

9 Tuberculosis

Marian Loveday and Lieve Vanleeuw

Introduction

Tuberculosis (TB) remains a major health problem in South Africa, with the BRICS countries (Brazil, the Russian Federation, India, China and South Africa) together accounting for almost 50% of the global TB burden.^a Although TB incidence in South Africa reached its peak in 2008 and has declined since then, the 2014 Global TB report estimates that South Africa still has the second-highest incidence of TB in the world (860 per 100 000).^{a,b} Furthermore, TB remains a leading cause of premature mortality in South Africa,^c and post-mortem studies have shown that undetected TB and drug-resistant TB (DR-TB) contribute significantly to hospital deaths.^{d,e}

Over the last six years the National TB programme has made slow and continued progress in addressing TB. This is evidenced by an increase in successful treatment outcomes, most importantly the cure rate. However, for a number of reasons, South Africa has failed to achieve the Millennium Development Goals (MDG) targets set for TB. Problems to be addressed include the size of the TB burden in the country, high TB and HIV co-infection rates, and a number of patient-related factors. In addition, although South Africa spends more than most countries on TB services,^a a number of health system-related factors hinder effective TB service delivery. These include vacant managerial positions (e.g. district TB coordinators), staff shortages, a rapid turnover of staff (staff trained in TB management move on and those skills are lost to that facility), and inadequate follow-up systems.

In addition to failing to reach the MDGs, the burden of DR TB is increasing annually and South Africa has the second-highest number of DR-TB cases in the world.^a Management of patients with DR-TB is complicated, requiring a co-ordinated and comprehensive health system response that is more costly than management of regular (drug-sensitive) TB patients. Despite DR-TB comprising only 7% of incident TB in South Africa in 2014, approximately 65% of the National Tuberculosis Programme budget was spent on DR-TB control.^{a,f} Treatment of DR-TB is not only more costly, it is also less likely to be effective, emphasising the importance of successful treatment of patients with drug-sensitive TB.

Given that many countries failed to reach the MDGs for 2015, the World Health Organization (WHO) launched the End TB Strategy^g earlier this year. Table 1 details the vision, goal, indicators and principles of this strategy. Furthermore, in October 2014, in line with the 90-90-90 HIV treatment targets,^h led by the South African Minister of Health, the BRICS countries agreed that intensified action in their countries was essential to curtail TB, and agreed to the 90-90-90 TB targets:

- ◆ 90% of vulnerable groups screened (for TB)
- ◆ 90% diagnosed and started on treatment
- ◆ 90% treatment success

The BRICS ministers also agreed to cooperate on scientific research and innovations on diagnostics and treatment, including drug resistance and service delivery of TB.^h

As a first step towards this ambitious strategy, on World TB day 24 March 2015, Deputy President Cyril Ramaphosa launched “the largest tuberculosis screening campaign yet seen in South Africa”.ⁱ In its first year, this screening campaign will focus on six priority districts, which are linked to mines and peri-mining communities: Lejweleputswa in the Free State (FS), West Rand in Gauteng (GP), Sekhukhune and Waterberg in Limpopo Province (LP) and Bojanala and Dr Kenneth Kaunda in North West Province (NW). In addition, at least 135 000 inmates in correctional facilities and up to half a million mineworkers will be screened in the first year. The metropolitan districts will be added in the second year, and in the third year the campaign will focus on four provinces, namely the Eastern Cape (EC), Gauteng, Western Cape (WC) and KwaZulu-Natal (KZN).

a World Health Organization. Global tuberculosis report 2014. WHO/HTM/TB/2014.08. Geneva, Switzerland: WHO; 2014.

b Nanoo A, Izu A, Ismail N, et al. Nationwide and regional incidence of microbiologically confirmed pulmonary tuberculosis in South Africa, 2004–12: a time series analysis. *Lancet Infect Dis* 2015; published online June 23, 2015 [http://dx.doi.org/10.1016/S1473-3099\(15\)00147-4](http://dx.doi.org/10.1016/S1473-3099(15)00147-4).

c Groenewald P, Bradshaw D, Day C, Laubscher R. Burden of disease. In: Massyn N, Day C, Peer N, Padarath A, Barron P, English R, eds. *District Health Barometer 2013/14*. Durban: Health Systems Trust; 2013/14.

d Cohen T, Murray M, Wallengren K, Alvarez G, Samuel E, Wilson D. The prevalence and drug sensitivity of tuberculosis among patients dying in hospital in KwaZulu-Natal, South Africa: A postmortem study. *PLoS Med* 7(6) 2010;7:e1000296. doi:10.1371/journal.pmed.

e Martinson N, Karstaedt A, Venter W, et al. Causes of death in hospitalized adults with a premortem diagnosis of tuberculosis: an autopsy study. *AIDS* 2007;21:2043–50.

f National Health Laboratory Service. GeneXpert MTB/RIF Progress Report, July 2014. Pretoria, South Africa: NHL; 2014.

g World Health Organization. The End TB Strategy: Global strategy and targets for tuberculosis prevention, care and control after 2015. Geneva, Switzerland: WHO; 2015. Available at: http://www.who.int/tb/post2015_TBstrategy.pdf?ua=1 [accessed 31 July 2015].

h Communiqué of the IV Meeting of BRICS Health Ministers, BRICS Ministry of External Relations, Brasilia, 5 December 2014. Available at <http://brics.itamaraty.gov.br/category-english/21-documents/242-ivhealth> [accessed 31 July 2015].

i Deputy President Cyril Ramaphosa: World TB Day, 24 March 2015. Available on: <http://www.gov.za/speeches/deputy-president-cyril-ramaphosa-world-tb-day-24-mar-2015-0000> [accessed 31 July 2015].

Table 1: The End TB Strategy

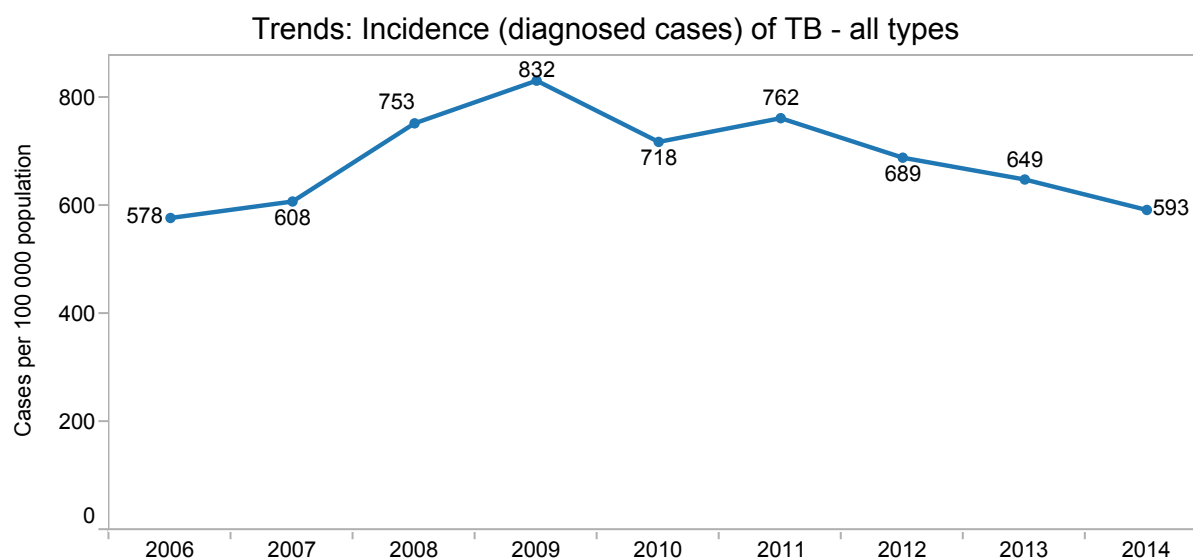
VISION	A world free of TB – zero deaths, disease and suffering due to TB			
GOAL	End the global TB epidemic			
INDICATORS	MILESTONES		TARGETS	
	2020	2025	SDG2030	END TB 2035
Reduction in number of TB deaths compared with 2015 (%)	35%	75%	90%	95%
Reduction in TB incidence rate compared with 2015 (%)	20% (<85/100 000)	50% (<55/100 000)	80% (<20/100 000)	90% (<10/100 000)
TB-affected families facing catastrophic costs due to TB (%)	Zero	Zero	Zero	Zero
PRINCIPLES				
<ol style="list-style-type: none"> 1. Government stewardship and accountability, with monitoring and evaluation 2. Strong coalition with civil society organizations and communities 3. Protection and promotion of human rights, ethics and equity 4. Adaptation of the strategy and targets at country level, with global collaboration 				
PILLARS AND COMPONENTS				
<ol style="list-style-type: none"> 1. INTEGRATED, PATIENT-CENTRED CARE AND PREVENTION <ol style="list-style-type: none"> A. Early diagnosis of TB including universal drug-susceptibility testing, and systematic screening of contacts and high-risk groups B. Treatment of all people with TB including drug-resistant TB, and patient support C. Collaborative TB/HIV activities, and management of co-morbidities D. Preventive treatment of persons at high risk, and vaccination against TB 2. BOLD POLICIES AND SUPPORTIVE SYSTEMS <ol style="list-style-type: none"> A. Political commitment with adequate resources for TB care and prevention B. Engagement of communities, civil society organizations, and public and private care providers C. Universal health coverage policy, and regulatory frameworks for case notification, vital registration, quality and rational use of medicines, and infection control D. Social protection, poverty alleviation and actions on other determinants of TB 3. INTENSIFIED RESEARCH AND INNOVATION <ol style="list-style-type: none"> A. Discovery, development and rapid uptake of new tools, interventions and strategies B. Research to optimise implementation and impact, and promote innovations 				

9.1 Incidence of TB – all types

As shown in Figure 1, the number of TB patients (all TB types) starting treatment and recorded in the Electronic TB Register (ETR.Net) peaked in 2009 at 832 per 100 000, and has since decreased to 593 per 100 000. It has been suggested that the decline in incident TB is in response to an increasing number of HIV-infected individuals started on ART. This decline occurred despite a continuing increase in the number of individuals with HIV infection.^{bj}

Due to the disparity between the reported incidence and the estimated incidence (593 versus 860 per 100 000), a national survey to determine the true incidence of TB in South Africa is being planned and will be conducted shortly.

Figure 1: Trends: Incidence (diagnosed cases) of TB – all types



j Pretorius C, Menzies N, Chindelevitch L. The potential effects of changing HIV treatment policy on tuberculosis outcomes in South Africa: results from three tuberculosis-HIV transmission models. AIDS 2014;Suppl 1:S25-34.

Map 1 and Figure 2 show the districts with the highest TB incidence. Four districts currently have TB incidence over 1 000 per 100 000 population. Sarah Baartman (EC) has a TB incidence of 1 127 per 100 000; in uMgungundlovu (KZN) the incidence is 1 097 per 100 000; Ugu (KZN) has a TB incidence of 1 044 per 100 000; and Nelson Mandela Bay Metro (EC) has a TB incidence of 1 009 per 100 000. In addition to these four districts with high TB incidence, eight districts had high burdens of TB in 2014, with over 10 000 people initiated on treatment: eThekweni (KZN) 32 000 patients, Cape Town (WC) 25 225, Johannesburg (GP) 17 306, Nelson Mandela Bay (EC) 11 958, uMgungundlovu (KZN) 11 733, Tshwane (GP) 11 109, OR Tambo (EC) 10 439, and Ekurhuleni (GP) 10 401. At a sub-district level, Ga-Segonyana sub-district in the John Taolo Gaetsewe district in the Northern Cape appears have the highest incidence of TB in the country of 4 156 cases per 100 000

Map 1: Incidence (diagnosed cases) of TB – all types by sub-district, 2014

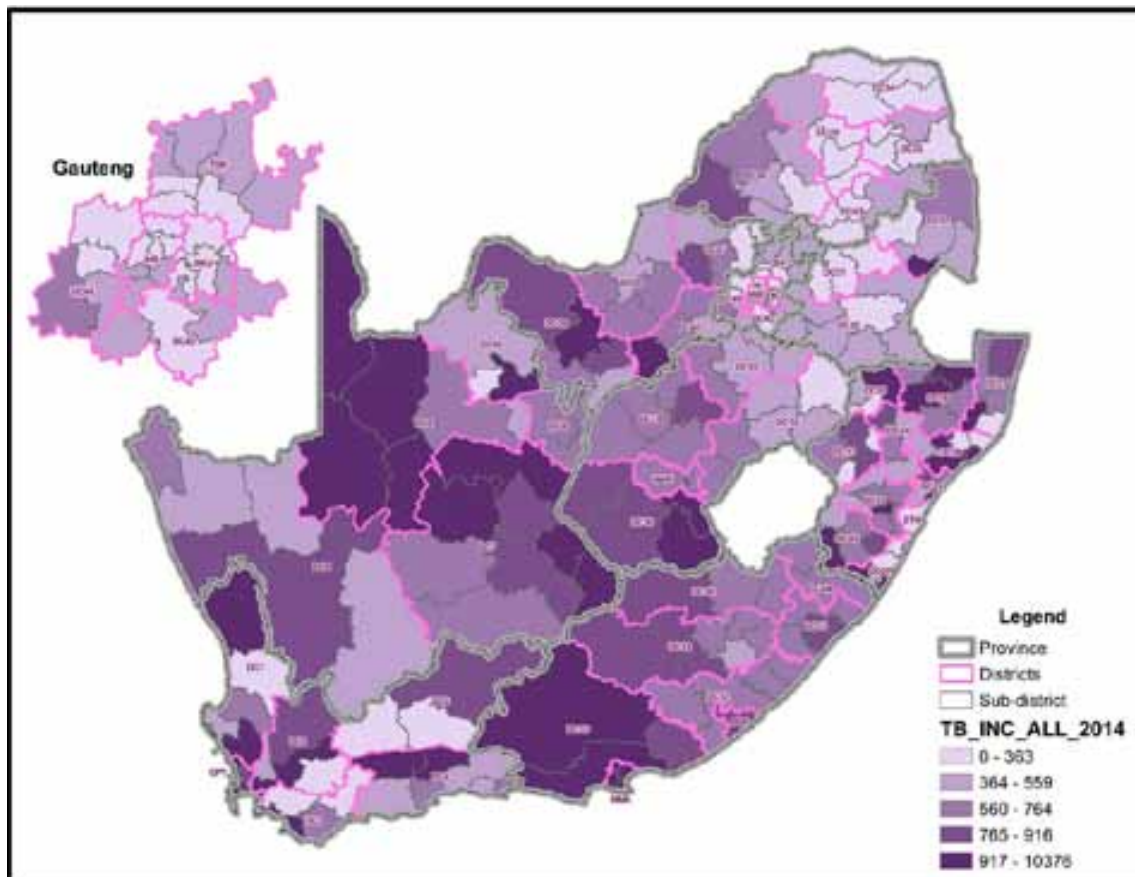
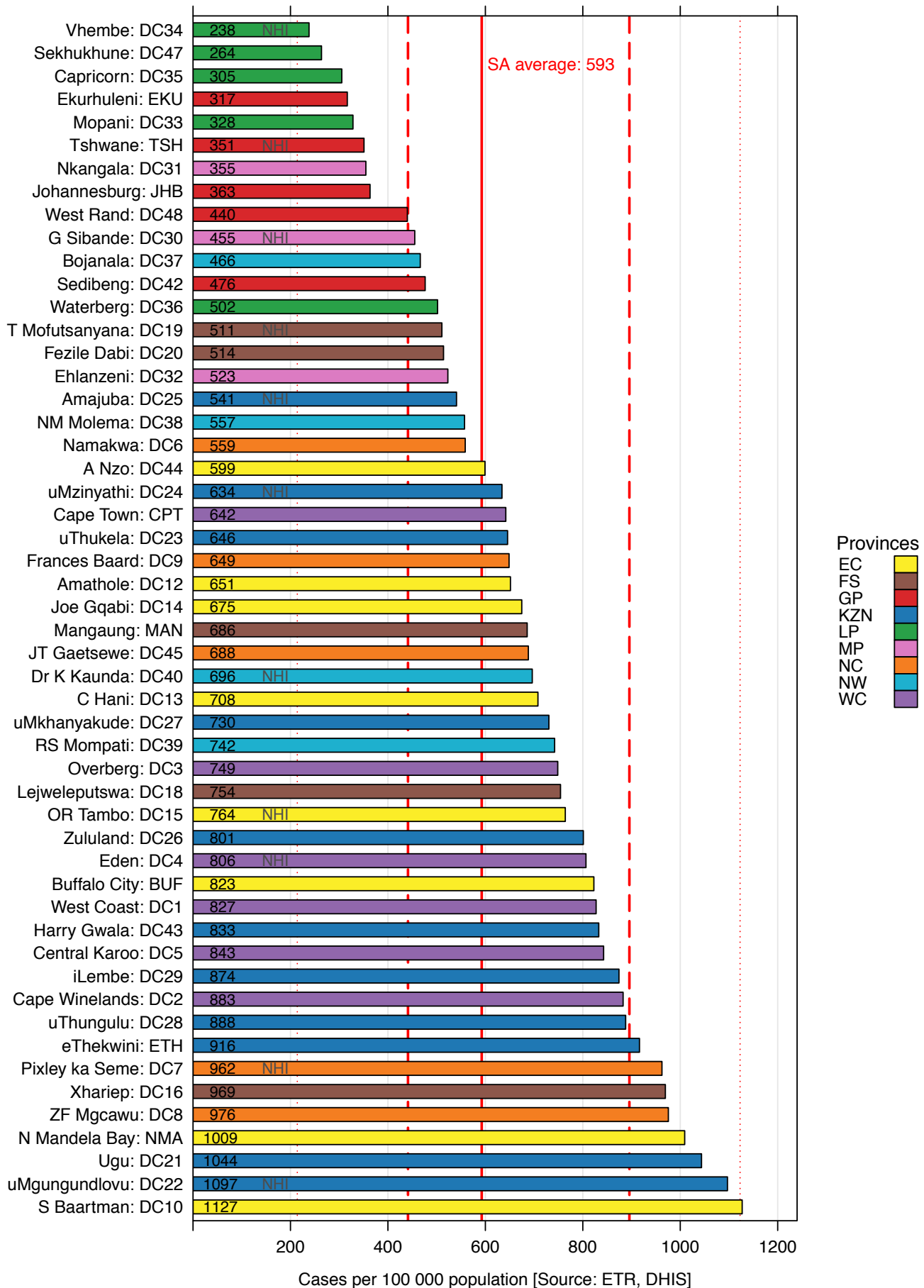


Figure 2: Incidence (diagnosed cases) of TB – all types by district, 2013



Very few places globally have such high incidences or high burdens of TB as the 12 districts and one sub-district listed above. These districts are TB hotspots. For South Africa to meet the goals of the End TB Strategy and the 90-90-90 targets, these districts/sub-district have to address their TB burdens by ensuring that all TB cases are diagnosed as quickly as possible through active case finding, that patients are started on appropriate therapy as soon as possible, and that treatment is completed.

With the widespread roll-out of GeneXpert diagnostic machines through the country, many patients are diagnosed as having DR-TB at their first clinic visit. This not only enables the early initiation of appropriate therapy, but has exposed the increasing burden of DR-TB, which may have contributed slightly to the decline in number of patients with drug-sensitive TB.

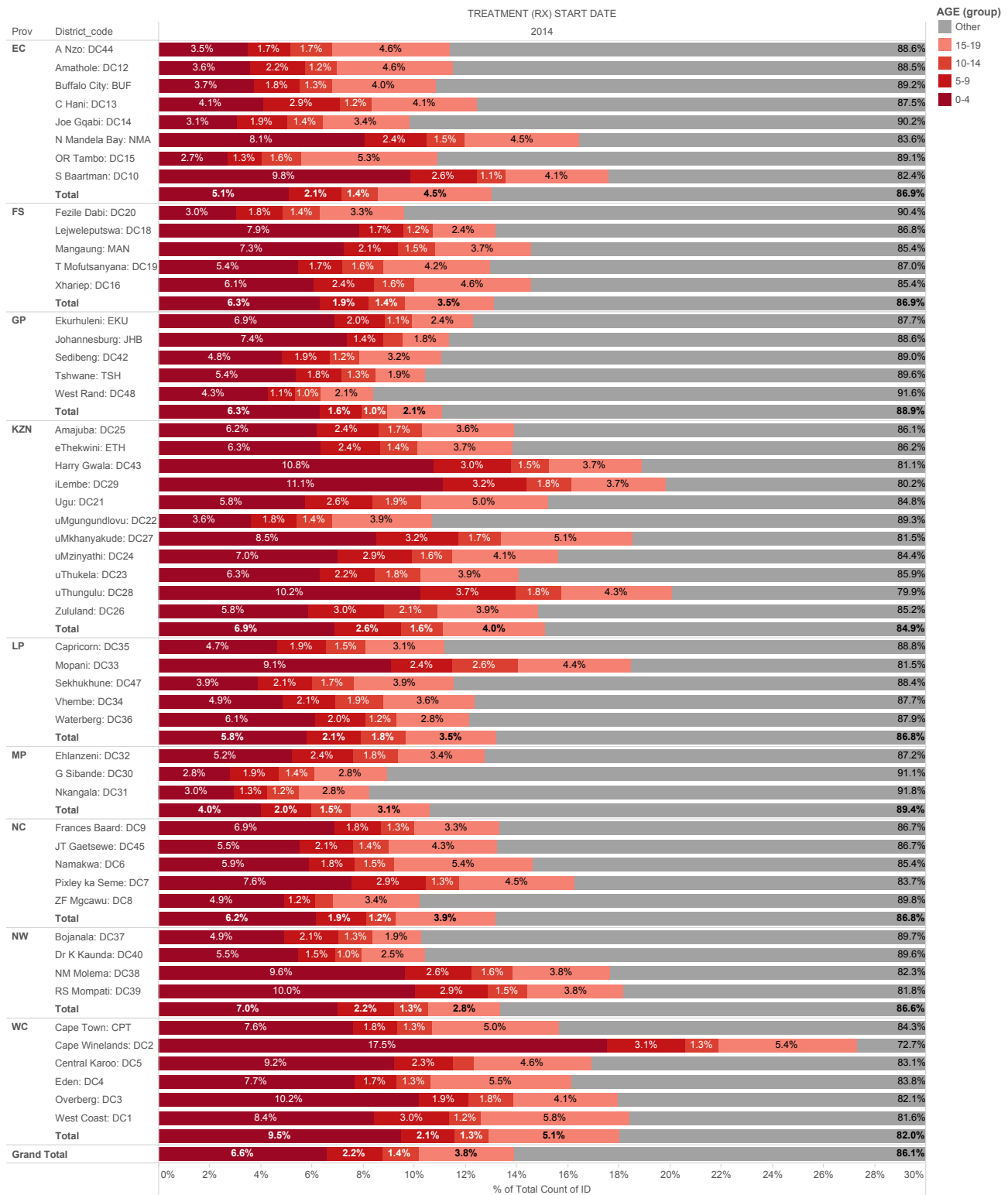
Figure 3 shows the proportion of TB cases across different childhood age groups. Nationally, the proportion of TB cases in the 0–4-year-old age group is 6.6%, in the 5–9-year-old age group it is 2.2%, in the 10–14-year-old age group it is 1.4%, and in the 15–19-year-old age group 3.8%. These relative proportions within the different age groups are expected.^k

There is considerable variation in the proportion of children under 5 years diagnosed as having TB across the districts. In Gert Sibande district in Mpumalanga (MP), children under 5 years comprised only 2.8% of the proportion of TB cases diagnosed, whereas in the Cape Winelands (WC) children under 5 years comprised 17.5% of the district's TB cases. Districts in which children under 5 years comprise less than 5% of TB cases are possibly under-diagnosing TB in this age group. The high proportion of children in the Cape Winelands suggests both excellent case detection (compared with other hyper-endemic parts of the country); however, it might also be over diagnosis. Further investigation is required to understand this very high proportion of TB in under 5 year olds.

^k Personal communication: Professor Ben Marais; 24 July 2015.

Section A: Tuberculosis

Figure 3: Case finding in children, 2014

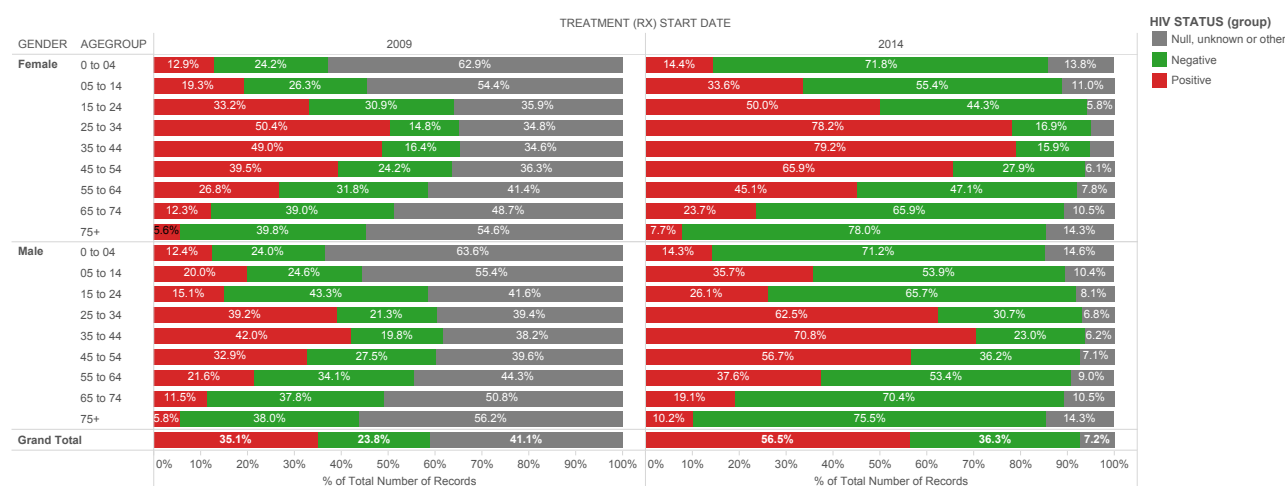


% of Total Count of ID for each District_code broken down by TREATMENT (RX) START DATE Year vs. Prov. Color shows details about AGE (group). The marks are labeled by % of Total Count of ID. The data is filtered on CFDATA, which keeps Y. The view is filtered on TREATMENT (RX) START DATE Year, which keeps 2014.

In 2009, the proportion of TB patients starting treatment with an unknown HIV status was 41.1%, but this has decreased annually over the last five years to 7.2% in 2014. As noted in previous years, TB patients younger than 15 years and over 65 years were least likely to be tested.

In 2014, the average HIV co-infection rate was 56.5% for the whole country (Figure 4). However, co-infection rates as high as 78.2% and 79.2% were reported in females aged 25 to 34 and 35 to 44 years old respectively. In males, the highest co-infection rate reported was 70.8%, in those between 35 and 44 years old. The number of HIV-positive TB patients on antiretroviral treatment (ART) continues to increase; in 2014 it was 78.9%, an encouraging improvement from the 72.0% reported for 2013.

Figure 4: Case finding by gender and age and HIV status, 2009 to 2014



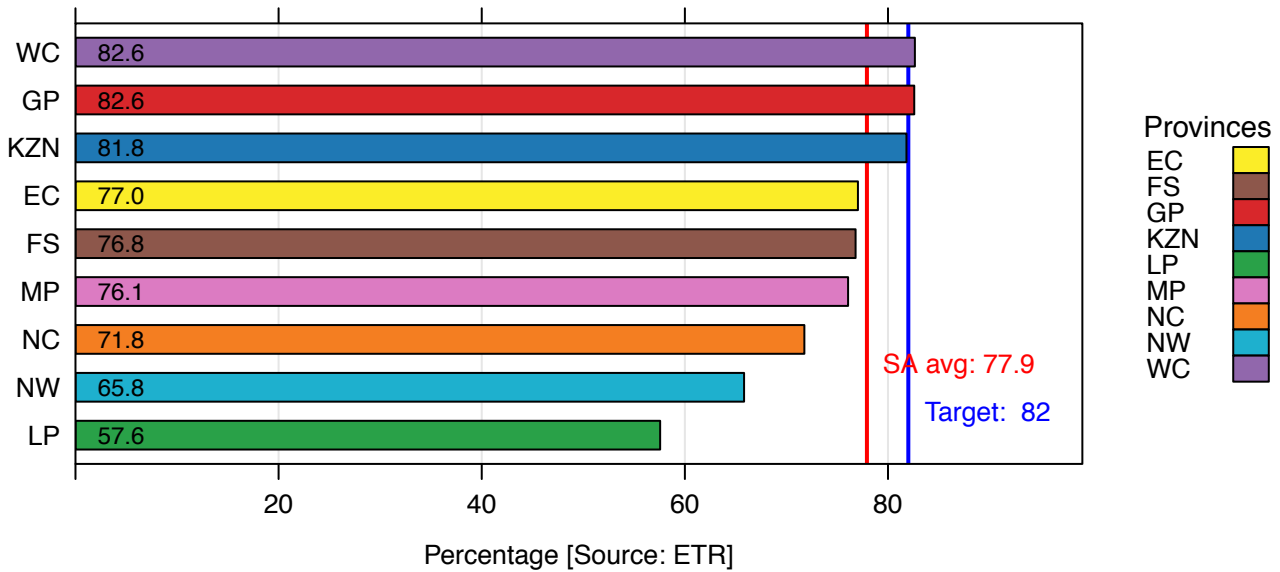
% of Total Number of Records for each AGE GROUP broken down by TREATMENT (RX) START DATE Year vs. GENDER. Color shows details about HIV STATUS (group). The data is filtered on CF-DATA, which keeps Y. The view is filtered on TREATMENT (RX) START DATE Year and GENDER. The TREATMENT (RX) START DATE Year filter keeps 2009 and 2014. The GENDER filter keeps Female and Male.

9.2 TB successful treatment rate (all TB)

This indicator monitors the success of TB treatment in South Africa's health facilities by measuring the proportion of all types of TB patients (smear-positive, smear-negative and extra-pulmonary) that were either cured or completed a full course of treatment.¹ The national treatment success rate continued to rise from 76.1% in 2012 to 77.9% in 2013. Although we are slowly approaching the national target of 82%, considerable effort will be needed to achieve the international target of 85% set by the WHO, and the target of 90% approved by the BRICS ministers of health in December 2014.

At provincial level, six of the nine provinces have steadily continued to increase the percentage of patients treated successfully. In particular, the improvement in the Eastern Cape from 71.9% in 2012 to 77.0% in 2013 is very encouraging. However, the decline in successful treatment outcomes in Limpopo, Northern Cape (NC) and North West is concerning. In Limpopo, successful treatment outcomes have declined from 64.5% to 57.6%, in the Northern Cape from 74.1% to 71.8%, and in North West from 66.4% to 65.8% (Figure 5). All three provinces are struggling with high proportions of patients who have died or who are not evaluated.

Figure 5: TB successful treatment rate (all TB) by province, 2013



At district level (Figure 6 and Map 2), uThungulu (KZN) recorded the highest treatment success rate, namely 90.1%. The three districts that performed most poorly were Sekhukhune (56.2%), Capricorn (50.2%) and Vhembe (46.7%) (all in LP). All three districts had extremely high 'not-evaluated' case rates, namely 18.4%, 15.4% and 35.8% respectively. Improvement in the provincial treatment success rate is dependent on these districts reducing the number of not-evaluated patients; they must ensure that patients are followed up and that a successful or unsuccessful treatment outcome is assigned as appropriate. The variation in treatment success across the National Health Insurance (NHI) districts is considerable, from 82.9% in uMgungundlovu and uMzinyathi (both KZN) to 46.7% in Vhembe (LP) (Figure 7).

Map 2: TB successful treatment rate (all TB) by sub-district, 2013

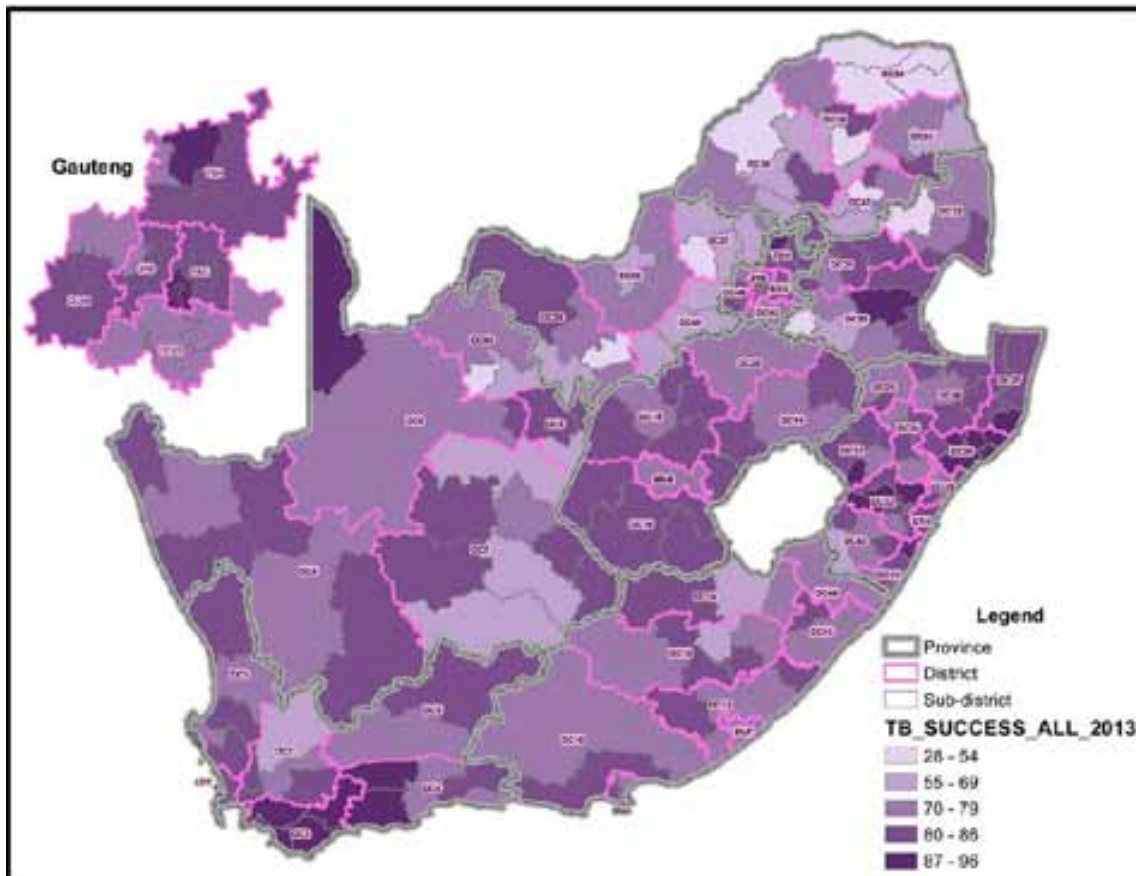


Figure 6: TB successful treatment rate (all TB) by district, 2013

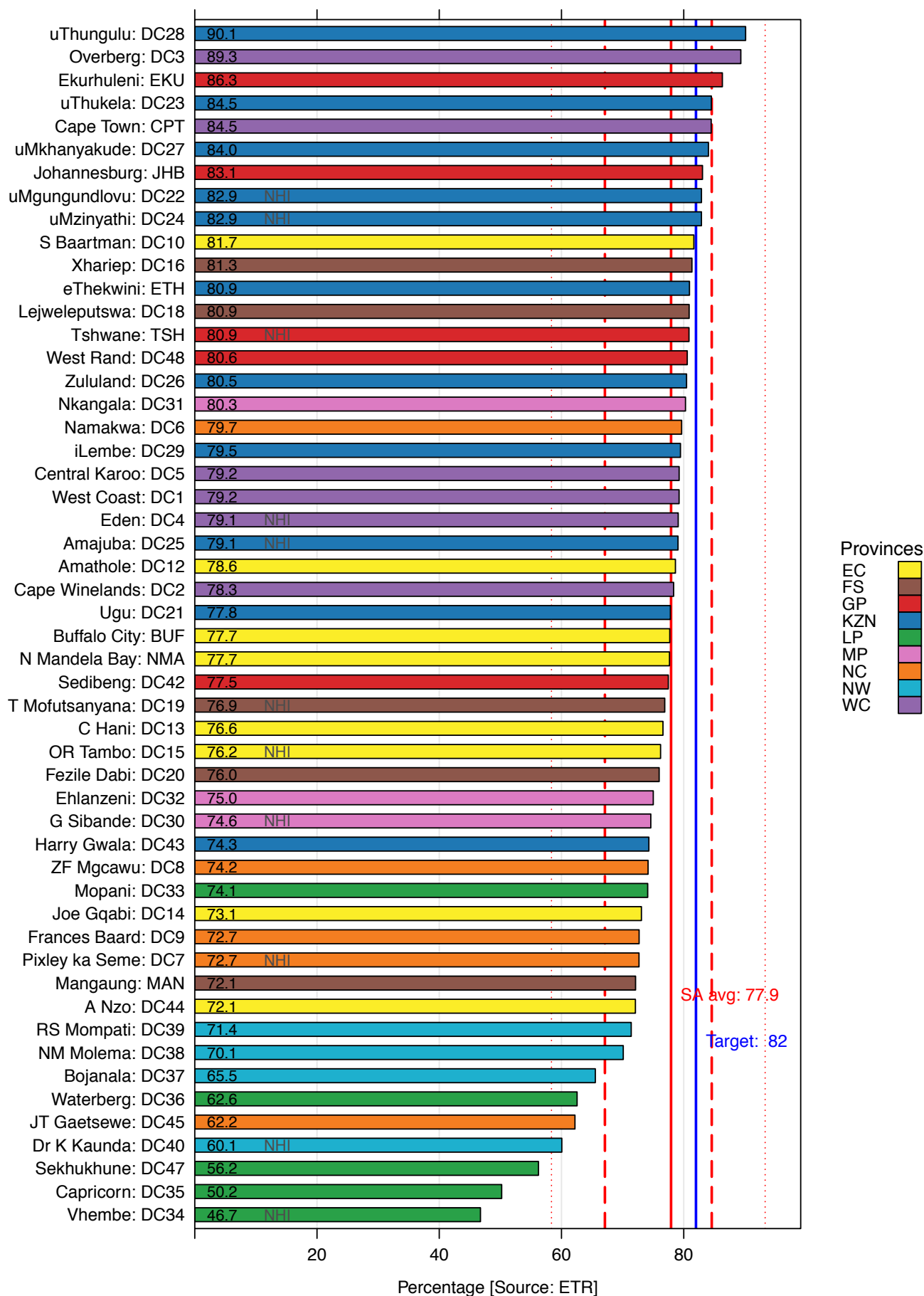
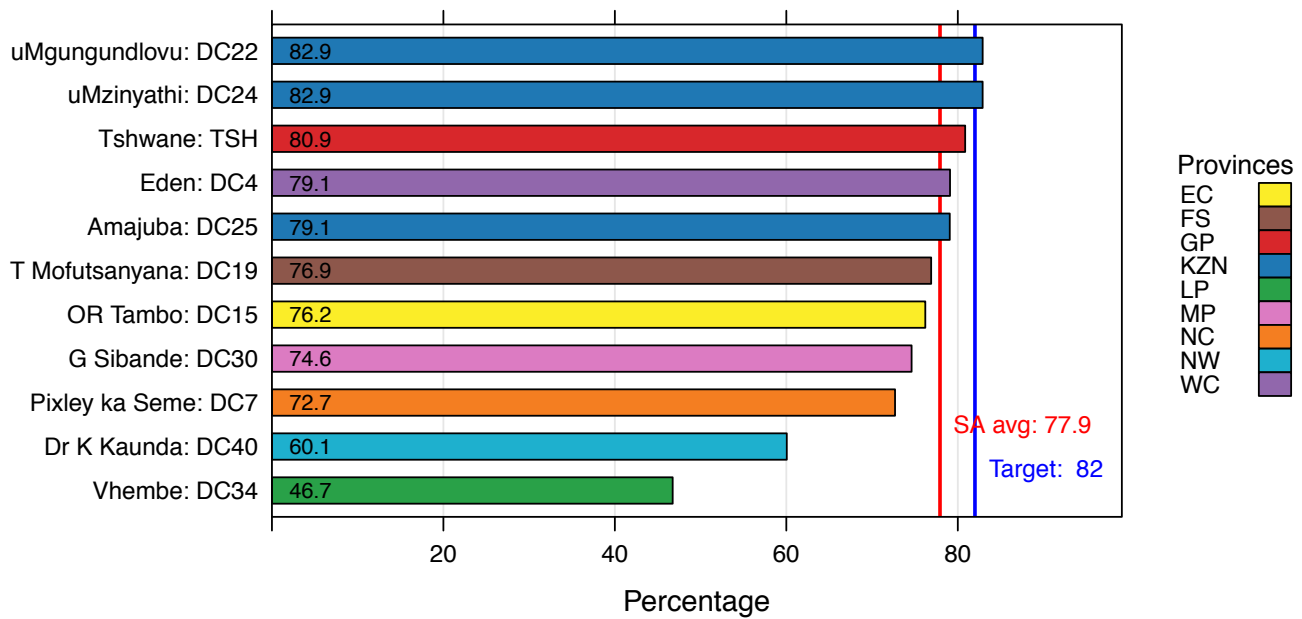


Figure 7: TB successful treatment rate (all TB) by NHI district, 2013

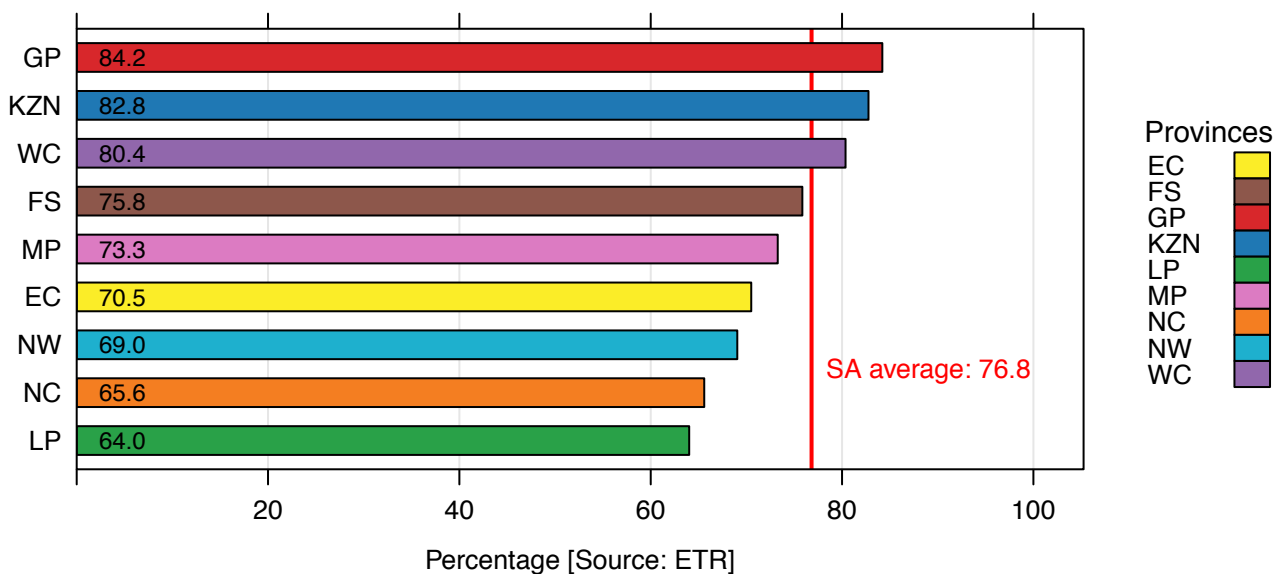


9.3 TB cure rate (new pulmonary smear-positive)

This indicator measures the proportion of smear-positive patients that are smear-negative in the last month of treatment, and on at least one other occasion a minimum of 30 days prior to that.^m The National TB Control Programme gives priority to new smear-positive TB cases as these patients are infectious and by spreading the disease they continue to drive the TB epidemic in South Africa.

The cure rate for new pulmonary smear-positive TB patients rose steadily from 75.8% in 2012 to 76.8% in 2013 (Figure 8). However, the rate of increase was less than the increase over the last couple of years. This can be explained by the drop in cure rate in four provinces: Limpopo (-10.5%), Mpumalanga (-3.5%), Northern Cape (-2.9%) and Western Cape (-0.9%). In contrast, KwaZulu-Natal and Gauteng continue to improve their cure rate and are on track to achieve the WHO target of 85%. In 2013, Gauteng had a cure rate of 84.2%, increased from 83.0% in 2012. In a similar vein, KwaZulu-Natal reported a cure rate of 82.8% in 2013, up from 79.6% in 2012. It is very encouraging that the Eastern Cape made great strides in one year, improving its cure rate from 65.8% in 2012 to 70.5% in 2013.

Figure 8: TB cure rate (new pulmonary smear-positive) by province, 2013



^m South African National Department of Health. National Tuberculosis Management Guidelines 2014, TB DOTS Strategy Coordination. Pretoria: NDOH; 2014.

Seventeen districts did remarkably well, reporting cure rates of over 80% in 2013. Eight of these districts are in KwaZulu-Natal, five in Gauteng Province, two in the Free State and two in the Western Cape (Figure 9). Furthermore, uThungulu, iLembe and uMzinyathi (KZN), Overberg (WC), and Ekurhuleni (GP) achieved the WHO target of 85%. uMkhanyakude (KZN) made remarkable strides over four years, working its way up from being the worst-performing district in the country in 2009, with a cure rate of 49.6%, to a cure rate of 80.9% in 2013. Map 3 illustrates the cure rate across the sub-districts; it is encouraging to see that some sub-districts in the North West (Kagisano, Molopo), Limpopo (Molemole, Marulang) and Free State (Mohokare, Mantsopa) reported cure rates of over 85%. The success of these sub-districts in districts and provinces that are not performing well needs to be encouraged and analysed and the reasons for their success shared with other areas in their provinces.

Of the five worst-performing districts, three are located in Limpopo, namely Vhembe, Sekhukhune and Waterberg. In Vhembe the cure rate plummeted from 77.5% in 2012 to 47.9% in 2013, in Sekhukhune from 73.2% to 58.8%, and in Waterberg from 68.8% to 64.9%. This warrants further investigation, with steps taken to address the reasons.

Map 3: TB cure rate (new pulmonary smear-positive) by sub-district, 2013

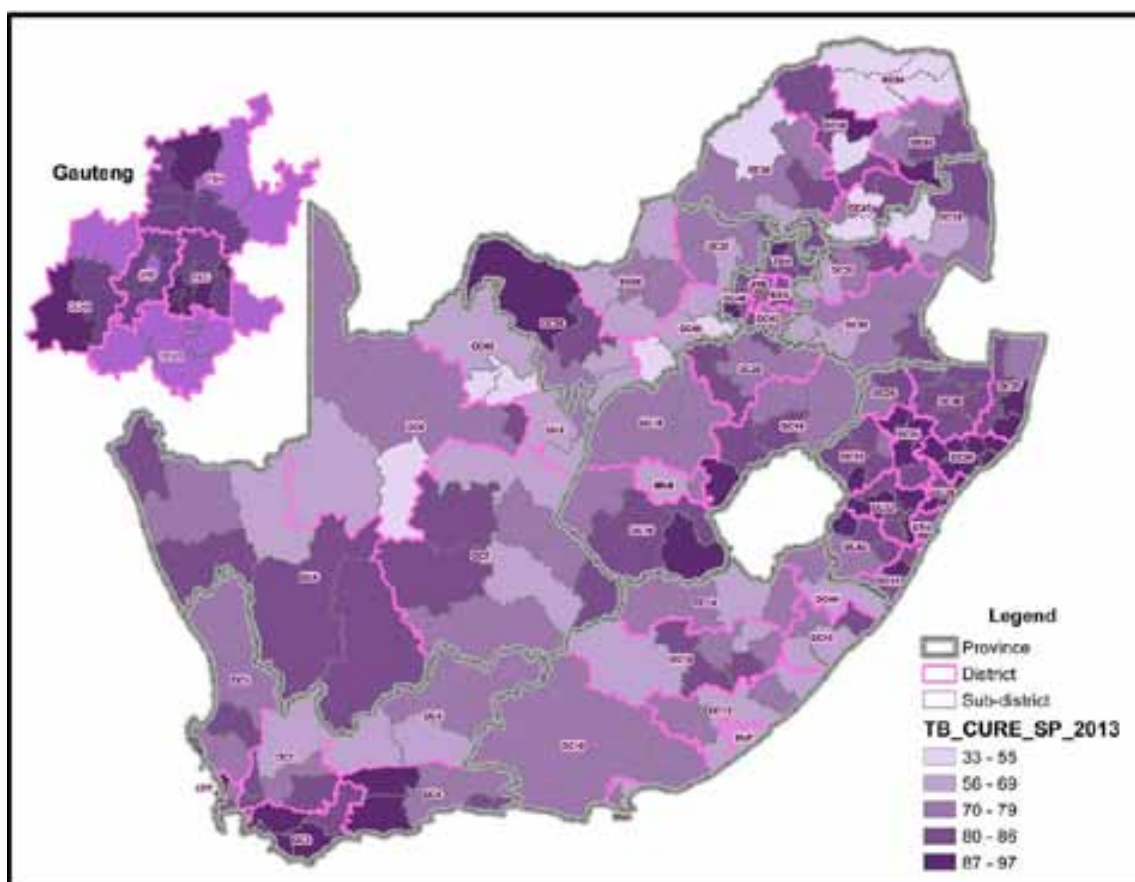
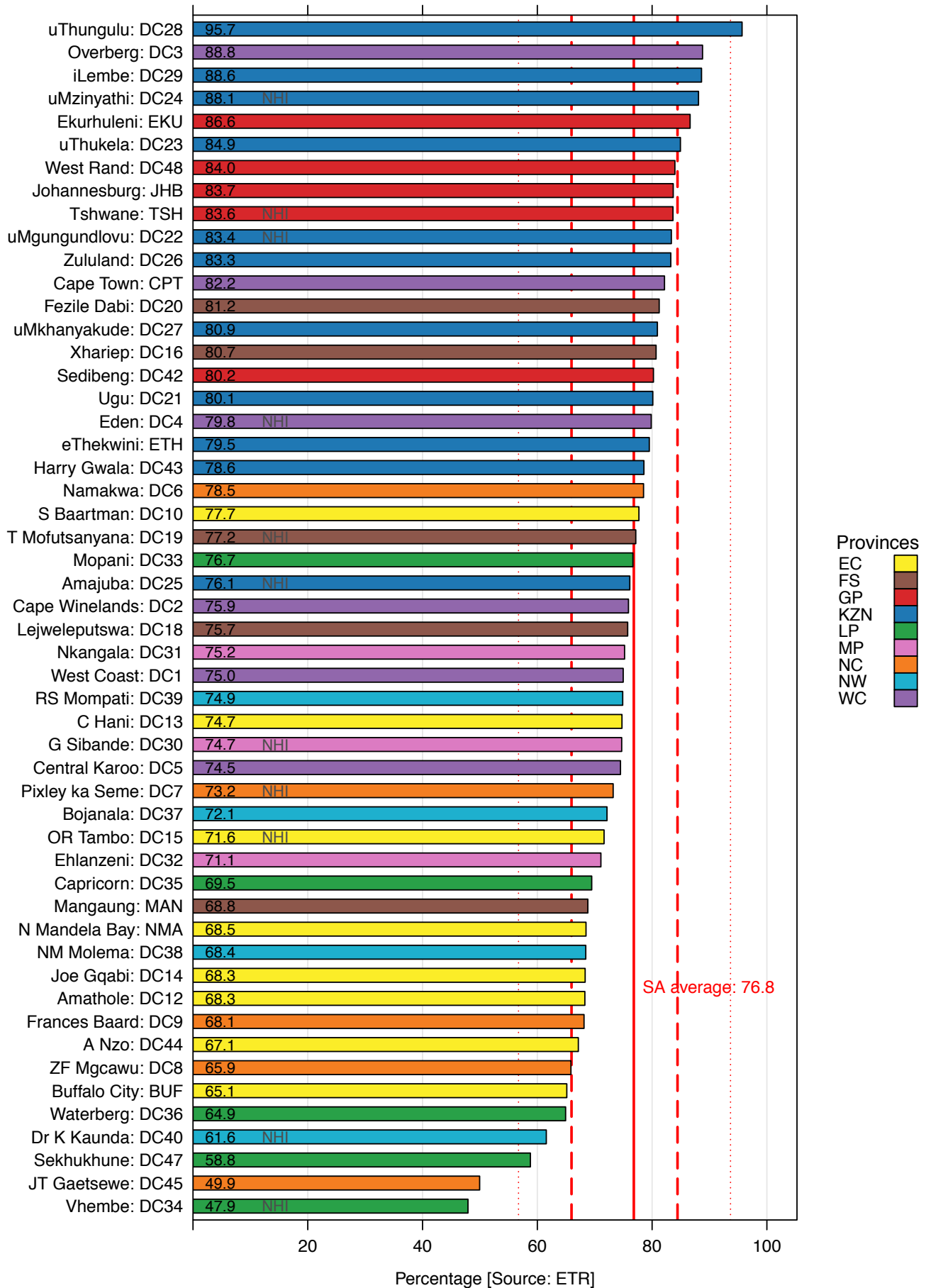


Figure 9: TB cure rate (new pulmonary smear-positive) by district, 2013

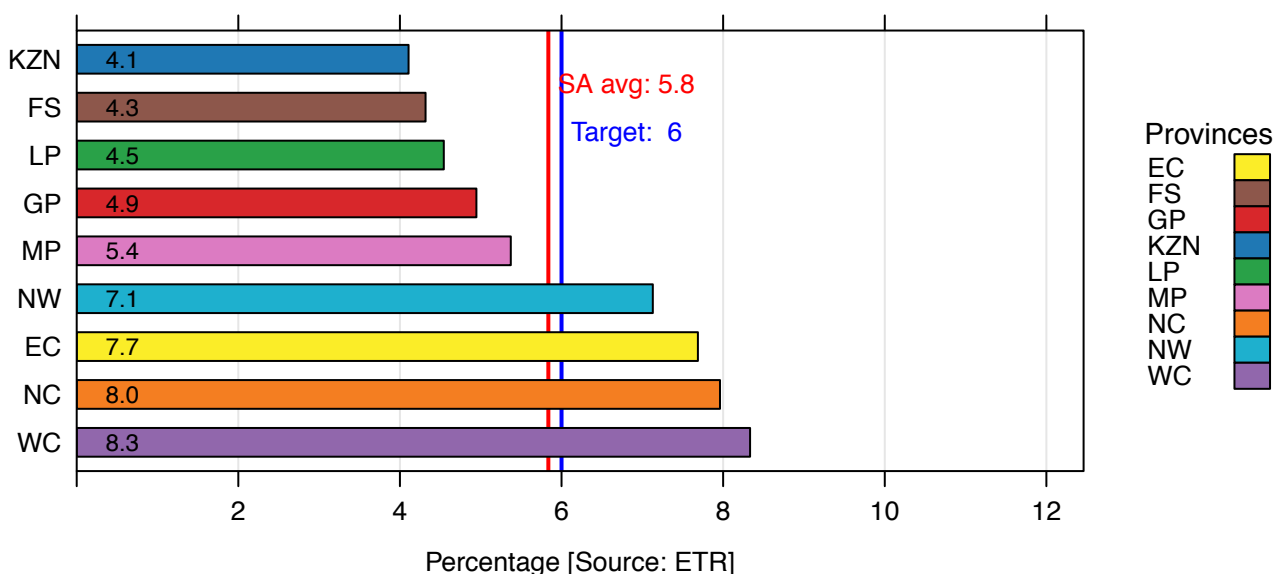


9.4 TB loss to follow-up rate (new pulmonary smear-positive)

The loss to follow-up rate (previously known as defaulter rate) indicator monitors the percentage of new smear-positive TB patients that have interrupted their treatment,^m and indicates why cure and treatment success are not increasing. The national loss to follow-up rate reached the national target of 6% for the first time, and in 2013 was 5.8%, a decrease from 6.2% in 2012.

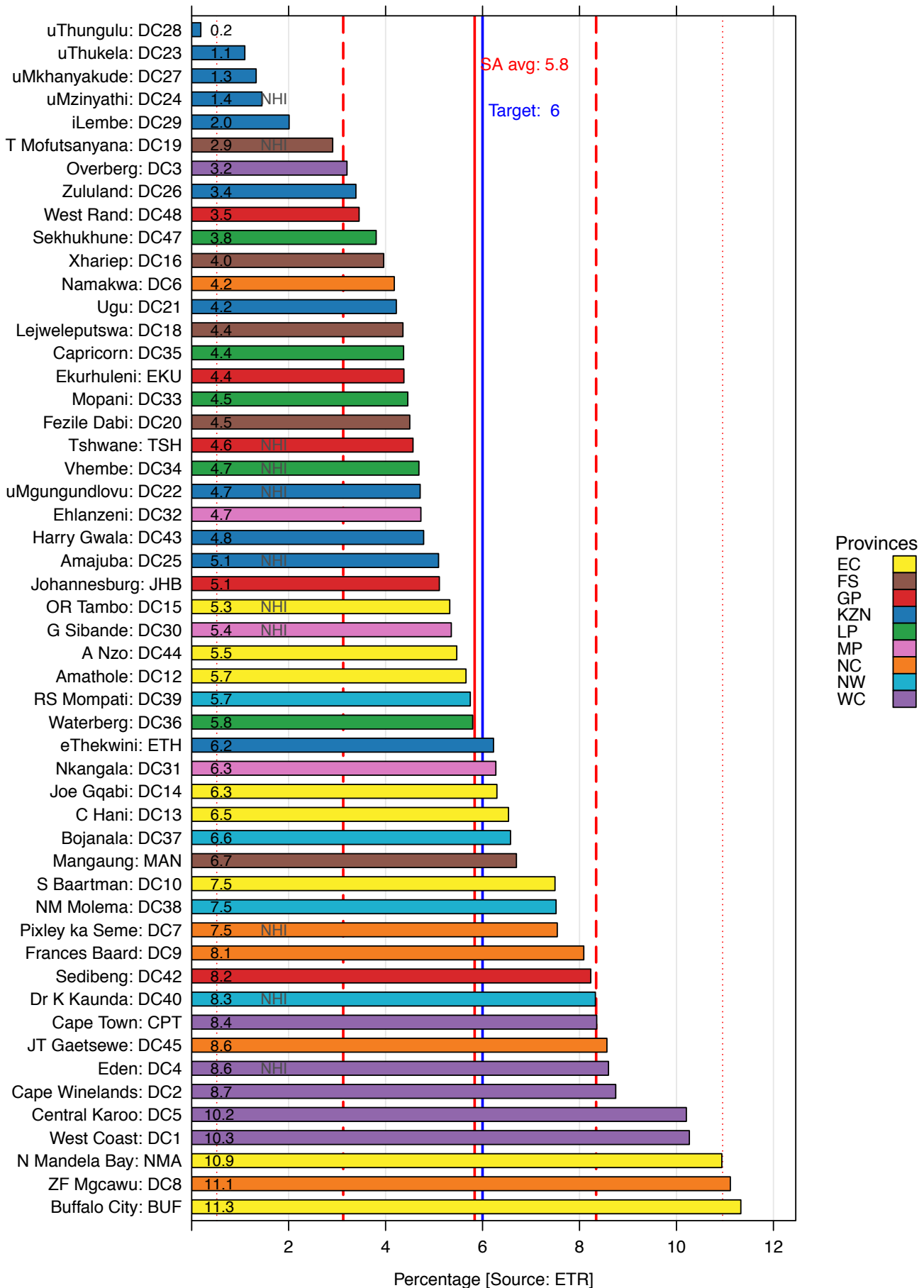
At provincial level, the loss to follow-up rate decreased in seven of the nine provinces (Figure 10). The most notable decreases reported were in KwaZulu-Natal (from 4.9% in 2012 to 4.1% in 2013), the Free State (from 5.6% in 2012 to 4.3% in 2013), and the Eastern Cape (from 8.5% in 2012 to 7.7% in 2013). The Western Cape and Northern Cape continue to struggle with high proportions of loss to follow-up cases, and in 2013 the loss to follow-up rate in both provinces increased. In the Western Cape the loss to follow-up rate increased from 7.9% in 2012 to 8.3% in 2013 and in the Northern Cape from 7.0% in 2012 to 8.0% in 2013.

Figure 10: TB loss to follow-up (new pulmonary smear-positive) by province, 2013

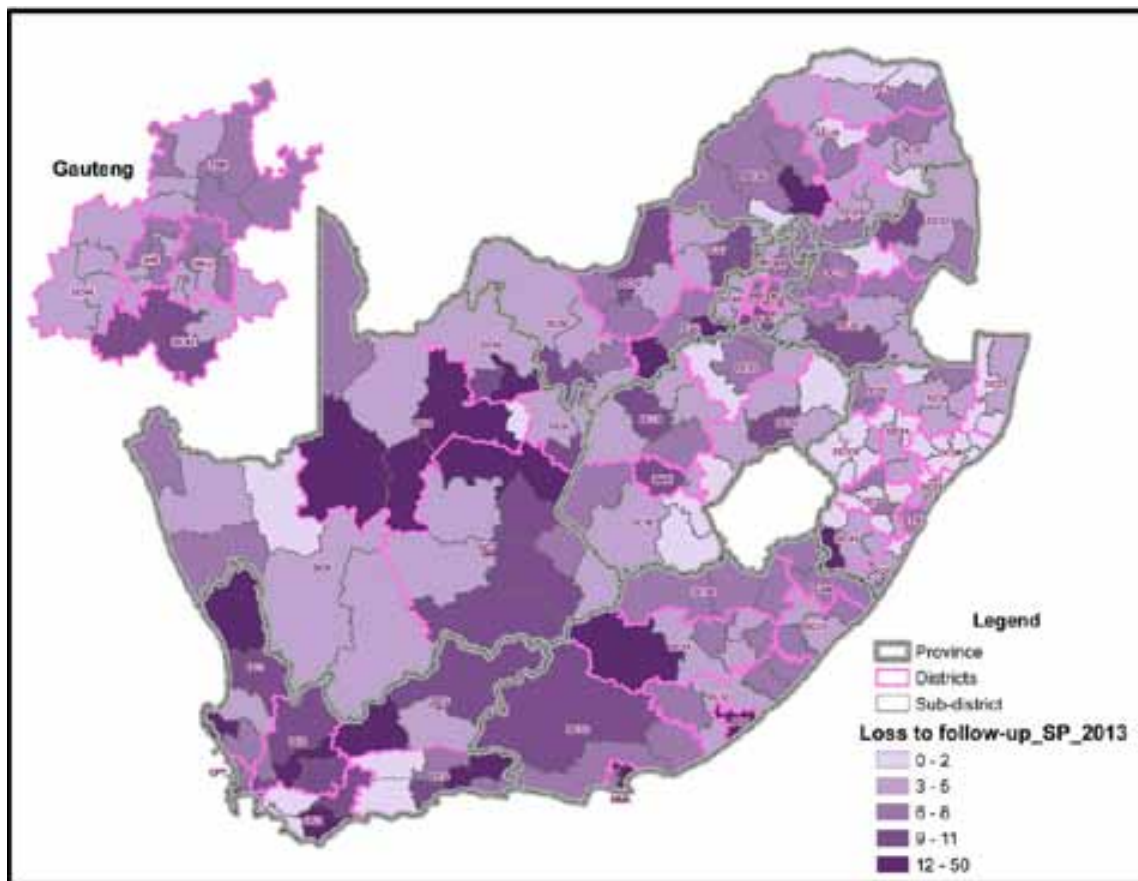


When looking at loss to follow-up rates across districts, the five best-performing districts are all located in KwaZulu-Natal: uThungulu (0.2%), uThukela (1.1%), uMkhanyakude (1.3%), uMzinyathi (1.4%), and iLembe (2.0%) (Figure 11 and Map 4). Four of the seven districts with the highest loss to follow-up rates are in the Western Cape: West Coast (10.3%), Central Karoo (10.2%), Cape Winelands (8.7%) and Eden (8.6%). The three districts with the highest loss to follow-up rates are Buffalo City (EC) (11.3%), ZF Mgcau (NC) (11.1%), and Nelson Mandela Bay (EC) (10.9%). Buffalo City and Nelson Mandela Bay have been struggling with a high proportion of loss to follow-up cases for several years and their rates are still among the highest in the country. However, it is encouraging that in 2013 the loss to follow-up rates in both these districts improved marginally.

Figure 11: TB loss to follow-up rate (new pulmonary smear-positive) by district, 2013



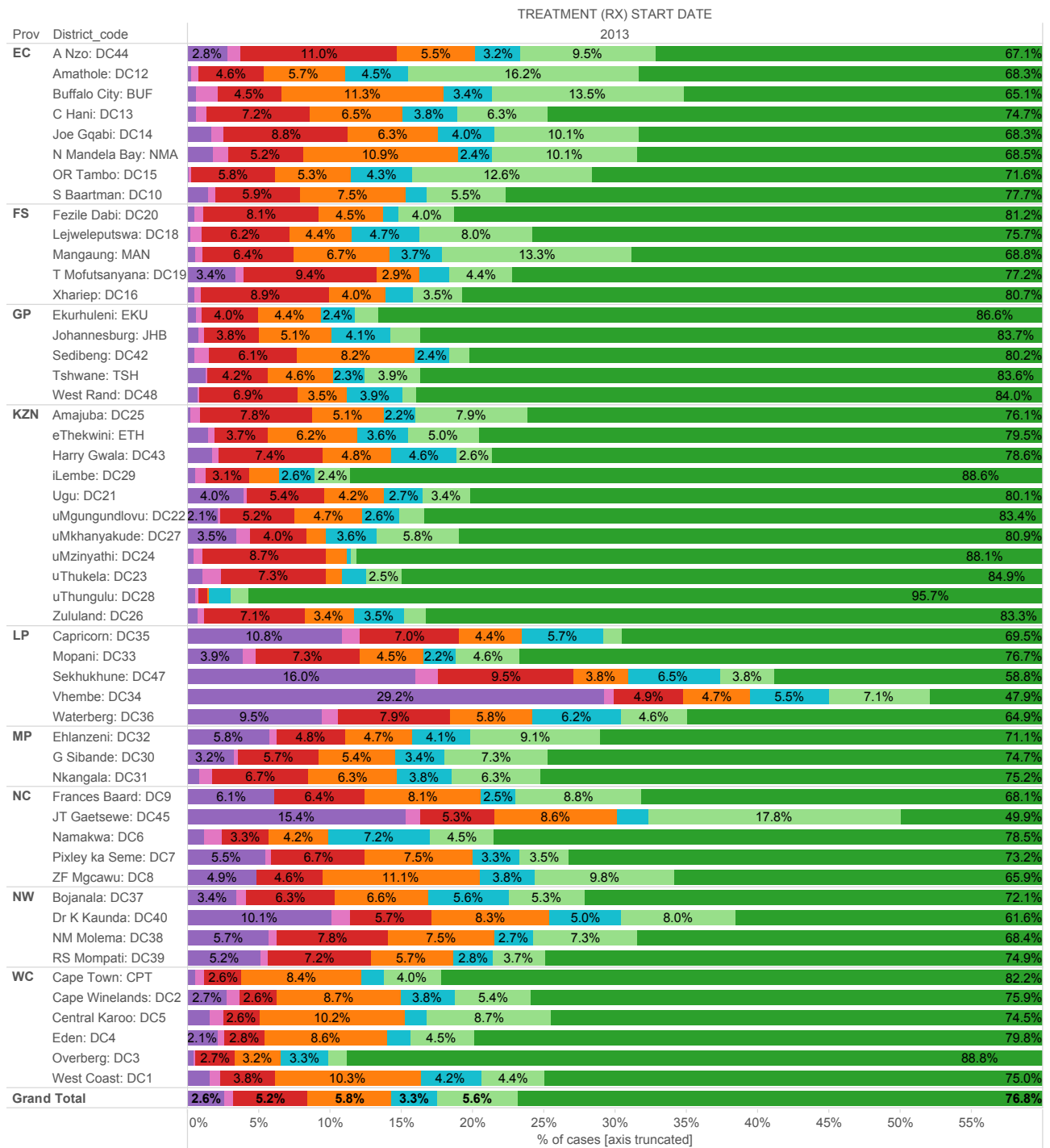
Map 4: TB loss to follow-up rate (new pulmonary smear-positive) by sub-district, 2013



Although there has been a decrease in loss to follow-up rates across the country, there has been an increase in not-evaluated rates from less than 1% in 2012 to 3.8% in 2013, a category that may 'hide' treatment loss to follow-up cases (Figure 12). Of particular concern are the high rates of cases not evaluated in Limpopo, North West, and the Northern Cape. The highest not-evaluated rates were reported in Limpopo: Vhembe had a record high of 35.8%, Sekhukhune 18.4%, Capricorn 15.4%, and Waterberg 11.5%. In the Northern Cape, John Taolo Gaetsewe also reported a very high not-evaluated rate (18.9%). In the North West province two districts reported not-evaluated rates over 10%, namely Bojanala (10.2%) and RS Mompoti (11.0%).

Section A: Tuberculosis

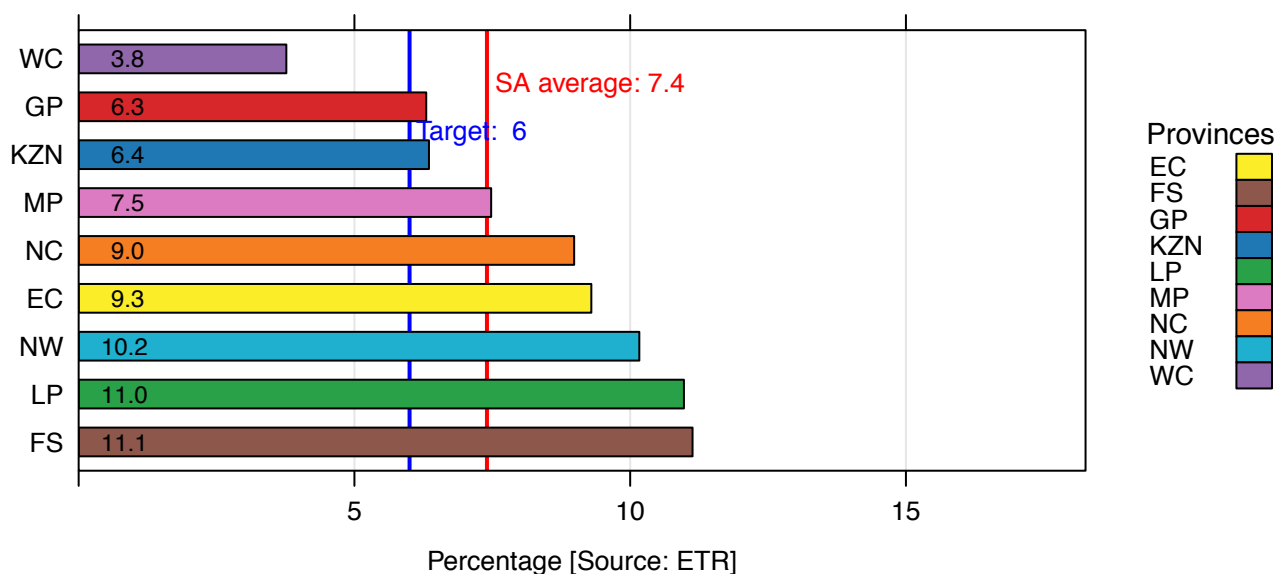
Figure 12: Treatment outcomes new smear-positive TB, 2013



9.5 TB death rate (all TB)

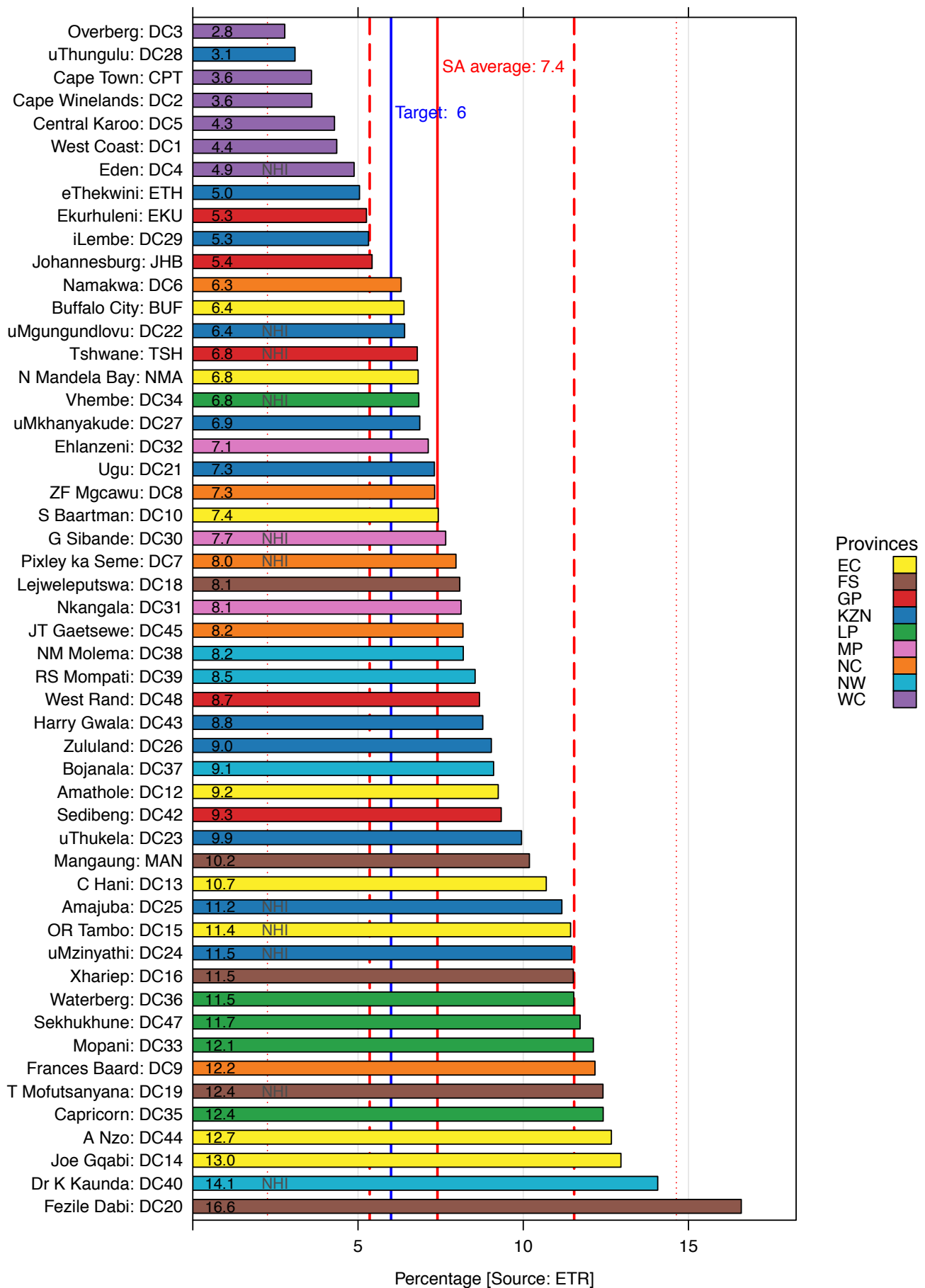
As TB has been a leading cause of premature mortality in South Africa for a number of years,^c this year we report the proportion of patients who died while on TB treatment. In 2013 an average of 7.4% of the patients who started TB treatment died during the course of their treatment. The death rate varied across the provinces, from a high of 11.1% in the Free State to a low of 3.8% in the Western Cape. Given the high HIV co-infection rate in KZN and the contribution of HIV and TB to premature deaths in the province, it is somewhat surprising that the death rate in KZN is only 6.4%, but this may be because many patients in KZN are diagnosed with DR-TB and do not form part of the cohort reported here (Figure 13).

Figure 13: TB death rate (all TB) by province, 2013



Across the districts during 2013, the proportion of patients who died while on TB treatment varied, from a low of 2.8% in Overberg (WC) to a high of 16.6% in Fezile Dabi (FS). It is concerning that the proportion of deaths is still so high in most of the NHI districts, with five NHI districts reporting death rates over 10% (Figures 14 and 15, and Map 5)

Figure 14: TB death rate by district, 2013



Map 5: TB death rate (all TB) by sub-district, 2013

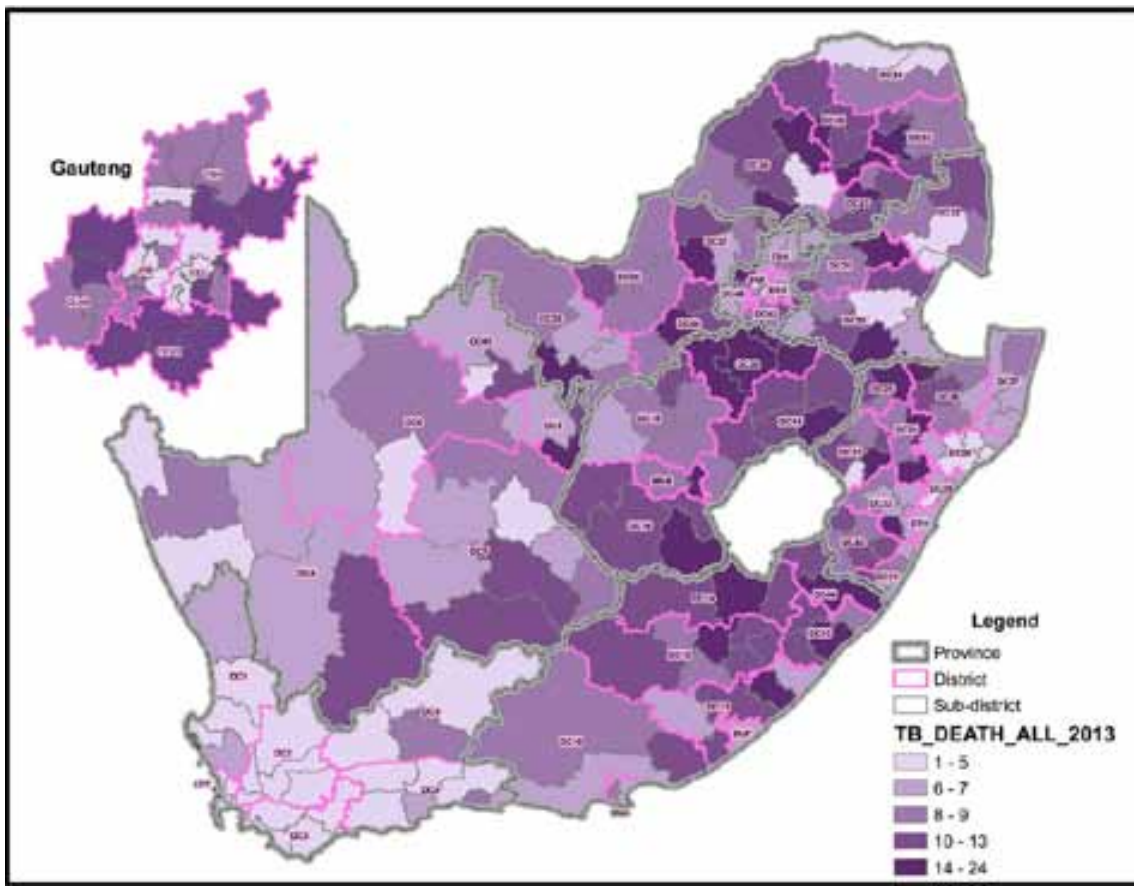
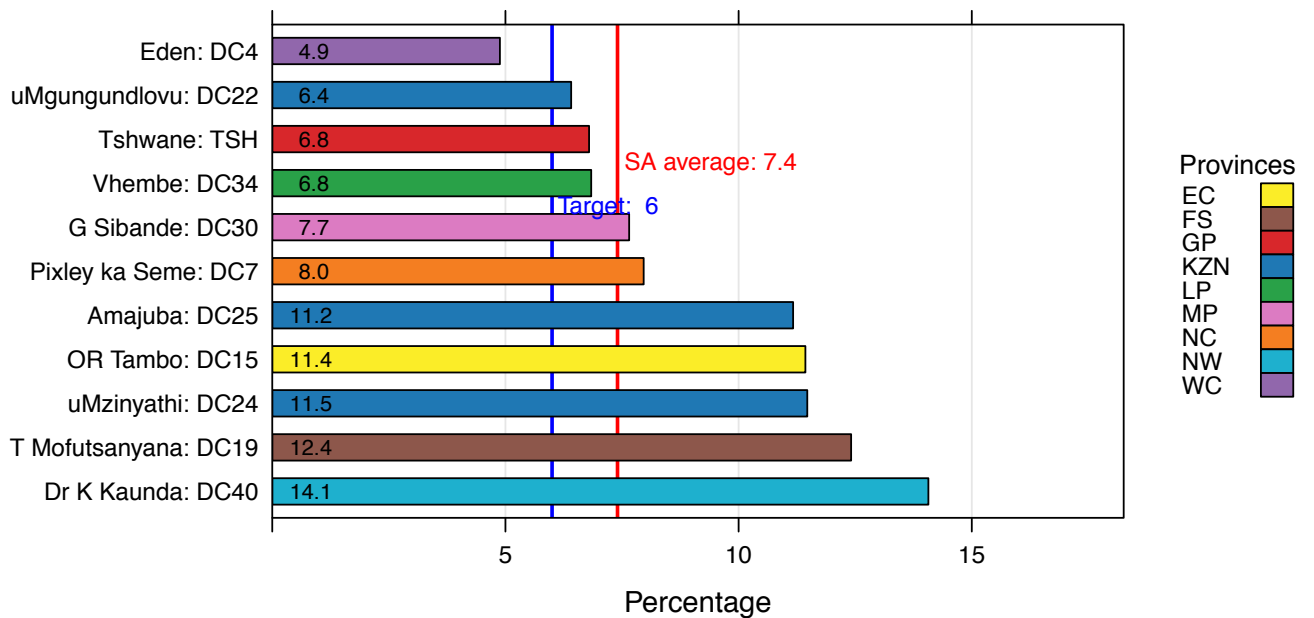


Figure 15: TB death rate (all TB) by NHI districts, 2013



9.6 TB Rifampicin resistance confirmed client rate

In 2011, GeneXpert diagnostic machines were introduced across South Africa; these machines can detect both TB and rifampicin resistance in just 2 hours. The rifampicin resistance confirmed client rate was reported for the first time in the 2013/14 District Health Barometer. This indicator measures the proportion of TB suspects detected to have rifampicin resistance.

There are still some problems with the data received from the National Health Laboratory Services (NHLS), as many health facilities were incorrectly aligned with districts. For the purposes of this analysis, therefore, facility-level data were matched where possible with the latest District Health Information Software (DHIS) list of facilities and recoded to the DHIS districts where possible. Where there was insufficient evidence to confirm changes in districts, the given NHLS district was retained.

The overall number of GeneXpert tests being done annually appears to have stabilised; in 2014/15 the figure was just over 2 million. Of the TB-positive tests diagnosed using GeneXpert in 2013/14, 11.3% were reported as positive for TB, and of these, 6.6% were reported as rifampicin resistant. In 2014/15, 10.6% of the GeneXpert TB-positive tests done were reported as MTB-positive and of these, 6.4% were reported as rifampicin resistant.

Map 6 and Figure 16 illustrate the proportion of TB cases identified using the GeneXpert diagnostic tool that were detected to have rifampicin resistance by district. Both the map and figure illustrate clearly that KwaZulu-Natal is the DR-TB hotspot in the country, with all districts in the province reporting proportions of rifampicin resistance above the national average. uMkhanyakude (KZN) and Zululand (KZN) report the highest proportions in the country, at 13.2% and 12.0% respectively. Rates vary across the country, and in contrast to KZN, three Western Cape districts, Eden, Overberg and Central Karoo, reported proportions under 3%.

Until 2008 all patients with DR-TB in South Africa were initially hospitalised in a specialised, centralised DR-TB unit in each province. In 2008, KZN started to introduce new models of care for DR-TB in an attempt to treat the increasing numbers of DR-TB patients, reduce the waiting time to treatment initiation, and improve treatment outcomes. Presently there is national decentralisation of DR-TB services and every district and sub-district will be expected to manage patients with DR-TB. For effective district management of DR-TB, district managers and their teams require data on the number of patients with DR-TB in their districts, the proportion of these patients started on treatment, and their treatment outcomes. With data issues at the NHLS and web-based DR-TB platform being addressed, we hope in future to be able to report on and compare DR-TB treatment management and outcome indicators across districts.

Map 6: TB Rifampicin resistance confirmed client rate by district, 2014/15

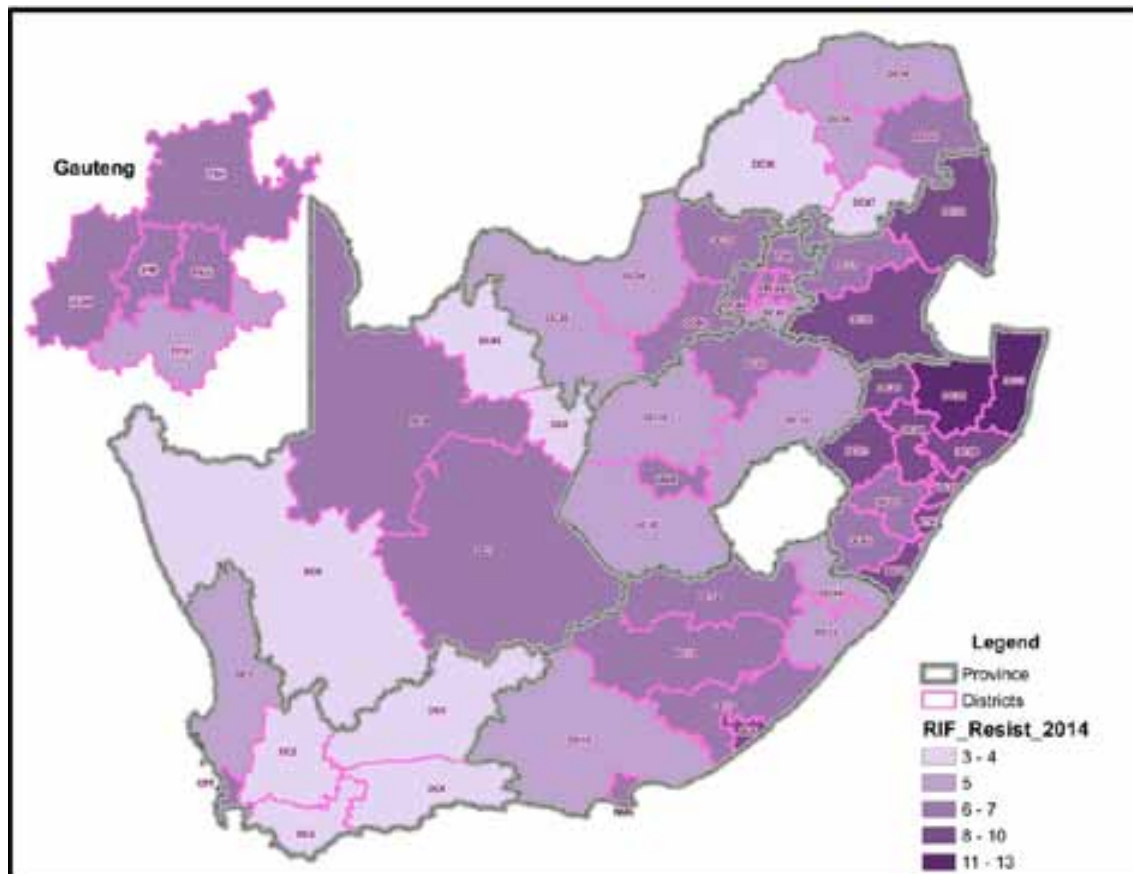
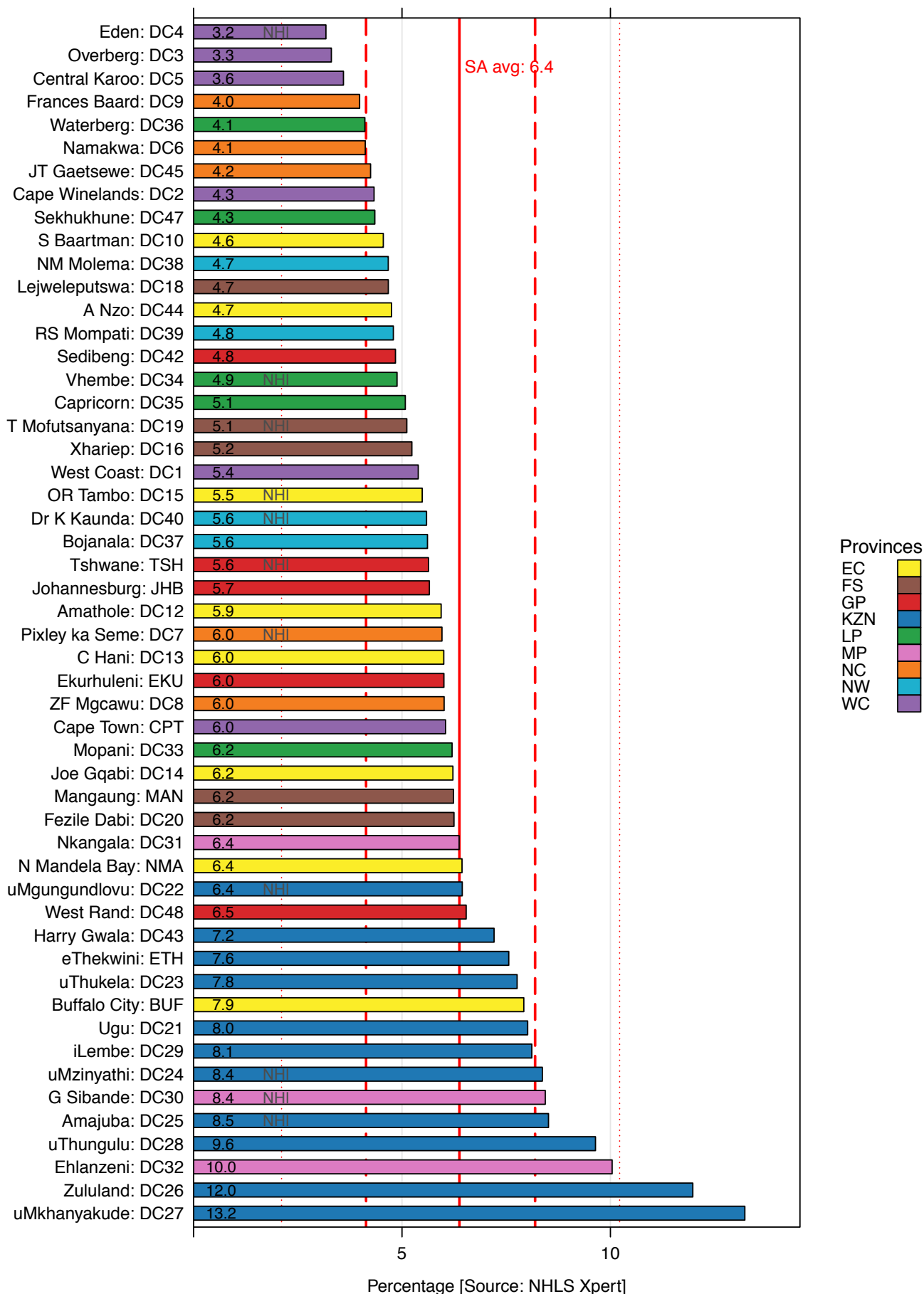


Figure 16: TB Rifampicin resistance confirmed client rate by district, 2014/15



Conclusion and recommendations

A number of districts have been implementing the TB programme well and achieving good results. However, several districts have under-performed for a number of years and continue to do so. These districts have been a factor in South Africa's failure to achieve the MDG 6 targets for TB. For the country to rise to the challenge of the growing DR-TB burden and meet the End TB Strategy and 90-90-90 targets for TB, the performance of every health worker, health manager and district needs to improve. The first step towards achieving these targets is to minimise the number of patients not evaluated.