | 2 | 3 | 150.0% | 150.0% |
| Baringo Central | 3 | 3 | 3 | 100.0% | 100.0% | 3 | 2 | 3 | 150.0% | 150.0% |
| Busia | 3 | 3 | 3 | 100.0% | 100.0% | 1 | 1 | 1 | 100.0% | 100.0% |
| Samia | 3 | 3 | 3 | 100.0% | 100.0% | 1 | 1 | 1 | 100.0% | 100.0% |
| Garissa | 4 | 2 | 5 | 200.0% | 250.0% | 5 | 2 | 6 | 250.0% | 300.0% |
| Garissa | 1 | 2 | 2 | 50.0% | 100.0% | 2 | 2 | 2 | 100.0% | 100.0% |
| Refugee Camps | 3 | 0 | 3 | 0.0% | 0.0% | 3 | 0 | 4 | 0.0% | 0.0% |
| Homa Bay | 1 | 1 | 1 | 100.0% | 100.0% | 2 | 2 | 2 | 100.0% | 100.0% |
| Kasipul | 1 | 1 | 1 | 100.0% | 100.0% | 2 | 2 | 2 | 100.0% | 100.0% |
| Isiolo | 5 | 4 | 5 | 125.0% | 125.0% | 4 | 4 | 4 | 100.0% | 100.0% |
| Isiolo | 5 | 4 | 5 | 125.0% | 125.0% | 4 | 4 | 4 | 100.0% | 100.0% |
| Kajiado | 0 | 0 | 0 | 0.0% | 0.0% | 3 | 3 | 1 | 100.0% | 33.3% |
| Kajiado North | 0 | 0 | 0 | 0.0% | 0.0% | 3 | 3 | 1 | 100.0% | 33.3% |
| Kiambu | 3 | 3 | 2 | 100.0% | 66.7% | 11 | 14 | 8 | 78.6% | 57.1% |
| Ruiru | 3 | 3 | 2 | 100.0% | 66.7% | 5 | 8 | 3 | 62.5% | 37.5% |
| Thika | 0 | 0 | 0 | 0.0% | 0.0% | 6 | 6 | 5 | 100.0% | 83.3% |
| Kisumu | 2 | 2 | 2 | 100.0% | 100.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Kisumu East A | 2 | 2 | 2 | 100.0% | 100.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Kitui | 1 | 0 | 1 | 0.0% | 0.0% | 4 | 4 | 4 | 100.0% | 100.0% |
| Kitui Central | 0 | 0 | 0 | 0.0% | 0.0% | 3 | 3 | 3 | 100.0% | 100.0% |
| Kitui South | 1 | 0 | 1 | 0.0% | 0.0% | 1 | 1 | 1 | 100.0% | 100.0% |
| Lamu | 0 | 0 | 0 | 0.0% | 0.0% | 1 | 0 | 1 | 0.0% | 0.0% |
| Lamu West | 0 | 0 | 0 | 0.0% | 0.0% | 1 | 0 | 1 | 0.0% | 0.0% |
| Machakos | 2 | 1 | 2 | 200.0% | 200.0% | 0 | 0 | 1 | 0.0% | 0.0% |
| Yatta | 2 | 1 | 2 | 200.0% | 200.0% | 0 | 0 | 1 | 0.0% | 0.0% |
| Makueni | 3 | 4 | 4 | 75.0% | 100.0% | 1 | 3 | 2 | 33.3% | 66.7% |

| | | | | | | | | | | |
|---------------------------|-----------|-----------|-----------|---------------|---------------|-----------|-----------|-----------|--------------|---------------|
| Kibwezi East | 3 | 4 | 4 | 75.0% | 100.0% | 1 | 3 | 2 | 33.3% | 66.7% |
| Migori | 1 | 1 | 1 | 100.0% | 100.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Rongo | 1 | 1 | 1 | 100.0% | 100.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Mombasa | 4 | 0 | 2 | 0.0% | 0.0% | 1 | 0 | 1 | 0.0% | 0.0% |
| Ganjoni | 1 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Mvita | 3 | 0 | 2 | 0.0% | 0.0% | 1 | 0 | 1 | 0.0% | 0.0% |
| Nakuru | 4 | 5 | 5 | 80.0% | 100.0% | 4 | 6 | 6 | 66.7% | 100.0% |
| Naivasha | 3 | 5 | 4 | 60.0% | 80.0% | 3 | 3 | 3 | 100.0% | 100.0% |
| Njoro | 1 | 0 | 1 | 0.0% | 0.0% | 1 | 3 | 3 | 33.3% | 100.0% |
| Nyeri | 7 | 7 | 8 | 100.0% | 114.3% | 1 | 1 | 1 | 100.0% | 100.0% |
| Othaya Mukurweini | 4 | 4 | 4 | 100.0% | 100.0% | 1 | 1 | 1 | 100.0% | 100.0% |
| Tetu | 3 | 3 | 4 | 100.0% | 133.3% | 0 | 0 | 0 | 0.0% | 0.0% |
| Pokot | 1 | 2 | 1 | 50.0% | 50.0% | 4 | 12 | 12 | 33.3% | 100.0% |
| Pokot North | 1 | 1 | 1 | 100.0% | 100.0% | 4 | 5 | 5 | 80.0% | 100.0% |
| West Pokot | 0 | 1 | 0 | 0.0% | 0.0% | 0 | 7 | 7 | 0.0% | 100.0% |
| Siaya | 0 | 0 | 0 | 0.0% | 0.0% | 6 | 3 | 6 | 200.0% | 200.0% |
| Bondo | 0 | 0 | 0 | 0.0% | 0.0% | 6 | 3 | 6 | 200.0% | 200.0% |
| Tana River | 0 | 0 | 0 | 0.0% | 0.0% | 2 | 1 | 2 | 200.0% | 200.0% |
| Tana Delta | 0 | 0 | 0 | 0.0% | 0.0% | 2 | 1 | 2 | 200.0% | 200.0% |
| Tharaka Nithi | 0 | 0 | 0 | 0.0% | 0.0% | 6 | 1 | 5 | 600.0% | 500.0% |
| Chuka Igambang Ombe | 0 | 0 | 0 | 0.0% | 0.0% | 1 | 1 | 1 | 100.0% | 100.0% |
| Maara | 0 | 0 | 0 | 0.0% | 0.0% | 5 | 0 | 4 | 0.0% | 0.0% |
| Uasin Gishu | 0 | 6 | 6 | 0.0% | 100.0% | 3 | 6 | 4 | 50.0% | 66.7% |
| Eldoret Mtrh | 0 | 3 | 3 | 0.0% | 100.0% | 0 | 1 | 1 | 0.0% | 100.0% |
| Turbo | 0 | 3 | 3 | 0.0% | 100.0% | 3 | 5 | 3 | 60.0% | 60.0% |
| Grand Total | 44 | 44 | 51 | 100.0% | 115.9% | 62 | 65 | 70 | 95.4% | 107.7% |

In 2017, we had complete agreement for cases in the log book, register and TIBU in 7 (32 %) control zones in 2017 and in 9 (35%) control zones in 2018. Agreement between the log books and the registers occurred in 9 (49%) of the control zones, and 11 (50%) control zones between the DR TB register and TIBU in 2017. In 2018, agreement between the logbook and the register occurred in 11 (42%) control zones and 13 (50%) control zones between the register and TIBU. Majority of the control zones, there was no agreement of data across all the three data sources reviewed. This may be due to late registration and missing tools (logbooks and registers) in the health facilities.

In 2017, 3 control zones (West pokot, MTRH and Turbo) had no patient log books but had cases captured in the registers and TIBU. This occurred in two Control zones (West Pokot and MTRH) in 2018. This was due to absence of log books in this control zones.

In 2017, 5 control zones (Refugee camps, kitui south, Ganjoni, mvita and Njoro) had no cases documented in the DR TB register but available in the log book and notified in electronic surveillance (TIBU). In 2018, this occurred in 4 control zones (Refugee camps, Lamu west, mvita and Maara). This can be attributed due to absence of DR TB registers in this control zones.

Aggregate RR TB case data

The national level of agreement for RR TB cases between the log books to the register was 94% in 2017 and 105% in 2018. There were cases without log books in 2017, and patients with logbooks who were not documented in the register in 2018. The agreement between the register and TIBU was 106% in 2017 and 119% in 2018. This implies there more patients in TIBU than the source register. This can be attributed to the absence of registers, or no documentation of cases in the register.

Table 2. Aggregate forms of RR in 2017 and 2018

| | RR Patients -- Found in 37 Facilities (2017) and in 48 Facilities (2018) | | | | | | | | | |
|--------------------|--|----------|------|---------------------------------|-----------------------------|---------|----------|------|---------------------------------|-----------------------------|
| | 2017 | | | | | 2018 | | | | |
| County/ Sub County | Logbook | DRTB Reg | TIBU | Agreement Log book vs DR TB reg | Agreement TIBU vs DR TB Reg | Logbook | DRTB Reg | TIBU | Agreement Log book vs DR TB reg | Agreement TIBU vs DR TB Reg |
| Baringo | 3 | 3 | 3 | 100.0% | 100.0% | 3 | 2 | 2 | 150.0% | 100.0% |
| Baringo Central | 3 | 3 | 3 | 100.0% | 100.0% | 3 | 101 | 2 | 3.0% | 2.0% |
| Busia | 3 | 3 | 3 | 100.0% | 100.0% | 1 | 1 | 1 | 100.0% | 100.0% |
| Samia | 3 | 3 | 3 | 100.0% | 100.0% | 1 | 1 | 1 | 100.0% | 100.0% |
| Garissa | 4 | 2 | 2 | 200.0% | 100.0% | 4 | 2 | 5 | 200.0% | 250.0% |
| Garissa | 1 | 2 | 2 | 50.0% | 100.0% | 2 | 2 | 2 | 100.0% | 100.0% |
| Refugee Camps | 3 | 0 | 0 | 0.0% | 0.0% | 2 | 0 | 3 | 0.0% | 0.0% |
| Homa Bay | 1 | 1 | 1 | 100.0% | 100.0% | 1 | 1 | 1 | 100.0% | 100.0% |
| Kasipul | 1 | 1 | 1 | 100.0% | 100.0% | 1 | 1 | 1 | 100.0% | 100.0% |
| Isiolo | 4 | 4 | 4 | 100.0% | 100.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Isiolo | 4 | 4 | 4 | 100.0% | 100.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Kajiado | 0 | 0 | 0 | 0.0% | 0.0% | 1 | 1 | 0 | 100.0% | 0.0% |
| Kajiado North | 0 | 0 | 0 | 0.0% | 0.0% | 1 | 1 | 0 | 100.0% | 0.0% |
| Kiambu | 2 | 0 | 0 | 0.0% | 0.0% | 7 | 10 | 6 | 70.0% | 60.0% |
| Ruiru | 2 | 0 | 0 | 0.0% | 0.0% | 2 | 5 | 3 | 40.0% | 60.0% |
| Thika | 0 | 0 | 0 | 0.0% | 0.0% | 5 | 5 | 3 | 100.0% | 60.0% |
| Kisumu | 1 | 1 | 1 | 100.0% | 100.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Kisumu East A | 1 | 1 | 1 | 100.0% | 100.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Nyando | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Kitui | 0 | 0 | 0 | 0.0% | 0.0% | 3 | 3 | 3 | 100.0% | 100.0% |
| Kitui Central | 0 | 0 | 0 | 0.0% | 0.0% | 3 | 3 | 3 | 100.0% | 100.0% |
| Lamu | 0 | 0 | 0 | 0.0% | 0.0% | 1 | 0 | 1 | 0.0% | 0.0% |
| Lamu West | 0 | 0 | 0 | 0.0% | 0.0% | 1 | 0 | 1 | 0.0% | 0.0% |
| Machakos | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 1 | 0.0% | 0.0% |

| | | | | | | | | | | |
|---------------------------|-----------|-----------|-----------|---------------|---------------|-----------|------------|-----------|---------------|---------------|
| Yatta | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 1 | 0.0% | 0.0% |
| Makueni | 1 | 1 | 1 | 100.0% | 100.0% | 1 | 2 | 2 | 50.0% | 100.0% |
| Kibwezi East | 1 | 1 | 1 | 100.0% | 100.0% | 1 | 2 | 2 | 50.0% | 100.0% |
| Migori | 1 | 1 | 1 | 100.0% | 100.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Rongo | 1 | 1 | 1 | 100.0% | 100.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Mombasa | 3 | 0 | 2 | 0.0% | 0.0% | 1 | 0 | 1 | 0.0% | 0.0% |
| Ganjoni | 1 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Mvita | 2 | 0 | 2 | 0.0% | 0.0% | 1 | 0 | 1 | 0.0% | 0.0% |
| Nakuru | 2 | 5 | 4 | 40.0% | 80.0% | 1 | 1 | 2 | 100.0% | 200.0% |
| Naivasha | 2 | 5 | 4 | 40.0% | 80.0% | 1 | 1 | 2 | 100.0% | 200.0% |
| Nyeri | 7 | 7 | 8 | 100.0% | 114.3% | 1 | 1 | 1 | 100.0% | 100.0% |
| Othaya Mukurweini | 3 | 3 | 4 | 100.0% | 133.3% | 1 | 1 | 1 | 100.0% | 100.0% |
| Tetu | 4 | 4 | 4 | 100.0% | 100.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Pokot | 0 | 0 | 0 | 0.0% | 0.0% | 2 | 6 | 6 | 33.3% | 100.0% |
| Pokot North | 0 | 0 | 0 | 0.0% | 0.0% | 2 | 2 | 2 | 100.0% | 100.0% |
| West Pokot | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 4 | 4 | 0.0% | 100.0% |
| Siaya | 0 | 0 | 0 | 0.0% | 0.0% | 4 | 0 | 3 | 0.0% | 0.0% |
| Bondo | 0 | 0 | 0 | 0.0% | 0.0% | 4 | 0 | 3 | 0.0% | 0.0% |
| Tana River | 0 | 0 | 0 | 0.0% | 0.0% | 1 | 1 | 2 | 100.0% | 200.0% |
| Tana Delta | 0 | 0 | 0 | 0.0% | 0.0% | 1 | 1 | 2 | 100.0% | 200.0% |
| Tharaka Nithi | 0 | 0 | 0 | 0.0% | 0.0% | 4 | 1 | 3 | 400.0% | 300.0% |
| Chuka Igambang Ombe | 0 | 0 | 0 | 0.0% | 0.0% | 1 | 1 | 1 | 100.0% | 100.0% |
| Maara | 0 | 0 | 0 | 0.0% | 0.0% | 3 | 0 | 2 | 0.0% | 0.0% |
| Uasin Gishu | 0 | 6 | 6 | 0.0% | 100.0% | 3 | 6 | 4 | 50.0% | 66.7% |
| Eldoret Mtrh | 0 | 3 | 3 | 0.0% | 100.0% | 0 | 1 | 1 | 0.0% | 100.0% |
| Turbo | 0 | 3 | 3 | 0.0% | 100.0% | 3 | 5 | 3 | 60.0% | 60.0% |
| Grand Total | 32 | 34 | 36 | 94.1% | 105.9% | 39 | 137 | 44 | 28.5% | 32.1% |

In 2017, 3 control zones (refugee camps, Ganjoni and Ruiru) had RR cases were documented in log books but no corresponding entries in the registers and TIBU. This could imply the cases were not notified. In 2018, 5 control zones (refugee camps, Lamu west, Mvita, Bondo and Maara) had cases documented in the log book and TIBU but no documentation in the registers.

In 2018, 5 control zones (refugee camps, Lamu West, Mvita, Bondo and Maara) had a cases in the log book and electronic surveillance system (TIBU) but not documented in the registers.

MDR

Nationally, agreement for aggregate number of MDR cases between the logbooks and the registers occurred in 8 (80%) records in 2017 and 8 (89%) records in 2018. This could be due to absence of logbooks, poor documentation or misclassification of the resistance pattern in the logbook or the register.

Agreement of number of cases between the MDR cases in the register and TIBU occurred in 14 (140%) cases in 2017 and 10 (89%) cases in 2018. The higher number of patients in TIBU than the register could be due poor documentation in the register, absence of registers, duplicate records in TIBU or late notification of cases from the previous year.

TABLE 3. Aggregate MDR for 2017 and 2018

| | MDR Patients -- Found in 37 Facilities (2017) and in 48 Facilities (2018) | | | | | | | | | |
|------------------|---|-----------|------|---------------------------------|-----------------------------|---------|----------|------|---------------------------------|-----------------------------|
| | 2017 | | | | | 2018 | | | | |
| County/SubCounty | Logbook | DR TB Reg | TIBU | Agreement Log book vs DR TB reg | Agreement TIBU vs DR TB Reg | Logbook | DRTB Reg | TIBU | Agreement Log book vs DR TB reg | Agreement TIBU vs DR TB Reg |
| Baringo | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Baringo Central | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Mogotio | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Bomet | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Sotik | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Bungoma | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Mt Elgon | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Busia | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Nambale | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Samia | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Garissa | 0 | 0 | 3 | 0.0% | 0.0% | 0 | 0 | 1 | 0.0% | 0.0% |
| Garissa | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Refugee Camps | 0 | 0 | 3 | 0.0% | 0.0% | 0 | 0 | 1 | 0.0% | 0.0% |
| Homa Bay | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Kasipul | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Isiolo | 0 | 0 | 1 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Isiolo | 0 | 0 | 1 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Merti | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Kajiado | 0 | 0 | 0 | 0.0% | 0.0% | 1 | 1 | 1 | 100.0% | 100.0% |
| Kajiado North | 0 | 0 | 0 | 0.0% | 0.0% | 1 | 1 | 1 | 100.0% | 100.0% |
| Kiambu | 0 | 3 | 0 | 0.0% | 0.0% | 0 | 2 | 1 | 0.0% | 50.0% |
| Ruiru | 0 | 3 | 0 | 0.0% | 0.0% | 0 | 2 | 0 | 0.0% | 0.0% |
| Thika | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 1 | 0.0% | 0.0% |
| Kisumu | 0 | 1 | 1 | 0.0% | 100.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Kisumu East A | 0 | 1 | 1 | 0.0% | 100.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Nyando | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Kitui | 1 | 0 | 1 | 0.0% | 0.0% | 1 | 1 | 1 | 100.0% | 100.0% |
| Kitui Central | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Kitui South | 1 | 0 | 1 | 0.0% | 0.0% | 1 | 1 | 1 | 100.0% | 100.0% |

| | | | | | | | | | | |
|---------------------------|----------|-----------|-----------|--------------|---------------|----------|----------|-----------|--------------|---------------|
| Lamu | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Lamu West | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Machakos | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Yatta | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Makueni | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Kibwezi East | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Migori | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Rongo | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Mombasa | 1 | 0 | 1 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Ganjoni | 1 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Mvita | 0 | 0 | 1 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Nakuru | 0 | 0 | 0 | 0.0% | 0.0% | 1 | 0 | 0 | 0.0% | 0.0% |
| Naivasha | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Njoro | 0 | 0 | 0 | 0.0% | 0.0% | 1 | 0 | 0 | 0.0% | 0.0% |
| Nyeri | 5 | 5 | 6 | 100.0% | 120.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Othaya Mukurweini | 2 | 2 | 2 | 100.0% | 100.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Tetu | 3 | 3 | 4 | 100.0% | 133.3% | 0 | 0 | 0 | 0.0% | 0.0% |
| Pokot | 1 | 1 | 1 | 100.0% | 100.0% | 3 | 3 | 4 | 100.0% | 133.3% |
| Pokot North | 1 | 1 | 1 | 100.0% | 100.0% | 3 | 3 | 3 | 100.0% | 100.0% |
| West Pokot | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 1 | 0.0% | 0.0% |
| Siaya | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 2 | 0 | 0.0% | 0.0% |
| Bondo | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 2 | 0 | 0.0% | 0.0% |
| Tana River | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Tana Delta | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Tharaka Nithi | 0 | 0 | 0 | 0.0% | 0.0% | 2 | 0 | 2 | 0.0% | 0.0% |
| Chuka Igambang Ombe | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Maara | 0 | 0 | 0 | 0.0% | 0.0% | 2 | 0 | 2 | 0.0% | 0.0% |
| Turkana | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Loima | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Uasin Gishu | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Eldoret Mtrh | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Turbo | 0 | 0 | 0 | 0.0% | 0.0% | 0 | 0 | 0 | 0.0% | 0.0% |
| Grand Total | 8 | 10 | 14 | 80.0% | 140.0% | 8 | 9 | 10 | 88.9% | 111.1% |

In 2017, only 2 (18%) control zones that notified cases had 100% agreement in the log books, DR TB registers and TIBU. In 2018, this occurred in 3(30%) control zones.

In 2017 3(27%) control zones (isiolo, refugee camp and Mvita) had no data in log books and registers but had cases notified in TIBU without these source documents. In 2018, this occurred in 3(30%) control zones (refugee camps, Thika and West Pokot). This may be due to absence of these documents log books.

In Mvita control zone there was a case documented in the register, but without corresponding documentation in the logbook and TIBU. The case may not have been notified, or due to the data loss that occurred in 2018 without subsequent re-entry into TIBU or the absence of log books.

DR TB OUTCOMES CURED

Nationally the Agreement for aggregate data on cure between the logbooks and registers for occurred in 11 (85%) records and in 14 (108%) between the registers and TIBU. The lower agreement rate in the logbooks could be due to logbooks that were not updated, or using the registers as the primary source document without updating the logbook. In 2017, 7(50%) cases had no log books but documentation was done in registers and/or TIBU.

TABLE 4. Aggregate DR TB outcome of CURE 2017

| Cured | | | | | |
|-------------------------|-----------|-----------|-----------|-------------------------------|----------------------------|
| Counties / Sub Counties | Logbook | DRTB reg | TIBU | Agreement DRTB Reg Vs LogBook | Agreement DRTB Reg vs TIBU |
| Baringo | 2 | 2 | 0 | 100.0% | 0.0% |
| Baringo Central | 2 | 2 | 0 | 100.0% | 0.0% |
| Busia | 2 | 2 | 2 | 100.0% | 100.0% |
| Samia | 2 | 2 | 2 | 100.0% | 100.0% |
| Homa Bay | 0 | 0 | 1 | 0.0% | 0.0% |
| Kasipul | 0 | 0 | 1 | 0.0% | 0.0% |
| Kiambu | 1 | 1 | 1 | 100.0% | 100.0% |
| Ruiru | 1 | 1 | 1 | 100.0% | 100.0% |
| Kisumu | 0 | 0 | 1 | 0.0% | 0.0% |
| Kisumu East A | 0 | 0 | 1 | 0.0% | 0.0% |
| Kitui | 1 | 0 | 1 | 0.0% | 0.0% |
| Kitui South | 1 | 0 | 1 | 0.0% | 0.0% |
| Machakos | 1 | 0 | 1 | 0.0% | 0.0% |
| Yatta | 1 | 0 | 1 | 0.0% | 0.0% |
| Makueni | 0 | 2 | 0 | 0.0% | 0.0% |
| Kibwezi East | 0 | 2 | 0 | 0.0% | 0.0% |
| Migori | 0 | 1 | 1 | 0.0% | 100.0% |
| Rongo | 0 | 1 | 1 | 0.0% | 100.0% |
| Nakuru | 0 | 0 | 1 | 0.0% | 0.0% |
| Naivasha | 0 | 0 | 1 | 0.0% | 0.0% |
| Njoro | 0 | 0 | 0 | 0.0% | 0.0% |
| Nyeri | 3 | 3 | 3 | 100.0% | 100.0% |
| Othaya Mukurweini | 2 | 2 | 3 | 100.0% | 150.0% |
| Tetu | 1 | 1 | 0 | 100.0% | 0.0% |
| Pokot | 1 | 1 | 1 | 100.0% | 100.0% |
| Pokot North | 1 | 1 | 1 | 100.0% | 100.0% |
| Uasin Gishu | 0 | 1 | 1 | 0.0% | 100.0% |
| Eldoret Mtrh | 0 | 1 | 1 | 0.0% | 100.0% |
| Grand Total | 11 | 13 | 14 | 84.6% | 107.7% |

In two control zones (Baringo central and Tetu) there was no documentation of the outcome in TIBU despite documentation in the logbooks and registers. The outcomes may not have been assigned, or another outcome assigned in TIBU by the SCTLC. It is also likely that the outcome assigned in the register and log book by the HCW at the facility was not correct, as the TIBU system validates the outcomes based on follow up smear and culture results keyed in.

TREATMENT COMPLETED

Nationally the agreement for aggregate data on the treatment complete outcome between the logbooks and registers for occurred in 9(100%) records and in 15 (167%) of records between the registers and TIBU. This may be due to the desire to improve their treatment success rate by the SCTLCs.

| Treatment Completed | | | | | |
|-------------------------|----------|----------|-----------|-------------------------------|----------------------------|
| Counties / Sub Counties | Logbook | DRTB reg | TIBU | Agreement DRTB Reg Vs LogBook | Agreement DRTB Reg vs TIBU |
| Baringo | 0 | 1 | 3 | 0.0% | 300.0% |
| Baringo Central | 0 | 1 | 3 | 0.0% | 300.0% |
| Garissa | 3 | 0 | 3 | 0.0% | 0.0% |
| Refugee Camps | 3 | 0 | 3 | 0.0% | 0.0% |
| Isiolo | 0 | 0 | 3 | 0.0% | 0.0% |
| Isiolo | 0 | 0 | 3 | 0.0% | 0.0% |
| Kiambu | 1 | 1 | 1 | 100.0% | 100.0% |
| Ruiru | 1 | 1 | 1 | 100.0% | 100.0% |
| Mombasa | 1 | 0 | 0 | 0.0% | 0.0% |
| Ganjoni | 0 | 0 | 0 | 0.0% | 0.0% |
| Mvita | 1 | 0 | 0 | 0.0% | 0.0% |
| Nakuru | 3 | 4 | 2 | 75.0% | 50.0% |
| Naivasha | 3 | 4 | 2 | 75.0% | 50.0% |
| Njoro | 0 | 0 | 0 | 0.0% | 0.0% |
| Nyeri | 1 | 1 | 1 | 100.0% | 100.0% |
| Othaya Mukurweini | 1 | 1 | 1 | 100.0% | 100.0% |
| Uasin Gishu | 0 | 2 | 2 | 0.0% | 100.0% |
| Eldoret Mtrh | 0 | 2 | 2 | 0.0% | 100.0% |
| Turbo | 0 | 0 | 0 | 0.0% | 0.0% |
| Grand Total | 9 | 9 | 15 | 100.0% | 166.7% |

In 2017, 3(38%) control zones(Baringo central,isiolo and MTRH) had no log books but outcome documented in the register and TIBU. This preference to the use of registers as the primary source document.

In Mvita 1(13%) an outcome documented in the log book but was not documented in the register and TIBU. The SCTLC did not update TIBU or visit the health facility to update the outcome.

DEATH

Nationally the agreement for aggregate data on the number of deaths between the logbooks and registers for occurred in 5 (71%) records and in 8 (167%) of records between TIBU and the registers . There were more deaths in TIBU and the registers compared to the logbooks. This could be due to poor documentation in the logbooks and using the registers as the primary source document. In 2017, 4 (57%) control zones (Isiolo, Kisumu East A,Naivasha and Bondo) had no documentation in the log books but death documented as an outcome outcome in the register and TIBU.

| Died | | | | | |
|-------------------------|----------|----------|----------|-------------------------------|----------------------------|
| Counties / Sub Counties | Logbook | DRTB reg | TIBU | Agreement DRTB Reg Vs LogBook | Agreement DRTB Reg vs TIBU |
| Homa Bay | 1 | 1 | 1 | 100.0% | 100.0% |
| Kasipul | 1 | 1 | 1 | 100.0% | 100.0% |
| Isiolo | 0 | 1 | 1 | 0.0% | 100.0% |
| Isiolo | 0 | 1 | 1 | 0.0% | 100.0% |
| Kiambu | 1 | 0 | 0 | 0.0% | 0.0% |
| Ruiru | 1 | 0 | 0 | 0.0% | 0.0% |
| Thika | 0 | 0 | 0 | 0.0% | 0.0% |
| Kisumu | 0 | 1 | 1 | 0.0% | 100.0% |
| Kisumu East A | 0 | 1 | 1 | 0.0% | 100.0% |
| Nakuru | 0 | 1 | 0 | 0.0% | 0.0% |
| Naivasha | 0 | 1 | 0 | 0.0% | 0.0% |
| Nyeri | 3 | 3 | 3 | 100.0% | 100.0% |
| Tetu | 3 | 3 | 3 | 100.0% | 100.0% |
| Siaya | 0 | 0 | 2 | 0.0% | 0.0% |
| Bondo | 0 | 0 | 2 | 0.0% | 0.0% |
| Grand Total | 5 | 7 | 8 | 71.4% | 114.3% |

In 2 (29%) control zones(Ruiru and Naivasha) had documentation of death in the log book and register but no documentation in TIBU. This could be due to the SCTLC not visiting the health facility to update the outcome and not reviewing the patients regularly.

CASE BASED DR TB : Data Results and Discussion

Registration Number

Nationally there were 41 records, only 22(53%) entries had agreement between the logbook and TIBU, while 23(52%) had agreement between register and TIBU. The high level of discrepancy could be explained by the SCLC not visiting the facilities to update the records in the health facility, or just collecting data without updating the records.

| County | Subcounty | Numbers | | | | Agreement | |
|--------------------|-------------------|-----------|----------------|-----------|-----------------|------------------|-----------------------|
| | | logbook | Total logbooks | Reg | Total registers | log book VS TIBU | DRTB Register Vs TIBU |
| Baringo | Baringo Central | 1 | 2 | 0 | 2 | 50.0% | 0.0% |
| Busia | Samia | 1 | 1 | 0 | 1 | 100.0% | 0.0% |
| Garissa | Garissa | 0 | 2 | 0 | 2 | 0.0% | 0.0% |
| Garissa | Refugee Camps | 1 | 3 | 0 | 3 | 33.3% | 0.0% |
| Homa Bay | Kasipul | 1 | 1 | 0 | 0 | 100.0% | 0.0% |
| Isiolo | Isiolo | 1 | 4 | 4 | 4 | 25.0% | 100.0% |
| Kajiado | Kajiado North | 0 | 3 | 0 | 3 | 0.0% | 0.0% |
| Kiambu | Ruiru | 0 | 2 | 2 | 2 | 0.0% | 100.0% |
| Kiambu | Thika | 4 | 6 | 5 | 6 | 66.7% | 83.3% |
| Kitui | Kitui Central | 3 | 3 | 1 | 3 | 100.0% | 33.3% |
| Kitui | Kitui South | 1 | 1 | 1 | 1 | 100.0% | 100.0% |
| Lamu | Lamu West | 1 | 1 | 0 | 1 | 100.0% | 0.0% |
| Makueni | Kibwezi East | 0 | 1 | 0 | 1 | 0.0% | 0.0% |
| Nakuru | Njoro | 1 | 1 | 2 | 2 | 100.0% | 100.0% |
| Nyeri | Othaya Mukurweini | 1 | 1 | 1 | 1 | 100.0% | 100.0% |
| Pokot | Pokot North | 0 | 0 | 0 | 0 | 0.0% | 0.0% |
| Pokot | West Pokot | 0 | 0 | 1 | 1 | 0.0% | 100.0% |
| Siaya | Bondo | 3 | 4 | 3 | 4 | 75.0% | 75.0% |
| Tana River | Tana Delta | 1 | 1 | 0 | 1 | 100.0% | 0.0% |
| Tharaka Nithi | Maara | 1 | 1 | 0 | 1 | 100.0% | 0.0% |
| Uasin Gishu | Eldoret Mtrh | 0 | 0 | 0 | 1 | 0.0% | 0.0% |
| Uasin Gishu | Turbo | 1 | 3 | 3 | 4 | 33.3% | 75.0% |
| Grand Total | | 22 | 41 | 23 | 44 | 53.7% | 52.3% |

Agreement between the registration number in log book, DR TB registers and TIBU occurred in only 3 control zones (Kitui South, Njoro and Othaya-Mukurweini). Substantial discrepancies were noted in 4 control zones (Refugee camps, isiolo, Thika and Turbo).

Date of registration

Nationally agreement, Only 22 (54%) had agreement in date of registration in log book and TIBU, while 17 (17%) had agreement in DR TB register and TIBU. The high level of discrepancy could be explained by the SCLC not visiting the facilities to update the records in the health facility, or just collecting data without updating the records.

| County | Subcounty | Numbers | | | | Agreement | |
|--------------------|-------------------|---------|----------------|-----|-----------------|------------------|-----------------------|
| | | logbook | Total logbooks | Reg | Total registers | Log book VS TIBU | DRTB Register vs TIBU |
| Baringo | Baringo Central | 1 | 2 | 0 | 2 | 50.0% | 0.0% |
| Busia | Samia | 1 | 1 | 1 | 1 | 100.0% | 100.0% |
| Garissa | Garissa | 0 | 2 | 0 | 2 | 0.0% | 0.0% |
| Garissa | Refugee Camps | 1 | 3 | 2 | 3 | 33.3% | 66.7% |
| Homa Bay | Kasipul | 1 | 1 | 0 | 1 | 100.0% | 0.0% |
| Isiolo | Isiolo | 1 | 4 | 1 | 4 | 25.0% | 25.0% |
| Kajiado | Kajiado North | 0 | 3 | 0 | 3 | 0.0% | 0.0% |
| Kiambu | Ruiru | 0 | 2 | 2 | 2 | 0.0% | 100.0% |
| Kiambu | Thika | 4 | 6 | 4 | 6 | 66.7% | 66.7% |
| Kitui | Kitui Central | 3 | 3 | 0 | 3 | 100.0% | 0.0% |
| Kitui | Kitui South | 1 | 1 | 1 | 1 | 100.0% | 100.0% |
| Lamu | Lamu West | 1 | 1 | 0 | 1 | 100.0% | 0.0% |
| Makueni | Kibwezi East | 0 | 1 | 0 | 1 | 0.0% | 0.0% |
| Nakuru | Njoro | 1 | 1 | 1 | 2 | 100.0% | 50.0% |
| Nyeri | Othaya Mukurweini | 1 | 1 | 0 | 1 | 100.0% | 0.0% |
| Pokot | Pokot North | 0 | 0 | 1 | 1 | 0.0% | 100.0% |
| Pokot | West Pokot | 0 | 0 | 1 | 1 | 0.0% | 100.0% |
| Siaya | Bondo | 3 | 4 | 1 | 6 | 75.0% | 16.7% |
| Tana River | Tana Delta | 1 | 1 | 0 | 1 | 100.0% | 0.0% |
| Tharaka Nithi | Maara | 1 | 1 | 0 | 1 | 100.0% | 0.0% |
| Uasin Gishu | Eldoret Mtrh | 0 | 0 | 1 | 1 | 0.0% | 100.0% |
| Uasin Gishu | Turbo | 1 | 3 | 1 | 4 | 33.3% | 25.0% |
| Grand Total | 0 | 22 | 41 | 17 | 48 | 53.7% | 35.4% |

In 2 control zones (Samia, Kitui South) had 100% agreement in the log book, DR TB registers and TIBU, while in 3 control zones (Ruiru, Bondo and Eldoret-MTRH) had great discrepancies in log book, registers and TIBU.

Treatment Started Date

Nationally agreement, Only 22 (54%) had agreement in the log book and TIBU, While Only 18 (38%) had agreement entries in the DR TB registers and TIBU.

| County | Subcounty | Numbers | | | | Agreement | |
|--------------------|-------------------|-----------|----------------|-----------|------------|---------------------------|-----------------------|
| | | logbook | Total logbooks | Tibu | Total Tibu | log book VS DRTB Register | TIBU Vs DRTB Register |
| Baringo | Baringo Central | 1 | 2 | 1 | 2 | 50.0% | 50.0% |
| Busia | Samia | 1 | 1 | 1 | 1 | 100.0% | 100.0% |
| Garissa | Garissa | 2 | 2 | 1 | 2 | 100.0% | 50.0% |
| Garissa | Refugee Camps | 2 | 3 | 2 | 3 | 66.7% | 66.7% |
| Homa Bay | Kasipul | 0 | 1 | 0 | 1 | 0.0% | 0.0% |
| Isiolo | Isiolo | 2 | 4 | 1 | 4 | 50.0% | 25.0% |
| Kajiado | Kajiado North | 2 | 3 | 1 | 3 | 66.7% | 33.3% |
| Kiambu | Ruiru | 2 | 2 | 2 | 2 | 100.0% | 100.0% |
| Kiambu | Thika | 2 | 6 | 0 | 6 | 33.3% | 0.0% |
| Kitui | Kitui Central | 0 | 3 | 0 | 3 | 0.0% | 0.0% |
| Kitui | Kitui South | 1 | 1 | 0 | 1 | 100.0% | 0.0% |
| Lamu | Lamu West | 0 | 1 | 1 | 1 | 0.0% | 100.0% |
| Makueni | Kibwezi East | 0 | 1 | 0 | 1 | 0.0% | 0.0% |
| Nakuru | Njoro | 1 | 1 | 1 | 2 | 100.0% | 50.0% |
| Nyeri | Othaya Mukurweini | 1 | 1 | 1 | 1 | 100.0% | 100.0% |
| Pokot | Pokot North | 0 | 0 | 1 | 1 | 0.0% | 100.0% |
| Pokot | West Pokot | 0 | 0 | 1 | 1 | 0.0% | 100.0% |
| Siaya | Bondo | 2 | 4 | 1 | 6 | 50.0% | 16.7% |
| Tana River | Tana Delta | 0 | 1 | 0 | 1 | 0.0% | 0.0% |
| Tharaka Nithi | Maara | 0 | 1 | 0 | 1 | 0.0% | 0.0% |
| Uasin Gishu | Eldoret MTRH | 0 | 0 | 0 | 1 | 0.0% | 0.0% |
| Uasin Gishu | Turbo | 3 | 3 | 3 | 4 | 100.0% | 75.0% |
| Grand Total | 0 | 22 | 41 | 18 | 48 | 53.7% | 37.5% |

In 37 control zones (Samia, Ruiru and Othaya-Mukurweini) had 100% agreement in log book, DR TB registers and TIBU while 4 control zones (Isiolo, Kajiado North, Bondo and Turbo) had discrepancies in log books, DR TB registers and TIBU. This might due transcription errors in transferring treatment dates in log books, registers and electronic surveillance (TIBU).

GeneXpert Results

In general, we had an average of 56% agreement between the DRTB register and TIBU while 68% agreed on average between the logbook and register. We had 7/22 (32%) control zones having 100% agreement in all the data tools, while 11/22 (50%) had an agreement between the logbook and the register. There is 10/22 (45%) agreement between DRTB register and TIBU.

| County | Subcounty | Numbers | | | | Agreement | |
|--------------------|-------------------|-----------|----------------|-----------|------------|---------------------------|-----------------------|
| | | logbook | Total logbooks | Tibu | Total Tibu | log book VS DRTB Register | TIBU Vs DRTB Register |
| Baringo | Baringo Central | 1 | 2 | 0 | 2 | 50.0% | 0.0% |
| Busia | Samia | 1 | 1 | 1 | 1 | 100.0% | 100.0% |
| Garissa | Garissa | 2 | 2 | 2 | 2 | 100.0% | 100.0% |
| Garissa | Refugee Camps | 1 | 3 | 1 | 3 | 33.3% | 33.3% |
| Homa Bay | Kasipul | 1 | 1 | 0 | 1 | 100.0% | 0.0% |
| Isiolo | Isiolo | 2 | 4 | 4 | 4 | 50.0% | 100.0% |
| Kajiado | Kajiado North | 2 | 3 | 0 | 3 | 66.7% | 0.0% |
| Kiambu | Ruiru | 2 | 2 | 2 | 2 | 100.0% | 100.0% |
| Kiambu | Thika | 6 | 6 | 4 | 6 | 100.0% | 66.7% |
| Kitui | Kitui Central | 0 | 3 | 0 | 3 | 0.0% | 0.0% |
| Kitui | Kitui South | 1 | 1 | 1 | 1 | 100.0% | 100.0% |
| Lamu | Lamu West | 0 | 1 | 0 | 1 | 0.0% | 0.0% |
| Makueni | Kibwezi East | 1 | 1 | 1 | 1 | 100.0% | 100.0% |
| Nakuru | Njoro | 1 | 1 | 2 | 2 | 100.0% | 100.0% |
| Nyeri | Othaya Mukurweini | 1 | 1 | 1 | 1 | 100.0% | 100.0% |
| Pokot | Pokot North | 0 | 0 | 1 | 1 | 0.0% | 100.0% |
| Pokot | West Pokot | 0 | 0 | 1 | 1 | 0.0% | 100.0% |
| Siaya | Bondo | 2 | 4 | 3 | 6 | 50.0% | 50.0% |
| Tana River | Tana Delta | 1 | 1 | 0 | 1 | 100.0% | 0.0% |
| Tharaka Nithi | Maara | 0 | 1 | 0 | 1 | 0.0% | 0.0% |
| Uasin Gishu | Eldoret MTRH | 0 | 0 | 0 | 1 | 0.0% | 0.0% |
| Uasin Gishu | Turbo | 3 | 3 | 3 | 4 | 100.0% | 75.0% |
| Grand Total | 0 | 28 | 41 | 27 | 48 | 68.3% | 56.3% |

In five control zones, Kajiado had a drop from 67% to 0%, Baringo Central (50%-0%), Kasipul 100% to 0%, Thika from 100% to 67% and turbo from 100% to 75%. This indicated a possibility lack of supervision by SCTL, In Thika and turbo have a possibility of high staff turnover compromising the capacity to handle the data entry.

In two control zones, Isiolo showed an improvement from 50% to 100% in the two levels of agreement (log book verses register and register verses TIBU), both Pokot North and West from 0% to 100%. The improvement may be attributed to non-availability of the DRTB log book for Pokot case but for Isiolo there could have been focused mentorship.

In 3 control zones (Kitui central, Maara and Eldoret MTRH) had zero data across all the tools and we are attributing this to either lack of tools or use other reporting mechanisms,

Patient Type

Overall we had 61% agreement between the logbook and register while 54% had an agreement between the register TIBU.

| County | Subcounty | Numbers | | | | Agreement | |
|--------------------|-------------------|-----------|----------------|-----------|------------|---------------------------|-----------------------|
| | | logbook | Total logbooks | Tibu | Total Tibu | Log book VS DRTB Register | TIBU Vs DRTB Register |
| Baringo | Baringo Central | 1 | 2 | 1 | 2 | 50.0% | 50.0% |
| Busia | Samia | 1 | 1 | 1 | 1 | 100.0% | 100.0% |
| Garissa | Garissa | 2 | 2 | 2 | 2 | 100.0% | 100.0% |
| Garissa | Refugee Camps | 3 | 3 | 3 | 3 | 100.0% | 100.0% |
| Homa Bay | Kasipul | 1 | 1 | 1 | 1 | 100.0% | 100.0% |
| Isiolo | Isiolo | 2 | 4 | 3 | 4 | 50.0% | 75.0% |
| Kajiado | Kajiado North | 1 | 3 | 1 | 3 | 33.3% | 33.3% |
| Kiambu | Ruiru | 0 | 2 | 1 | 2 | 0.0% | 50.0% |
| Kiambu | Thika | 5 | 6 | 4 | 6 | 83.3% | 66.7% |
| Kitui | Kitui Central | 0 | 3 | 0 | 3 | 0.0% | 0.0% |
| Kitui | Kitui South | 1 | 1 | 1 | 1 | 100.0% | 100.0% |
| Lamu | Lamu West | 1 | 1 | 0 | 1 | 100.0% | 0.0% |
| Makueni | Kibwezi East | 0 | 1 | 0 | 1 | 0.0% | 0.0% |
| Nakuru | Njoro | 1 | 1 | 1 | 2 | 100.0% | 50.0% |
| Nyeri | Othaya Mukurweini | 1 | 1 | 1 | 1 | 100.0% | 100.0% |
| Pokot | Pokot North | 0 | 0 | 1 | 1 | 0.0% | 100.0% |
| Pokot | West Pokot | 0 | 0 | 1 | 1 | 0.0% | 100.0% |
| Siaya | Bondo | 1 | 4 | 0 | 6 | 25.0% | 0.0% |
| Tana River | Tana Delta | 0 | 1 | 0 | 1 | 0.0% | 0.0% |
| Tharaka Nithi | Maara | 1 | 1 | 1 | 1 | 100.0% | 100.0% |
| Uasin Gishu | Eldoret Mtrh | 0 | 0 | 1 | 1 | 0.0% | 100.0% |
| Uasin Gishu | Turbo | 3 | 3 | 2 | 4 | 100.0% | 50.0% |
| Grand Total | | 25 | 41 | 26 | 48 | 61.0% | 54.2% |

In the year 2017, 7 (32%) had 100% agreement in all the tools (log book, register and Tibu). Improvement in reporting patient type, we had 4 control zones (Eldoret MTRH ,West Pokot and North Pokot having an improvement from 0%-100%, while Isiolo improved from 50% to 75%. This may be attributed to focused mentorship.

Zero reporting or data

We had three control zones that had no data (Kitui Central, Kibwezi and Tana Delta). This may be perhaps due to lack of patients and inadequate staff for reporting.

Drop in data capture

It was noted that in the four DRTB control zones, there were a notable drop. Bondo had a drop from 25% to 0% , Turbo had a drop from 100% to 50%, Njoro from 100% to 50% and Thika from 83% to 67%. This may have happened because of focal staff turnover, lack consistent mentorship and training.

Static data reporting

Baringo and Kajiado North maintained a steady of 50% and 33% respectively. This may be attributed to low mentorship and motivation

DRTB -Treatment Outcomes

In the 22 DRTB control zones 7 (32%) had an agreement in the log book, DRTB register and TIBU- (Garissa, Kasipul, Ruiru, Kitui South, Kibwezi East, Njoro and Othaya /Mukurweini). Those that had 100% agreement between the log-book and DRTB were 10/22 (45%) adding on the earlier list is Samia, Kajiado North and Turbo. We had a similar agreement at 45% between the register and Tibu having Refugee camp, Kajiado North and West adding on the initial list.

| | | Numbers | | | | Agreement | |
|--------------------|-------------------|-----------|----------------|-----------|------------|---------------------------|-----------------------|
| County | Subcounty | logbook | Total logbooks | Tibu | Total Tibu | Log book VS DRTB Register | TIBU Vs DRTB Register |
| Baringo | Baringo Central | 1 | 2 | 0 | 2 | 50.0% | 0.0% |
| Busia | Samia | 1 | 1 | 0 | 1 | 100.0% | 0.0% |
| Garissa | Garissa | 2 | 2 | 2 | 2 | 100.0% | 100.0% |
| Garissa | Refugee Camps | 2 | 3 | 3 | 3 | 66.7% | 100.0% |
| Homa Bay | Kasipul | 1 | 1 | 1 | 1 | 100.0% | 100.0% |
| Isiolo | Isiolo | 3 | 4 | 0 | 4 | 75.0% | 0.0% |
| Kajiado | Kajiado North | 3 | 3 | 1 | 3 | 100.0% | 33.3% |
| Kiambu | Ruiru | 2 | 2 | 2 | 2 | 100.0% | 100.0% |
| Kiambu | Thika | 5 | 6 | 2 | 6 | 83.3% | 33.3% |
| Kitui | Kitui Central | 0 | 3 | 0 | 3 | 0.0% | 0.0% |
| Kitui | Kitui South | 1 | 1 | 1 | 1 | 100.0% | 100.0% |
| Lamu | Lamu West | 0 | 1 | 0 | 1 | 0.0% | 0.0% |
| Makueni | Kibwezi East | 1 | 1 | 1 | 1 | 100.0% | 100.0% |
| Nakuru | Njoro | 1 | 1 | 2 | 2 | 100.0% | 100.0% |
| Nyeri | Othaya Mukurweini | 1 | 1 | 1 | 1 | 100.0% | 100.0% |
| Pokot | Pokot North | 0 | 0 | 1 | 1 | 0.0% | 100.0% |
| Pokot | West Pokot | 0 | 0 | 1 | 1 | 0.0% | 100.0% |
| Siaya | Bondo | 3 | 4 | 4 | 6 | 75.0% | 66.7% |
| Tana River | Tana Delta | 0 | 1 | 0 | 1 | 0.0% | 0.0% |
| Tharaka Nithi | Maara | 0 | 1 | 0 | 1 | 0.0% | 0.0% |
| Uasin Gishu | Eldoret Mtrh | 0 | 0 | 0 | 1 | 0.0% | 0.0% |
| Uasin Gishu | Turbo | 3 | 3 | 3 | 4 | 100.0% | 75.0% |
| Grand Total | | 30 | 41 | 25 | 48 | 73.2% | 52.1% |

We realized an average of 73% agreement between the register and the log book in all the 22 DRTB control zones whereas we had an average of 52% agreement between the register and Tibu.

Facilities that had Zero agreement

Kitui Central, Tana Delta, Maara, Eldoret MTRH and Lamu West had 0% across all the comparison. Possible reasons as to the zero agreement may be attributed to not having DRTB sensitization and training but also DRTB log book non availability and using another method of data capture.

Facilities that dropped in the next level of reporting (Log book vs Register and register and log book)

Thika 83%-33, West Pokot from 75%-67%, Turbo 100%-75%, Isiolo 75% - 0%, and Baringo Central from 50% to Zero percent. There are possible reasons that we may have realized a drop. To begin with, the focal staff may have gone leave, staff turnover, there was a stockout on Gene expert cartridges.

Facilities that improved in the next stage (From log vs Register and Register and Tibu)

Some control zones had an improvement from no data in the previous stage to having data in the last point of comparison to a tune of 100% (Refugee camp, Pokot West and Pokot North). This may be attributed to not having the DRTB logbook and were using the DRTB register as a primary document

Treatment outcome dates

In the 22 control zones that handle DRTB, 6/22 (27%) had data agreeing in all the three tools, we had 7/22 (32%) agreeing at 100% between the logbook and DRTB register having Turbo adding to the initial list. We had 9/22 (41%) agreeing at 100% between the register and Tibu, having Njoro, Pokot North and Pokot West adding unto the initial list.

| County | Subcounty | Numbers | | | | Agreement | |
|------------|-------------------|---------|----------------|------|------------|---------------------------|-----------------------|
| | | logbook | Total logbooks | Tibu | Total Tibu | Log book VS DRTB Register | TIBU Vs DRTB Register |
| Baringo | Baringo Central | 1 | 2 | 1 | 2 | 50.0% | 50.0% |
| Busia | Samia | 0 | 1 | 0 | 1 | 0.0% | 0.0% |
| Garissa | Garissa | 1 | 2 | 1 | 2 | 50.0% | 50.0% |
| Garissa | Refugee Camps | 2 | 3 | 2 | 3 | 66.7% | 66.7% |
| Homa Bay | Kasipul | 1 | 1 | 1 | 1 | 100.0% | 100.0% |
| Isiolo | Isiolo | 1 | 4 | 1 | 4 | 25.0% | 25.0% |
| Kajiado | Kajiado North | 1 | 3 | 1 | 3 | 33.3% | 33.3% |
| Kiambu | Ruiru | 2 | 2 | 2 | 2 | 100.0% | 100.0% |
| Kiambu | Thika | 2 | 6 | 2 | 6 | 33.3% | 33.3% |
| Kitui | Kitui Central | 0 | 3 | 0 | 3 | 0.0% | 0.0% |
| Kitui | Kitui South | 1 | 1 | 1 | 1 | 100.0% | 100.0% |
| Lamu | Lamu West | 1 | 1 | 1 | 1 | 100.0% | 100.0% |
| Makueni | Kibwezi East | 0 | 1 | 0 | 1 | 0.0% | 0.0% |
| Nakuru | Njoro | 2 | 1 | 2 | 2 | 200.0% | 100.0% |
| Nyeri | Othaya Mukurweini | 1 | 1 | 1 | 1 | 100.0% | 100.0% |
| Pokot | Pokot North | 1 | 0 | 1 | 1 | 0.0% | 100.0% |
| Pokot | West Pokot | 1 | 0 | 1 | 1 | 0.0% | 100.0% |
| Siaya | Bondo | 5 | 4 | 5 | 6 | 125.0% | 83.3% |
| Tana River | Tana Delta | 1 | 1 | 1 | 1 | 100.0% | 100.0% |

| | | | | | | | |
|--------------------|--------------|-----------|-----------|-----------|-----------|--------------|--------------|
| Tharaka Nithi | Maara | 0 | 1 | 0 | 1 | 0.0% | 0.0% |
| Uasin Gishu | Eldoret Mtrh | 0 | 0 | 0 | 1 | 0.0% | 0.0% |
| Uasin Gishu | Turbo | 3 | 3 | 3 | 4 | 100.0% | 75.0% |
| Grand Total | | 27 | 41 | 27 | 48 | 65.9% | 56.3% |

Zones without data

We had five zones having zero percent in data availability in all the comparison levels (Tharaka, Eldoret MTRH, Kibwezi east, Kitui Central and Samia.

The condition above may be due to Lack of tools to report in , having no patients, use of other methods and platform to report the data and also having patients spilling to the next reporting timeline.

Over-reporting

Some facilities showed over-reporting in the primary comparison (log book and Register) – These are Bondo at 125% and Njoro at 200% but in the subsequent comparison, Bondo had 83% and Njoro had 100%.

Assumptions

The over- reporting could due to cooked data, data spilling another quarter and late date notification.

3.3 Leprosy findings for DQA 2019

Out of the 37 control zones visited for the DQA exercise, 8 control zones had leprosy cases representing 22% of the zones. A total of 13 and 9 patients were recorded in facility leprosy register for 2017 & 2018 respectively. In 2017 the number of leprosy cases reported in both leprosy register and TIBU was 13. However in the TIBU register the number of patients were 13 & 10 for 2017 & 2018 respectively. This indicated that one extra patient was notified in TIBU for the year 2018 as compared to the facility leprosy register. This could be as a result of double notification in one of the control zones. This duplication might explain the extra cases recorded in TIBU exceeding the facility register. Where TIBU register has less cases than the leprosy patient register, there is a possibility that SCTLCs failed to notify cases on time before the conduct of the DQA.

| | | 2017 | | | 2018 | | |
|---------|------------------------|-------------|------|-----------------------|-------------|------|-----------------------|
| County | Counties/ Sub counties | Leprosy Reg | TIBU | Agreement Reg vs TIBU | Leprosy Reg | TIBU | Agreement Reg vs TIBU |
| Baringo | Baringo Central | 0 | 0 | 0 | 0 | 2 | 0 |
| Bomet | Sotik | 1 | 1 | 100.00% | 0 | 0 | 0 |
| Busia | Nambale | 2 | 1 | 200.00% | 1 | 2 | 200.00% |
| Kisumu | Kisumu East A | 2 | 2 | 100.00% | 4 | 4 | 100.00% |
| Lamu | Lamu West | 1 | 1 | 100.00% | 0 | 0 | 0 |

| | | | | | | | |
|----------------|--------------------|-----------|-----------|----------------|----------|-----------|----------------|
| Makueni | Kibwezi East | 1 | 1 | 100.00% | 1 | 0 | 0.00% |
| Mombasa | Ganjoni | 5 | 7 | 140.00% | 0 | 0 | 0 |
| Siaya | Bondo | 1 | 0 | 0.00% | 3 | 2 | 66.70% |
| | Grand Total | 13 | 13 | 100.00% | 9 | 10 | 111.10% |

There were 13 leprosy cases reported for the year 2017 which demonstrated 100% level of agreement between facility register and TIBU. However, further analysis showed that only 71.4% of the visited control zones with cases had an absolute agreement between the register and TIBU.

In 2017, Ganjoni reported 5 cases in facility register compared to 7 cases in notified in TIBU giving 140% level of agreement. In Nambale, there was a 200% agreement level in 2017 and 2018 which shows that there was a gap in notification of cases. The 2 extra cases in TIBU whose records could not be traced at the facilities' registers means that the records were either misplaced or SCTLCs notified the cases directly in TIBU from other sources other than the patient registers. In Siaya County leprosy control zone, the only case identified in 2017 was not notified in TIBU. This may mean that either the SCTLCs had not been trained on how to handle Leprosy cases in TIBU in 2017 and were trained in 2018, the 2017 case was notified in 2018 or the case simply missed being notified altogether. In 2018, one leprosy case failed to be notified probably because the SCTLCs picked the case when the year had expired.

Leprosy outcomes

| Released from Treatment | | | |
|-------------------------|------------------|----------|---------------------------|
| Counties / Sub Counties | Leprosy Register | TIBU | Agreement Lep Reg Vs TIBU |
| Busia | 2 | 1 | 50.0% |
| Nambale | 2 | 1 | 50.0% |
| Mombasa | 1 | 7 | 700.0% |
| Ganjoni | 1 | 7 | 700.0% |
| Siaya | 1 | 0 | 0.0% |
| Bondo | 1 | 0 | 0.0% |
| Grand Total | 4 | 8 | 200.0% |

Overall level of agreement between leprosy register and TIBU was 200% .In all three control zones there was a disparity in agreement levels across the register and TIBU. Mombasa took the lead in case notification with all their 7 cases having an outcome in TIBU though only one case had an outcome from the register. This brought about the 700% level of agreement Out of all control zones, 57% of leprosy reporting control zones did not have treatment outcomes altogether. This could be due to patients defaulting on treatment and poor defaulter tracing. Out of the seven control zones with leprosy cases, 3(43%) reported patients released from treatment.

3.4 Aggregate IPT

Overall, the level of agreement between IPT register and the ICF cards in 2017 was 13.2 % with a drop in 2018 to 10.2%.

The agreement between the register and TIBU was 89.6% in 2017 this dropped in 2018 to 52.8%. In 2017 only 11(29.7%) out of 37 TB control zones with IPT cases had IPT cases in the IPT cards. While 35 (95%) of the control zones had their cases in the register, two zones representing 5% (Kasipul and Eldoret mtrh) had no cases in register. In TIBU only 8(21.6%) control zones had no cases. Failure to have cases in the register could imply a total failure to undertake contact tracing or the index cases could be living very far away from registering facility and therefore not feasible to do contact tracing.

Agreement of Facility register vs Card

| Agreement Reg Vs Card | Number Of Zones 2017 | Control Zones 2017 | Number Of Zones 2018 | Control Zones 2018 |
|------------------------|----------------------|--|----------------------|---|
| 0.0% | 26 | Baringo_central, Bondo, Chuka_igambang_ombe, Eldoret_MTRH, Ganjoni, Garissa, Isiolo, Kajiado_north, Kisumu_east_a, Kitui_central, Lamu_west, Loima, Maara, Mt_Elgon, Naivasha, Nambale, Njoro, Nyando, Pokot_north, Refugee_camps, Rongo, Samia, Sotik, Tana_delta, Thika, Yatta | 26 | Baringo_central, Bondo, Chuka_igambang_ombe, Eldoret_MTRH, Ganjoni, Garissa, Isiolo, Kajiado_north, Kibwezi_east, Kisumu_east_a, Kitui_central, Lamu_west, Maara, Mogotio, Mt_elgon, Mvita, Naivasha, Nambale, Njoro, Nyando, Pokot_north, Rongo, Samia, Sotik, Tana_delta, Thika, West_pokot |
| Above 0% And Below 20% | 3 | Kibwezi_east, Kasipul, West_pokot | 3 | Yatta, Refugee_camps, Turbo |
| > 20% And < 50% | | West_pokot, Mvita | 2 | Loima, Kasipul |
| > 50% And < 100% | 2 | Ruiru, Kitui South | 3 | Othaya_mukurweini, Ruiru, Kitui_south |
| 100% | 4 | Merti, Mogotio, Tetu, Turbo | 1 | Merti |
| > 100% | 1 | Othaya_Mukurweini (105.6%) | 1 | Tetu (114.3%) |

From the table above

Majority of the visited control zones did not report any level of agreement between register and ICF card. 26 control zones in both 2017 and 2018 did not report any agreement. This could point to the fact that there were more cases in the registers than in ICF cards which could point to shortage of ICF cards in the said control zones. Some control zones had an agreement of over 100%. In 2017, Othaya mukuruweini control zone reported a 105.6% level of agreement while tetu reported 114.3% in 2018. These over 100% levels of agreement show that while there was proper usage of ICF cards in the said facilities, staff could be failing to update the IPT /Contact management registers with the cases reported in the ICF cards.

Agreement of Facility register vs TIBU

| Agreement Reg Vs Card | Number Of Zones 2017 | Control Zones 2017 | Number Of Zones 2018 | Control Zones 2018 |
|------------------------|----------------------|--|----------------------|--|
| 0.0% | 12 | Baringo_central, Eldoret_MTRH, Isiolo, Kajiado_north, Kasipul, Lamu_west, Loima, Mogotio, Njoro, Othaya_mukurweini, Refugee_camps, Yatta | 12 | Baringo_central, Eldoret_MTRH, Ganjoni, Isiolo, Kajiado_north, Kasipul, Lamu_west, Loima, Mogotio, Njoro, Othaya_mukurweini, Yatta |
| Above 0% And Below 20% | 2 | Bondo, Garissa | 1 | Bondo |
| > 20% And < 50% | 2 | Garissa, Kisumu_east | 9 | Garissa, Kisumu_east_a, Sotik, Kibwezi_east, Refugee_camps, Chuka_lgambang_ombe, Naivasha, Nyando, Turbo, Maara |
| > 50% And < 100% | 4 | Kisumu_east_a, Chuka_lgambang_ombe, Nyando, Sotik | 6 | Rongo, Tana_delta, West_pokot, Mt_elgon, Samia, Mvita |
| 100% | 4 | Ganjoni, Kitui_central, Merti, Tetu | 3 | Kitui_Central, Merti, Nambale |
| > 100% | 15 | Rongo, Naivasha, Mvita, Maara, Thika, Samia, Kitui_south, Nambale, Kibwezi_east, Pokot_north, Ruiru, Tana_delta, Mt_elgon, West_pokot, Turbo | 5 | Thika, Ruiru, Pokot_north, Kitui_south, Tetu |

From the table above

We can see that 12 control zones in both 2017 and 2018 did not have any level of agreement between TIBU and IPT/Contact management registers. This shows that there were cases in TIBU that did not exist in the said facility registers and it could point to a gap in notification of IPT cases in TIBU where SCTLCS are sourcing these cases from elsewhere apart from the registers. Additionally we can see that there is a significant number of control zones that had an agreement of over 100%. In 2017 there were 15 control zones and in 2018 they dropped to 5 control zones. This shows that there were some un-notified cases in the facility register to TIBU. In 2018, the situation appears to have improved slightly with the dropped by 10 control zones as 2018 has lesser number of control zones with un notified from facility regis

IPT OUTCOME OR RELEASE FROM TREATMENT

Among the control zones sampled 37 reported having IPT (for under 5) cases with an outcome of released from treatment. Those having an outcome released from treatment showed about 10% disparity between IPT register and TIBU, however 90.8% of the reported outcome showed an agreement as shown in the table below.

| Counties / Sub Counties | Register | Tibu | Agreement Ipt/Contact Reg Vs Tibu |
|-------------------------|----------|------|-----------------------------------|
| Baringo_central | 4 | 0 | 0.0% |
| Mogotio | 1 | 0 | 0.0% |
| Sotik | 24 | 32 | 133% |
| Mt_Elgon | 0 | 2 | 0 |
| Nambale | 13 | 29 | 223.1% |
| Samia | 6 | 7 | 116.7% |
| Garissa | 0 | 0 | 0 |

| | | | |
|---------------------|------------|------------|--------------|
| Refugee_camps | 4 | 4 | 100.0% |
| Kasipul | 32 | 10 | 31.3% |
| Isiolo | 10 | 0 | 0.0% |
| Merti | 4 | 4 | 100.0% |
| Kajiado_north | 2 | 0 | 0.0% |
| Ruiru | 35 | 36 | 102.9% |
| Thika | 45 | 52 | 115.6% |
| Kisumu_east_a | 27 | 9 | 33.3% |
| Nyando | 49 | 12 | 24.5% |
| Kitui_central | 22 | 22 | 100.0% |
| Kitui_south | 75 | 126 | 168.0% |
| Lamu_west | 17 | 0 | 0.0% |
| Yatta | 38 | 0 | 0.0% |
| Kibwezi_east | 10 | 0 | 0.0% |
| Rongo | 27 | 37 | 137.0% |
| Ganjoni | 0 | 0 | 0 |
| Mvita | 6 | 12 | 200.0% |
| Naivasha | 0 | 0 | 0 |
| Njoro | 23 | 0 | 0.0% |
| Othaya_mukurweini | 15 | 0 | 0.0% |
| Tetu | 4 | 4 | 100.0% |
| Pokot_north | 16 | 16 | 100.0% |
| West_pokot | 4 | 25 | 625.0% |
| Bondo | 26 | 18 | 69.2% |
| Tana_delta | 29 | 83 | 286.2% |
| Chuka_igambang_ombe | 2 | 7 | 350.0% |
| Maara | 27 | 0 | 0.0% |
| Loima | 9 | 0 | 0.0% |
| Eldoret_mtrh | 0 | 0 | 0 |
| Turbo | 0 | 3 | 0 |
| Grand Total | 606 | 550 | 90.8% |

A total of 15 sub counties had more cases in the register than in TIBU, representing 40% of all the control zones that had IPT cases with an outcome released from treatment. Of these 15 control zones, 11 (73%) (highlighted in red in the table below) did not report a case in TIBU registering a zero level of agreement. Whereas 5 control zones reported an agreement of 100% and 11 control zones reported over 100%, Among the control zones, 13 (35%) had more cases in TIBU than in the facility registers with the outcome of released from treatment. Two control zones had no outcome of release from treatment in the facility registers namely, Mt Elgon and Turbo sub counties.

It was notable that Garissa, Ganjoni, Naivasha, Mt Elgon and MTRH Eldoret control zones recorded zero outcomes on those under 5s started on IPT. This implies that either the patients defaulted on treatment or completed their IPT in another facility.

Below are tables of the counties that have more in the register than in TIBU and those with more cases in TIBU than in the Register

Sub counties that had more cases with the outcome of release from treatment in the register than in TIBU

| Sub Counties | Register | Tibu | Agreement Ipt/Contact Reg Vs Tibu |
|-------------------|----------|------|-----------------------------------|
| Baringo_central | 4 | 0 | 0.0% |
| Mogotio | 1 | 0 | 0.0% |
| Kasipul | 32 | 10 | 31.3% |
| Isiolo | 10 | 0 | 0.0% |
| Kajiado_north | 2 | 0 | 0.0% |
| Kisumu_east_a | 27 | 9 | 33.3% |
| Nyando | 49 | 12 | 24.5% |
| Lamu_west | 17 | 0 | 0.0% |
| Yatta | 38 | 0 | 0.0% |
| Kibwezi_east | 10 | 0 | 0.0% |
| Njoro | 23 | 0 | 0.0% |
| Othaya_mukurweini | 15 | 0 | 0.0% |
| Bondo | 26 | 18 | 69.2% |
| Maara | 27 | 0 | 0.0% |
| Loima | 9 | 0 | 0.0% |

From the table above, 11 sub counties had not reported any case with an outcome of Released from treatment in TIBU as highlighted in red above.

Counties with more cases in TIBU V/s the TB4 register for the outcome of Release from treatment

| Counties / Sub Counties | Register | Tibu | Agreement Ipt/Contact Reg Vs Tibu |
|-------------------------|----------|------|-----------------------------------|
| Sotik | 24 | 32 | 133.33% |
| Mt_elgon | 0 | 2 | 0.00% |
| Nambale | 13 | 29 | 223.08% |
| Samia | 6 | 7 | 116.67% |
| Garissa | 0 | 0 | 0.00% |
| Ruiru | 35 | 36 | 102.86% |

| | | | |
|---------------------|----|-----|---------|
| Thika | 45 | 52 | 115.56% |
| Kitui_south | 75 | 126 | 168.00% |
| Rongo | 27 | 37 | 137.04% |
| Ganjoni | 0 | 0 | 0.00% |
| Mvita | 6 | 12 | 200.00% |
| Naivasha | 0 | 0 | 0.00% |
| West_pokot | 4 | 25 | 625.00% |
| Tana_delta | 29 | 83 | 286.21% |
| Chuka_igambang_ombe | 2 | 7 | 350.00% |
| Eldoret_MTRH | 0 | 0 | 0.00% |
| Turbo | 0 | 3 | 0.00% |
| Average | | | 144.57% |

3.5 Availability of DS TB recording and reporting tools

The table below shows the availability of the various DSTB recording and reporting tools in the facilities visited.

| Availability of tools in the sampled facilities N=448 | |
|---|-----------|
| Patient cards | 398 (89%) |
| Patients TB4 register | 439 (98%) |
| Appointment cards | 392 (88%) |
| Sputum reporting forms | 359 (80%) |
| Commodity reporting tools | 341 (76%) |

From the table it can be inferred that:

Most of the facilities visited recorded over 70% availability of reporting tools. 11% of the facilities lacked the patient cards which is the primary document for TB management though the availability of the TB4 register was at 98%. This shows that many HCWs were using the TB4 register as the primary data entry point instead of the patient record cards. The unavailability of appointment cards in facilities at 12% poses a challenge in retrieval of records as well as cause some patients to miss out in following their clinic appointments. It was notable that 20% of facilities lacked the essential laboratory sputum reporting forms. This will ultimately hamper sputum smear routine follow up hence inability to detect treatment failures and cause lower treatment cure rates. Data showed that 25% of the visited facilities did not have commodity reporting tools and this could explain commodity stock outs as facility returns are a prerequisite for stock supplies.

Version of reporting tools used at the facility at the period of DQA

| Year | Facility register (TB4) | Patient Record cards | Appointment cards | F-CDRR |
|--------------|-------------------------|----------------------|-------------------|------------|
| Empty | 16 | 86 | 75 | 282 |
| 2011 | 0 | 0 | 9 | 0 |
| 2012 | 0 | 0 | 0 | 0 |
| 2013 | 0 | 1 | 0 | 0 |
| 2014 | 48 | 0 | 0 | 0 |
| 2015 | 7 | 0 | 17 | 0 |
| 2016 | 356 | 354 | 342 | 76 |
| 2017 | 21 | 5 | 0 | 81 |
| 2018 | 0 | 0 | 0 | 9 |
| 2016, 2011 | 0 | 0 | 1 | 0 |
| 2017, 2016 | 0 | 2 | 0 | 0 |
| Total | 448 | 448 | 448 | 448 |

From the above table

From the assessment of the version of the registers available at the facilities, over 75% of the facilities had the 2016 version of registers except the FCDRR where 63% of the facilities had no version indicated.

The most prevalent version of TB 4 register is the 2016 version. The version has 356 facilities using it representing 79.4% of the versions available.

Old facility registers are still in use. There are 48 facilities using the 2014 version representing 10.7% of all the TB4 registers seen in the facilities.

There are 16 facilities whose TB4 registers were not determined. 2016 version of patient cards are the most prevalent at 356 (79.4%) facilities visited. There are some 86 facilities (19.1%) whose patient record versions cannot be determined.

There are some facilities using multiple patient card versions. Two facilities had used the 2018, 2017 and 2016 patient card versions. The uptake of 2017 patient record card versions was noted to be low. Only 5 (1.1%) facilities reported using 2017 patient card version.

DQA teams were unable to ascertain the versions of most F-CDRR registers. The registers in 282 (62.9%) facilities either did not have version numbers or the teams were unable to decipher inscribed versions.

There is a better uptake of 2017 versions over the 2016 versions of F-CDRR registers. 2017 versions were reported to be in 81 facilities compared to 76 of version 2016.

Below are various facilities missing one recording tool or the other

| Facilities Without Patient Record Cards | | |
|---|-------------------------------|----------------------------------|
| Aar_medical_services_Docks_ | Kiptagich_health_centre | Ouya_dispensary |
| Aga_Khan_hospital_Kisumu_ | Koshok_dispensary | Oyamo_dispensary |
| Aga_Khan_hospital_Mombasa_ | Liverpool_VCT_Kisumu_east_ | Radat_dispensary |
| AIC_dispensary_Isiolo_ | Lobei_health_centre | Railway_dispensary |
| Anyuongi_dispensary | Malka_galla_dispensary | Riwo_dispensary |
| Borrowonin_dispensary | Matar_arba_dispensary | Rumbiye_dispensary |
| Cheberen_dispensary | Mogotio_dispensary | Saka_health_centre |
| Chesongo_dispensary | Molok_dispensary | Salawa_health_centre |
| Gk_Prisons_dispensary_Kapenguria_ | Molosirwe_dispensary | Samburu_complex |
| Got_matar_dispensary | Mombasa_hospital | Seretunin_health_centre |
| Hongwe_Catholic_dispensary | Mukuuni_dispensary | Sino_dispensary |
| Kabarnet_High_School_dispensary | Namuduru_dispensary | Sirwa_dispensary_mogotio_ |
| Kaibos_dipensary | Ng_endalel_dispensary | St_Jones_Ring_Road_health_clinic |
| Kamagambo_dispenasry | Nyaguda_health_centre | Ulungo_dispensary |
| Kapkelelwa_dispensary | Oldebes_dispensary | Usigu_health_centre |
| Katulye_dispensary_Kibwezi_ | Olodonyiro_dispensary_Isiolo_ | Waseges_dispensary |
| Kiboino_dispensary | Oserian_health_centre | Total Result:49 |

| Facilities Without Tb4 Registers | | |
|----------------------------------|----------------------------------|--|
| AIC_dispensary_Isiolo_ | Oldebes_dispensary | |
| Kabarnet_High_School_dispensary | Radat_dispensary | |
| Matar_arba_dispensary | St_Jones_Ring_Road_health_clinic | |
| Molok_dispensary | Waseges_dispensary | |
| Ng'endalel_dispensary | Total :9 | |

| Facilities Without Appointment Cards | | |
|--------------------------------------|---------------------------------|----------------------------------|
| Aga_Khan_hospital_Kisumu_ | Got_matar_dispensary | Matangwe_community_health_centre |
| Aga_Khan_hospital_Mombasa_ | Ifo_2_hospital | Matar_Arba_dispensary |
| Aic_dispensary_Isiolo_ | Kabarnet_High_School_dispensary | Mau_Narok_health_centre |
| Apu_dispensary | Kamagambo_dispenasry | Memon_medical_centre |
| Basa_dispensary | Kapkelelwa_dispensary | Mogotio_dispensary |
| Biliqo_Marara | Katulye_dispensary_Kibwezi_ | Molok_dispensary |
| Bisan_Biliqo_dispensary | Kiboino_dispensary | Molosirwe_dispensary |
| Borrowonin_dispensary | Kipsogon_dispensary | Namuduru_dispensary |
| Bulesa_dispensary | Koshok_dispensary | Ng'endalel_dispensary |
| Chesongo_dispensary | Liverpool_vct_Kisumu_east_ | Ngondi_dispensary |
| Chuka_cottage_hospital | Lobei_health_centre | Ngubereti_health_centre |
| Dr_Wachira | Maiela_health_centre | Nyaguda_health_centre |
| Egerton_university | Maji_moto_dispensary | Nyangoma_mission_health_centre |
| Gobei_health_centre | Malka_galla_dispensary | |

| |
|-----------------------|
| Oldebes_dispensary |
| Oserian_health_centre |
| Oyamo_dispensary |
| Radat_dispensary |
| Rumbiye_dispensary |
| Saka_health_centre |

| |
|----------------------------------|
| Salawa_health_centre |
| Serewo_health_centre |
| Sirwa_dispensary_mogotio_ |
| St_Jones_Ring_Road_health_clinic |
| Thika_nursing_home |
| Usigu_health_centre |

| |
|-------------------------------|
| Uyawi_sub_county_hospital |
| Waseges_dispensary |
| Waso_aipca_dispensary_isiolo_ |
| Total Result: 55 |

| Facilities Without Sputum Request Forms | | |
|---|----------------------------|------------------------------------|
| Aga_Khan_hospital_Mombasa_ | Kipini_health_centre | Ng'endalel_dispensary |
| AIC_dispensary_Isiolo_ | Kipsogon_dispensary | Ngere_dispensary |
| Basa_dispensary | Kishaunet_dispensary | Ngondi_dispensary |
| Benmac_clinic | Lare_health_centre | Njoro_health_centre |
| Biliqo_Marara | Likia_dispensary | Njoro_PCEA_dispensary |
| Bisan_Biliqo_dispensary | Lobei_health_centre | Nyabola_dispensary |
| Borrowonin_dispensary | Lomil_dispensary | Ochii_dispensary |
| Bulesa_dispensary | Lwala_dispensary | Oldebes_dispensary |
| Cheberen_dispensary | Mageta_health_centre | Oserian_health_centre |
| Chemworemwo_dispensary | Mai_Mahiu_health_centre | Oyamo_dispensary |
| Chuka_district_hospital | Maiela_health_centre | Piave_dispensary |
| Egerton_University | Maji_Moto_dispensary | Radat_dispensary |
| Galili_dispensary | Makongeni_dispensary | Saka_health_centre |
| Gorgor_dispensary | Malka_Galla_dispensary | Samburu_complex |
| Got_Agulu_sub_district_hospital | Matar_arba_dispensary | Sirwa_dispensary_Mogotio_ |
| Huruma_dispensary | Mau_narok_health_centre | Sugoi_a_dispensary |
| Idsowe_dispensary | Mauche_medical_clinic | Teret_dispensary |
| Ifo_2_hospital | Mnazini_dispensary | Thika_Level_5_hospital |
| Ikanga_sub_district_hospital | Moi_ndabi_dispensary | Timboiywo_dispensary |
| Kabarnet_High_School_dispensary | Mokowe_health_centre | Tumaini_medical_clinic_thika_west_ |
| Kamagambo_dispenasry | Molok_dispensary | Tungutu_dispensary |
| Kaptimbor_dispensary | Molosirwe_dispensary | Turkwel_dispensary_loima_ |
| Karagita_dispensary | Mugurin_dispensary | Ulungo_dispensary |
| Karandini_dispensary | Mulango_AIC_dispensary | Upendo_village_dispensary |
| Karibaribi_dispensary | Mulutu_Catholic_dispensary | Usigu_health_centre |
| Kasaala_dispensary | Munyu_health_centre | Waseges_dispensary |
| Kasyala_dispensary | Mutarakwa_dispensary_Molo_ | X_cellent_medical_Centre |
| Kiboino_dispensary | Mutomo_health_centre | Total Result:89 |
| Kihingo_dispensary_cdf_ | Naivasha_district_hospital | |
| Kijani_dispensary | Namoruputh_PAG_dispensary | |
| Kinyambu_dispensary | Ndabibi_dispensary | |

| Facilities Without Commodity Reporting Tools | | |
|--|--------------------------------------|--------------------------------|
| 12_Engineers | Kijani_dispensary | Ndeda_dispensary |
| Aga_Khan_hospital_Kisumu_ | Kinyambu_dispensary | Ndugamano_dispensary |
| Aga_Khan_hospital_Mombasa_ | Kipini_health_centre | Ng_endale_dispensary |
| Ahero_medical_centre | Kipsogon_dispensary | Ngao_district_hospital |
| AIC_dispensary_Isiolo_ | Kishaunet_dispensary | Ngere_dispensary |
| Basa_dispensary | Kitere_dispensary | Ngodhe_dispensary |
| Biliqo_Marara | Kituro_health_centre | Ngondi_dispensary |
| Bisan_Biliqo_dispensary | Kyangunga_dispensary | Ngubereti_health_centre |
| Borrowonin_dispensary | Kyasioni_dispensary | Ngwata_health_centre |
| Bulesa_dispensary | Mageta_health_centre | Nightingale_medical_centre |
| Cheberen_dispensary | Mai_mahiu_health_centre | Nyamonye_mission_dispensary |
| Cheera_dispensary | Maiela_health_centre | Nyangoma_mission_health_centre |
| Cherangan_dispensary | Maji_moto_dispensary | Nzunguni_dispensary |
| Chesongo_dispensary | Malka_galla_dispensary | Ochii_dispensary |
| Didewaride_dispensary | Maraigushu_dispensary | Oldebes_dispensary |
| Egerton_university | Maria_Teresa_Nuzzo_health_centre | Olkokwe_dispensary |
| Finlays_hospital | Matar_Arba_dispensary | Oserian_health_centre |
| Gk_Prison_annex_dispensary_Naivasha_ | Memon_medical_centre | Pstc_health_centre |
| Gk_Prison_dispensary_Kapenguria_ | Merti_health_centre | Radat_dispensary |
| Hindi_prison_dispensary | Mkunumbi_dispensary | Riwo_dispensary |
| Hongwe_Catholic_dispensary | Mogotio_dispensary | Rongena_dispensary |
| Ifo_2_hospital | Mogotio_town_dispensary | Saka_health_centre |
| Igara_dispensary | Moi_ndabi_dispensary | Sankuri_health_centre |
| Itoleka_dispenasry | Molok_dispensary | Seretunin_health_centre |
| Kabarnet_High_School_dispensary | Molosirwe_dispensary | Sirwa_dispensary_Mogotio_ |
| Kaibos_dipensary | Mpeketoni_sub_district_hospital | Sugoi_a_dispensary |
| Kamagambo_dispenasry | Muhamarani_dispensary | Syongila_dispensary |
| Kamketo_dispensary | Mukuuni_dispensary | Thika_nursing_home |
| Kapkelelwa_dispensary | Mulundi_dispensary | Tiva_dispensary |
| Karagita_dispensary | Mumbuni_dispensary_Maara_ | Tungutu_dispensary |
| Karandini_dispensary | Museve_dispensary | Turkwel_dispensary_loima_ |
| Kasei_dispensary | Nairobi_Women_Hospital_Ongata_Rongai | Upendo_village_dispensary |
| Katulye_dispensary_Kibwezi_ | Naivasha_max_prison_health_centre | Utawala_dispensary |
| Kiangondu_dispensary | Namboboto_dispensary | Waseges_dispensary |
| Kiboino_dispensary | Namuduru_dispensary | X_cellent_medical_centre |
| Kiereni_dispensary | Ndabibi_dispensary | Total Result:106 |

Versions of various recording and reporting tools in the facilities

Lack of reporting tools in facilities could be an indicator of communication breakdown affecting all levels of care. This could be heralded by lack of commodity reporting tools which is a formal means of communication on stock levels. Delayed update of systems could be sending erroneous data showing that commodities are available while there is stock out or almost depletion on the ground. A case in point is delay of SCTLCs to notify cases from the TB4 register and patient cards owing their delayed periodic visits to facilities. This could erroneously show used patient packs and genexpert cartridges as unused while they are actually spent. This could be replicated to missing tools too.

CHAPTER FOUR

Conclusion and recommendation

Conclusion

The overall level of data agreement comparing TIBU with facility registers were within acceptable limits for DSTB and leprosy in 2017, while for 2018 the level of agreement were outside the acceptable limits for all tools. There were variations in level of agreement among specific variables. The utilization of patient record cards was low. For DR TB, there was over reporting in TIBU as compared to facility registers. In 2018, IPT data was under reported and Leprosy data was over reported in TIBU. However, the performance varied across the sub counties.

Recommendations

Cross cutting recommendation

| # | Recommendation | Level | Priority | Responsible person(s) |
|---|--|------------------|----------|------------------------------|
| 1 | Create adequate offsite back-ups for TIBU data with a weekly replication schedule. | National | High | NTLD-P |
| 2 | The MoH through NTLD-P should be involved in contracting and oversight of service providers. | National | High | NTLD-P & Supporting Partners |
| 3 | The program should ensure that all the recording and reporting tools have all the relevant data inputs. The program should also develop a recall mechanism for all outdated tools and ensure all tools to have versions indicated. | National | High | NTLD-P |
| 4 | The program, counties and implementing partners should consider digitizing facility records | National, County | High | NTLD-P, Counties & Partners |
| 5 | County Directors of Health should be take lead in tracking TB indicators through random data checks at the facility by strengthening supervision and coordination at the county and sub county level. | County | High | County |
| 6 | There should be an orientation package for new staff deployed at the chest clinic | County | High | County |
| 7 | NTLD-P should conduct routine tools inventory assessment | National | Medium | NTLD-P |
| 8 | The program to put in place measures to ensure notification of cases in TIBU is done within timelines to avoid spill over. | National | High | NTLD-P |

DS TB

| # | Recommendation | Level | Priority | Responsible person(s) |
|---|--|--------------------|----------|-----------------------|
| 1 | Increase emphasis on the role of patient record card – in improving quality patient care and as the primary source document. The recommended flow of information is the record card to the TB4 register and eventually notification in TIBU. | County, Sub County | High | County, Sub County |

DR TB

| # | Recommendation | Level | Priority | Responsible person(s) |
|---|--|------------------------------|----------|----------------------------|
| 1 | The program should avail DRTB registers and log books. The NTLD-P and county/sub county coordination teams should focus on sensitization on use of these tools | National, County, Sub County | High | NTLD-P, County, Sub County |
| 2 | Mentorship, OJT and clinical supervisions during the monthly visits | County, Sub County | High | County, Sub County |

IPT

| # | Recommendation | Level | Priority | Responsible person(s) |
|---|---|------------------------------|----------|----------------------------|
| 1 | Institute periodic data reviews to ensure patients enlisted in care (IPT & Leprosy) are followed up until treatment completion. | National, County, Sub County | High | NTLD-P |
| 2 | Mainstream contact and treatment interrupters management to ensure proper recording and reporting. | National, County, Sub County | High | NTLD-P, County, Sub County |
| 3 | Take stock of commodities and reporting tools available for IPT and leprosy in facilities in view of updating supplies to forestall stock outs. | National | High | NTLD-P |
| 4 | The program to review TAs indicators to address areas of weakness in IPT and Leprosy. | National | High | NTLD-P |

ANNEXES

List of Counties Visited

| No. | Counties | TB control zones |
|-----|---------------|----------------------------|
| 1. | Busia | Samia, Nambale |
| 2. | Homabay | Kaispul |
| 3. | Isiolo | Merti, Isiolo |
| 4 | Baringo | Baringo Central, Mogotio |
| 5 | Bomet | Sotik |
| 6 | Bungoma | Mt. Elgon |
| 7 | Garissa | Garissa, Refugee Camps |
| 8 | Kajiado | Kajiado North |
| 9 | Kiambu | Ruiru, Thika |
| 10 | Kisumu | Kisumu East, Nyando |
| 11 | Kitui | Kitui Central, Kitui south |
| 12 | Lamu | Lamu West |
| 13 | Machakos | Yatta |
| 14 | Makueni | Kibwezi East |
| 15 | Migori | Rongo |
| 16 | Mombasa | Ganjoni, Mvita |
| 17 | Nakuru | Naivasha, Njoro |
| 18 | Nyeri | Othaya-mukurweini, Tetu |
| 19 | West Pokot | West Pokot, Pokot North |
| 20 | Siaya | Bondo |
| 21 | Tana River | Tana Delta |
| 22 | Tharaka Nithi | Chuka-Igambang'ombe, Maara |
| 23 | Turkana | Loima |
| 24 | Uasin Gishu | MTRH, Turbo |

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REPUBLIC OF KENYA



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