

Preliminary results on the use of QuantiFERON TB Gold (In-tube method) in a large cohort study of TB in adolescents in South Africa

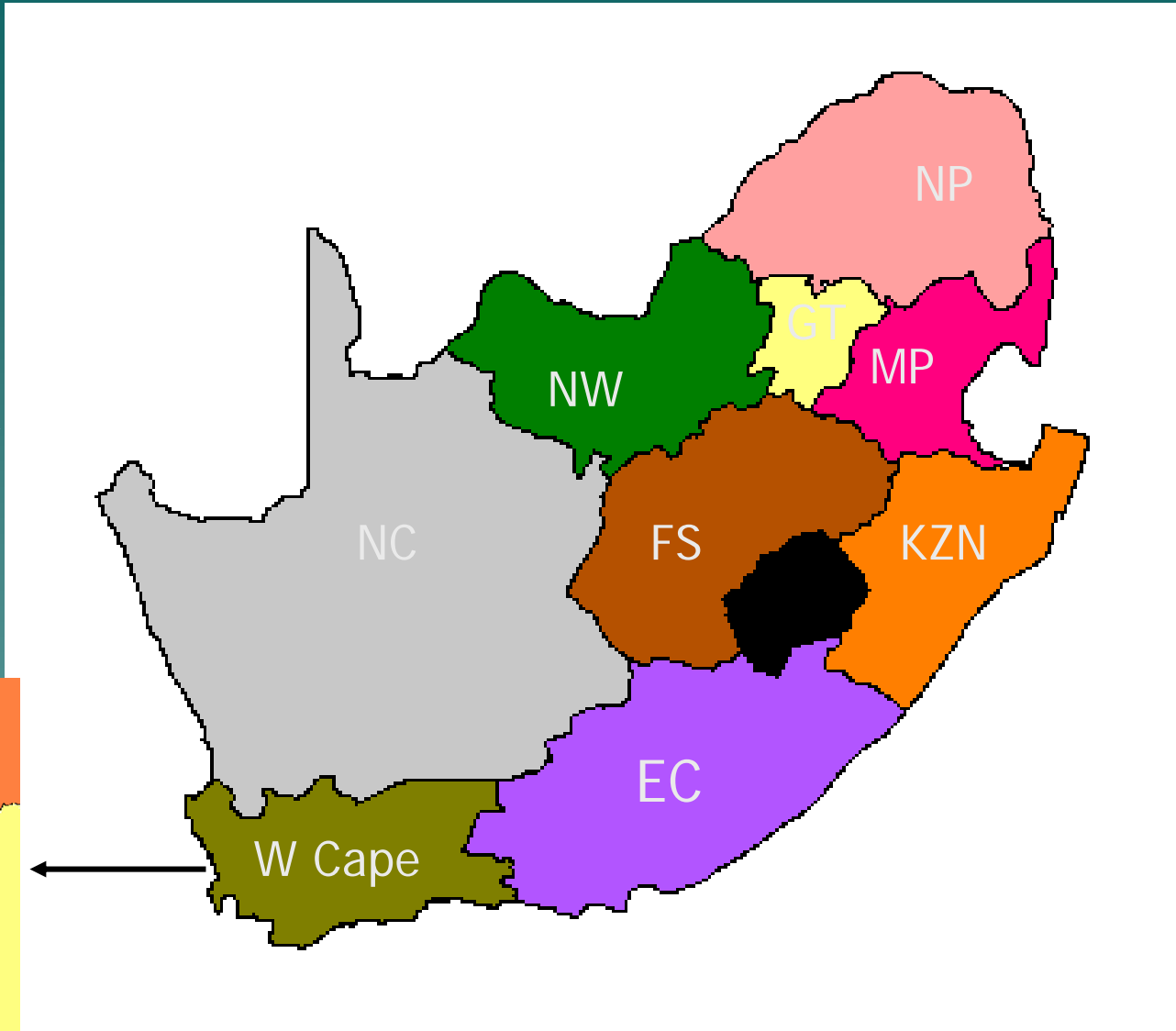
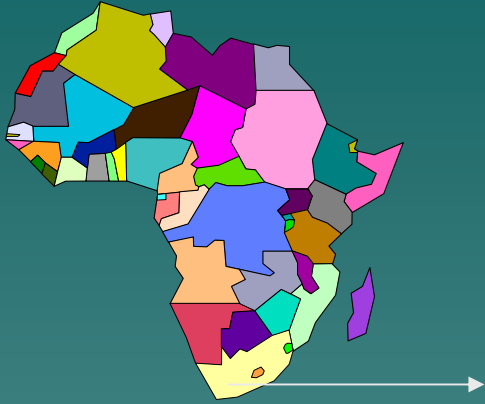
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Background

- ◆ TB vaccine trials are being planned at a research site near Cape Town, South Africa
- ◆ This site has a high TB burden (Incidence rate of 1400/100 000).
- ◆ An epidemiological cohort study of TB in adolescents is being conducted at this site as adolescents are a potential target for new TB vaccines.
- ◆ The usefulness of an interferon gamma test (QuantiFERON TB Gold [in-tube method]®) (QFT) is being evaluated as part of this study.



Methods

- ◆ Adolescents aged 12-18 years old are being recruited from high schools at the research site.
- ◆ Baseline evaluations include screening for TB disease and TB infection (blood is drawn for QFT and a TST is administered).
- ◆ Follow up is for two years: half the cohort are seen every 3 months while the other half will only be seen after two years.
- ◆ QFT is drawn every 6 months in the active follow up group and every year a TST is done. QFT will be drawn and a TST done on all at two year follow up.

Results

- ◆ Since July 2005, 5569 adolescents have been enrolled to date.
- ◆ 46% (95% CI 44.5-47.5%) were TST positive (>10 mm) at baseline (n=4092).
- ◆ 56% (95% CI 54.5-57.5%) were QFT positive at baseline (n=4092)
- ◆ 18 culture confirmed cases have been diagnosed so far at baseline.
- ◆ 3 culture confirmed incident cases have been detected through follow up.

TB profile (n = 5548)

BCG vaccinated	5178 (93.3%)
Currently on TB treatment	21 (0.38%)
Previously treated for TB	606 (10.9%)
Currently living with someone on TB treatment	283 (5.1%)
Previously lived with someone who had TB	1503 (27.1%)

Baseline TST/QFT agreement (n=4092)

	TST 10 mm cutoff	TST 15 mm cutoff
Both positive	41.1%	19.5%
Both negative	38.2%	41.6%
TST positive/ QFT negative	5.3%	1.9%
QFT positive/ TST negative	15.3%	40%
% agreement	79.3%	61.1%
Kappa	0.59	0.28

QFT/TST and reported exposure (current or prior)

	%	95% CI
QFT positivity in reported exposure (n=1167)	67.2%	64.5-69.9%
TST positivity in reported exposure -10 mm cutoff (n=1167)	57.7%	54.9-60.5%
TST positivity in reported exposure -15 mm cutoff (n=1167)	28.0%	25.5-35.5%
QFT negativity if no reported exposure (n=2925)	47.8%	46.0-49.6%
TST negativity if no reported exposure – 10 mm cutoff (n=2925)	58.1%	56.3-59.9%
TST negativity if no reported exposure – 15 mm cutoff (n=2925)	80.6%	79.2-82.0%

QFT/ TST positivity by time since exposure

Years since exposure	QFT positive	TST positive (10 mm cutoff)
0 – 4 (n=653)	460 (70.4%)	394 (60.3%)
5 – 9 (n=207)	137 (66.2%)	118 (57.0%)
10 – 14 (n=147)	85 (57.8%)	76 (51.7%)
>15 (n=44)	25 (56.8%)	19 (43.2%)
Chi square for trend	10.8 (p=0.000104)	7.5 (p=0.00607)

QFT/ TST and TB disease

	%	95% CI
QFT positivity in TB disease cases at baseline (n=22)	91%	79-100%
TST positivity in TB disease cases at baseline (n=14)	71%	47-95%
QFT positivity in reported previous TB disease (n= 85)	73%	63-82%
TST positivity in reported previous TB disease (n=85)	71%	61-80%

Conversion/ Reversion

	%	95% CI
QFT Conversion at 6 months (n=640)	10.3%	7.9-12.6%
QFT Reversion at 6 months (n=640)	2.5%	1.3-3.7%
QFT Conversion at 12 months (n=36)	43%	26.8-59.1%
QFT Reversion at 12 months (n=36)	5%	-2.1-12.1%
TST conversion at 12 months (n=32) (simple conversion)	33%	16.7-49.3%
TST conversion at 12 months (n=32) (a change of ≥ 10 mm)	12.5%	1.0-24.0%
TST reversion at 12 months (n=32) (simple conversion)	35%	18.5%-51.5%
TST reversion at 12 months (n=32) (a change of ≥ 10 mm)	9.4%	-0.7-19.5%

Conclusion

- ◆ Agreement between TST and QFT in this cohort at baseline varied according to TST cutoff.
- ◆ There was greater QFT sensitivity for TB infection (based on exposure) and disease but lower specificity than TST for TB infection.
- ◆ Both QFT and TST positivity was higher with more recent exposure.
- ◆ There were high conversion rates for QFT – the effect of TST at baseline is a possible explanation. (so far, not related to new exposure or new symptoms). QFT may require a similar definition for conversion as TST.
- ◆ The high conversion and reversion rates for TST are difficult to interpret at this stage because of the small numbers involved.

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