

***A RETROSPECTIVE REVIEW OF COMPLIANCE  
TO THE GENE XPERT MTB/RIF ALGORITHM IN  
A PRIMARY HEALTH CARE CENTRE IN KWA-  
ZULU NATAL, SOUTH AFRICA***

**Dr S Pillay**

**LONDON**

**FAST-TRACK CITIES 2019**

SEPTEMBER 8-11, 2019 | BARBICAN CENTRE

SPONSORED BY:



IN PARTNERSHIP WITH:



# Disclosures

- None

# Background

- Things we know
  - In 2017 the World Health Organization (WHO) revealed that 10 million people worldwide were diagnosed with TB.
  - The WHO went on to further identify 30 high TB burden countries, where South Africa fell amongst the top two thirds
  - South Africa had an incidence of 322000 TB cases in 2017 of these 193000 (60%) were HIV positive, the overall incidence of mortality was 56000.

# Background

- In 2015 the province of KwaZulu Natal out of all 9 provinces ranked as having the second highest incidence rate of TB with 685 per 100 000 population

# Background

- eThekweni is the largest city in the province and the third largest city in the country, KwaMashu falls under the Northern central district of the eThekweni municipality in KwaZulu-Natal, South Africa. This district has a population of 3442 361 people
- Northern district was considered a 'hot spot' for the prevalence of HIV, which was estimated at 39 %



# Background

- In 2015 During my community service year at KwaMashu Community Health centre (CHC)
  - Ravages of TB and its impact on a struggling community
  - Noted that the management of TB patients was challenging to the healthcare providers

# Background

- The proposed study aimed to help identify compliance to the TB sputum guidelines by staff at the health centre. This would then improve the diagnosis and management of patients with TB.
  - Quality Improvement project

# Background

## KwaMashu CHC

- Catchment population of about 750 000.
- MOPD, Casualty, POPD, Labour Ward, 12 bed Short stay ward



# Background

## Within the clinic

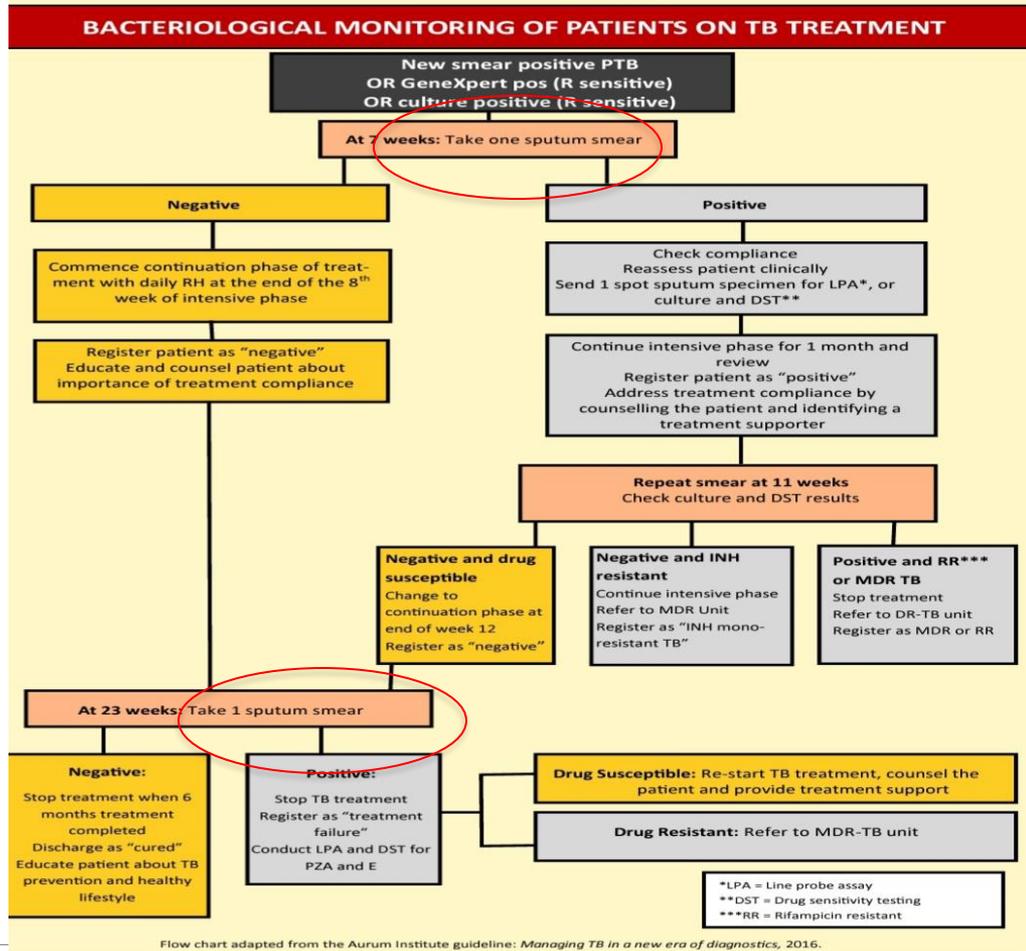
-400 people screened weekly for TB

-+/- 90 people monthly initiated on TB treatment



# Methods

- A Retrospective study design was adopted to characterise adult patients diagnosed with GXP positive TB at KwaMashu Community Health Centre.
- The sample period is 1 January 2016-31 December 2017.
- The source of data consists of a chart review.
- The study was approved by the University of KwaZulu-Natal Biomedical Research Ethics Committee.



# Results

| Variable   | Category        | Frequency – n (%)  |
|------------|-----------------|--------------------|
| Age        | Below 20        | 36 (6.04)          |
|            | <b>20 - 29</b>  | <b>192 (32.21)</b> |
|            | <b>30 - 39</b>  | <b>204 (34.23)</b> |
|            | 40 - 49         | 95 (15.94)         |
|            | 50 - 59         | 45 (7.55)          |
|            | Above 60        | 24 (4.03)          |
| Gender     | <b>Male</b>     | <b>381 (63.93)</b> |
|            | Female          | 215 (36.07)        |
| HIV Status | <b>Positive</b> | <b>360 (60.40)</b> |
|            | Negative        | 168 (28.19)        |
|            | Unknown         | 68 (11.41)         |
| On ART     | No              | 326 (54.70)        |
|            | <b>Yes</b>      | <b>250 (41.95)</b> |
|            | Unknown         | 20 (3.36)          |

**Demographic Data n=596**

# Results

| Gene Xpert         | Category     | Frequency – n (%)  |
|--------------------|--------------|--------------------|
| Procedure (n =596) | Done         | 572 (95.97)        |
|                    | Not done     | 24 (4.03)          |
| Results (n = 572)  | Unsuccessful | 4 (0.70)           |
|                    | Detected     | <b>558 (97.55)</b> |
|                    | Undetected   | 10 (1.75)          |

# Results

- TB Culture at baseline

| TB Culture result | Frequency – n (%) |
|-------------------|-------------------|
| Negative          | 52 (32.3)         |
| Positive          | <b>74 (46.0)</b>  |
| Contaminated      | 35 (21.7)         |
| Total             | <b>161 (100)</b>  |

# Results

- MDR

| Rifampicin resistant | Frequency– n (%) |
|----------------------|------------------|
| No                   | 512 (85.9)       |
| Yes                  | <b>56 (9.4)</b>  |
| Unsuccessful         | 2 (0.3)          |
| Inconclusive         | 1 (0.2)          |
| Unknown              | 25 (4.2)         |
| Total                | 596 (100)        |

|            | MDR TB n=56 |           |
|------------|-------------|-----------|
| HIV Status | Yes         | Total (%) |
| Positive   | <b>42</b>   | <b>75</b> |
| Negative   | 14          | 25        |
| Total      | 56          | 100       |

# Results

- Sputum microscopy results 2 and 5 months

| Smear Microscopy   | Category | Frequency – n (%)  |
|--------------------|----------|--------------------|
| 2 Months (n = 596) | No       | 208 (34.90)        |
|                    | Yes      | <b>388 (65.10)</b> |
| 5 Months (n = 596) | No       | 337 (56.54)        |
|                    | Yes      | <b>257 (43.12)</b> |
|                    | Unknown  | 2 (0.34)           |

| Sputum conversion  | Category | Frequency – n (%)  |
|--------------------|----------|--------------------|
| 2 Months (n = 546) | No       | 162 (29.67)        |
|                    | Yes      | <b>384 (70.33)</b> |
| 5 Months (n = 458) | No       | 59 (12.88)         |
|                    | Yes      | <b>399 (87.12)</b> |

# Results

- Age and Gender: 2 month sputum

| Age          | Smear Microscopy 2 month |            | Total (%)        |
|--------------|--------------------------|------------|------------------|
|              | No                       | Yes        |                  |
| Below 20     | 19                       | 17         | 36(6)            |
| 20 - 29      | 61                       | 131        | <b>192(32.2)</b> |
| 30 - 39      | 71                       | 133        | <b>204(34.1)</b> |
| 40 - 49      | 31                       | 64         | 95(16)           |
| 50 - 59      | 15                       | 30         | 45(7.5)          |
| Above 60     | 11                       | 13         | 24(4.2)          |
| <b>Total</b> | <b>208</b>               | <b>388</b> | <b>596</b>       |

| Gender       | Smear Microscopy |                  | Total (%)  |
|--------------|------------------|------------------|------------|
|              | No               | Yes              |            |
| Male         | 130              | <b>251(64.7)</b> | 381(63.9)  |
| Female       | 78               | 137(35.3)        | 215(36.1)  |
| <b>Total</b> | <b>208</b>       | <b>388</b>       | <b>596</b> |

# Results

- HIV status and use of ARV's: 2 month sputum

| Status       | Smear Microscopy conversion |                  | Total (%) |
|--------------|-----------------------------|------------------|-----------|
|              | No                          | Yes              |           |
| Positive     | 122                         | <b>238(61.3)</b> | 360(60.4) |
| Negative     | 48                          | <b>120(30.9)</b> | 168(28.2) |
| Unknown      | 38                          | 30(7.8)          | 68(11.4)  |
| <b>Total</b> | 208                         | 388              | 596       |

| On ARV'S     | Smear Microscopy conversion |                  | Total (%) |
|--------------|-----------------------------|------------------|-----------|
|              | No                          | Yes              |           |
| No           | 132                         | <b>194(50)</b>   | 326(54.7) |
| Yes          | 68                          | <b>182(46.9)</b> | 250(41.9) |
| Unknown      | 8                           | 12(3.1)          | 20(3.4)   |
| <b>Total</b> | 208                         | 388              | 596       |

# Results

- Age and Gender: 5 month sputum

| Age          | Smear Microscopy 5 months |            |          | Total (%)        |
|--------------|---------------------------|------------|----------|------------------|
|              | No                        | Yes        | Unknown  |                  |
| Below 20     | 24                        | 12         | 0        | 36(6.1)          |
| 20 - 29      | 111                       | 80         | 1        | 192(32.2)        |
| 30 - 39      | 116                       | 88         | 0        | <b>204(34.2)</b> |
| 40 - 49      | 51                        | 44         | 0        | 95(15.9)         |
| 50 - 59      | 22                        | 22         | 1        | 45(7.6)          |
| Above 60     | 13                        | 11         | 0        | 24(4)            |
| <b>Total</b> | <b>337</b>                | <b>257</b> | <b>2</b> | <b>596</b>       |

| Gender       | Smear Microscopy |            |          | Total(%)         |
|--------------|------------------|------------|----------|------------------|
|              | No               | Yes        | Unknown  |                  |
| Male         | 213              | 168        | 0        | 381(63.9)        |
| Female       | 124              | 89         | 2        | <b>215(36.1)</b> |
| <b>Total</b> | <b>337</b>       | <b>257</b> | <b>2</b> | <b>596</b>       |

# Results

- HIV status and use of ARV's: 5 month sputum

| Status       | Smear Microscopy conversion |            |          | Total      |
|--------------|-----------------------------|------------|----------|------------|
|              | No                          | Yes        | Unknown  |            |
| Positive     | 214                         | <b>146</b> | 0        | 360(60.4)  |
| Negative     | 82                          | <b>85</b>  | 1        | 168((28.2) |
| Unknown      | 41                          | 26         | 1        | 68(11.4)   |
| <b>Total</b> | <b>337</b>                  | <b>257</b> | <b>2</b> | <b>596</b> |

| On ARV'S     | Smear Microscopy conversion |            |          | Total      |
|--------------|-----------------------------|------------|----------|------------|
|              | No                          | Yes        | Unknown  |            |
| No           | 191                         | <b>133</b> | 2        | 326(54.7)  |
| Yes          | 135                         | <b>115</b> | 0        | 250(42)    |
| Unknown      | 11                          | 9          | 0        | 20(3.3)    |
| <b>Total</b> | <b>337</b>                  | <b>257</b> | <b>2</b> | <b>596</b> |

# Results

**Treatment outcomes of new smear positive pulmonary tuberculosis patients as per the standard criteria**

| <b>Treatment outcomes</b> | <b>Patients<br/>n (%)</b> | <b>Total<br/>n (%)</b> |
|---------------------------|---------------------------|------------------------|
| <b>Successful</b>         |                           |                        |
| - Cure                    | 305 (51.17)               | 332 (55.70)            |
| - Treatment completed     | 27 (4.53)                 |                        |
| <b>Unsuccessful</b>       |                           |                        |
| - Treatment failure       | 53 (8.89)                 | 264 (44.30)            |
| - Loss to follow-up       | 142 (23.83)               |                        |
| - Died                    | 3 (0.50)                  |                        |
| - Unaccountable           | 66 (11.07)                |                        |

World Health Organization and International Union Against Tuberculosis and Lung Disease Criteria

# Discussion

- The impact of optimal management of TB on treatment, TB cure and other outcomes is highlighted, including the burden of HIV and TB co-infection.
- The rates of sputum culture at the point of GXP diagnosis is low.
- GXP Rifampicin resistance of 9.4%, this underscores the need for compliance with the GXP algorithm.
- Significantly, with few TB culture specimens taken at baseline, isoniazid resistance may be missed.

# Discussion

- Despite having reasonable smear conversion rates at 2 and 5 months, the number of samples taken at these times are also low. Strategies to strengthen TB management is needed

# Discussion

- What plays a role in converting guidelines into practice.
  - The characteristics of health professionals
  - Practice setting
  - Regulatory environment
  - Incentives and patient factors

# Discussion

- This study serves as a quality improvement project.
- Plans for distributing clinical guidelines are often dependent on access to information and teaching of the guidelines.
- Initiatives that audit and provide feedback to individuals regarding their own performance are found to be more effective in implementing guidelines.

# Discussion

- Part 2 of study:
  - Testing the health professional's knowledge of the guidelines
  - Recognising the gaps and providing Inservice training

# Conclusion

- *The Global plan to end TB 2016-2020: The Paradigm shift* aims to end the epidemic by 2030.
- Further people centred global targets of 90/90/90
  - reach 90% of high risk, underserved population groups and achieve 90% treatment success rates.
- This research aims to assist in achieving this goal

# Acknowledgments

- Discovery Health Foundation
  - Scholarship funding
- Healthcare staff and management at KwaMashu CHC management
- The patients
- My supervisor Prof NP Magula