

5 PMTCT Indicators

Linda Mureithi

The success in scale-up of South Africa's prevention of mother-to-child transmission (PMTCT) programme has been widely documented.^{a,b} This has been achieved through progressive policy changes that have aimed to bring about widespread system transformation to improve the access and quality of PMTCT services in order to decrease mother-to-child transmission (MTCT), and ultimately progress towards eliminating new HIV infections. To this end, South Africa (SA) has committed to the global pledge of ending the AIDS epidemic through the 90-90-90 Strategy.^c This strategy aims to ensure that: 90% of all people living with HIV will know their status, 90% of all those diagnosed with HIV infection will receive sustained antiretroviral therapy (ART), and 90% of all people receiving ART will have viral suppression by 2020. The National Consolidated Guidelines for PMTCT and the Management of HIV in Children, Adolescents and Adults,^d which were released in April 2015, outline a consolidated integrated approach to HIV prevention, treatment and care across all age groups and populations that will help guide the health system towards these targets. Key changes in the guidelines include adoption of the World Health Organization's option B+ approach, which now makes all HIV-positive pregnant and breastfeeding women eligible for lifelong ART irrespective of CD4 count or clinical staging. In addition, a new algorithm for early infant diagnosis (EID) has been introduced with a view to optimising infant diagnosis and reducing mortality.

This chapter presents the core national indicators used to assess the progress and performance of key services in the PMTCT programme. Data are primarily from the District Health Information Software (DHIS).

5.1 Antenatal 1st visit before 20 weeks rate

Early registration for antenatal care is an important entry point into the health system for pregnant women, allowing them to access healthcare services (and health information), including PMTCT services. Furthermore, it has been shown that early booking is associated with being on ART at time of delivery. This in turn reduces the risk of vertical transmission of HIV.^e

This indicator shows the percentage of pregnant women who have their first antenatal visit before 20 weeks, out of all antenatal clients' first visits (those whose first visit was before and after 20 weeks).

The 2014/15 national average for this indicator was 53.9%, 11.1 percentage points below the national target of 65%. Overall, the indicator continued to show the steady increase that has occurred each year since 2008/09. There was a 3.9 percentage point improvement from 2013/14. Six out of nine provinces had rates above the national average, namely: Western Cape (WC), Free State (FS), Northern Cape (NC), KwaZulu-Natal (KZN), Mpumalanga (MP) and North West (NW) (see Figure 1). Mpumalanga, Eastern Cape (EC), Gauteng (GP) and Limpopo (LP) all showed an improvement of more than 10 percentage points from the previous year. However, only the Western Cape achieved the target rate.

a Sherman GG, Lilian RR, Bhardwaj S, Candy S, Barron P. Laboratory information system data demonstrate successful implementation of the prevention of mother-to-child transmission programme in South Africa. *S Afr Med J*. 2014;104(3 Suppl 1):235-8.

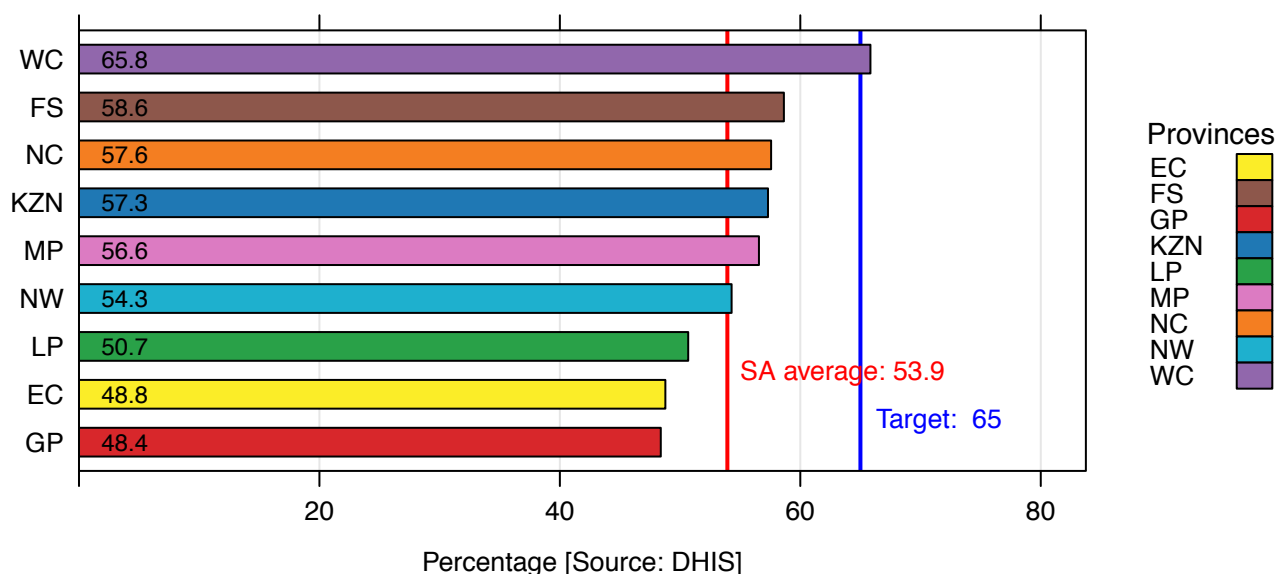
b Goga A, Dinh T, Jackson D. Evaluation of the effectiveness of the National Prevention of Mother-to-Child Transmission (PMTCT) Programme measured at six weeks postpartum in South Africa, 2010. South African Medical Research Council, National Department of Health of South Africa and PEPFAR/US Centers for Disease Control and Prevention; 2012.

c Joint United Nations Programme on HIV/AIDS (UNAIDS). 90-90-90: An ambitious treatment target to help end the AIDS epidemic. Geneva: UNAIDS; October 2014.

d National Department of Health. National Consolidated Guidelines for the Prevention of Mother-to-child Transmission of HIV (PMTCT) and the Management of HIV in Children, Adolescents and Adults. Pretoria: NDoH; April 2015.

e National Department of Health. National Consolidated Guidelines for the Prevention of Mother-to-child Transmission of HIV (PMTCT) and the Management of HIV in Children, Adolescents and Adults. Pretoria: NDoH; April 2015.

Figure 1: Antenatal 1st visit before 20 weeks rate by province, 2014/15



The antenatal first visit before 20 weeks rate ranged from 37.5% in Alfred Nzo (EC) to 76.1% in Eden district (WC). Only seven out of 52 districts achieved the target rate of 65%, namely five of the six districts in the Western Cape, plus Namakwa (NC) and Xhariep (FS). Less than one-third of all districts (15 out of 52) had rates below the national average. Of these, four were in Limpopo Province and the Eastern Cape each, and three in Gauteng (Figure 2 and Map 1).

Four districts showed a decline in the rate from the previous year, with Amajuba (KZN) and uMkhanyakude (KZN) displaying the highest percentage differences at 11.2% and 3.1% respectively. Three districts in the Eastern Cape, namely OR Tambo, Buffalo City and Amathole, reported increases of 21.6%, 20.7% and 17.6% respectively, and Ehlanzeni (MP) reported an increase of 19.5%. These were the four highest improvements among all 52 districts.

Map 1: Antenatal 1st visit before 20 weeks rate by sub-district, 2014/15

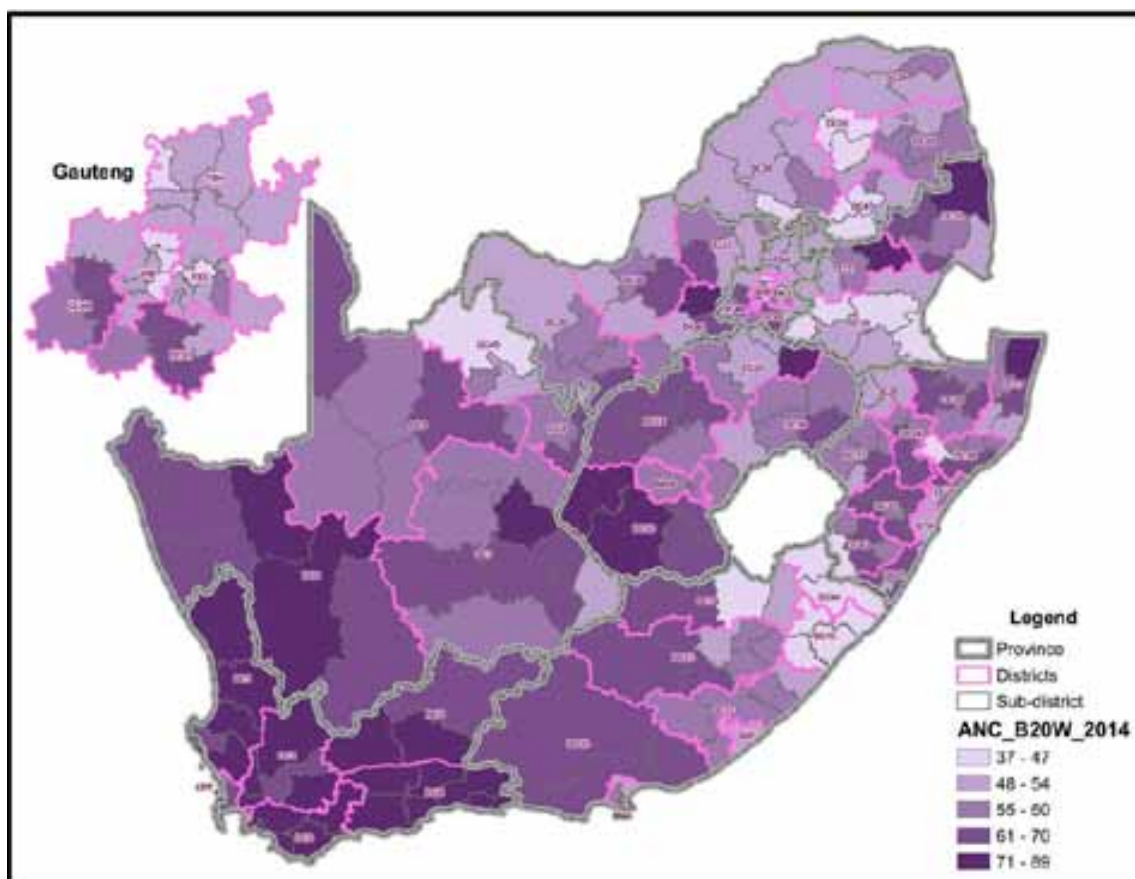
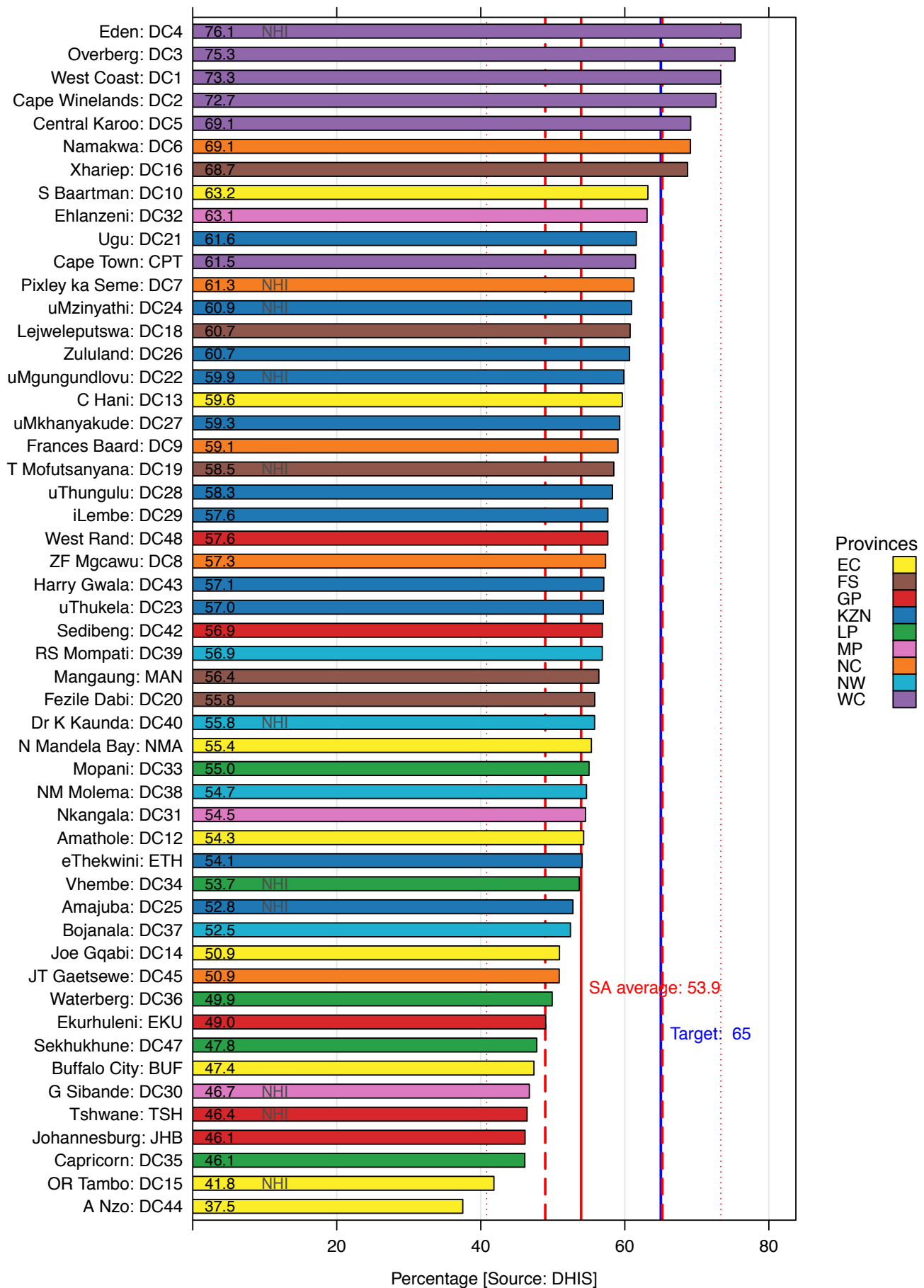
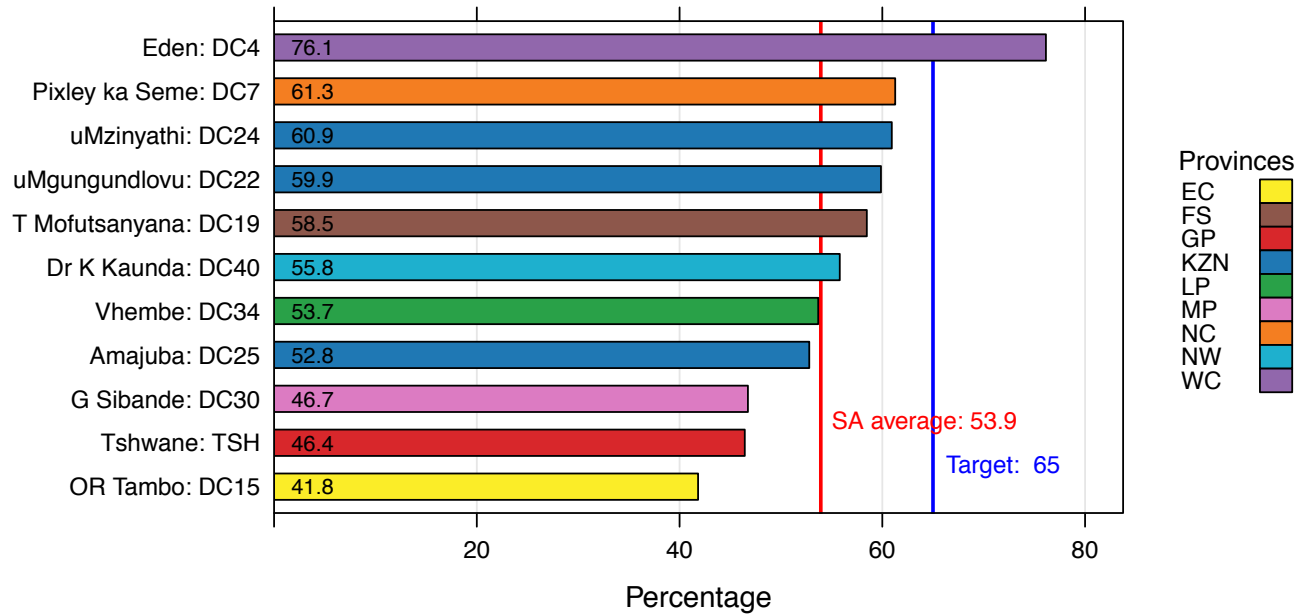


Figure 2: Antenatal 1st visit before 20 weeks rate by district, 2014/15



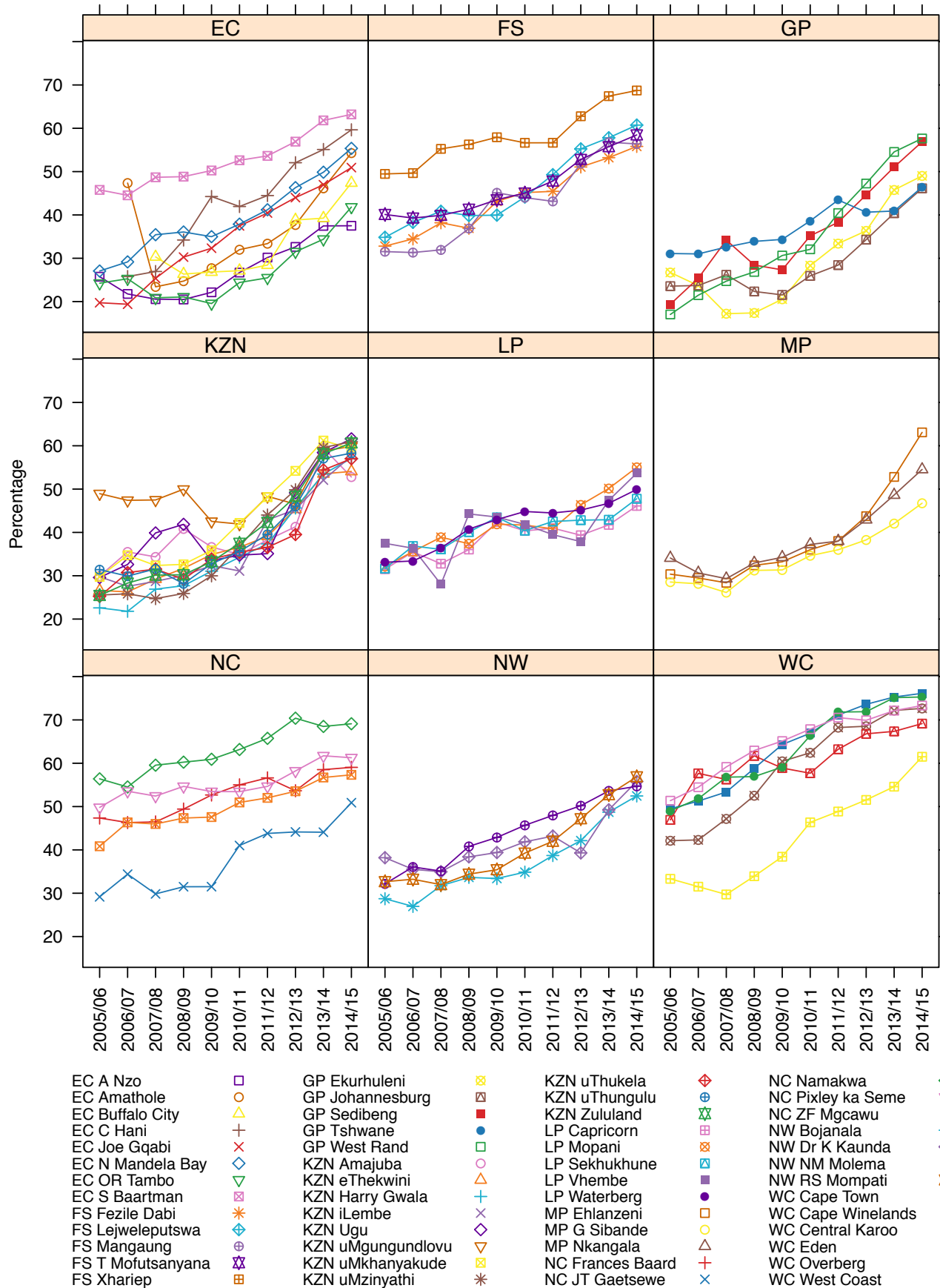
Among the National Health Insurance (NHI) districts (Figure 3), only Eden reached the national target. Five out of the 11 NHI districts are below the national average, namely Vhembe (LP), Amajuba (KZN), Gert Sibande (MP), Tshwane (GP) and OR Tambo (EC). However, with the exception of Amajuba (KZN) and Pixley ka Seme (NC) districts, which showed percentage difference declines of 11.2% and 0.7% respectively, all these districts reported an increase in this indicator.

Figure 3: Antenatal 1st visit before 20 weeks rate by NHI district, 2014/15



There was not much inter-district variation in annual trends for KwaZulu-Natal, Limpopo and North West (Figure 4).

Figure 4: Annual trends: Antenatal 1st visit before 20 weeks rate



Participants at district workshops on the findings of the DHB cited a number of issues as contributing to late antenatal first visits. Reasons were related to poor access, poor quality of care, data-quality issues, efficiency-related factors, lack of health promotion and education, staff shortages, cultural issues, and high teenage pregnancy rates, as described below:

- ◆ Poor access:
 - Services limited to certain days
 - Limited clinic hours
 - Limits placed on number of new antenatal care cases seen per day
- ◆ Poor quality of care:
 - Negative staff attitudes
 - Perceived poor quality of antenatal care
 - Data-quality issues, including hospitals not recording services provided
- ◆ Lack of efficiency:
 - Long waiting times
 - Non-functional or ineffective ward-based outreach teams
- ◆ Inadequate or inappropriate health education and promotion information
 - Patients sent home after confirmed pregnancy for later registration
 - Pregnant women not informed about MomConnect project
- ◆ Staff shortage
- ◆ Cultural issues
- ◆ High teenage pregnancy rates (teenagers tend to present to health facilities at a later stage of pregnancy)
- ◆ Use of over-the-counter pregnancy test (associated with late presentation for first antenatal visit)

These reasons speak to important health system barriers that prevent pregnant women from accessing antenatal care and PMTCT services offered. They represent missed opportunities for initiation of the PMTCT cascade of services and the ultimate goal of MTCT elimination.

5.2 Antenatal client initiated on ART rate

The National Antenatal Sentinel HIV and Syphilis Prevalence Survey results give HIV prevalence among antenatal clients. This annual survey aims to assess HIV sero-prevalence among first-visit antenatal clinic attendees in order to estimate prevalence in this sentinel group. It is thought that this subset of the population best represents the sexually active group in the general South African population.^f The survey has been conducted over the last two decades to assess trends in HIV prevalence over time. The national averages for the past 10 years, including the latest published result for the 2012 Antenatal Survey, have been steady at around 29.5%.^{f,g} These results indicate that around 30% of all pregnant women nationally need to be on ARTs. All HIV-positive pregnant women should be initiated on ART at the first antenatal visit if not already on ART.

The antenatal client initiated on ART rate indicator measures the percentage of antenatal clients initiated on ART out of all antenatal clients eligible for ART. Previously, accurate estimation of eligibility for ART (the denominator) was challenging due to unreliable DHIS data on CD4 count. However, with the implementation of the World Health Organization option B+ approach in January 2015, all HIV-positive pregnant women are now eligible for lifelong ART irrespective of CD4 count, simplifying future estimation of the denominator.

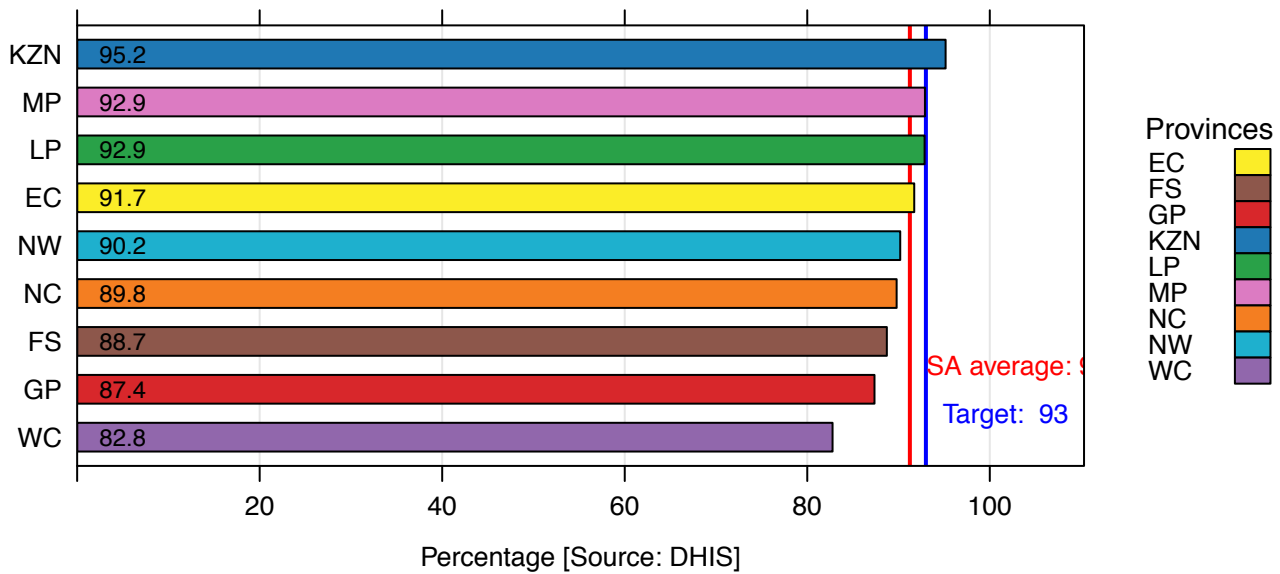
The SA average for antenatal client initiated on ART rate was 91.2%, against a national target of 93.0% for 2014/15. This was an improvement from 76.3% in 2013/14. This sharp increase could be partly attributed to an increase in the number of antenatal clients initiated on ART (numerator) as well as improved data quality.

Provincial rates ranged from 82.8% in the Western Cape to 95.2% in KwaZulu-Natal (Figure 5). Three out of nine provinces, namely KwaZulu-Natal, Mpumalanga and Limpopo, achieved the target rate of 93%. Furthermore, all provinces showed a notable increase in the rate compared with the previous year, with the biggest increase occurring in Gauteng (from 63.1% in 2013/14 to 87.4% in 2014/15).

^f National Department of Health. The 2011 National Antenatal Sentinel HIV and Syphilis Prevalence Survey in South Africa. Pretoria: NDoH; 2013

^g National Department of Health. The 2012 National Antenatal Sentinel HIV and Syphilis Prevalence Survey in South Africa. Pretoria: NDoH; 2014.

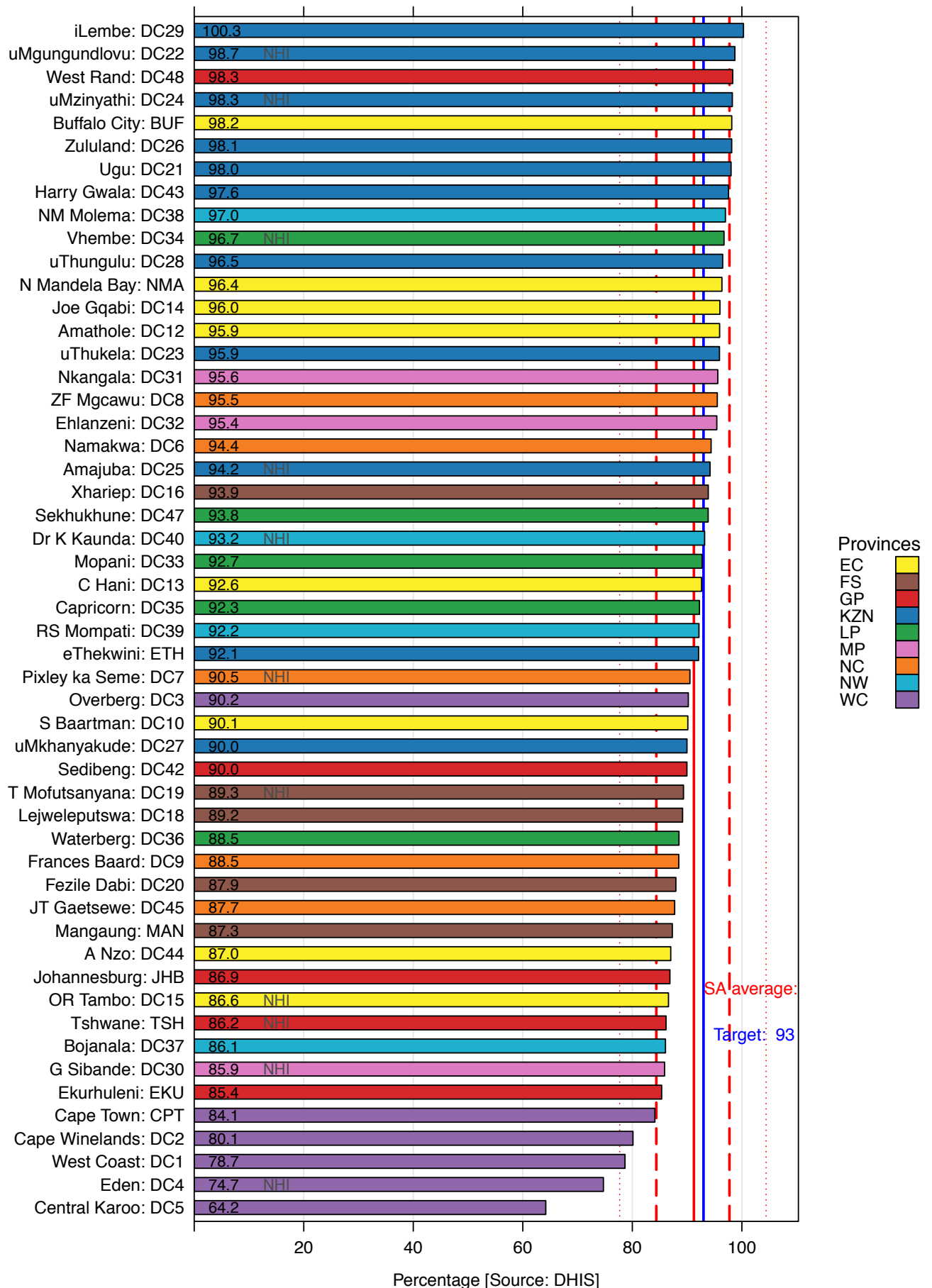
Figure 5: Antenatal client initiated on ART rate by province, 2014/15



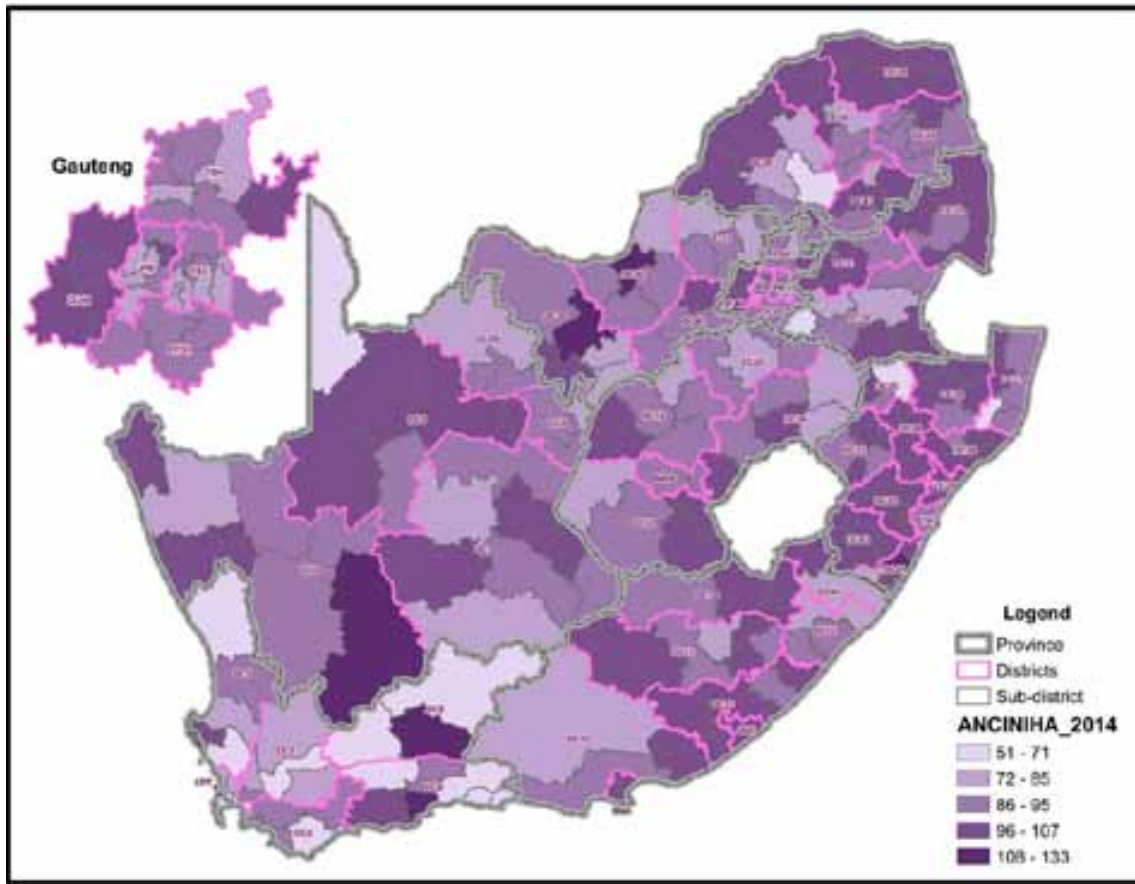
As shown in Figure 6 and Map 2, the district-level antenatal client initiated on ART rate ranged from 64.2% in the Central Karoo (WC) to 100.3% in iLembe (KZN). The rate of 100.3% suggests data-quality issues. Almost half the districts (23 of 52 districts), had rates above the national target, a notable improvement from 2013/14 when only nine districts achieved the target. All districts in KZN had rates above the national average. However, all districts in the Western Cape had rates below the national average. Of concern is the fact that Central Karoo (WC) showed a decrease of 35.8 percentage points over the last two years, from 100% in 2012/13 to 64.2% in 2014/15. This might be due to poor data quality. Five out of the 11 NHI districts achieved the national target; this included all three NHI districts in KZN, Vhembe (LP) and Dr K Kaunda (NW).

Participants at DHB district workshops cited data-quality issues and lack of data submission by regional and tertiary hospitals as factors affecting reported rates. Despite the fluctuation in this indicator over the past five years and concomitant difficulty interpreting trends, the overall improvement in performance is encouraging.

Figure 6: Antenatal client initiated on ART rate by district, 2014/15

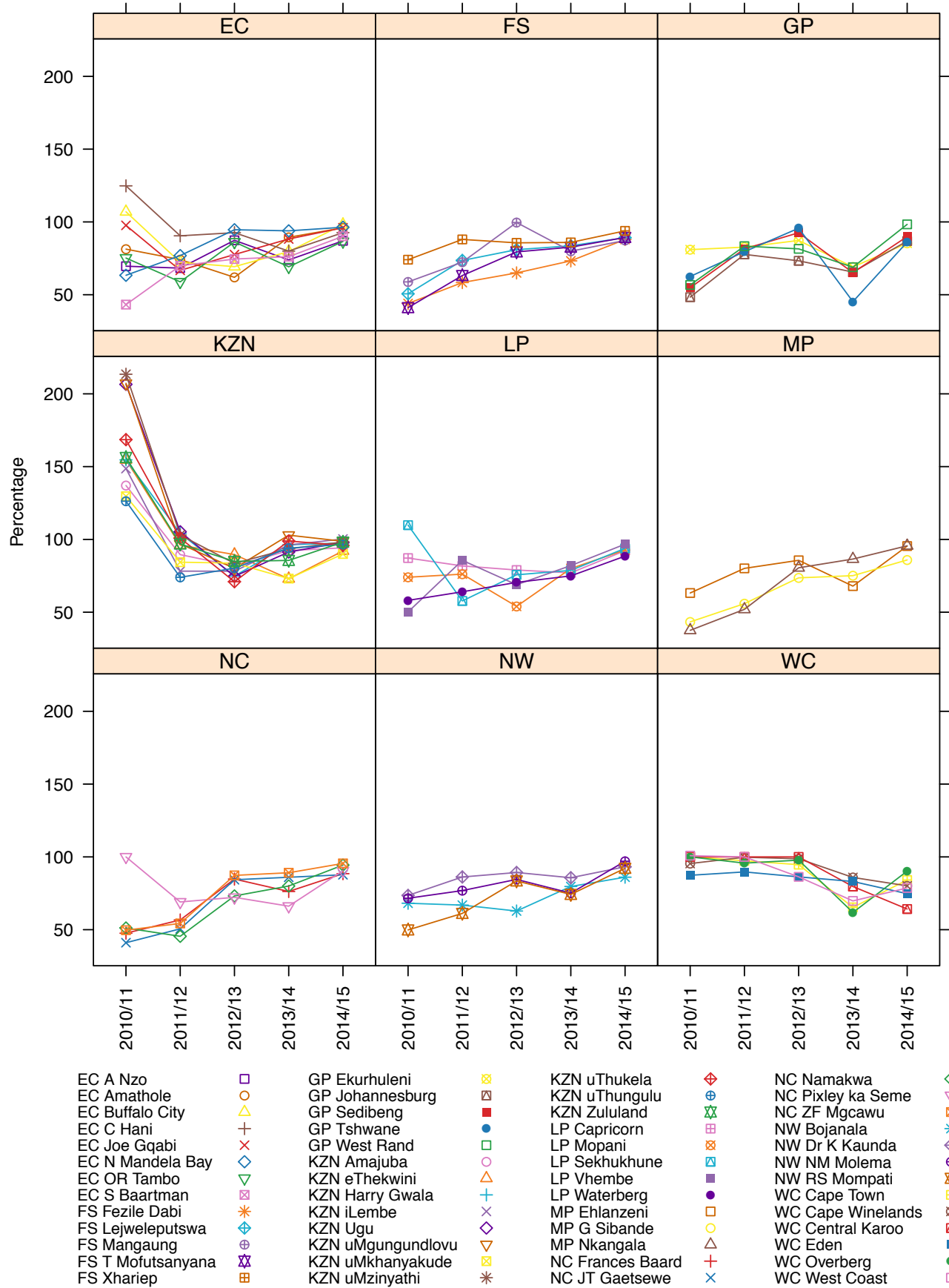


Map 2: Antenatal client initiated on ART rate by sub-district, 2014/15



There was not much inter-district variation in the annual trends for all provinces (Figure 7).

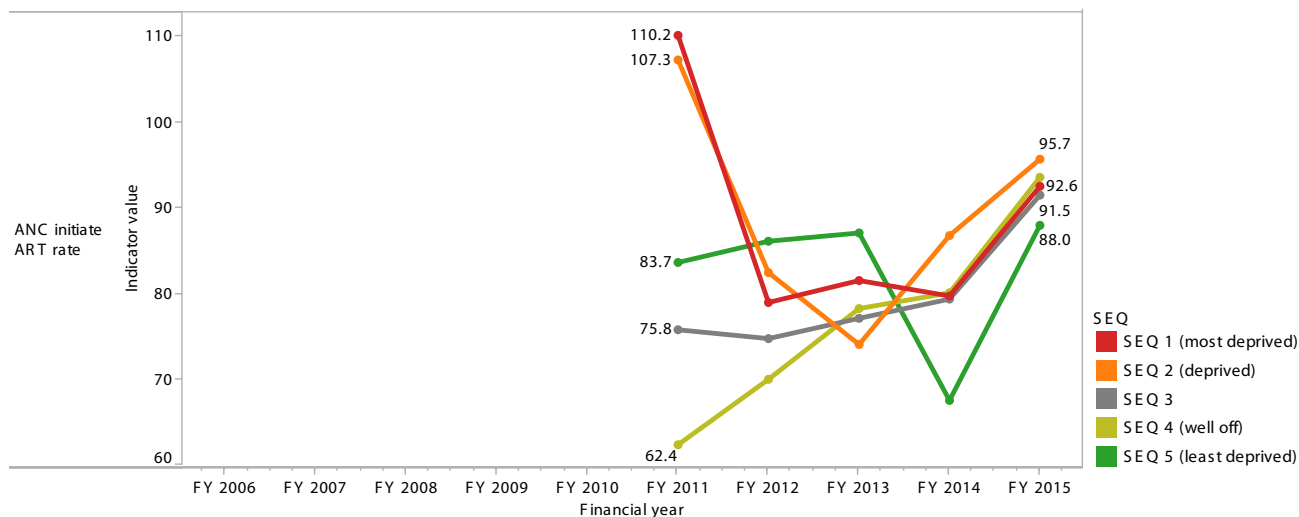
Figure 7: Annual trends: Antenatal client initiated on ART rate



Section A: PMTCT Indicators

Accurate interpretation of trends was difficult, especially given a series of changes in eligibility criteria. Nonetheless, the overall range in rates decreased over the last five years across all socio-economic quintiles (rates were notably wider in the lowest two socio-economic quintiles in 2010/11) (Figure 8). This may imply improved measurement of the indicator, and increasingly equitable access to ART.

Figure 8: Trends in average district values by SEQ for antenatal client initiated on ART rate

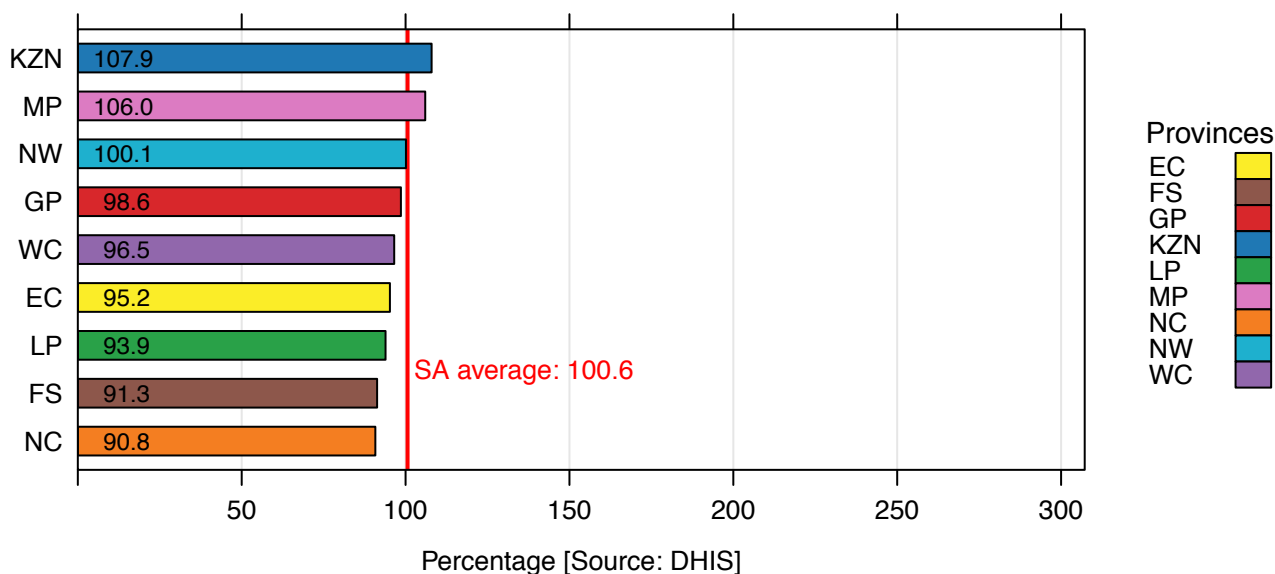


5.3 Infant 1st PCR test around 6 weeks uptake rate

This indicator measures the percentage of HIV-exposed infants who receive an early HIV test (around 6 weeks of age). It is calculated by dividing the number of polymerase chain reaction (PCR) tests performed in infants around 6 weeks (numerator) by live births to HIV-positive women (denominator). It can be used as a proxy for early infant diagnosis coverage. Different data sources can be used to calculate EID coverage.^a The EID coverage presented here is calculated using DHIS data. In previous years the DHB reported National Health Laboratory Service (NHLS) data; however, discrepancies between NHLS and DHIS values on this indicator have reduced over time.

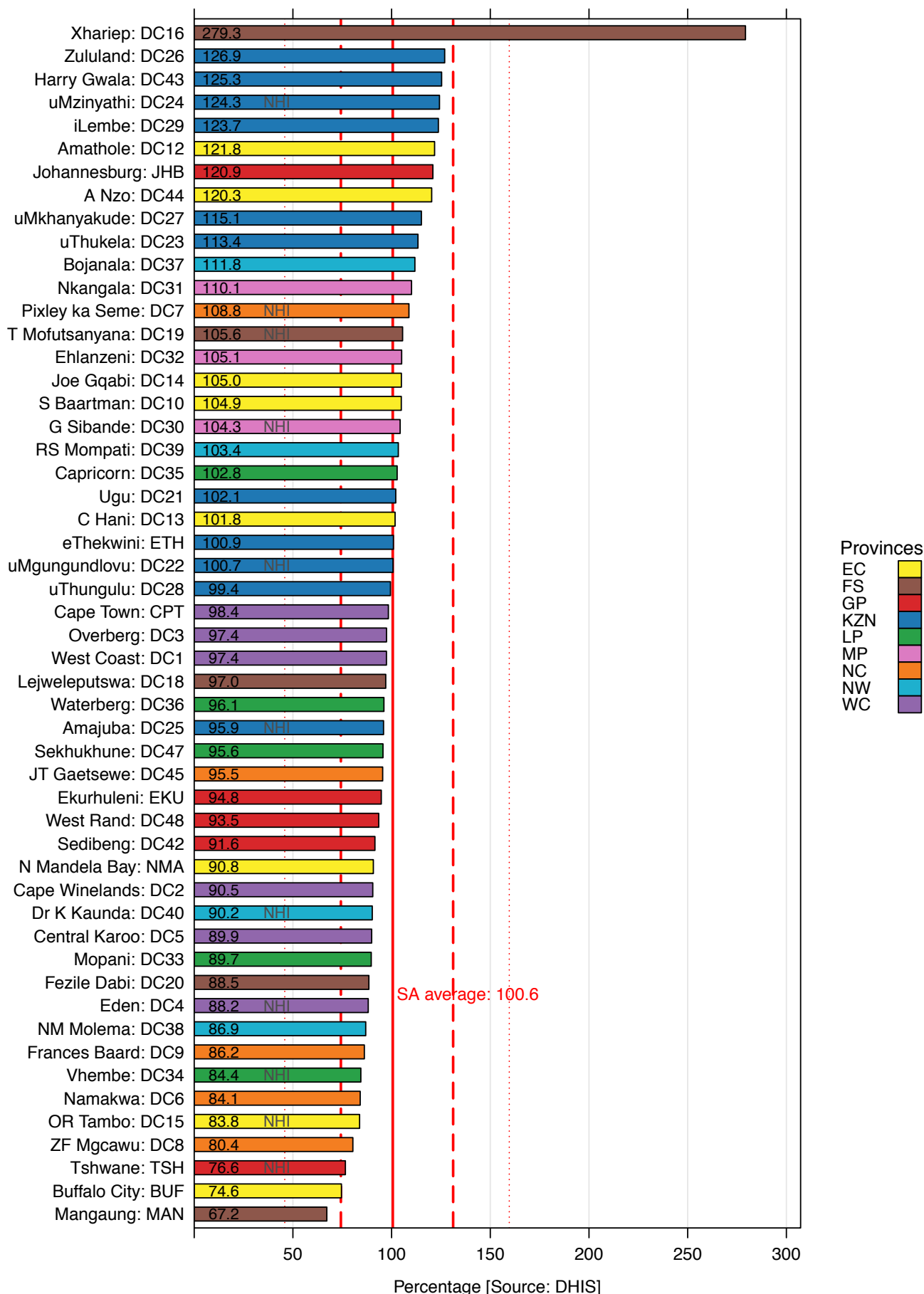
The national average for 2014/15 was reported as 100.6%. This may imply on-going issues with data quality, particularly underestimation of HIV-exposed live births in DHIS data. Provincial rates ranged from 90.8% in the Northern Cape to 107.9% in KwaZulu-Natal (Figure 9).

Figure 9: Infant 1st PCR test around 6 weeks uptake rate by province, 2014/15

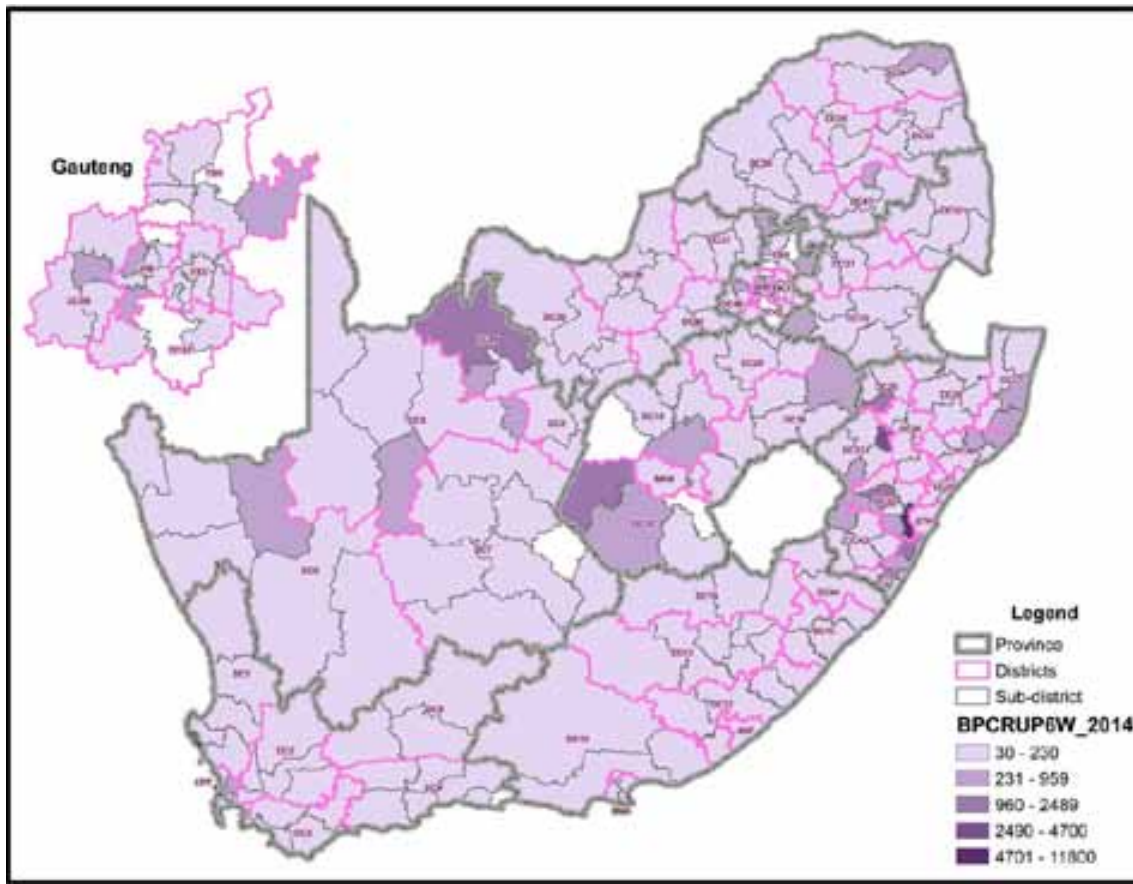


District rates ranged from 67.2% in Mangaung (FS) to 279.3% in Xhariep (FS), see Figure 10 and Map 3.

Figure 10: Infant 1st PCR test around 6 weeks uptake rate by district, 2014/15

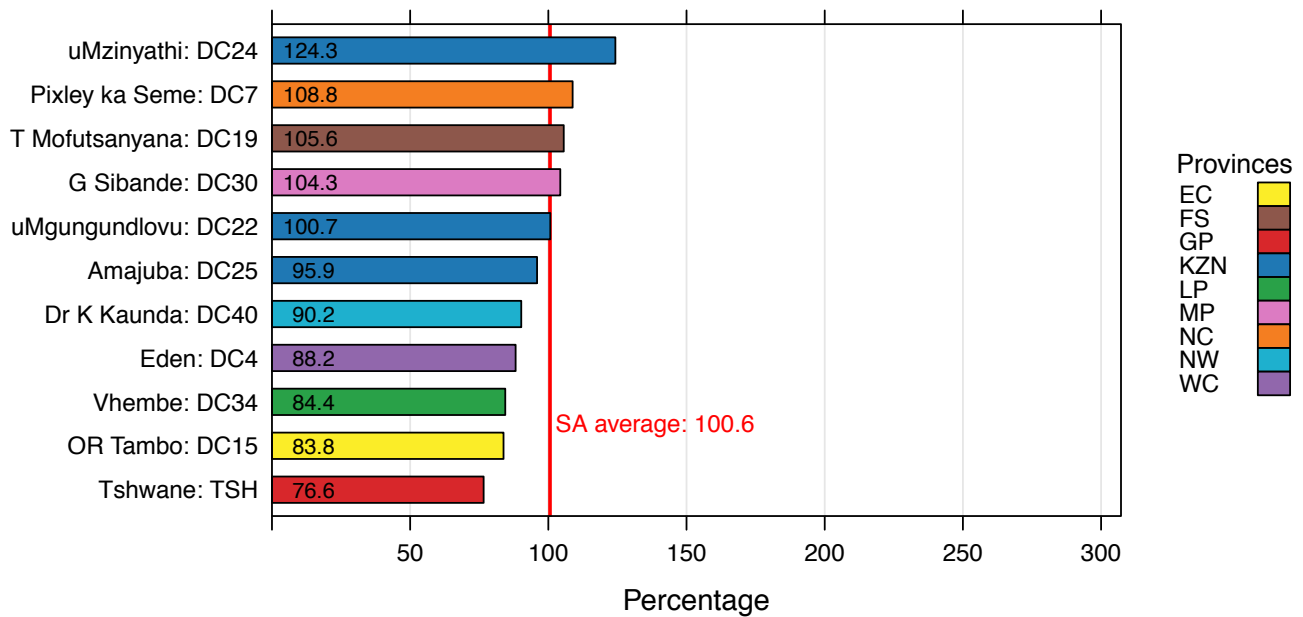


Map 3: Infant 1st PCR test around 6 weeks uptake rate by sub-district, 2014/15



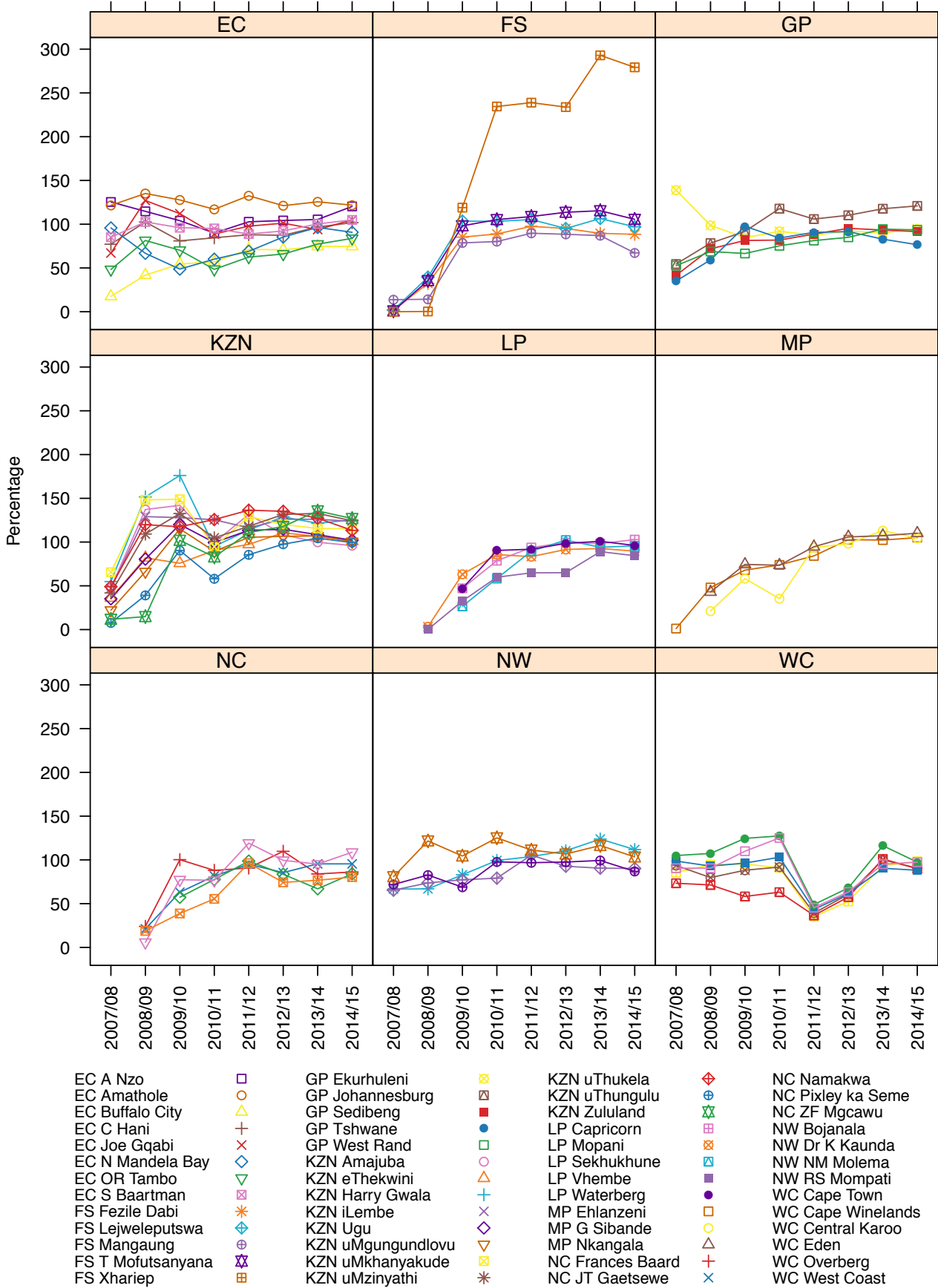
Of the NHI districts, rates varied from 76.6% in Tshwane (GP) to 124.3% in uMzinyathi (KZN) (Figure 11).

Figure 11: Infant 1st PCR test around 6 weeks uptake rate by NHI district, 2014/15



All the provinces, except Free State with Xhariep as outlier, have annual trends that do not exhibit much inter-district variation (Figure 12). Seventeen districts showed an increase compared with 2013/14, with Namakwa (NC) having a percentage point increase of 17.1 (from 67.1% in 2013/14 to 84.1% in 2014/15). Xhariep district in particular has persistently reported rates over 200% since 2010/11. The reason is because all complicated deliveries were referred to other districts and no Caesarean sections were performed in the district in 2014/15. However, the infants were then tested for HIV in the district. Almost half of all districts (24 out of 52) reported coverage rates over 100%. This suggests data errors due to either underestimation of HIV-exposed infants or over-reporting of PCR testing.

Figure 12: Annual trends: Infant 1st PCR test around 6 weeks uptake rate



Reasons reported by DHB workshop participants for poor uptake of first PCR test at six weeks refer to data-quality issues, human-resource issues, technical issues, and cultural issues. Data-quality issues include the fact that in some districts a high proportion of births are referrals from other districts. This may result in an underestimation of the denominator (live births to HIV-positive women) in one district relative to another. However, some districts report that in some instances delivering mothers remain in the district, meaning that PCR testing may also be done in the referral district, resulting in an overestimation of the numerator (number of PCR tests). Technical issues refer to poor technique on the part of healthcare workers when performing PCR tests, resulting in rejection of samples by the laboratory and the need for repeat testing. Unreliable courier services have also been cited as a system barrier. Cultural issues may refer to mothers only bringing their babies for their first visit after six weeks. Other barriers relate to infants cared for by the grandparents who are not aware of the need for PCR testing. Human-resource issues refer to high staff turnover, which leads to poor technique in inadequately trained replacement staff.

The revised algorithm for HIV testing in infants and children recommends that PCRs be conducted in all HIV-exposed neonates in order to identify intra-uterine infections, allow early initiation of ART, and reduce early infant mortality.^d A second PCR test is recommended at 10 weeks (in all HIV-exposed infants not already diagnosed) in order to identify intra-partum infections. These new guidelines will impact on future estimation of early infant diagnosis coverage and vertical HIV transmission (intra-uterine, intra-partum and postpartum). It is hoped that implementing PCR testing at birth will circumvent some of the health system barriers to accessing first PCR testing. However, some of the aforementioned technical, administrative and data-quality issues may persist if not addressed.

5.4 Infant 1st PCR test positive around 6 weeks rate

This indicator measures the percentage of early infant PCR tests that have a positive result; it is used as a proxy for early vertical (intra-uterine and intra-partum) transmission for those infants who access an early PCR test. The indicator can be calculated using either DHIS or NHLS data; however, the data reported here are primarily sourced from the DHIS. It is hoped that with the implementation of the new infant testing guidelines, intra-uterine transmission will be identified through birth PCR testing, with a subsequent 10-week PCR test used to identify intra-partum transmission.

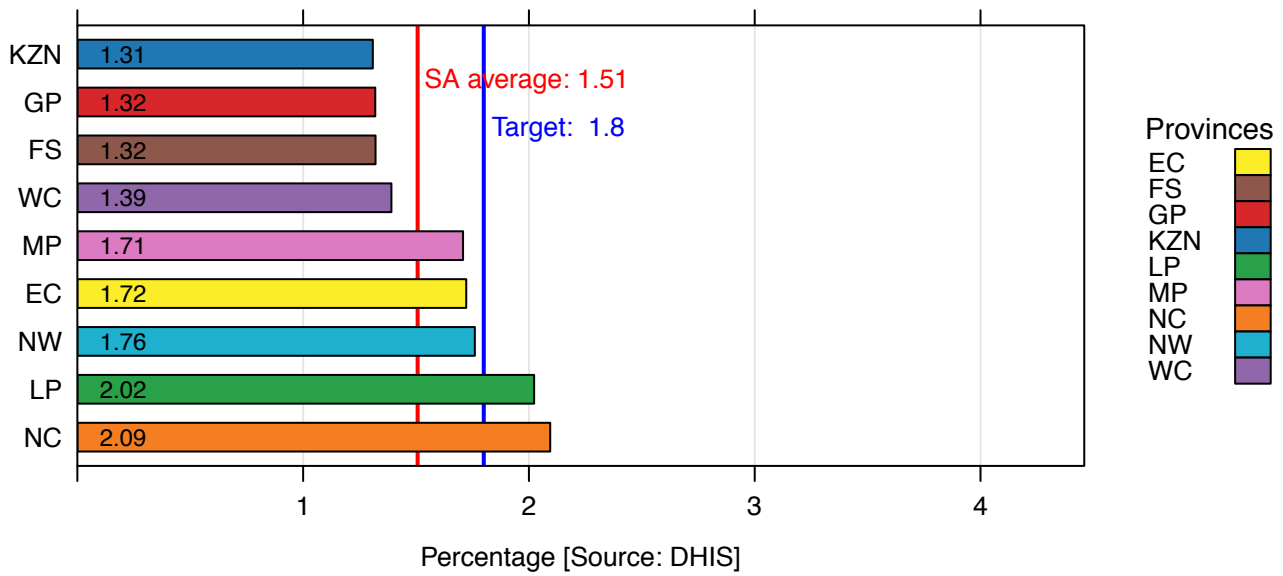
In 2014/15, the national infant 1st PCR test positive around 6 weeks rate was 1.5% and 0.5 percentage points lower than reported in the previous year (2.0%) (DHIS data). The target rate set by the National Department of Health (NDoH) is 1.8%. The provincial rate varied from 1.3% in KwaZulu-Natal to 2.1% in the Northern Cape (Figure 13). Only two provinces (Limpopo and Northern Cape) did not reach the target rate of 1.8%.

At district level, the infant first PCR test positivity rate ranged from 0.8% in uMgungundlovu (KZN) to 4.1% in Namakwa (NC). Almost two-thirds of all districts (33 out of 52) had rates below the target rate. Of these, only one province, Free State, had all districts that achieved this target (Figure 14 and Map 4).

Among the NHI districts, all but three achieved the target set. These districts were Tshwane (GP), Dr K Kaunda (NW) and Pixley ka Seme (NC) (see Figure 15). The MTCT rate decreased progressively over the last seven years, indicating a sustained improvement in the PMTCT programme and progress towards elimination of MTCT.

Nine districts had rate increases varying between 0.1 percentage points to 1.2. In Central Karoo (WC) the rate increased from 2.1% in 2013/14 to 3.4% in 2014/15, probably due to small numbers (Figure 16).

Figure 13: Infant 1st PCR test positive around 6 weeks rate by province, 2014/15



Map 4: Infant 1st PCR test positive around 6 weeks rate by sub-district, 2014/15

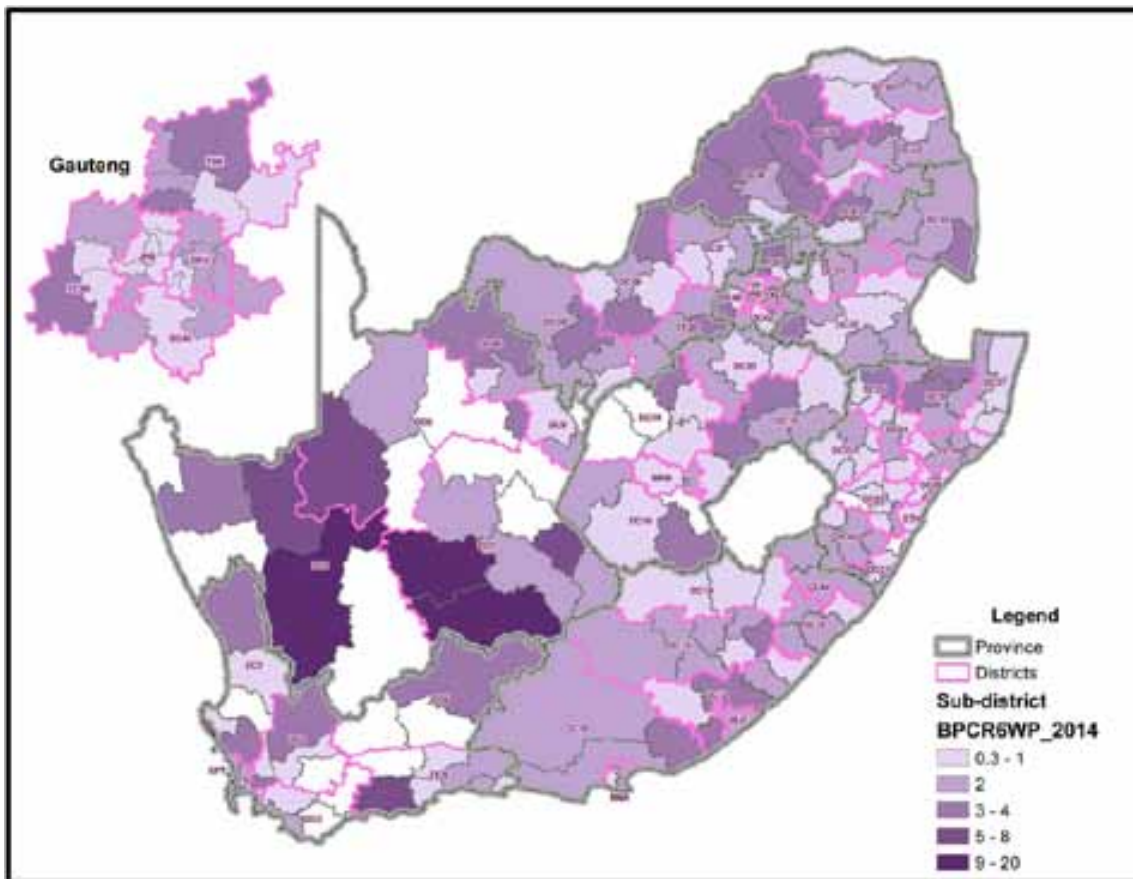


Figure 14: Infant 1st PCR test positive around 6 weeks rate by district, 2014/15

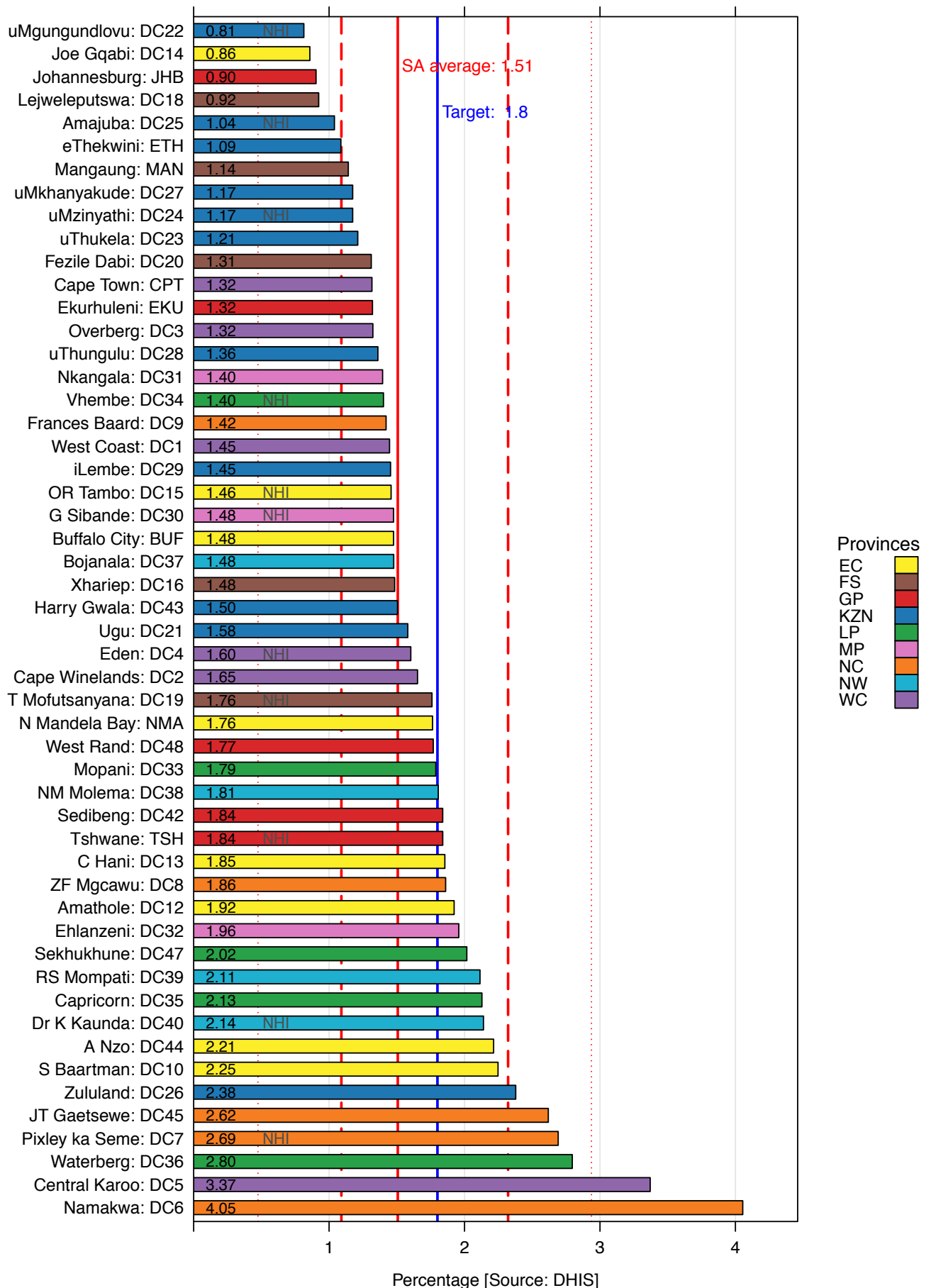


Figure 15: Infant 1st PCR test around 6 weeks uptake rate by NHI district, 2014/15

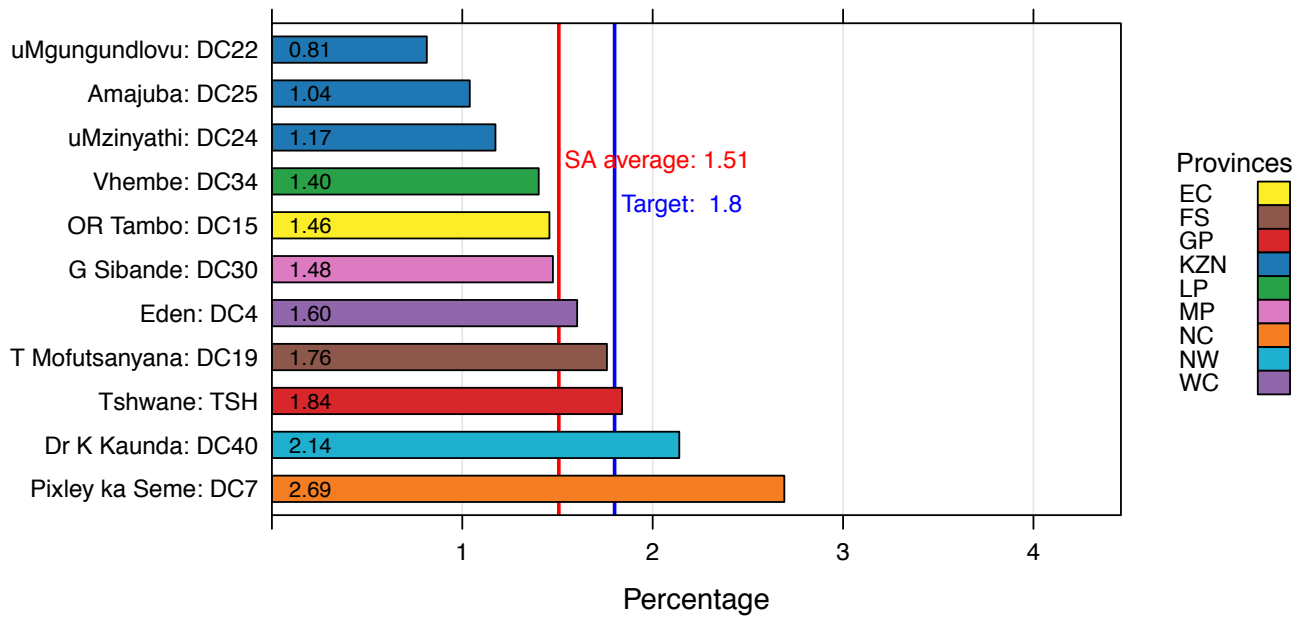


Figure 16: Annual trends: Infant 1st PCR test around 6 weeks uptake rate

