

10 Tuberculosis

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Introduction

The End TB Strategy adopted by the World Health Assembly in 2014 aims to end the global TB epidemic with targets to reduce TB deaths by 95%, to reduce the number of new cases by 90% between 2015 and 2035, and to ensure that no family is burdened with catastrophic expenses due to TB.^a A treatment success rate of 90% is one of the key operational indicators for countries to monitor their progress towards “zero deaths, disease and suffering due to TB”. In South Africa, the National Strategic Plan (NSP) for HIV, TB and STIs 2017–2022 (NSP2017) has adopted this target to be reached by 2020.^b

In this chapter on TB, we refer to the targets of the End TB Strategy. However, the targets used are those of the National Department of Health’s Annual Performance Plan (APP) 2016/17–2018/19.^c

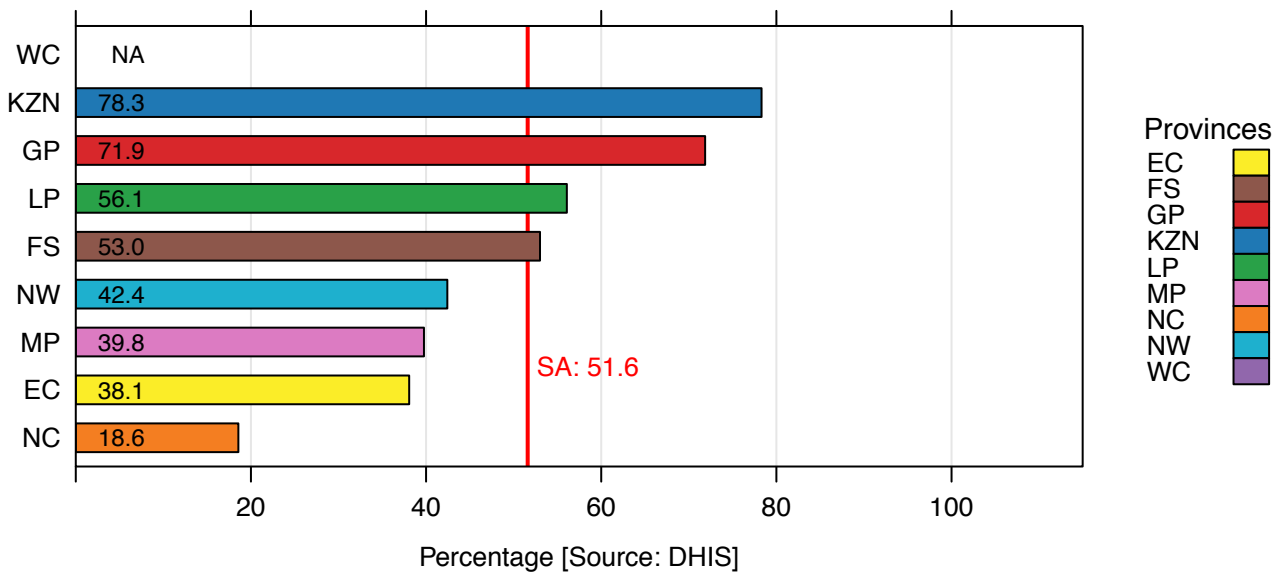
10.1 TB symptom 5 years and older screened in facility rate

As transmission is driving the TB epidemic in South Africa, the early detection of disease and getting those diagnosed with TB onto treatment as quickly as possible is of the utmost importance. It is for this reason that all clients entering PHC facilities are supposed to be screened for TB.

This indicator measures the proportion of clients 5 years and older attending PHC facilities who were screened for TB. The numerator is the number of clients 5 years and older that were screened for TB and the denominator is the PHC headcount 5 years and older.

Nationally the TB symptom 5 years and older screened in facility rate in 2016/17 was 51.6%.

Figure 1: TB symptom 5 years and older screened in facility rate by province, 2016/17

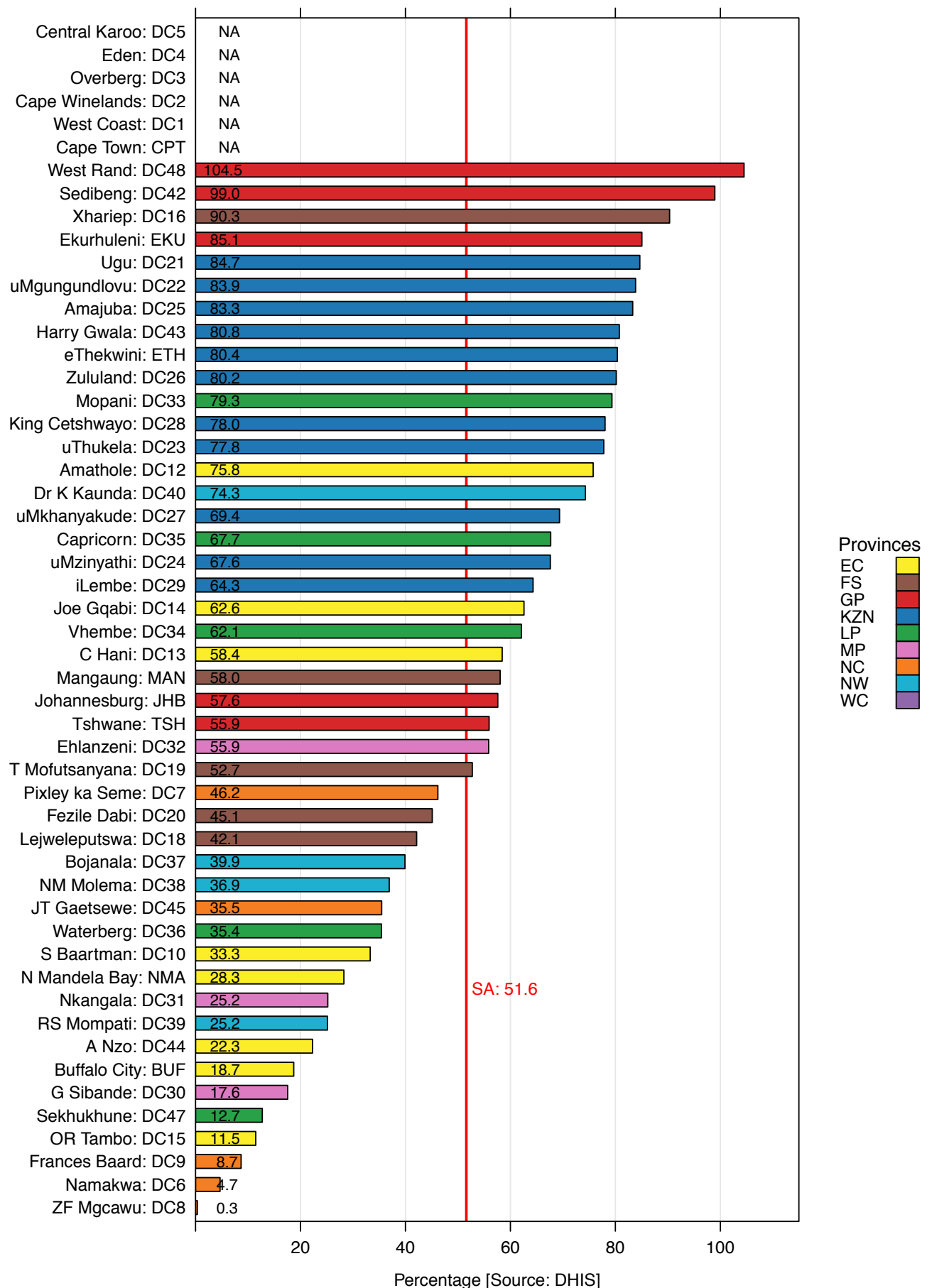


a World Health Organization. End TB Strategy. WHO/HTM/TB/2015.19. Geneva, Switzerland: World Health Organization, 2015. Available from http://www.who.int/tb/End_TB_brochure.pdf?ua=1 [accessed 1 July 2017].

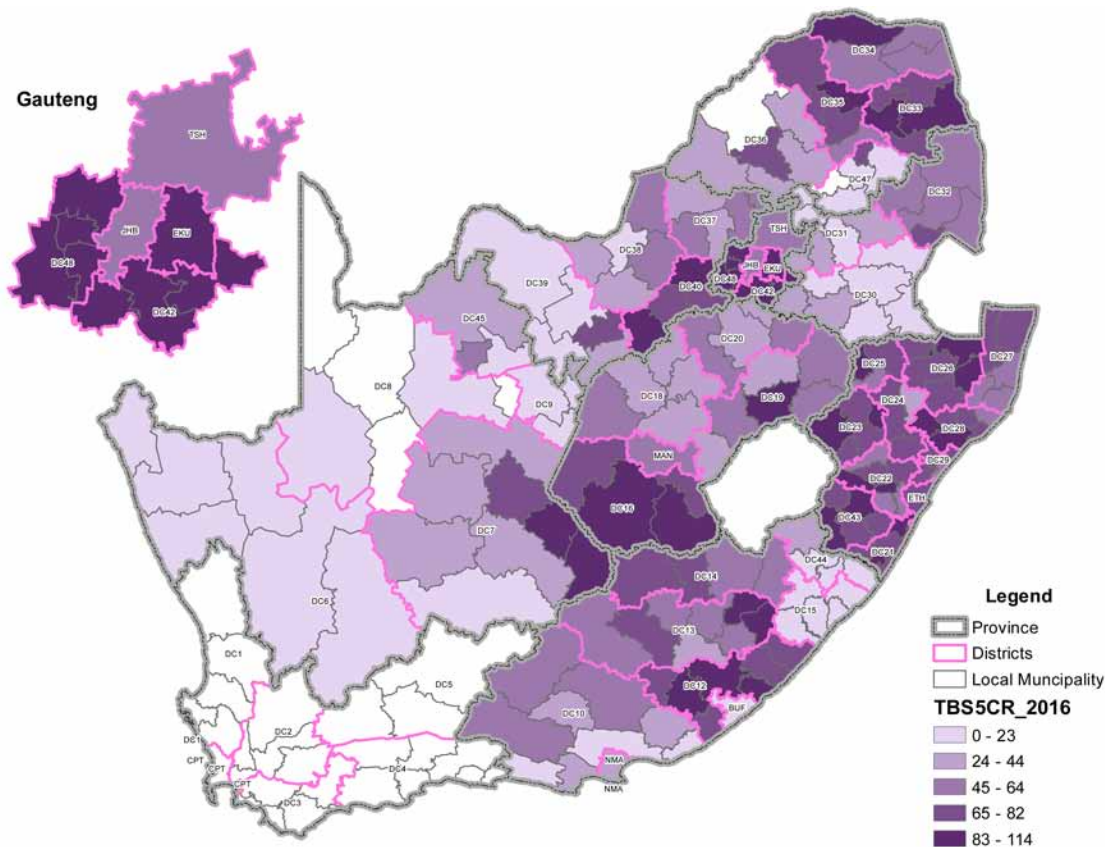
b SANAC. Let Our Actions Count. South Africa’s National Strategic Plan for HIV, TB and STIs 2017–2022. Pretoria: SANAC, 2017. <http://sanac.org.za/2017/05/11/download-the-full-version-of-the-national-strategic-plan-for-hiv-tb-and-stis-2017-2022/> [accessed 1 July 2017].

c South African National Department of Health. Annual Performance Plan 2016/2017–2018/2019. Pretoria. National Department of Health. 2016.

Figure 2: TB symptom 5 years and older screened in facility rate by district, 2016/17



Map 1: TB symptom 5 years and older screened in facility rate by sub-district, 2016/17



Key findings and recommendations

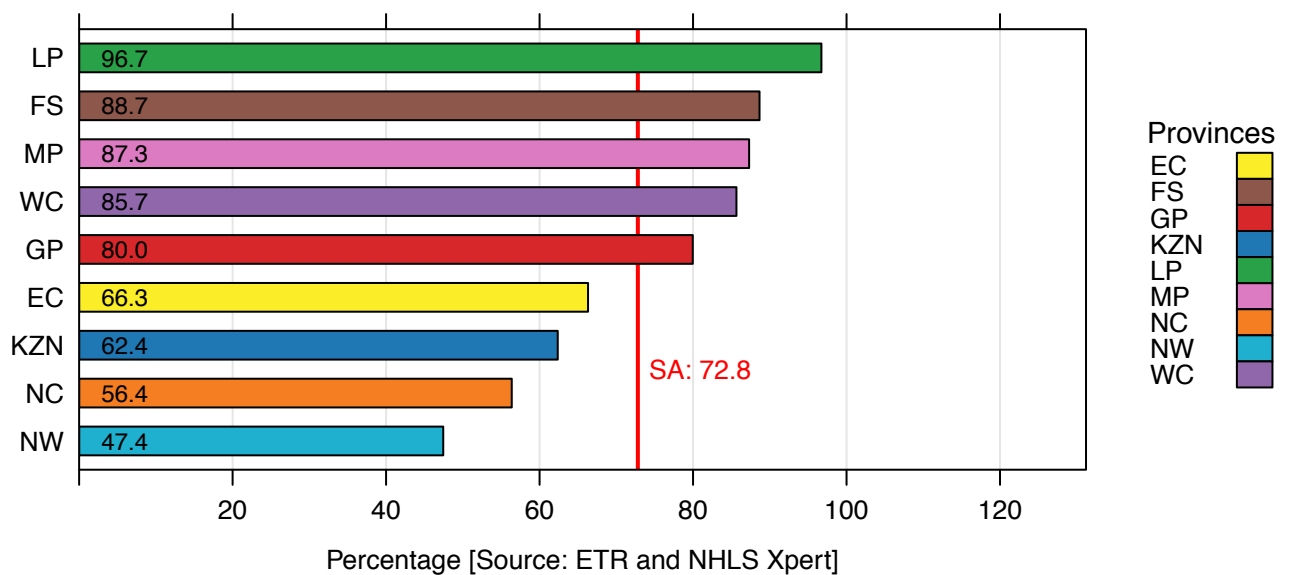
- ◆ It is concerning that the Western Cape (WC) did not report any data on this indicator and that some districts reported such low screening rates. Most of the districts in Northern Cape (NC), Eastern Cape (EC) and North West (NW) reported a screened rate below the national average.
- ◆ For South Africa, reducing TB transmission is a prerequisite for addressing the TB burden of the country. In the next financial year facilities have to ensure that many more clients 5 years and older attending PHC facilities are screened as an attempt to reach the 94% APP target.
- ◆ In the next financial year all facilities must implement and report screening for TB more rigorously.

10.2 TB client initiated on treatment rate

This indicator measures the proportion of clients with a positive TB diagnosis who were started on treatment. The numerator is number of clients diagnosed with TB (using GeneXpert) who were started on treatment according to the Electronic TB Register. The denominator is the total number of clients who were diagnosed with TB using GeneXpert data reported by National Health Laboratory Service (NHLS). This indicator is sometimes referred to as the treatment gap or the initial loss to follow-up (ILTFU) rate.

In 2016, the national average of clients diagnosed with TB and started on treatment was 72.8%.

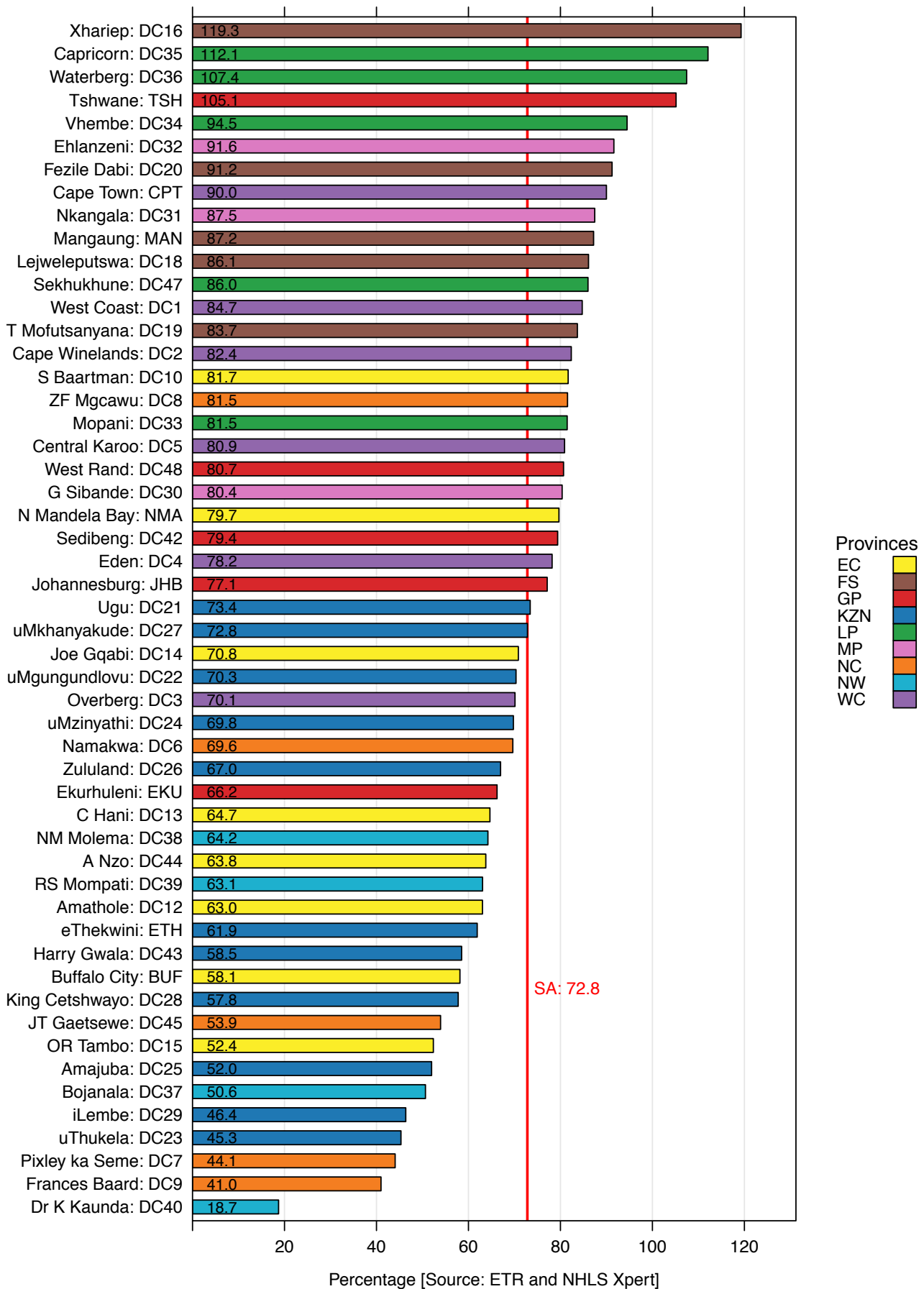
Figure 3: TB client initiated on treatment rate by province, 2016



Key Findings

- ◆ A new concern for TB programmes globally is the initial loss to follow-up rate. This refers to patients who are diagnosed with TB, but not started on treatment. Initial loss to follow-up is an area that needs monitoring for both drug-sensitive and drug-resistant TB.
- ◆ The low proportion of clients diagnosed with TB who were started on treatment in four provinces is of concern: the Eastern Cape, KwaZulu-Natal (KZN), Northern Cape and the North West.
- ◆ Most concerning is the North West where less than half the patients diagnosed with TB were started on treatment.
- ◆ South Africa will not reduce the TB burden if patients diagnosed with TB are not started on treatment.
- ◆ Four districts had rates that exceed 100% – Xhariep (Free State (FS)), Capricorn (Limpopo (LP)), Waterberg (LP) and Tshwane (Gauteng (GP)), and this needs to be investigated.

Figure 4: TB client initiated on treatment rate by district, 2016

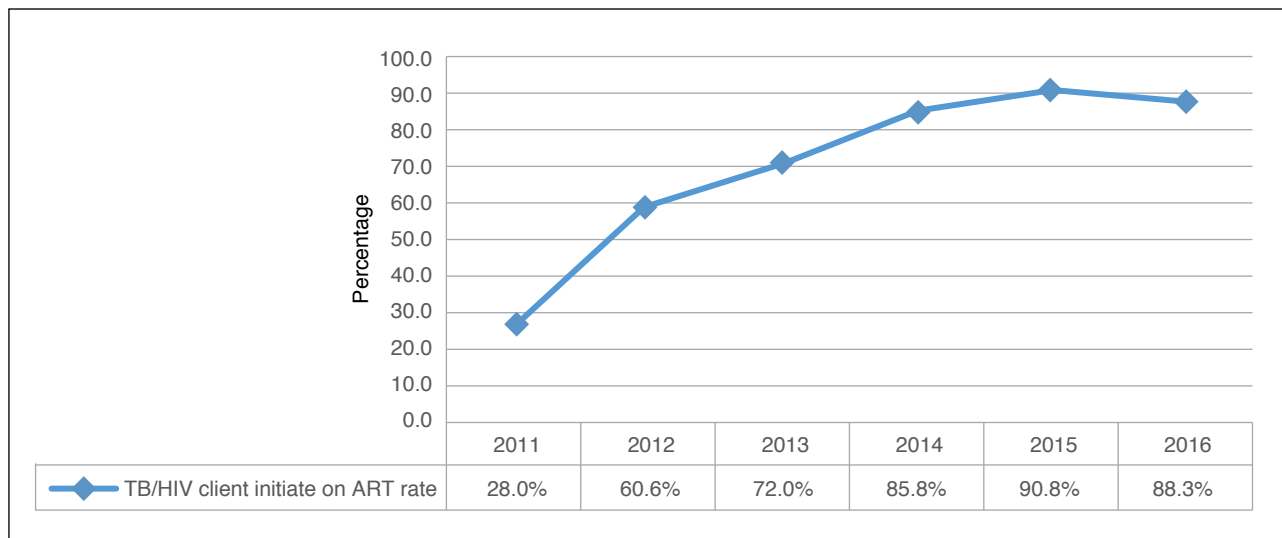


10.3 TB/HIV co-infected client on ART rate

This indicator measures the proportion of TB patients co-infected with HIV who were on antiretroviral therapy (ART) in 2016. The numerator is the total number of TB/HIV co-infected patients on ART and the denominator is the total number of TB/HIV co-infected patients. Antiretroviral therapy for co-infected TB/HIV patients is necessary to reduce mortality due to TB and achieve the End TB Strategy^a and NSP targets.^b

As illustrated in Figure 5 below, the TB/HIV co-infected client on ART rate has increased significantly over the last 5 years, from 28.0% in 2011 to 88.0% in 2016. It is not clear why there was a decrease from 2015 to 2016. The target for the proportion of TB/HIV co-infected patients on ART in the APP is 80%.^c This target is lower than the rate reported here as different data sources were used for setting the targets and programme monitoring.

Figure 5: National TB/HIV co-infected client on ART rate, 2011–2016



Source: ETR.

Figure 6: TB/HIV co-infected client on ART rate by province, 2016

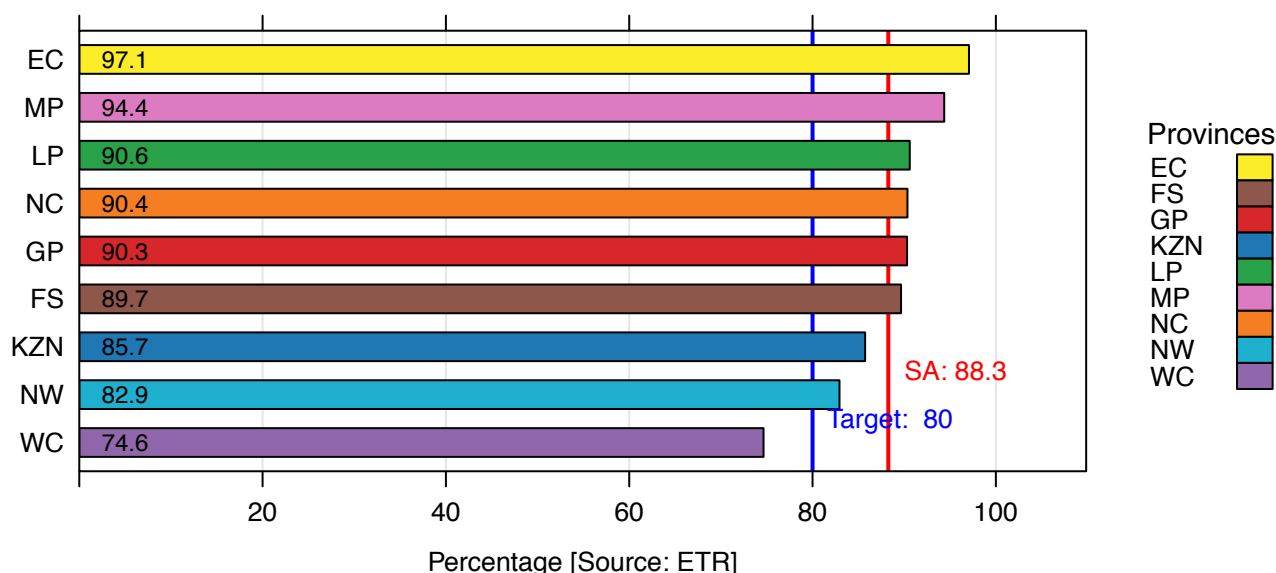
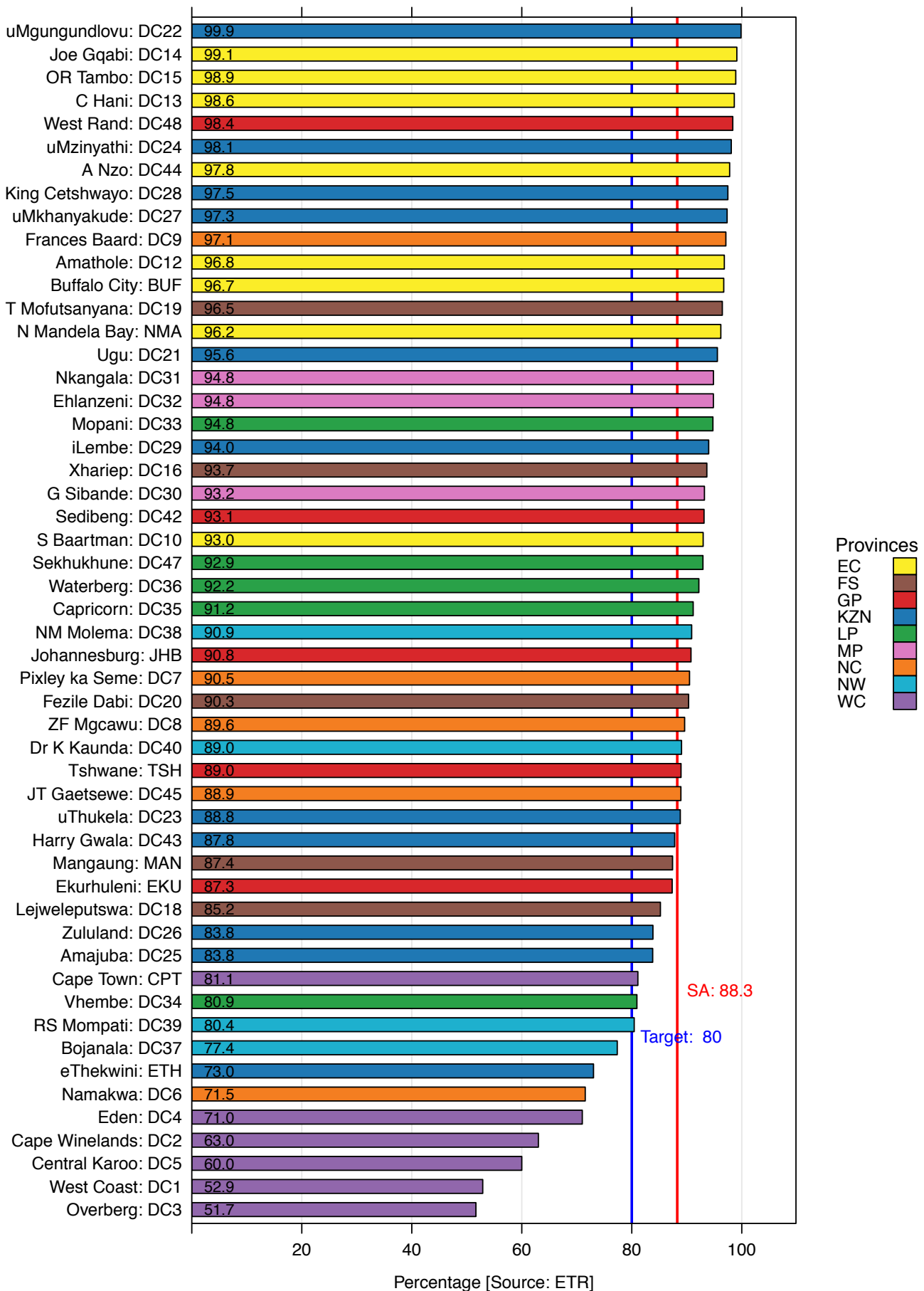
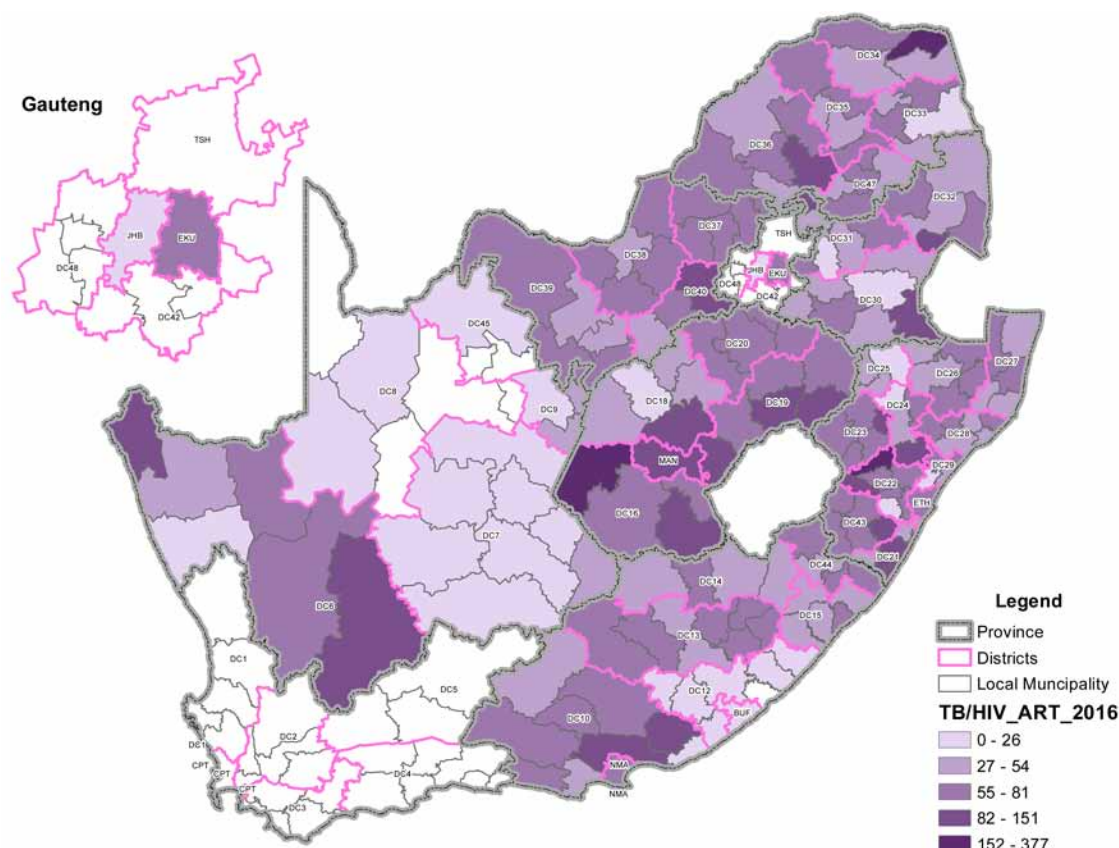


Figure 7: TB/HIV co-infected client on ART rate by district, 2016



Map 2: TB/HIV co-infected client on ART rate by sub-district, 2016



Key findings and recommendations

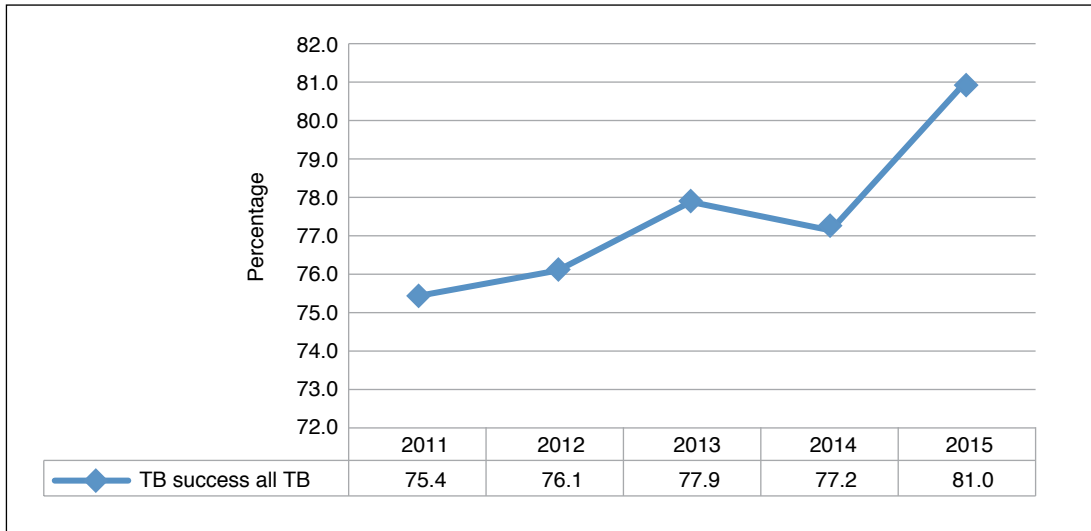
- ◆ Nationally the proportion of TB/HIV co-infected clients on ART in 2016 was 88.3%, above the national target of 80%. This increase is due to the change in ART policy whereby ART initiation in all TB/HIV co-infected clients irrespective of CD4 count is possible.
- ◆ Eight districts (15%) had an ART initiation rate below the 80% target, five of which were in the Western Cape. However, it is likely that the proportion of co-infected clients on ART in the Western Cape is much higher, as in the Western Cape this data is captured on a different database which is not reflected here.
- ◆ Given the risk of increased morbidity and mortality in TB/HIV co-infected clients, all co-infected clients should be started on ART as soon as possible, and all districts should aim for 90% or more of co-infected clients on ART rate in the 2017/18 financial year.

10.4 TB client treatment success rate

TB treatment success rate measures the proportion of TB patients that completed treatment or were cured. The numerator for this indicator is the number of patients who completed treatment or were cured, the denominator is the sum of all TB patients in the cohort. Treatment success is used to measure the effectiveness of the TB programme.

In the APP the target TB treatment success rate is 84% and in 2015 the national treatment success rate was 81.0%.^c As can be seen in Figure 8, the national treatment success rate has increased, despite a dip in 2014. To date, with only one district attaining a treatment success of 90%, a sustained effort across the country will be needed to reach the 90% NSP 2017 target.^b

Figure 8: National TB treatment success rate, 2011–2015



Source: ETR.

Figure 9: TB client treatment success rate by province, 2015

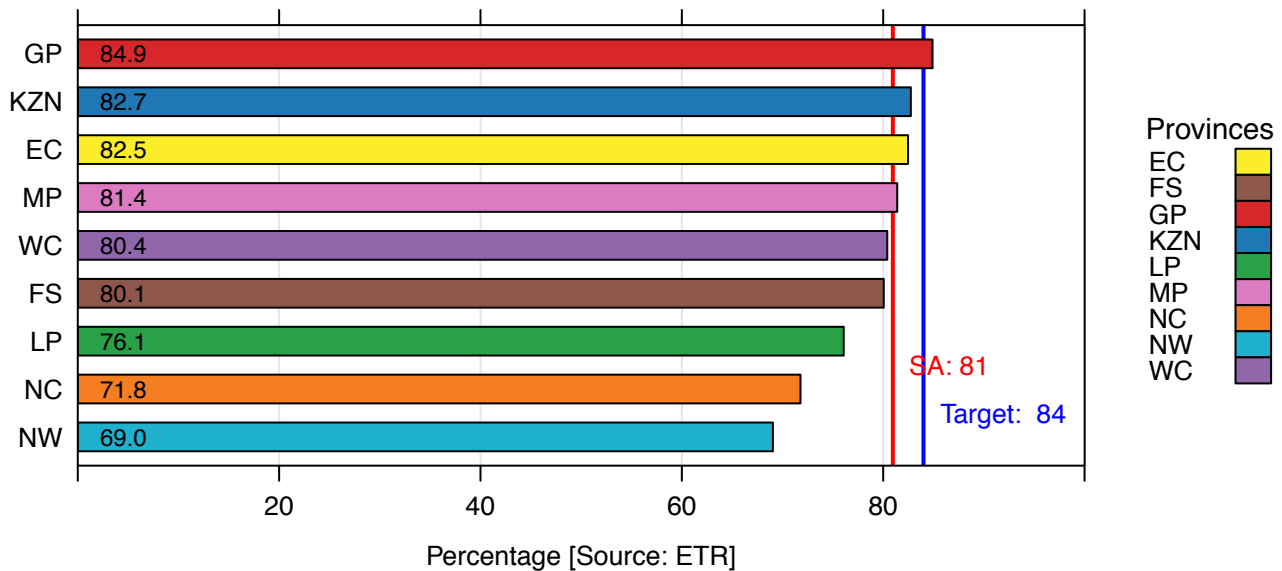


Figure 10: TB client treatment success rate by district, 2015

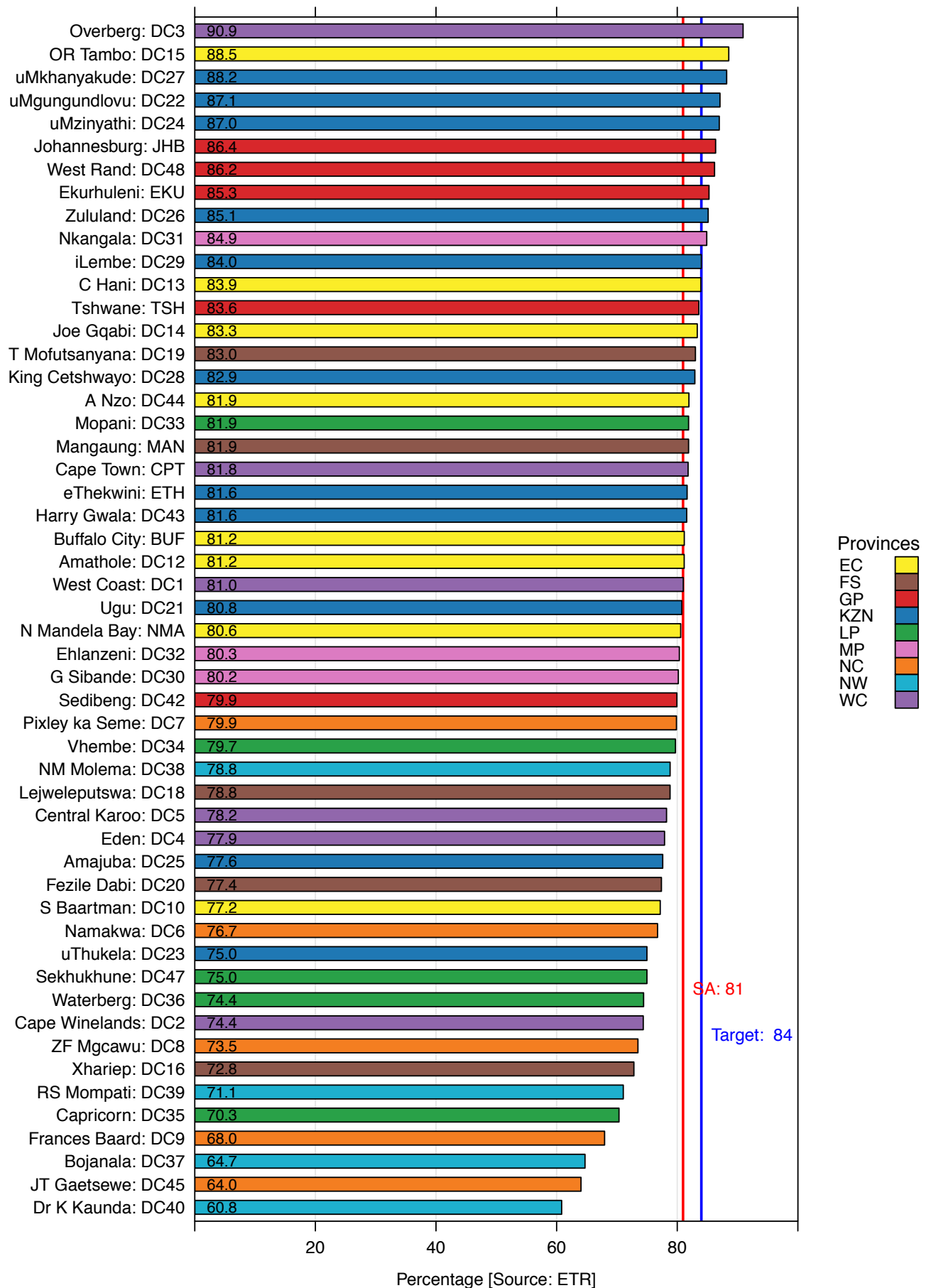
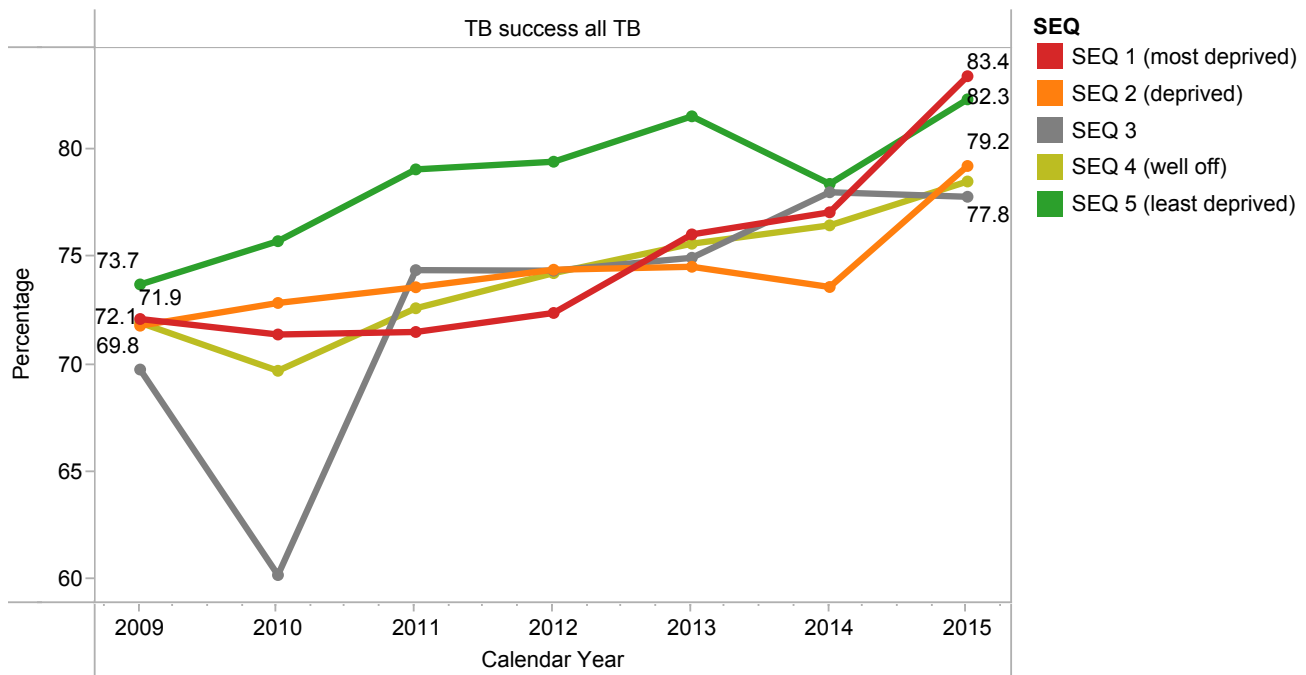


Figure 11: Trends in average district values by socio-economic quintile for TB treatment success rate, 2009–2015



Key findings and recommendations

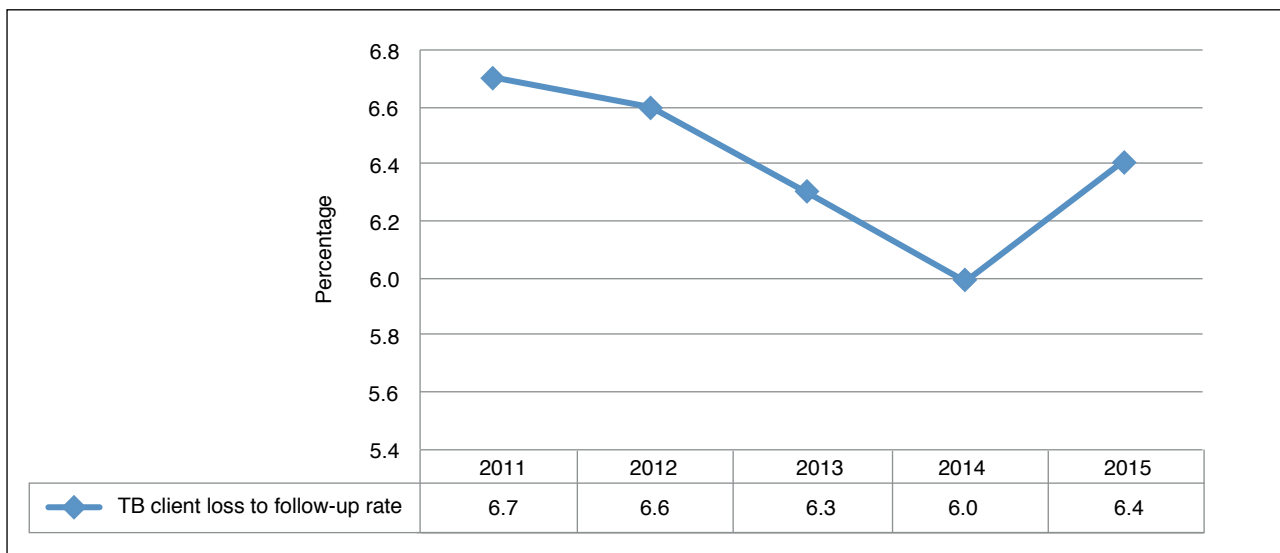
- ◆ The national treatment success rate continues to improve. Eleven districts have attained the national target in 2015 with Overberg (WC) achieving 90% treatment success, illustrating that it is feasible to attain the 2020 target of 90%.
- ◆ The treatment success rates in the North West (NW) and Northern Cape have failed to improve adequately since 2012. All the districts in these provinces had treatment success rates below the national average. Furthermore, each province had two districts whose performance has declined from 2011 to 2015. In Bojanala and Dr K Kaunda (NW) and Frances Baard and JT Gaetsewe (both NC) treatment success declined from 2011 to 2015. In Limpopo four of the five districts had treatment success rates below the national average. Provinces have to focus on the poorly performing districts in their province to improve their overall treatment outcomes.
- ◆ In the last seven years the 20% (socio-economic quintile (SEQ1)) of the population that is the most deprived has made the most progress in treatment outcomes compared to the other four socio-economic quintiles. This is encouraging given the new focus on the very poor as a vulnerable group.
- ◆ If we are to reach the NSP target of 90% the provinces which have achieved a treatment success rate of over 80% should celebrate their good work, but at the same time ensure they build on their success and that further improvements are forthcoming.

10.5 TB client loss to follow-up rate

The TB loss to follow-up rate measures the proportion of TB patients who interrupted treatment for two consecutive months or more (previously known as the defaulter rate). The numerator for this indicator is the number of TB clients lost to follow-up, the denominator is the number of TB clients who started treatment. To minimise the transmission of TB and the development of drug-resistant TB, it is important to minimise the loss to follow-up rate.

The APP target for the loss to follow-up rate for TB is 5.4%.^c As can be seen in the figure below, the national loss to follow-up rate has decreased over the last nine years and remained fairly constant over the past five years.

Figure 12: National TB loss to follow-up rate, 2006–2015



Source: ETR.Net

Figure 13: TB client loss to follow-up rate by province, 2015

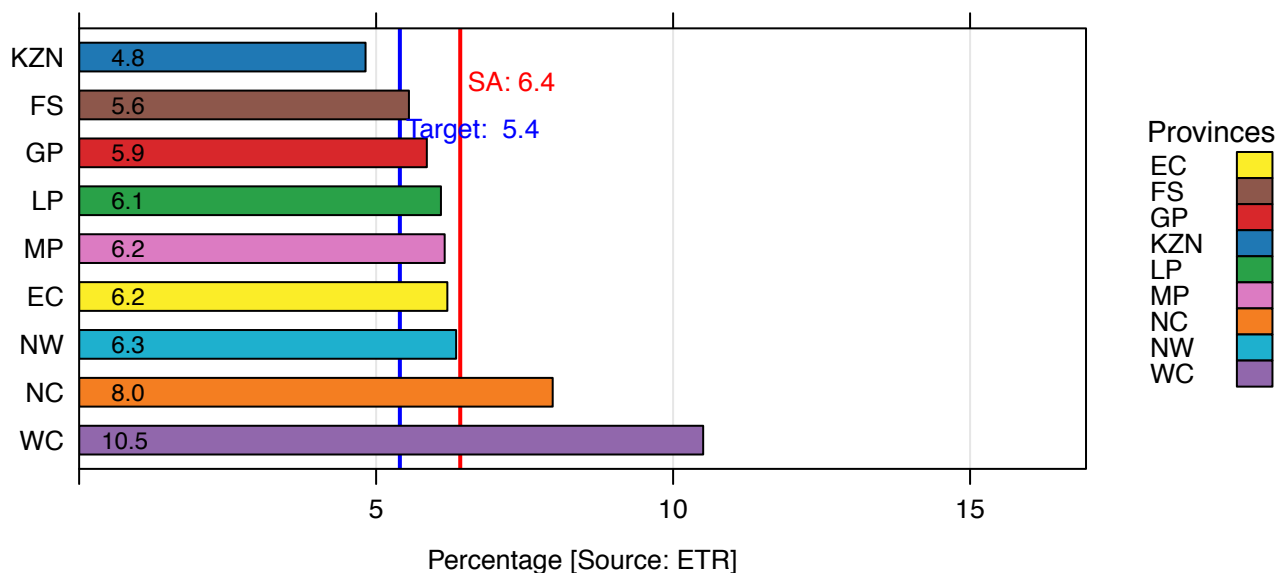


Figure 14: TB client loss to follow-up rate by district, 2015

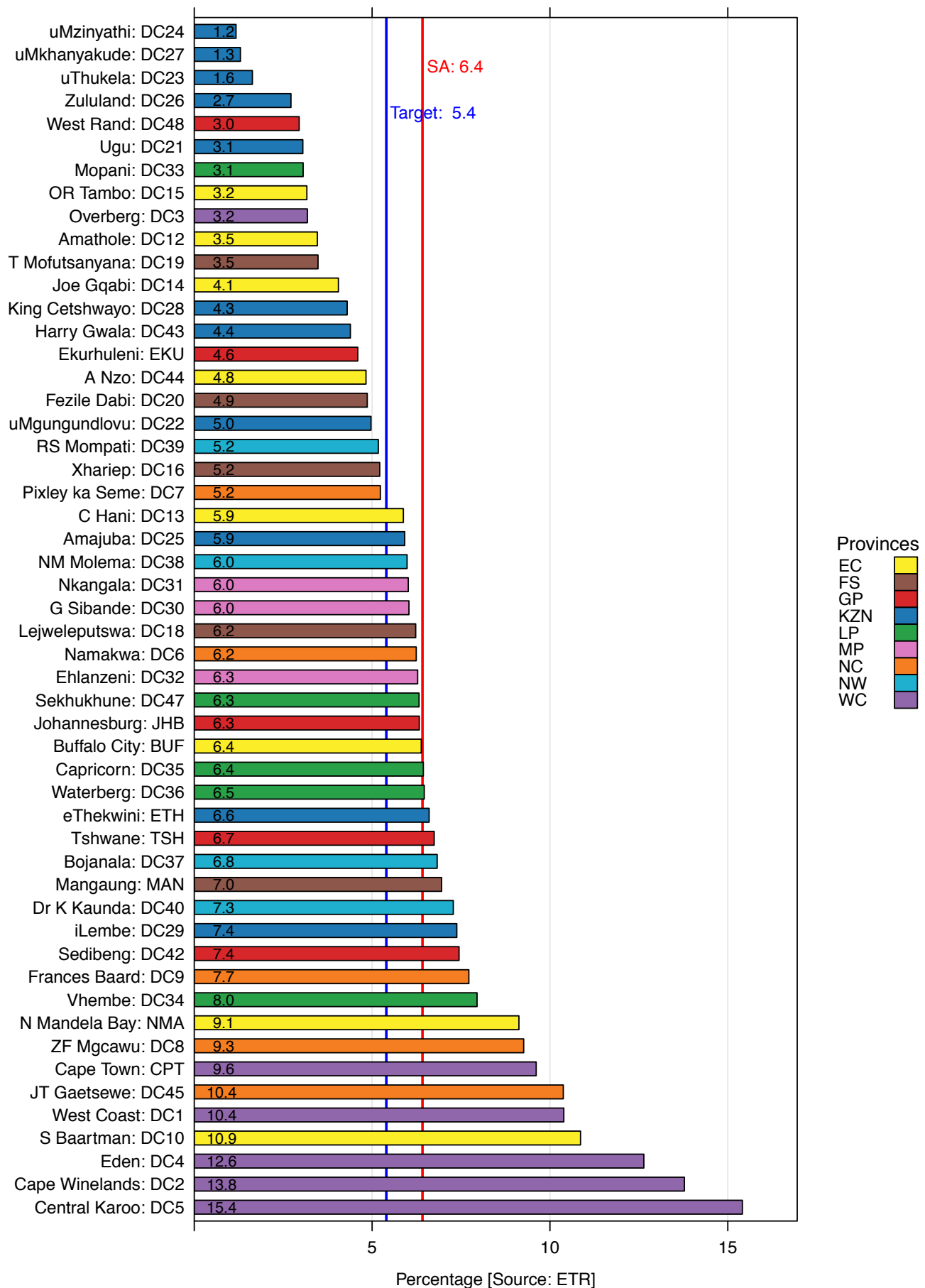
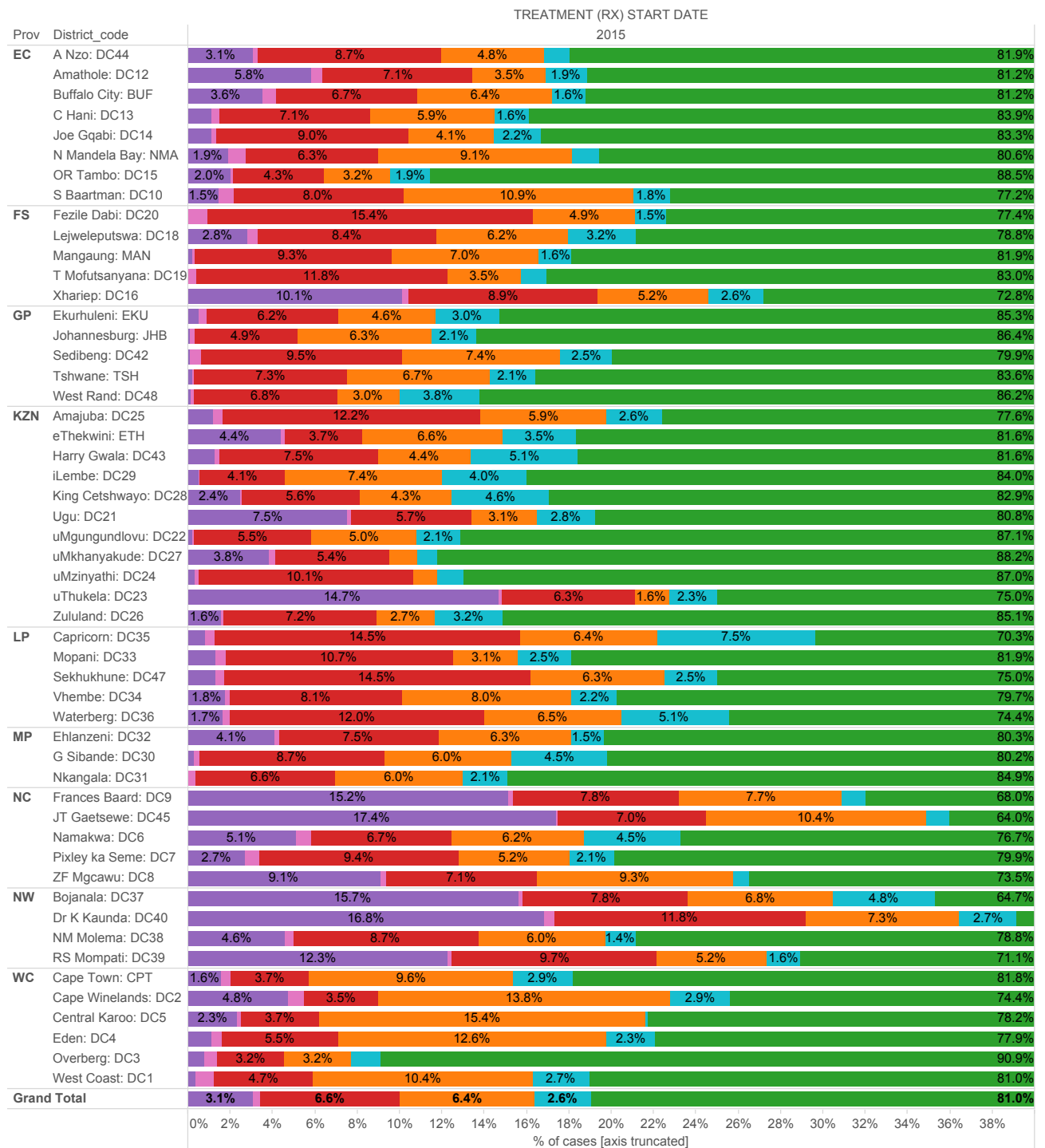


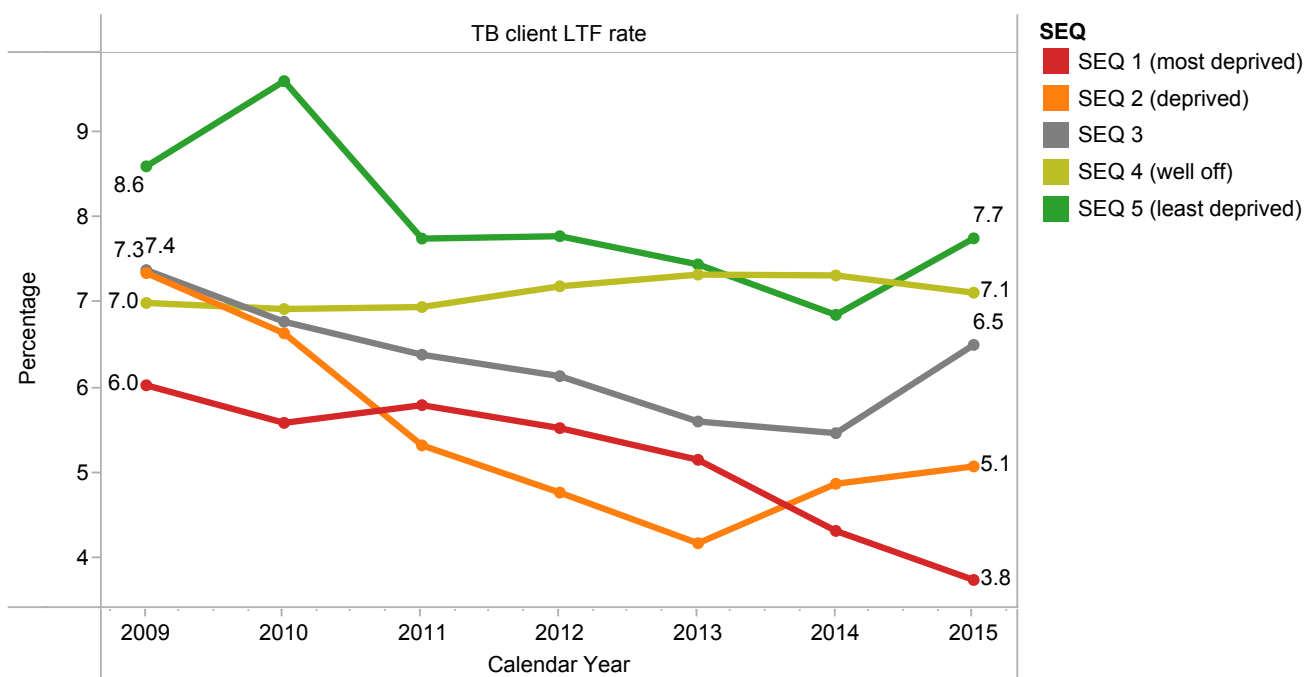
Figure 15: Treatment outcomes for TB patients by district, 2015



SYSGENOUTCOME (group)
■ Treatment Success
■ Transferred Out
■ LTFU
■ Died
■ Failed
■ Not Evaluated

Note: X-axis is truncated to show the range of treatment outcomes.

Figure 16: Trends in average district values by socio-economic quintile for TB loss to follow-up rate, 2009–2015



Key findings and recommendations

- ◆ Loss to follow-up was highest in SEQ5, 20% of the population that is the least deprived, and the lowest in SEQ1, 20% of the population that is the most deprived.
- ◆ Although the national trend for the loss to follow-up rate is decreasing, only KwaZulu-Natal achieved the national target of 5.4% in 2015. Four districts in KwaZulu-Natal had a loss to follow-up rate less than 3%. The three Western Cape districts with loss to follow-up rates higher than 12.5% (Eden, Cape Winelands and Central Karoo) need to address their loss to follow-up rates. More flexible service hours, compassionate health care workers and improved patient education have been reported to improve adherence to TB treatment.^d

10.6 TB death rate

The TB death rate measures the proportion of TB patients that died whilst on treatment. The numerator is the number of TB patients that died; the denominator is the total number of TB patients in the cohort.

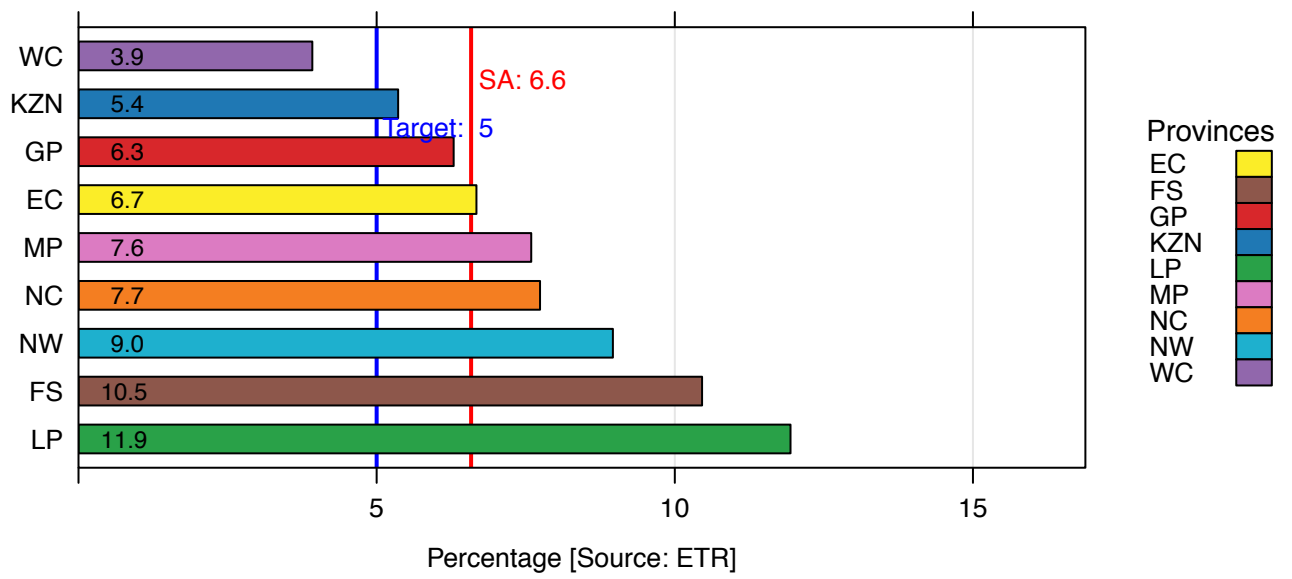
As TB remains the country’s leading cause of death,^e one of the goals of the 2017 NSP is to reduce the deaths associated with TB. This is in line with the End TB Strategy which aims to reduce the number of TB deaths by 35% by 2020, 75% by 2025, and 95% by 2035, compared with 2015.^b

The APP target for death rate in TB patients is 5% and in 2015, 6.6% of TB patients were reported to have died during TB treatment.^c

^d Munro, S A, et al. (2007). Patient adherence to tuberculosis treatment: a systematic review of qualitative research. PLoS Med, 4 (7): e238.

^e Statistics South Africa. Mortality and causes of death in South Africa, 2014: Findings from death notification. Pretoria. Statistics South Africa. 2015.

Figure 17: TB death rate by province, 2015



Map 3: TB death rate by district, 2015

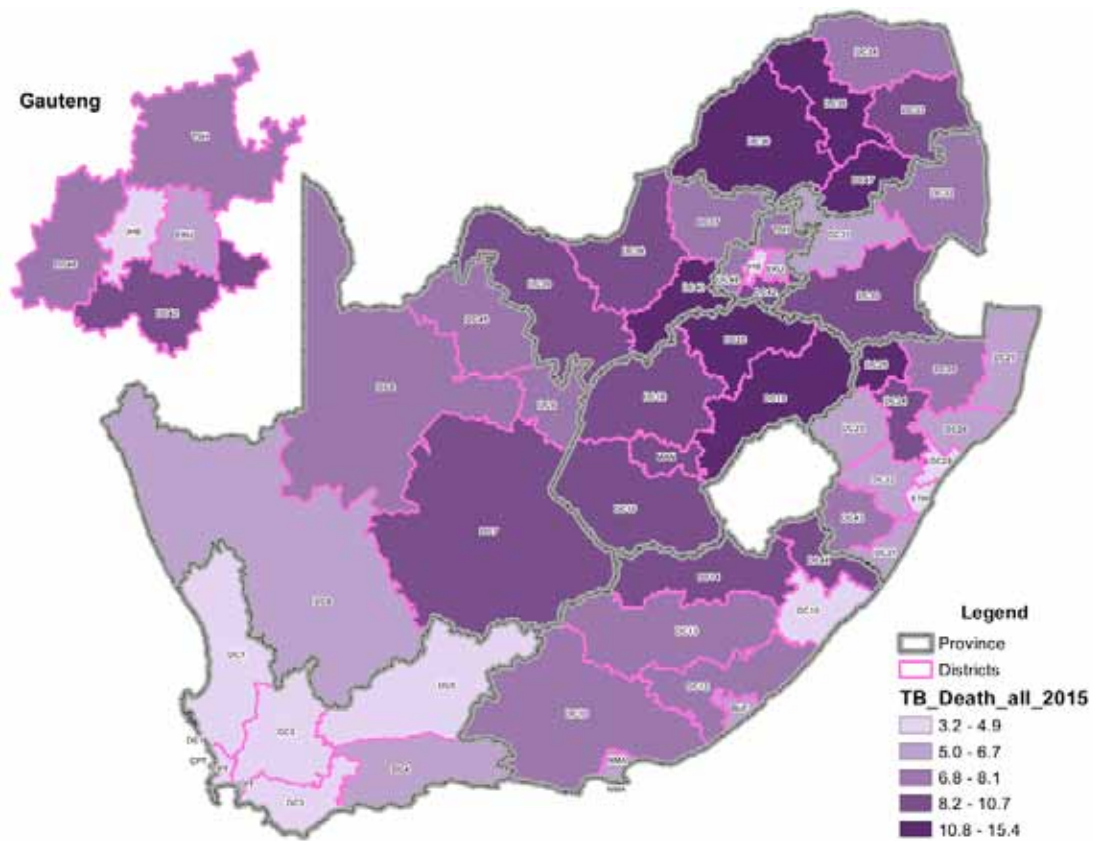


Figure 18: TB death rate by district, 2015

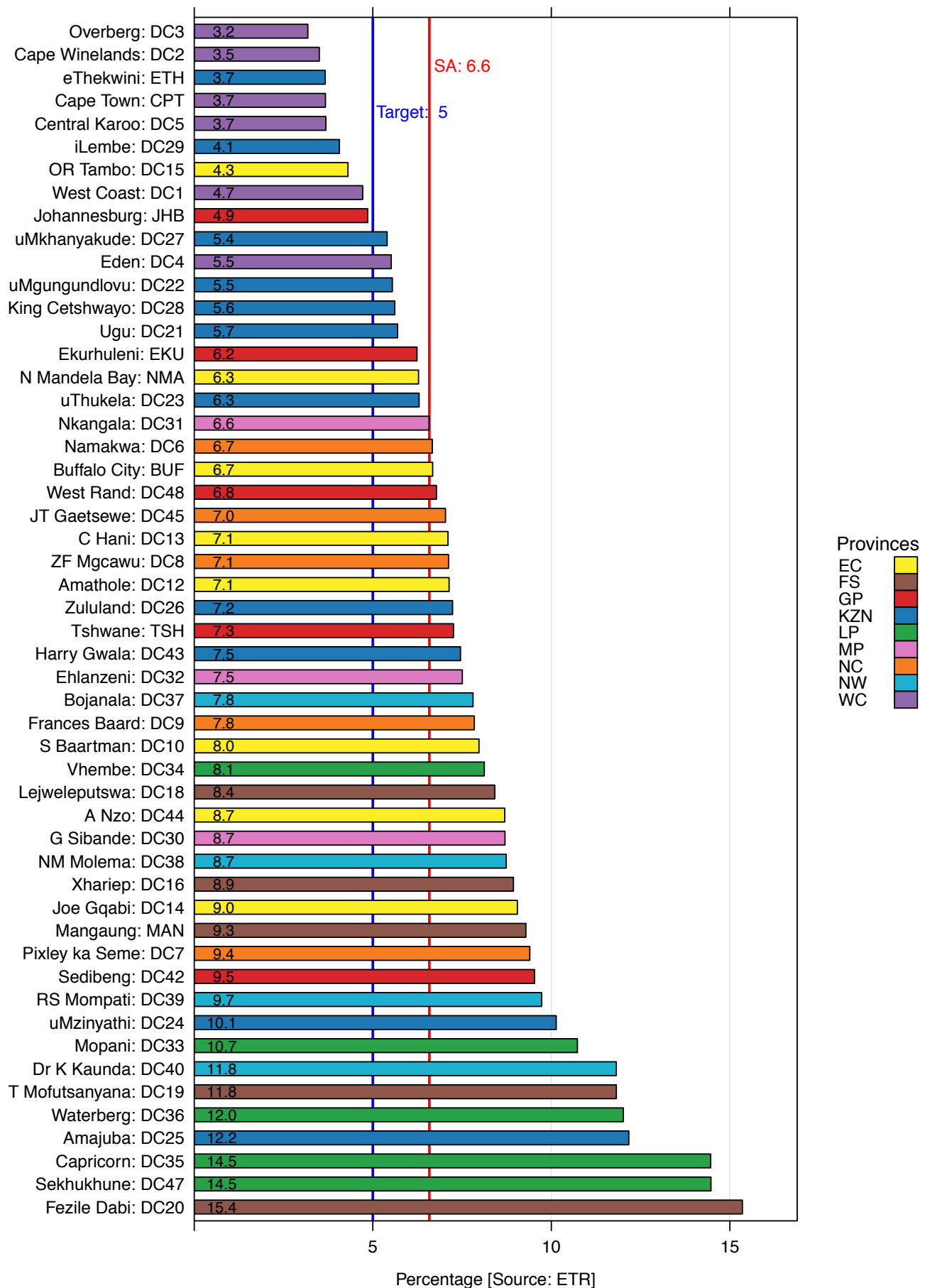
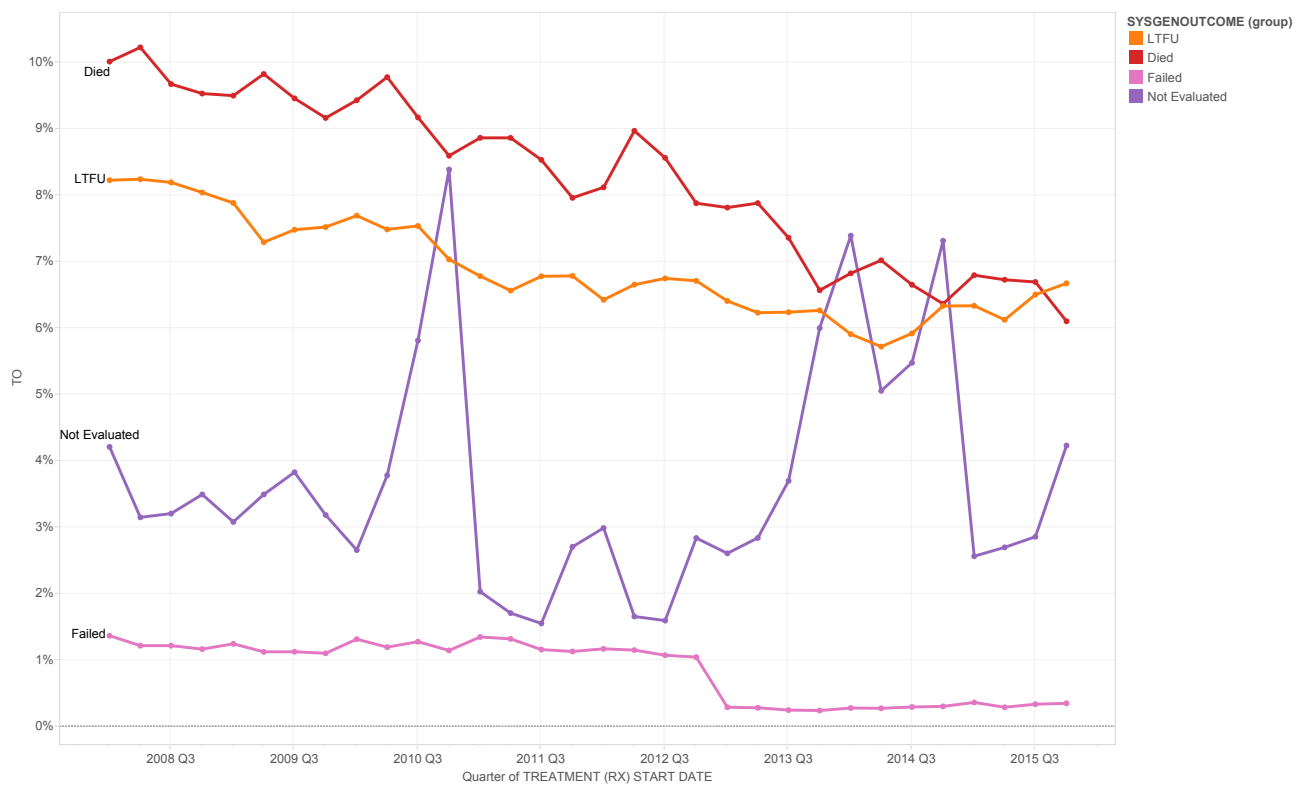


Figure 19: National trend for unsuccessful treatment outcomes, 2008–2015



Source: ETR.

Key findings and recommendations

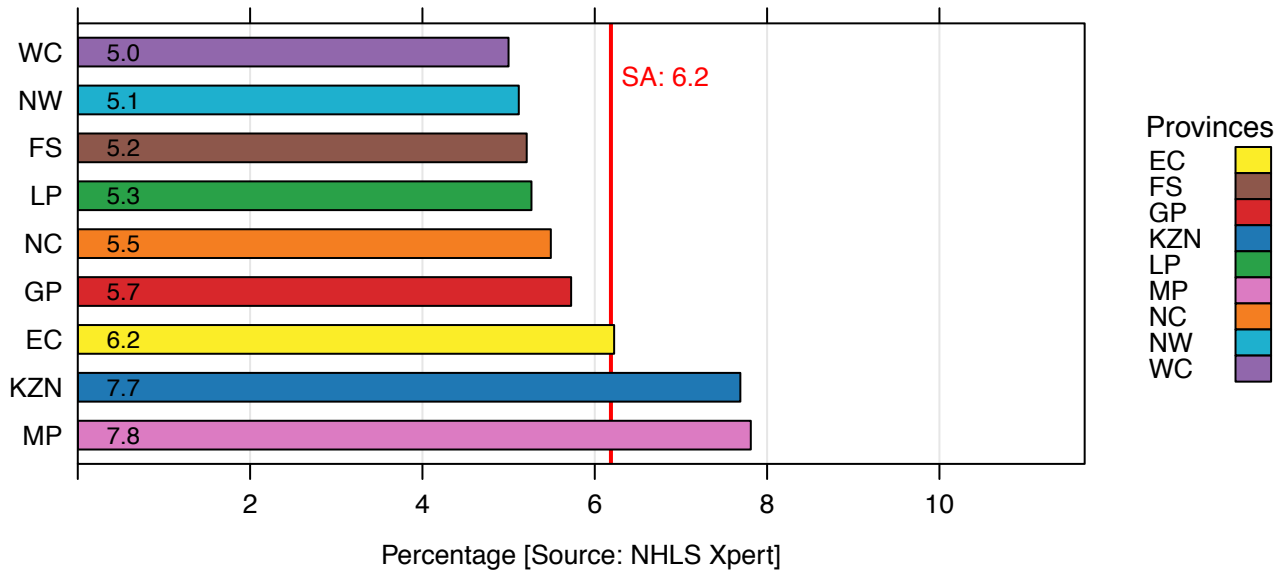
- ◆ The death rate during TB treatment varies significantly across the provinces and districts of the country. In the Western Cape five of the nine districts attained the national target in 2015. However, although the Western Cape was the only province to achieve the national target, we suspect that the high loss to follow-up rates in five Western Cape districts may be concealing a number of patients who have died.
- ◆ The death rate in Limpopo and the Free State was at least twice that of the Western Cape. Four of the nine districts reporting a death rate above 10% were in Limpopo. The districts with death rates higher than 10%, together with Fezile Dabi (FS) which reported a death rate of 15.4%, need to investigate which TB patients are dying and why and then develop targeted interventions to address these issues. This fluctuation in death rate could be due to poor TB programme performance or inadequate TB/HIV service integration.

10.7 TB rifampicin resistance confirmed client rate

This indicator measures the proportion of TB suspects detected to have rifampicin resistance. The numerator is the number of TB tests (detected using GeneXpert) that showed rifampicin resistance. The denominator is the total number of TB tests that indicated the presence of Mycobacterium Tuberculosis.

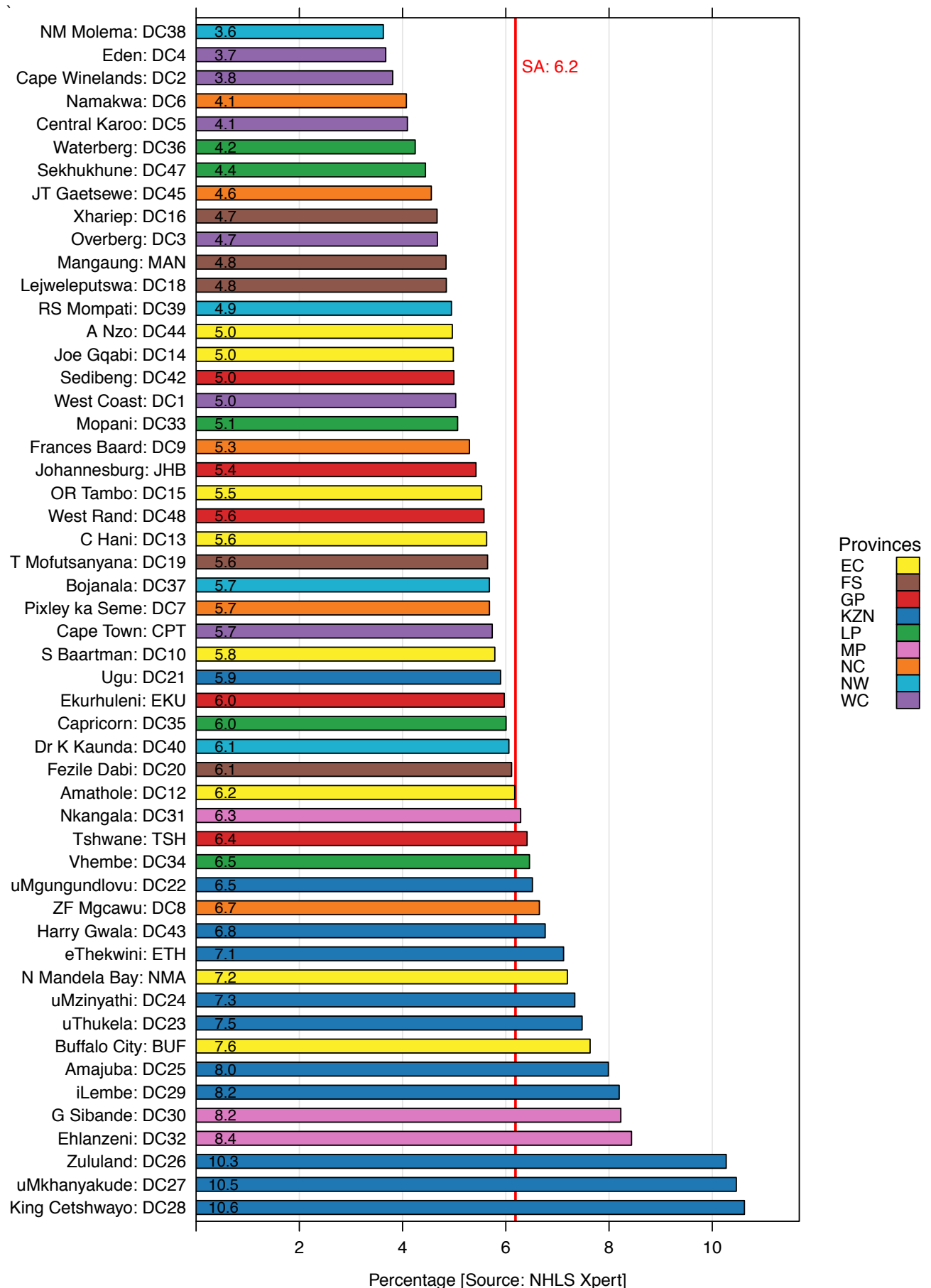
Globally in 2014, there were an estimated 3.3% of new cases and 20% of previously treated cases with drug-resistant TB (DR-TB).^f In South Africa, it is estimated that 3.5% of new cases and 7.1% of previously treated TB cases have DR-TB.^f The confirmed rifampicin resistant client rate has been relatively stable in the last four years. In 2016, the national average was 6.2% (Figure 20).

Figure 20: TB rifampicin resistance confirmed client rate by province, 2016



^f World Health Organization. Global tuberculosis report 2016. WHO/HTM/TB/2016.22. Geneva, Switzerland: World Health Organization, 2016 (http://www.who.int/tb/publications/global_report/en/).

Figure 21: TB rifampicin resistance confirmed client rate by district, 2016



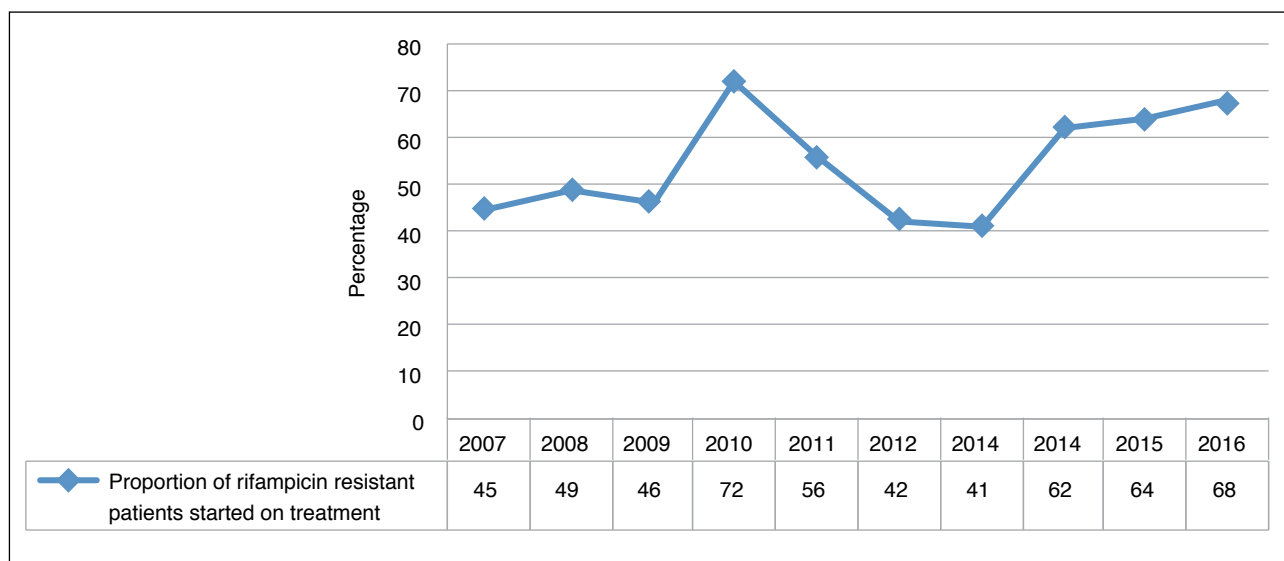
Key findings and recommendations

- ◆ In 2016, Mpumalanga (MP) and KwaZulu-Natal had the highest proportion of clients suspected to have TB detected with rifampicin resistance (RR). The Western Cape had the lowest.
- ◆ Three districts in KwaZulu-Natal, King Cetshwayo, uMkhanyakude and Zululand had RR-TB rates above 10%. In Mpumalanga there were two districts (Ehlanzeni and Gert Sibande) with rates higher than 8%. These two provinces need to investigate reasons for this and implement strategies to reduce transmission by reducing the time from diagnosis to treatment initiation and improving adherence.
- ◆ Two recent South African studies show that transmission rather than acquired resistance is driving the DR-TB epidemic in South Africa. To address the burden of DR-TB in South Africa considerable effort needs to be made to screen all patients at PHC facilities for TB, diagnose active disease and start appropriate treatment as quickly as possible.^{g,h}

10.8 TB rifampicin resistant confirmed treatment start rate

This indicator measures the proportion of diagnosed rifampicin resistant TB patients that have started treatment. The numerator for this indicator is the number of TB rifampicin resistant confirmed clients that have started treatment (from the Electronic Drug-resistant Tuberculosis Register (EDRWeb)), while the denominator is the total number of TB rifampicin resistant confirmed clients (NHLS GeneXpert). Historically there has been a wide gap between the number of patients that are diagnosed and those started on treatment. Until 2014, less than 50% of diagnosed rifampicin resistant patients were started on treatment (Figure 22). Closing this gap will depend on improving accessibility to DR-TB services through decentralising treatment.

Figure 22: Proportion of rifampicin resistant patients started on treatment, 2007–2016



Sources: 2007–2010: A policy framework on decentralised and deinstitutionalised management for SA.ⁱ
 2011–2015: WHO Global TB reports.^j
 2016: Calculated from NHLS GeneXpert data and EDRWeb.

g Shah S, Auld S, Brust J, Mathema B, Ismail N, Moodley P, Misana K, Allana S, Campbell A, Mthiyane T, Morris N, Mpangase P, van der Meulen H, Omar S, Brown T, Narechana A, Shaskina E, Kapwata T, Kreiswirth B, Gandhi N. (2017). Transmission of Extensively Drug-Resistant Tuberculosis in South Africa. *New England Journal of Medicine*. 376:243–53.

h Dheda K, Limberis JD, Pietersen E, Phelan J, Esmail A, Lesosky M, Fennelly KP, teRiele J, Mastrapa B, Streicher EM. Outcomes, infectiousness, and transmission dynamics of patients with extensively drug-resistant tuberculosis and home-discharged patients with programmatically incurable tuberculosis: a prospective cohort study. *The Lancet Respiratory Medicine*. 2017 Apr;5(4):269-281. doi: 10.1016/S2213-2600(16)30433-7. Epub 2017 Jan 19. [Accessed 1 July 2017].

i South African Department of Health. Multi-drug resistant tuberculosis: A policy framework on decentralised and deinstitutionalised management for South Africa. Pretoria. South Africa. Department of Health. South Africa. National Department of Health South Africa. 2011.

j World Health Organization. Global Tuberculosis Report 2012–2016. Geneva. World Health Organization.

Figure 23: TB rifampicin resistant clients treatment initiation rate by province, 2016

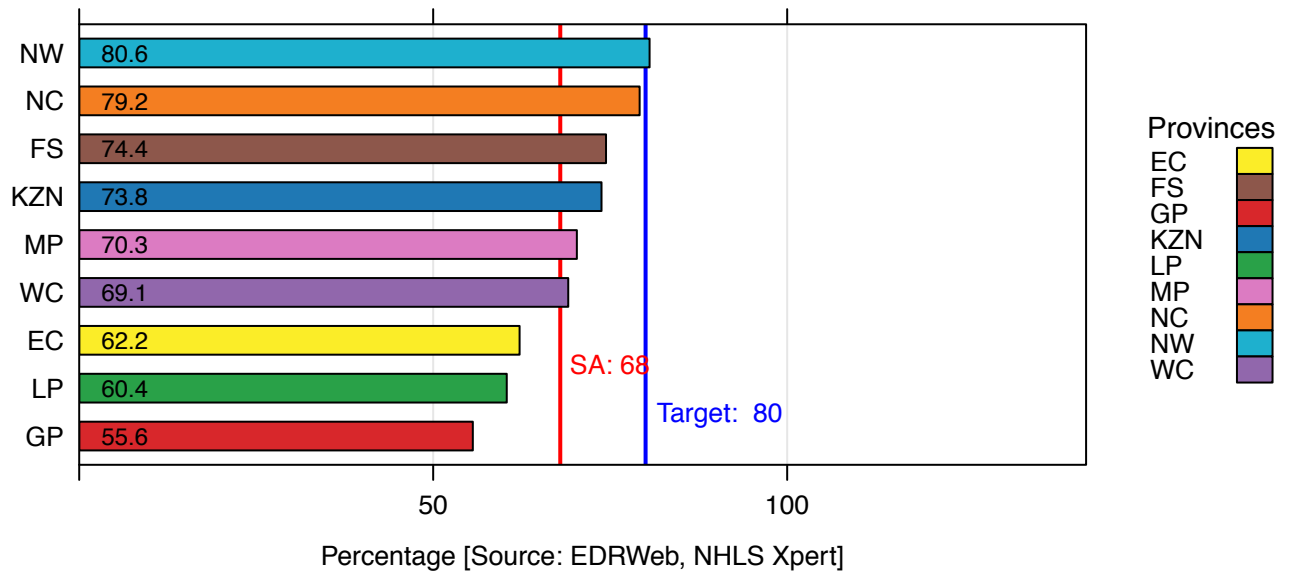
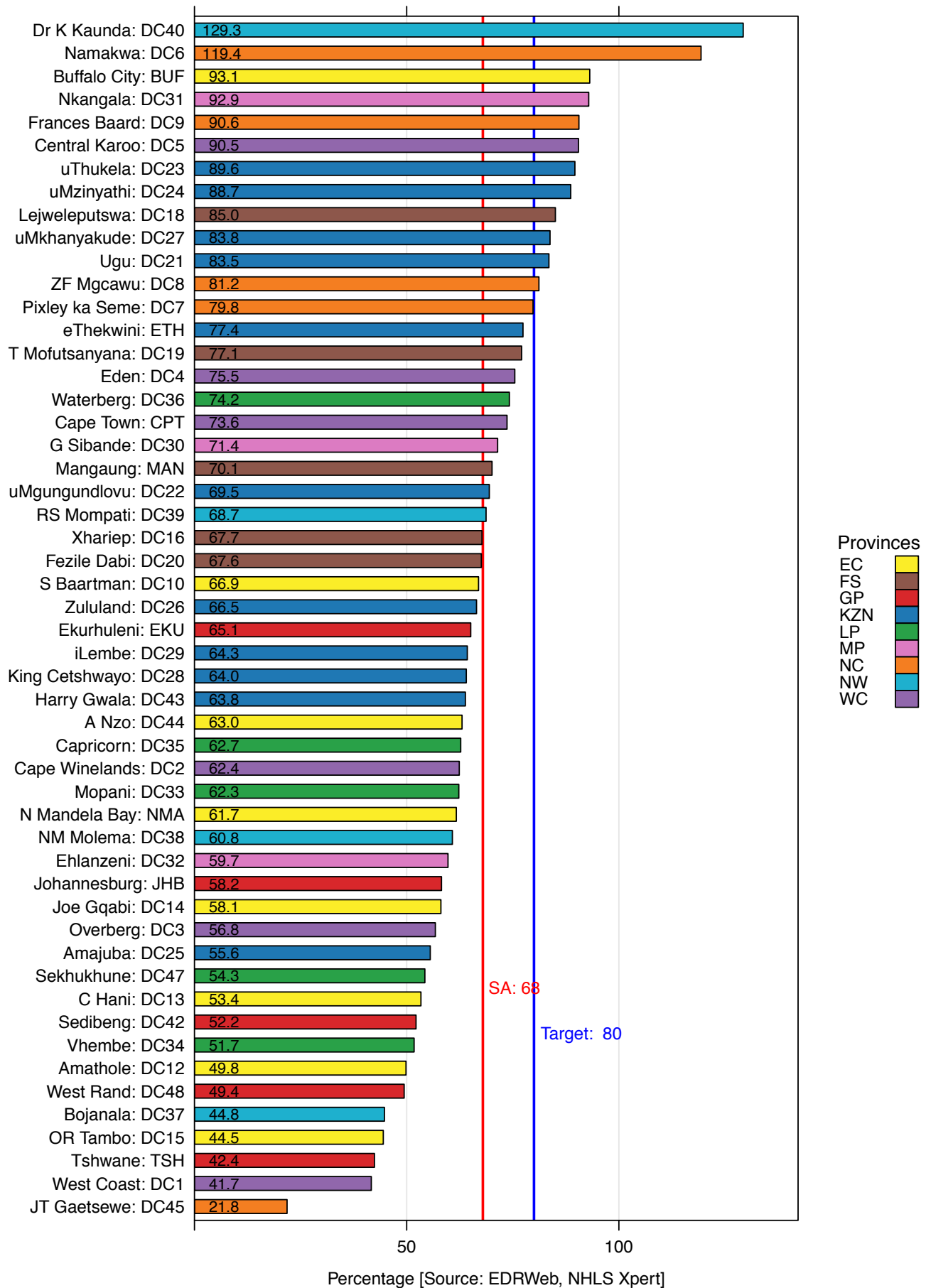


Figure 24: TB rifampicin resistant clients treatment initiation rate by district, 2016



Key findings and recommendations

- ◆ For this indicator, different data sources had to be used for the numerator (EDRWeb) and the denominator (NHLS database) which together with poor data quality probably accounts for the invalid results in some districts. This is the case in Namakwa (NC) and Dr K Kaunda (NW) where the treatment initiation rates are above 100%.
- ◆ It is concerning that in seven districts treatment initiation rates remain below 50%. In part, this might be because treatment may have been initiated in a different district from where the diagnostic test was conducted.
- ◆ While the gap between the number of patients diagnosed and those started on treatment is slowly closing, one in three confirmed DR-TB patients is still not started on treatment and will continue to transmit DR-TB. All facilities need to ensure that patients diagnosed with rifampicin resistance are started on treatment as quickly as possible.
- ◆ Data verification and cleaning should be a priority for all districts to improve the quality of their DR-TB data.

10.9 Drug-resistant TB treatment success rate

The DR-TB treatment success rate measures the proportion of DR-TB patients that completed treatment or were cured. The numerator for this indicator is the number of patients who were cured or completed treatment; the denominator is all DR-TB patients in the cohort. As all treatment for DR-TB at this time was two years, treatment outcomes for DR-TB lag by two years compared to the one year lag for drug-sensitive TB.

The APP target for DR-TB treatment success rate is 55%, and in 2014, the national treatment success rate reported was 50.5%.^c The National Department of Health (NDoH) has however set a very ambitious target of 75% in the NSP.^b

To reach this target, the NDoH has taken a number of bold steps to address the DR-TB burden in South Africa, including the introduction of new and repurposed drugs and a shortened DR-TB regimen. The hope is that these initiatives will make it possible to improve treatment success rates for DR-TB and reach the NSP 2020 treatment success target.

Figure 25: Drug-resistant TB treatment success rate by province, 2014

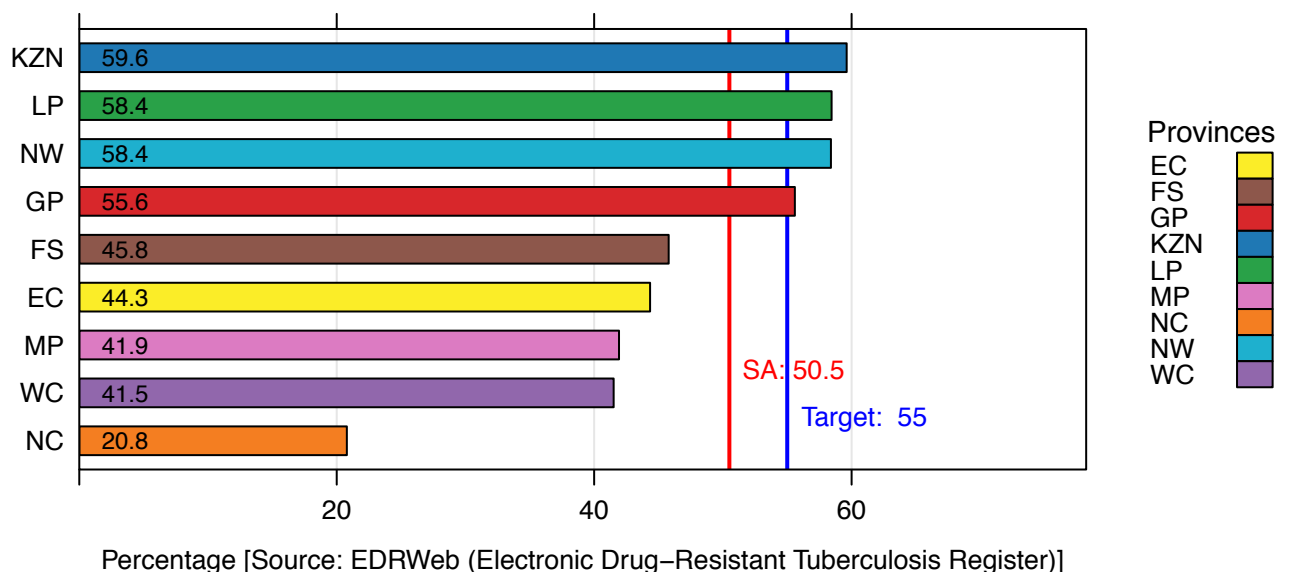
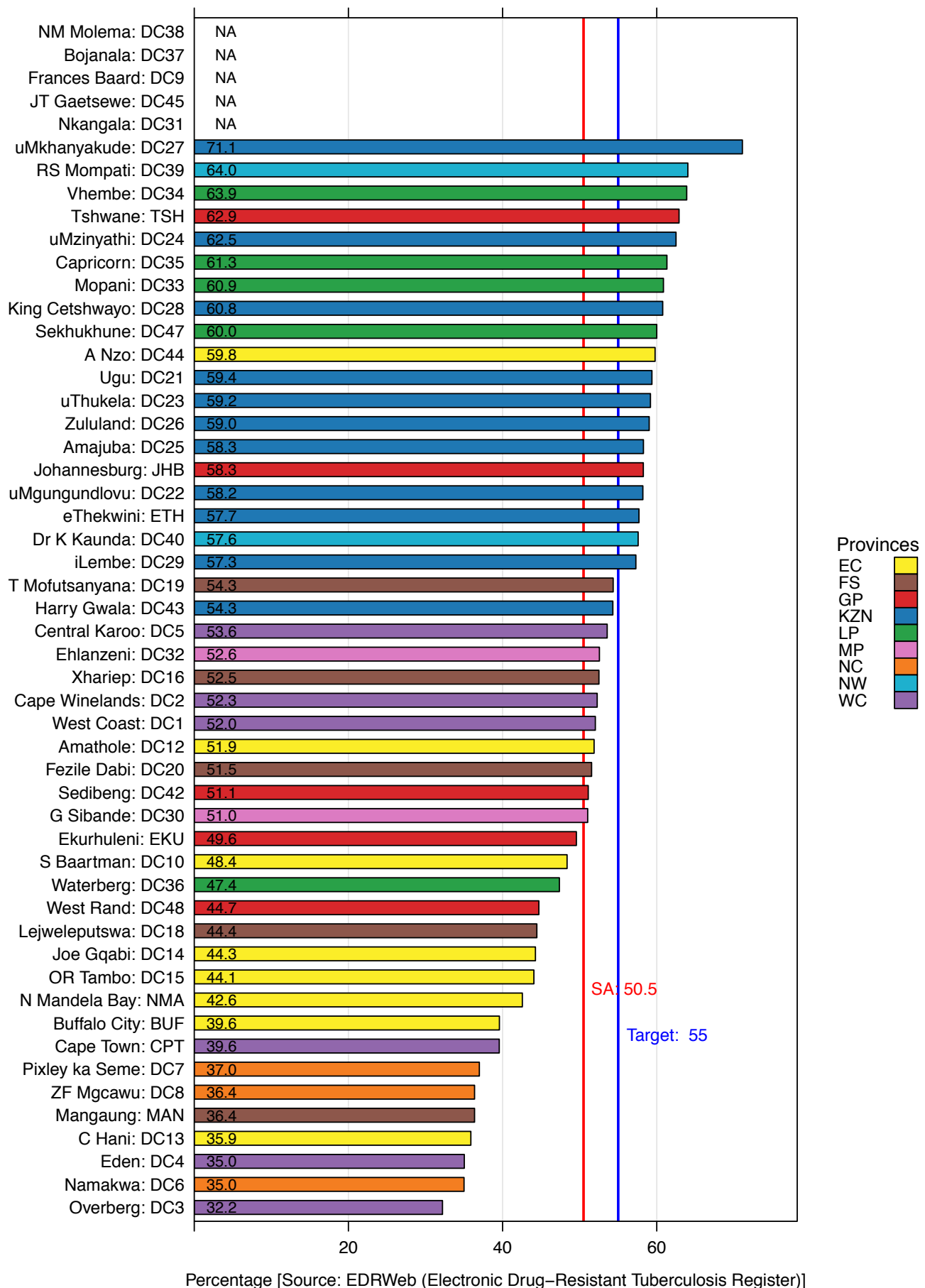


Figure 26: Drug-resistant TB client treatment success rate by district, 2014



Key findings and recommendations

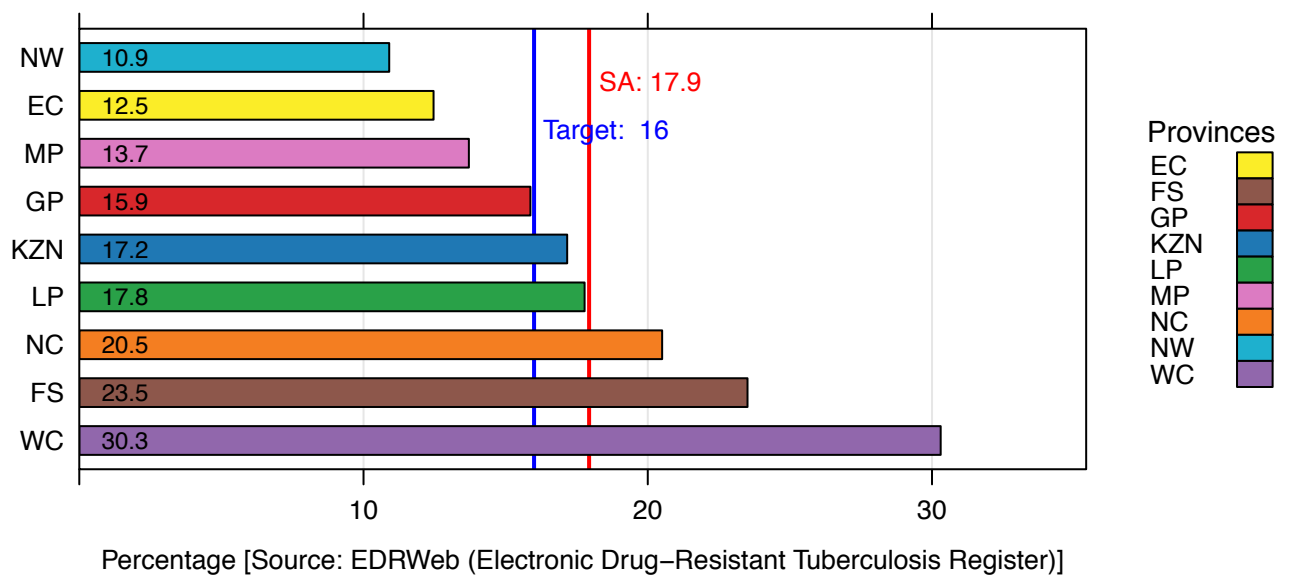
- ◆ The roll-out of new and repurposed drugs must be accompanied by extensive training and the adaptation and strengthening of the recording and reporting system to ensure better outcomes. However, ongoing training and supportive supervision will have to continue as the DR-TB programme is complex and regimens will undoubtedly be modified.
- ◆ Careful monitoring of the roll-out of new and repurposed drugs and the short DR-TB regimen is recommended to ensure DR-TB services are equitably distributed and equally effective across rural and urban areas.
- ◆ Seventeen districts reported treatment success rates below 50% in 2014. In contrast, uMkhanyakude's (KZN) treatment success rate of 71% illustrates that effective DR-TB services can be delivered in rural, resource-limited districts.
- ◆ The failure of certain districts to report treatment outcomes for DR-TB patients is concerning.

10.10 Drug-resistant TB client loss to follow-up rate

The DR-TB loss to follow-up rate measures the proportion of DR-TB patients that interrupted treatment for two consecutive months or more. The numerator for this indicator is the number of DR-TB patients who interrupted treatment for two consecutive months or more and the denominator is the total number of DR-TB patients in the cohort.

The national average loss to follow-up rate for DR-TB patients in 2014 was 17.9%, which is higher than the APP target of 16%.^c It is hoped that with the introduction of new drugs and the short regimen, patients will find the treatment more tolerable and loss to follow-up rates will drop.^k The variation in loss to follow-up rates across the provinces may be a reflection of data quality.

Figure 27: Drug-resistant TB client loss to follow-up rate by province, 2014



^k Lessem E, Cox H, Daniels C, et al. (2014). Access to new medications for the treatment of drug-resistant tuberculosis: Patient, provider and community perspectives. *Int J Infect Dis*, 32: 56–60.

Map 4: Drug-resistant TB client loss to follow-up rate by district, 2014

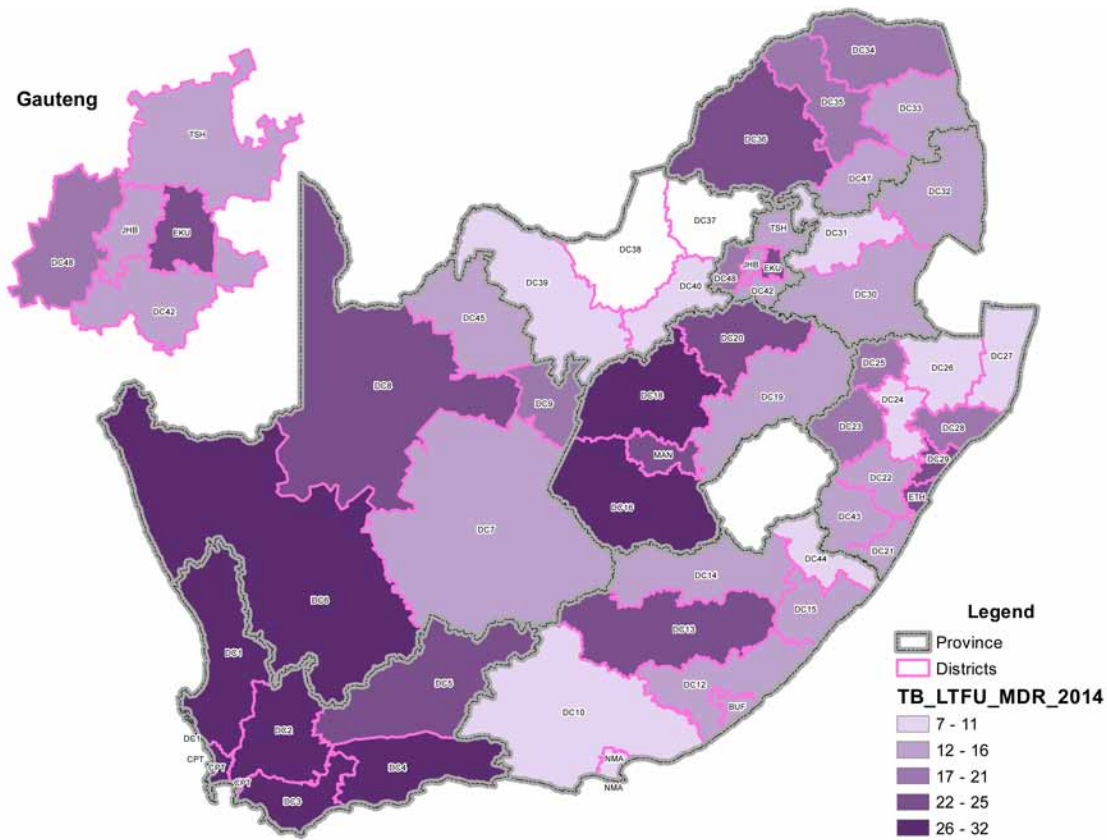
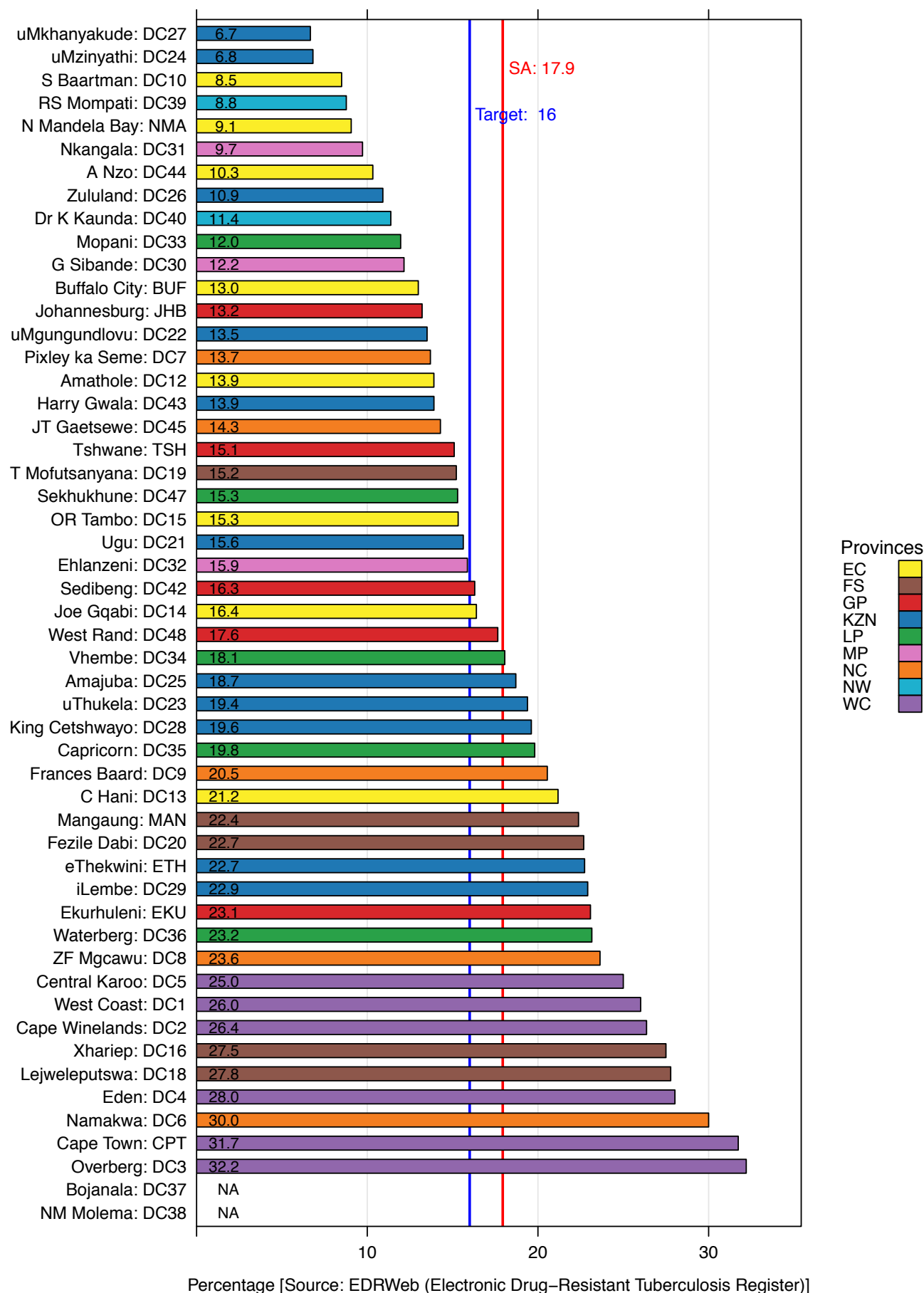


Figure 28: Drug-resistant TB client loss to follow-up rate by district, 2014



Key findings and recommendations

- ◆ The loss to follow up rates remained high, with 50% of districts failing to achieve the target of 16%. Reasons for this poor performance need to be investigated and appropriate retention in care strategies implemented.
- ◆ In 2014 uMkhanyakude and uMzinyathi (both KZN) districts reported the lowest loss to follow up rates, 6.7% and 6.8% respectively. Lessons from these districts can be scaled up in other districts with similar challenges.
- ◆ As South Africa will be treating large numbers of patients with the new and repurposed drugs, facilities need to ensure that patients stay on treatment and do not develop drug resistance to the few new drugs now available.
- ◆ To improve adherence to treatment patient education about DR-TB disease and the treatment must be improved. Furthermore, community-based support services, such as the Ward Based Outreach Teams, must be mobilised to support patients with DR-TB and utilised to contact patients who do not return to the services for their monthly follow-up appointments.

10.11 Drug-resistant TB client death rate

The DR-TB death rate measures the proportion of DR-TB patients that died while on treatment. The numerator is the number of DR-TB patients that died, the denominator is the total number of DR-TB patients in the cohort.

In South Africa, the average death rate for DR-TB patients in 2014 was 23%, which is higher than the APP target^c of 12%.

Figure 29: Drug-resistant TB client death rate by province, 2014

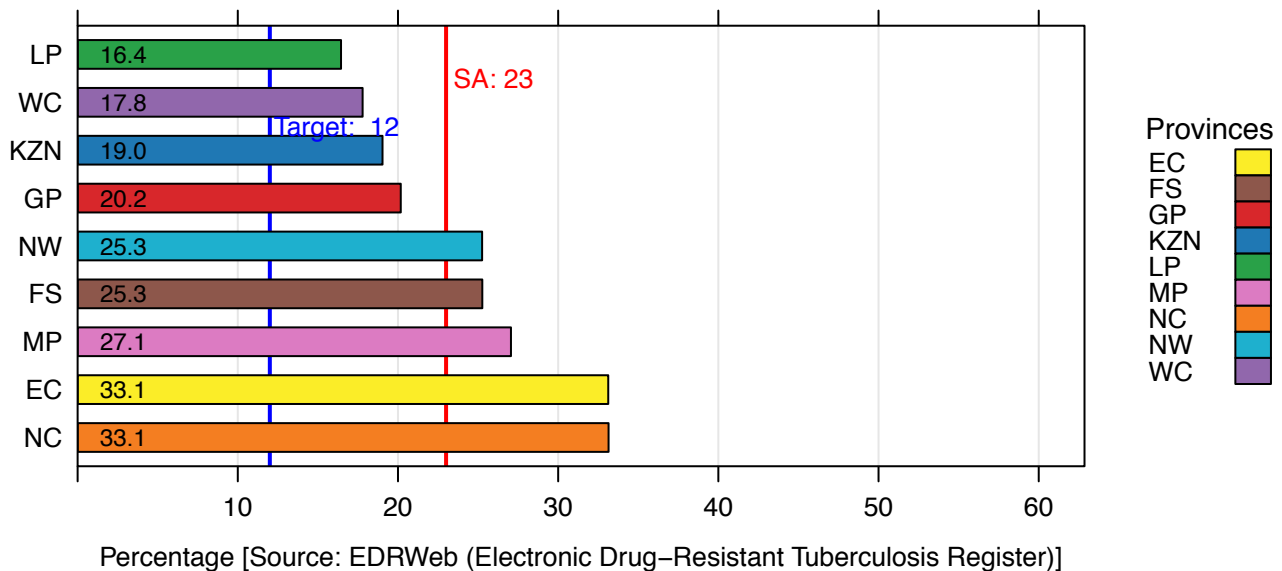
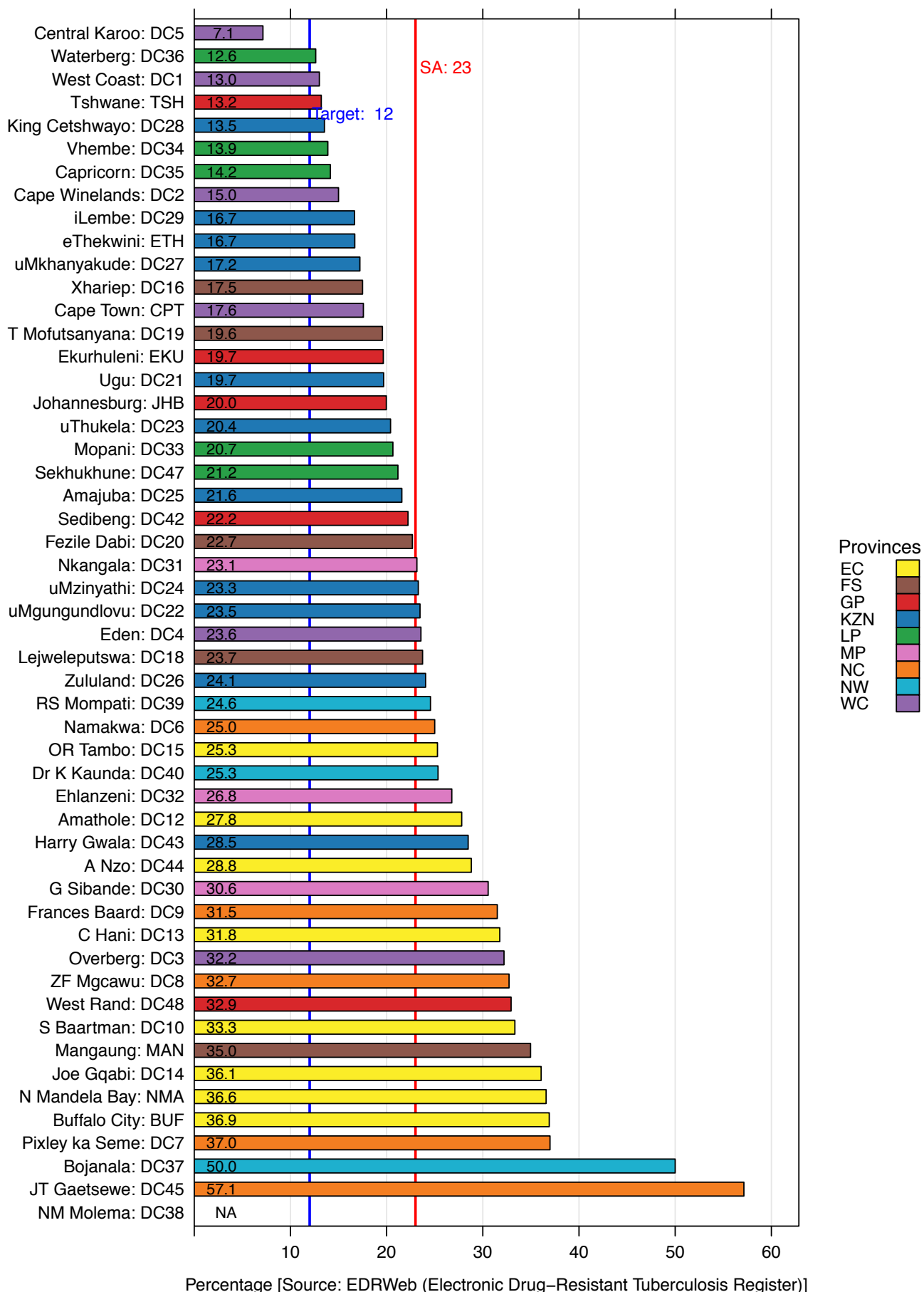


Figure 30: Drug-resistant TB client death rate by district, 2014



Key findings and recommendations

- ◆ None of the provinces attained the target of 12% in 2014. The national average for the death rate of DR-TB patients was 23% with six provinces reporting death rates above 20%. Across the provinces death rates varied considerably. In the Eastern Cape and Northern Cape, close to one in three DR-TB patients died whilst on treatment in 2014.
- ◆ Death rates varied across the districts too. Three Eastern Cape districts (Joe Gqabi, Nelson Mandela Bay and Buffalo City), two Northern Cape districts (JT Gaetsewe, and Pixley Ka Seme) and one district in North West (Bojanala) reported death rates greater than 35%. Moreover, two districts, JT Gaetsewe (NC) and Bojanala (NW) reported death rates of 57.1% and 50.0% respectively, which are exceptionally high and require further investigation.
- ◆ All provinces should investigate the causes of the high death rates and develop targeted interventions to address the problems identified.