11 Non-communicable diseases

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Undoubtedly, non-communicable diseases (NCDs) are playing an increasingly important role in defining South Africa's health profile, and they are an essential element to be taken into account in policy development and planning purposes at both national and local level.

Conditions in this broad class include cardiovascular and kidney disease, diabetes, chronic respiratory conditions, cancer, mental disorders, oral and eye pathologies, and musculoskeletal conditions. Today these conditions are among the top causes of death in South Africa, and together they have become the largest cause of years of life lost (YLLs). In 2009, they accounted for nearly one-third of total YLLs at national level.[a] In 2010, NCDs accounted for 36% of the total number of deaths, comparable to the number of deaths from HIV, AIDS and TB combined.[b]

Overall, age-standardised death rates for NCDs have shown a slight decrease in the last decade, mainly driven by the decreased mortality for cardiovascular disease, oesophageal cancer and chronic respiratory conditions.[b] However, because of the population growth and the changing age distribution, the decrease in age-standardised death rates does not correspond with a reduction in the burden of disease. The number of deaths due to NCDs is increasing steadily and despite the lack of reliable surveillance data, which makes it difficult to estimate the distribution of the various diseases in the population accurately, the evidence clearly points towards: (i) an increasing number of subjects living with non-communicable chronic conditions, especially diabetes and other diet-related disorders; (ii) a substantial overlap and interaction between the epidemic of communicable and non-communicable disease, with many 'shared' patients; and (iii) a growing pressure on both acute and chronic health-care services.[c,d,e,f]

The Strategic Plan for the Prevention and Control of Non-communicable Diseases 2013–2017[g] was launched by the South African National Department of Health (NDoH) in September 2013 and is currently being implemented. The plan provides a general framework for the prevention and treatment of NCDs and identifies a series of legislative and regulatory interventions aimed at reducing the prevalence of known NCD risk factors in the general population, chiefly hypertension, obesity and unhealthy dietary habits, alcohol and tobacco use, and physical inactivity. The plan recommends interventions to strengthen the primary health care (PHC) system and to adapt its organisation to the country's changed needs. It also aims to improve knowledge of NCD trends and the distribution of risk factors, and it explicitly recognises the shortcomings of the current surveillance system.

Far from aiming to provide a comprehensive picture of NCD distribution and temporal trends across districts, this chapter focuses on three specific indicators: (i) prevalence of hypertension in the general adult population; (ii) incidence of new diagnoses of hypertension in public health facilities; and (iii) incidence of new diagnoses of diabetes mellitus in public health facilities.

Hypertension is widely acknowledged as a major risk factor for cardiovascular disease, which in turn is the leading cause of NCD deaths. Tracking hypertension prevalence and the incidence of new cases across districts and time may, therefore, offer valuable insight into the distribution and temporal trends for the burden associated with this category of diseases. In order to understand how the health care system is responding to the hypertension epidemic, the description and interpretation of the two hypertension indicators is accompanied by estimates of treatment coverage (i.e. the proportion of hypertensive subjects who are in treatment) and level of control among those in treatment (i.e. the proportion of subjects taking antihypertensive drugs who have blood pressure values within the normal limits).

The third indicator examined in detail in this chapter is diabetes incidence. The incidence of new cases of diabetes is especially interesting because in addition to being a direct indicator of the changing characteristics of patients who access PHC facilities, convincing evidence associates the risk of diabetes with obesity and dietary habits.[h] This makes diabetes

a Day C, Groenewald P, Laubscher R, Chaudhry S, van Schaik N, Bradshaw D. Monitoring of non-communicable diseases such as hypertension in South Africa: Challenges for the post-2015 global development agenda. South African Medical Journal. 2014; 104(10):680–7.

b Nojilana B, Bradshaw D, Pillay-van Wyk V, Msemburi W, Laubscher R, Somdyala NI, et al. Emerging trends in non-communicable disease mortality in South Africa, 1997–2010. South African Medical Journal. 2016; 106(5):477–84.

c Mayosi BM, Flisher AJ, Lalloo UG, Sitas F, Tollman SM, Bradshaw D. The burden of non-communicable diseases in South Africa. Lancet. 2009; 374(9693):934–47.

d Oni T, Unwin N. Why the communicable/non-communicable disease dichotomy is problematic for public health control strategies: implications of multimorbidity for health systems in an era of health transition. International Health. 2015; 7(6):390–9.

e Spires M, Delobelle P, Sanders D, Puoane T, Hoelzel P, Swart R. Diet-related non-communicable diseases in South Africa: determinants and policy responses. In: Padarath A, King J, Mackie E, Casciola J, editors. South African Health Review 2016. Durban: Health System Trust; 2016.

f Mayosi BM, Lawn JE, van Niekerk A, Bradshaw D, Abdool Karim SS, Coovadia HM. Health in South Africa: changes and challenges since 2009. Lancet. 2012; 380(9858):2029–43.

g National Department of Health. Strategic Plan for the Prevention and Control of Non-Communicable Diseases 2013–2017. Pretoria: NDoH; 2013.

h Steyn NP, Mann J, Bennett PH, Temple N, Zimmet P, Tuomilehto J, et al. Diet, nutrition and the prevention of type 2 diabetes. Public Health Nutrition. 2004; 7(1a):147–65.

incidence a suitable tracker for the effect of the regulatory and educational interventions envisaged by the NDoH to curb the obesity epidemic (within the framework of the NCD Strategic Plan).

11.1 Prevalence of hypertension in the general population

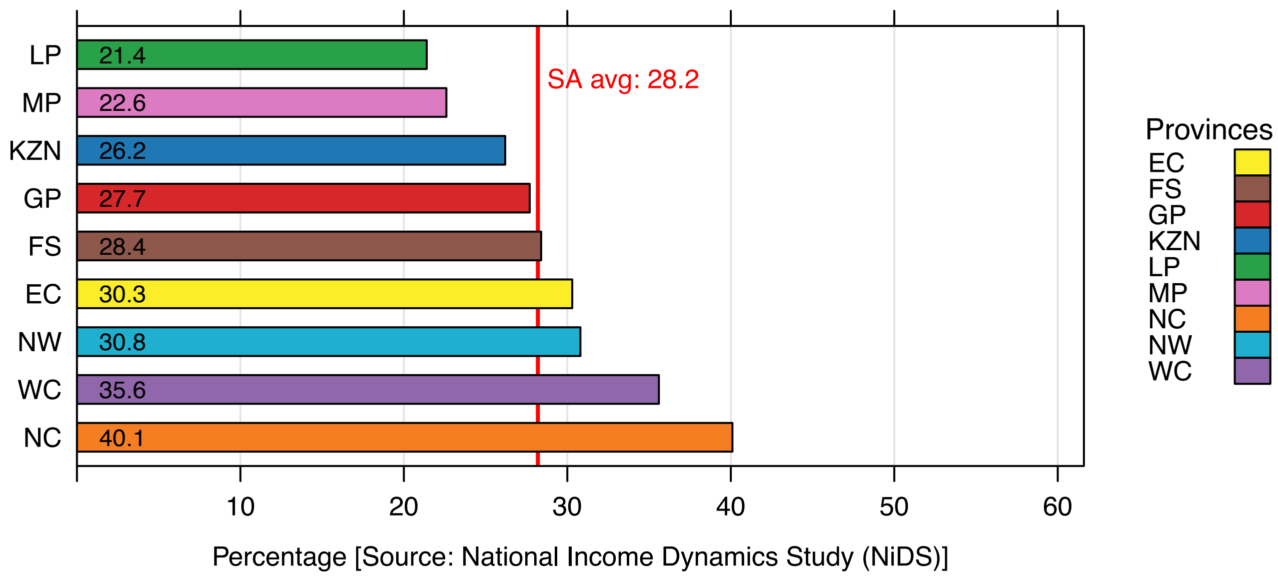
The prevalence of hypertension in the general adult population (15 years and over) was estimated from the individual-level data collected during the first four waves of the National Income Dynamics Study (NiDS), an ongoing panel survey of a large representative sample of the South African population.[i]

In 2008, the survey implemented a stratified, two-stage cluster sampling design to select a baseline sample of approximately 28 000 individuals from a target population consisting of individuals living in private households, worker hostels, convents and monasteries but excluding those living in student hostels, old age homes, hospitals, prisons and military barracks.[j] The sampled individuals were contacted again in 2010/11, 2012 and 2014/15. The large majority of data collection took place in 2010 for the 2010/11 wave, and in 2015 for the 2014/15 wave. For brevity, the waves are referred as the 2010 and 2015 waves, respectively, in the figures and comments.

On all occasions, the fieldworkers collected duplicate measurements of systolic and diastolic blood pressure and self-reported use of antihypertensive medication. Measurements for subjects 15 years or older in each data-collection wave were used to calculate the (crude) prevalence estimates reported in this chapter.[k] Following the standardised data-cleaning procedures applied in other large-scale surveys in South Africa,[l] measurements were excluded from the analyses if the systolic blood pressure was less than 80 mmHg or differed by less than 15 mmHg from the diastolic blood pressure. The first systolic/diastolic pair was also excluded if it differed by more than 5 mmHg from the second. The arithmetic means of the remaining systolic and diastolic measurements were considered as the subjects' blood pressure. Respondents were classified as hypertensive if their blood pressure was equal to or above 140/90 mmHg (systolic/diastolic) or if they were taking antihypertensive medication. Age-standardised hypertension prevalence was calculated by direct standardisation, using population proportions in each five-year age stratum as per the 2011 South African census.

Using the above method, the national hypertension prevalence was estimated at 28.2% in 2015, with large variations across provinces. The highest proportion of hypertensive individuals was recorded in the Northern Cape (NC) (40.1%), and the lowest in Limpopo Province (LP) (21.4%) (Figure 1).

Figure 1: Hypertension prevalence (crude) in people 15 years and older, by province, 2015



i National Income Dynamics Study [homepage on the Internet]. 2016. Available from: http://www.nids.uct.ac.za/ [Accessed 8 July 2016].

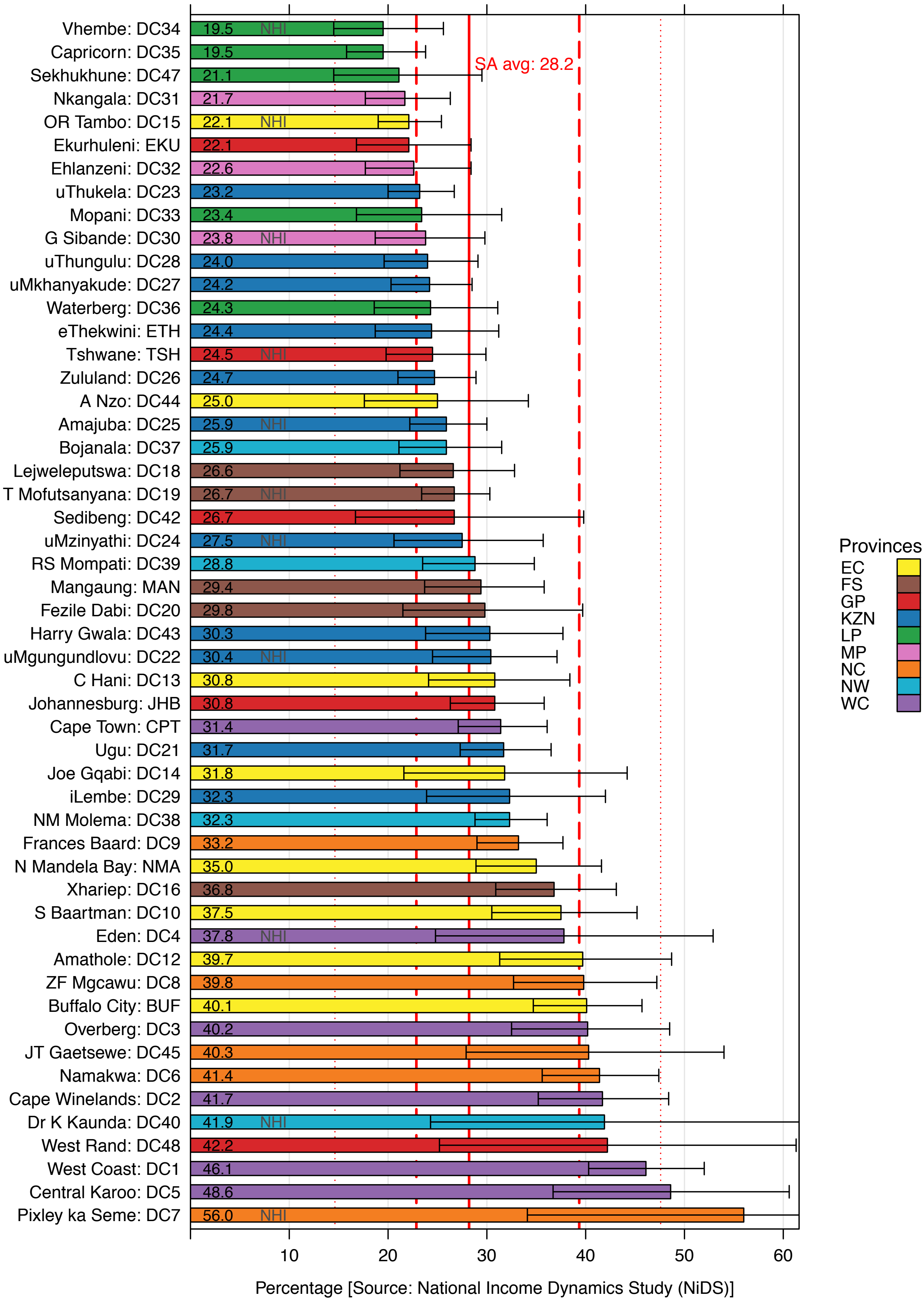
j Leibbrandt M, Woolard I, de Villiers L. Methodology: Report on NIDS Wave 1. Technical Paper no. 1. Cape Town: Southern Africa Labour and Development Research Unit; 2009.

k The NiDS data is regularly updated as new relevant information such as improved estimates of population totals from censuses or other administrative data become available. Updates also arise due to further improved cleaning of the data. The hypertension prevalence reported in this chapter used data versions 6, 3, 2 and 1 for waves 1, 2, 3 and 4 respectively.

l Including the two editions of the Demographic and Health Survey (Department of Health. South Africa Demographic and Health Survey 1998: Full report. Pretoria: NDoH; 2002).

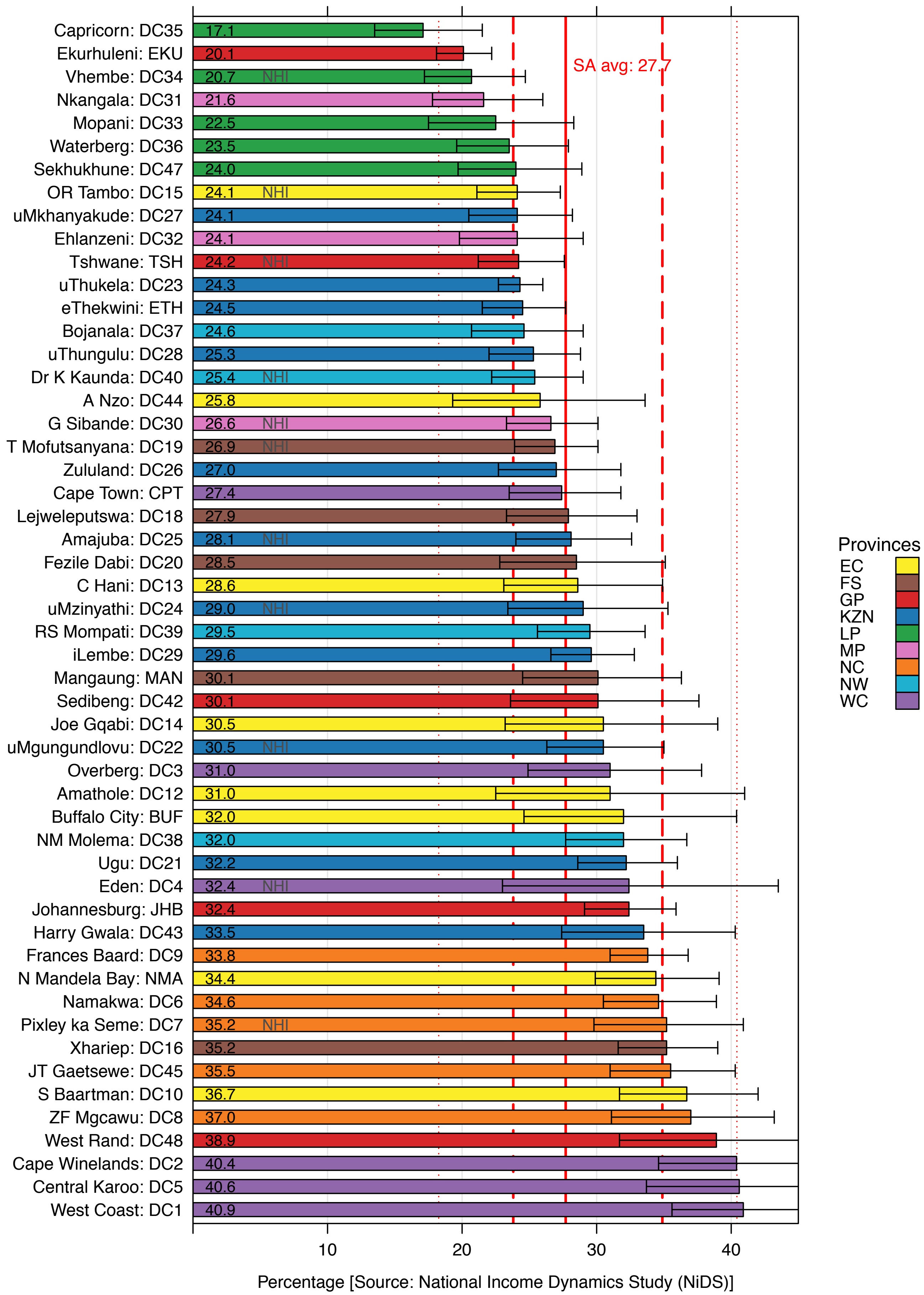
The estimated prevalence varied among districts within each province, as shown in Figure 2. The variability was extreme in the Eastern Cape (EC), where OR Tambo had one of the lowest prevalences in the country (22.1%), and Buffalo City had one of the highest (40.1%). The highest crude prevalence at district level was recorded in Pixley ka Seme in the Northern Cape (56.0%).

Figure 2: Hypertension prevalence (crude) in people 15 years and older, by district, 2015



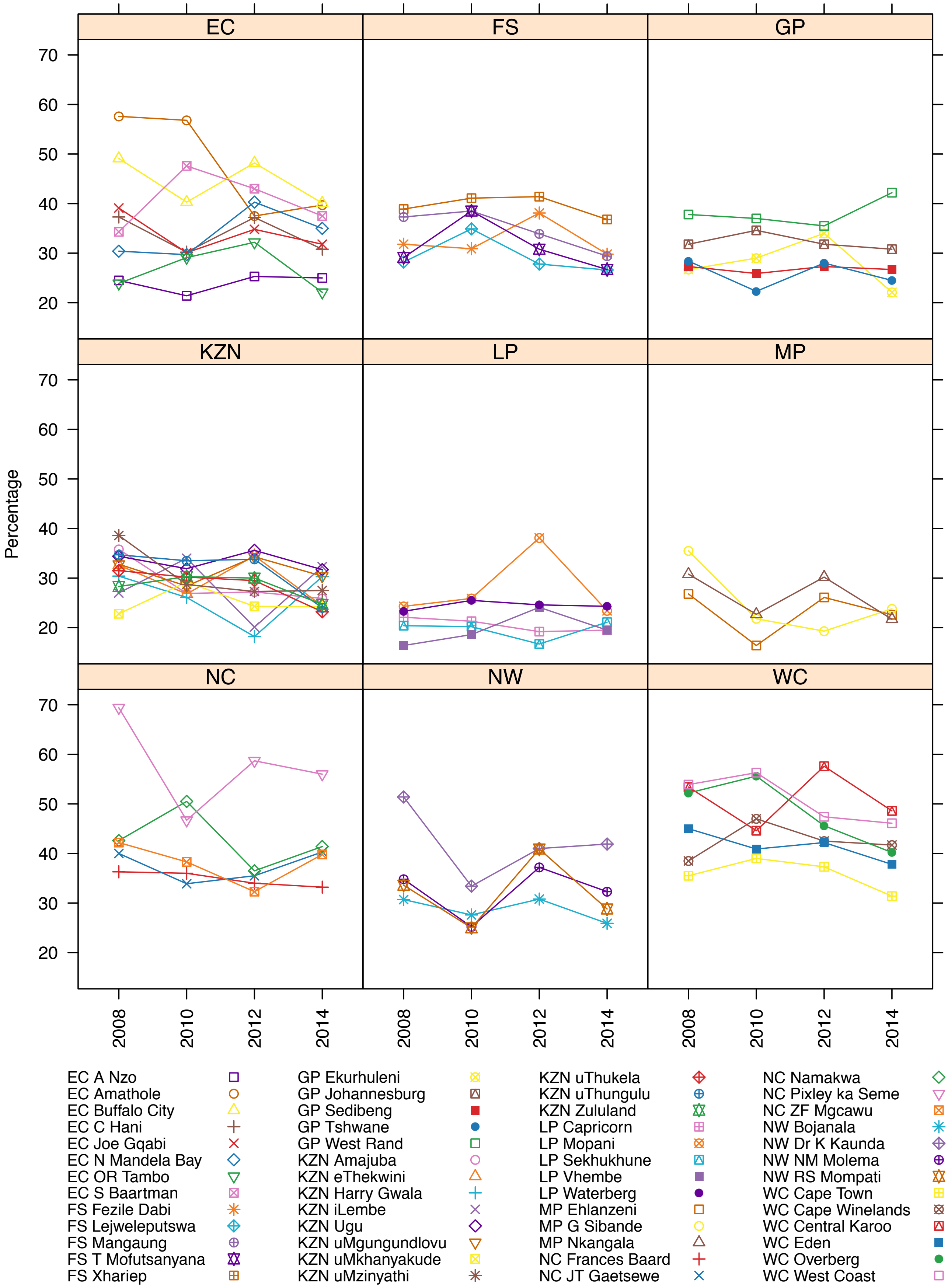
Because of the well-established direct relationship between age and blood pressure, differences in hypertension prevalence between provinces and districts were partly due to differences in the age distribution of the populations. In particular, the extreme values (50% or more) recorded in districts such as Pixley ka Seme (NC), Central Karoo (Western Cape (WC)) and West Coast (WC) were largely the result of the much older populations in these areas, and were reduced to more acceptable levels (at around 40%) after adjustment for age. However, age standardisation did not change the overall picture of geographical difference in hypertension prevalence (Figure 3).

Figure 3: Hypertension prevalence (age-standardised) in people 15 years and older by district, 2015



Comparison of the 2015 estimates with those calculated using the same method from the previous waves of the NiDS survey shows a clear decreasing trend, with the latest estimates consistently lower than those for 2008 across all provinces, and with few exceptions, across all districts (Figure 4).

Figure 4: Annual trends for hypertension prevalence (crude) in people 15 years and older



This decreasing trend is accompanied by a generalised increase in both treatment coverage and the prevalence of subjects with controlled hypertension, as shown in Figures 5 and 6.

Figure 5: Annual trends for hypertension treatment coverage, by province

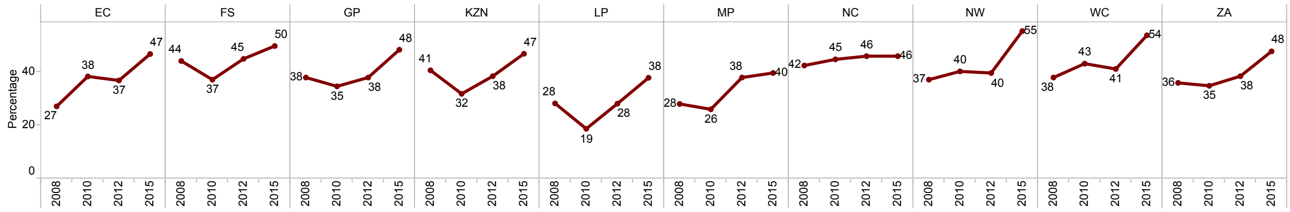
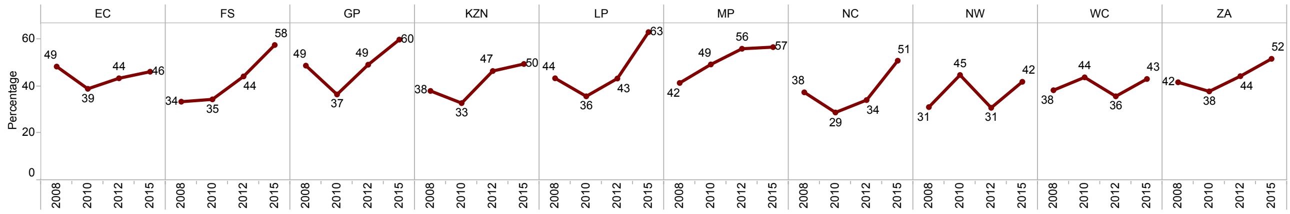


Figure 6: Annual trends for proportion of subjects with controlled hypertension

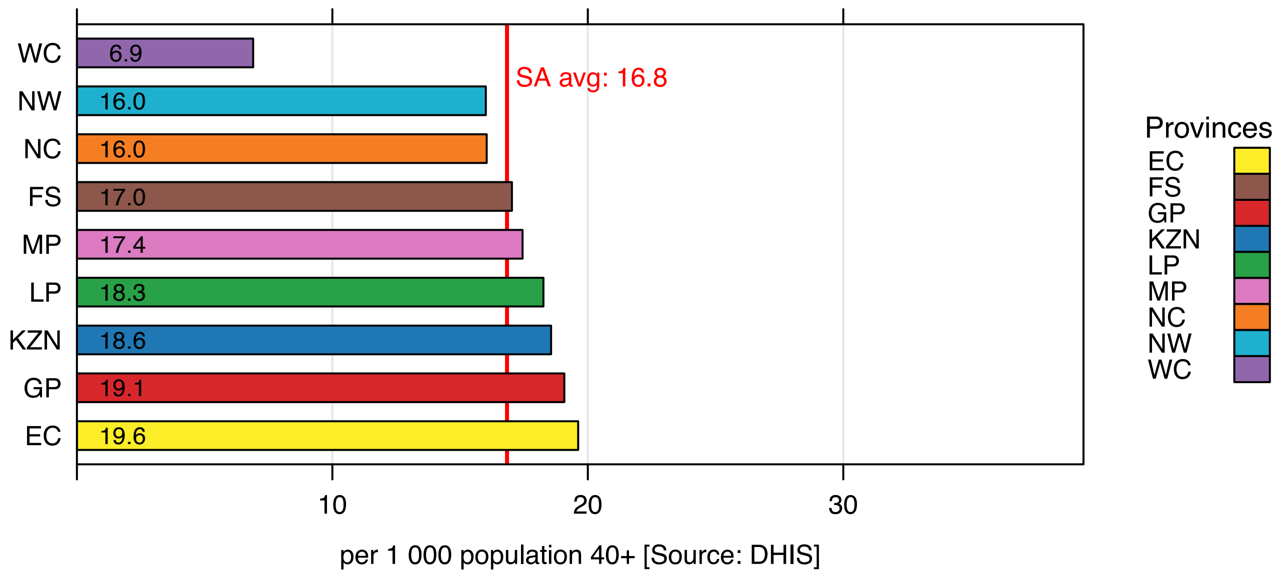


11.2 Hypertension incidence

Despite its name, the District Health Information Software (DHIS) indicator "hypertension incidence" does not measure the actual incidence of hypertension in the population, but rather the number of newly diagnosed cases of hypertension initiated on treatment in public health facilities per 1 000 population aged 40 years and older. It is also worth noting that while the numerator includes all new cases of hypertension, regardless of the age of the client, the denominator consists of the population 40 years and older. However, the number of patients younger than 40 years initiated on hypertensive treatment is very small, and therefore the values of this indicator can be interpreted as an approximation of the incidence of new cases in the main risk group, with slight overestimation of the true value.

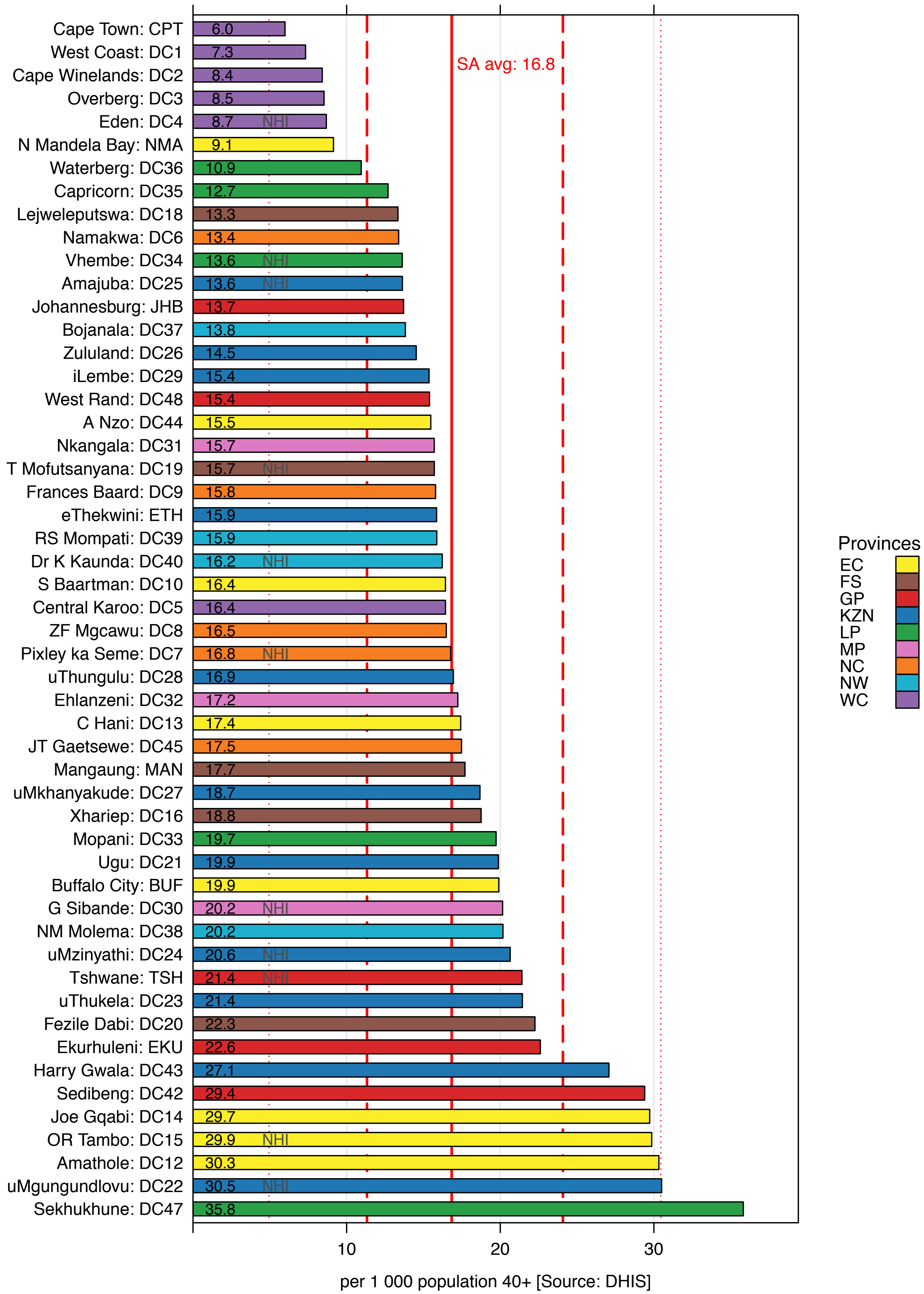
The national incidence of new hypertension diagnoses in 2015/16 was 16.8 cases per 1 000 population aged 40 years and older. The differences across provinces were relatively small, with the notable exception of the Western Cape, where the incidence was about half the national average, at 6.9 cases per 1 000 population aged 40 years and older. The highest values were recorded in the Eastern Cape and Gauteng (GP), with more than 19 cases per 1 000 population aged 40 years and older. Figure 7 shows the incidence in each province.

Figure 7: Hypertension incidence in people aged 40 years and older by province, 2015/2016



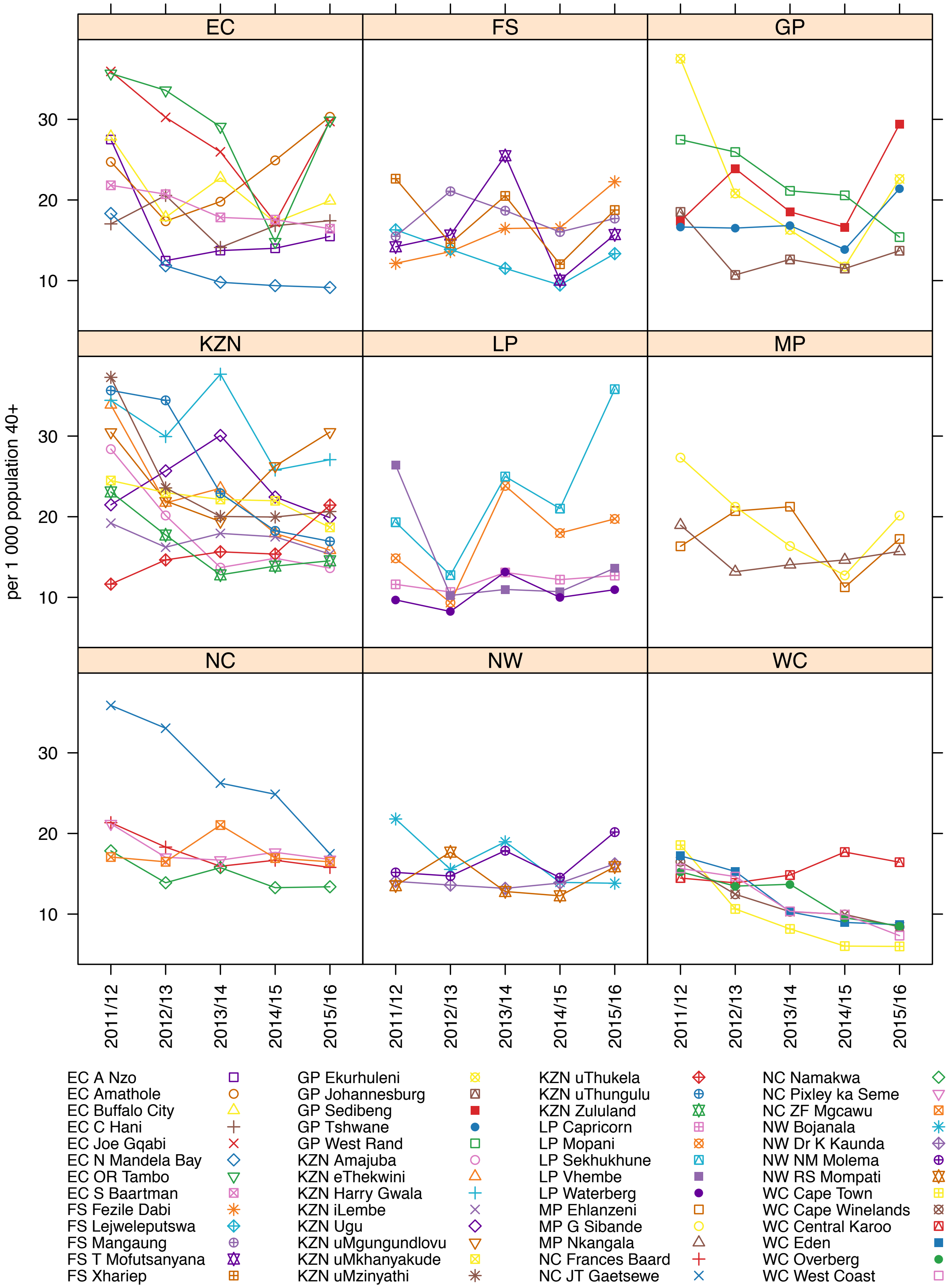
The incidence showed much greater variability across districts, as depicted in Figure 8. The lowest incidence was recorded in Cape Town (WC) (6.0 cases per 1 000 population aged 40 years and older), while the highest incidence was recorded in Sekhukhune (LP) (35.8 per 1 000). As already noticed for the estimated hypertension prevalence, districts geographically within the same province, showed in some cases large differences in hypertension incidence. The Eastern Cape was again the province with the greatest variability, with incidence rates varying from 9.1 cases per 1 000 population 40 years and older in N Mandela Bay (among the lowest in the country) to 30.3 cases per 1 000 population 40 years and older in Amathole (among the highest rates).

Figure 8: Hypertension incidence in people aged 40 years and older, by district, 2015/2016



At national level, hypertension incidence decreased consistently between 2011/12 and 2014/15 (from 22.3 cases per 1 000 population 40 years and older to 13.9 cases per 1 000), only to increase again between 2014/15 and 2015/16. The same trend was present in each province. The reversal in the last year of an otherwise consistently decreasing trend also occurred in most districts (Figure 9). Notable exceptions were all the districts in the Western and Northern Cape, where hypertension incidence was lower in 2015/16 than in the previous year.

Figure 9: Annual trends for hypertension incidence in people aged 40 years and older

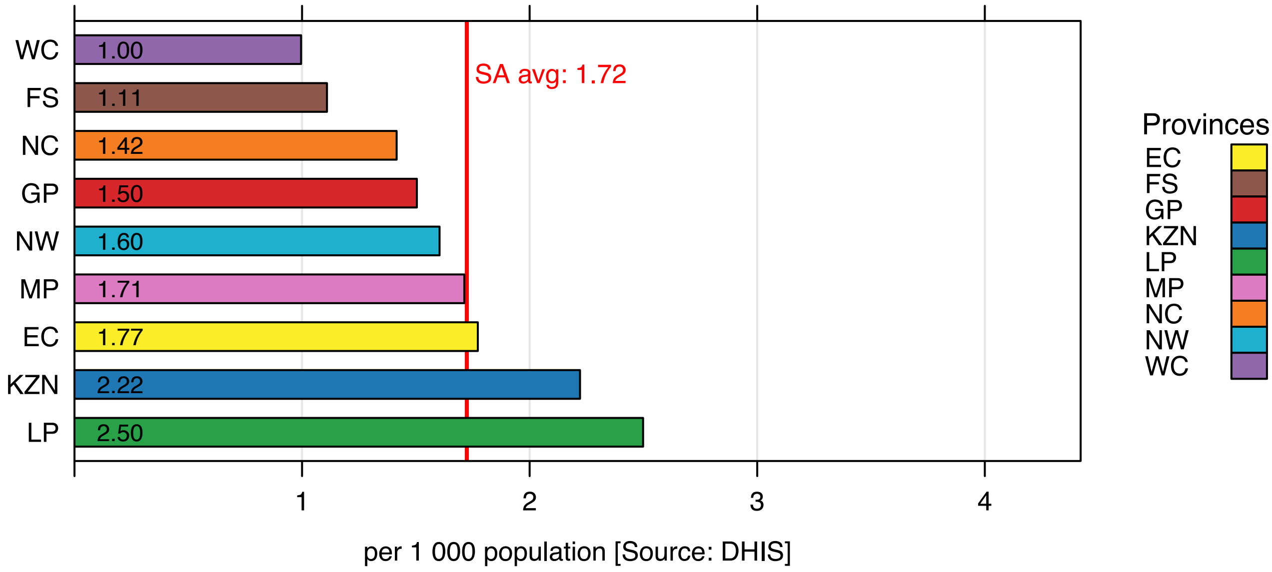


11.3 Diabetes incidence

The DHIS indicator "Diabetes incidence" measures the number of newly diagnosed cases of diabetes mellitus initiated on treatment per 1 000 total population, per year. Similarly to the previous indicator, it measures the number of diabetes cases identified within the public health system, which does not necessarily reflect the incidence in the population.

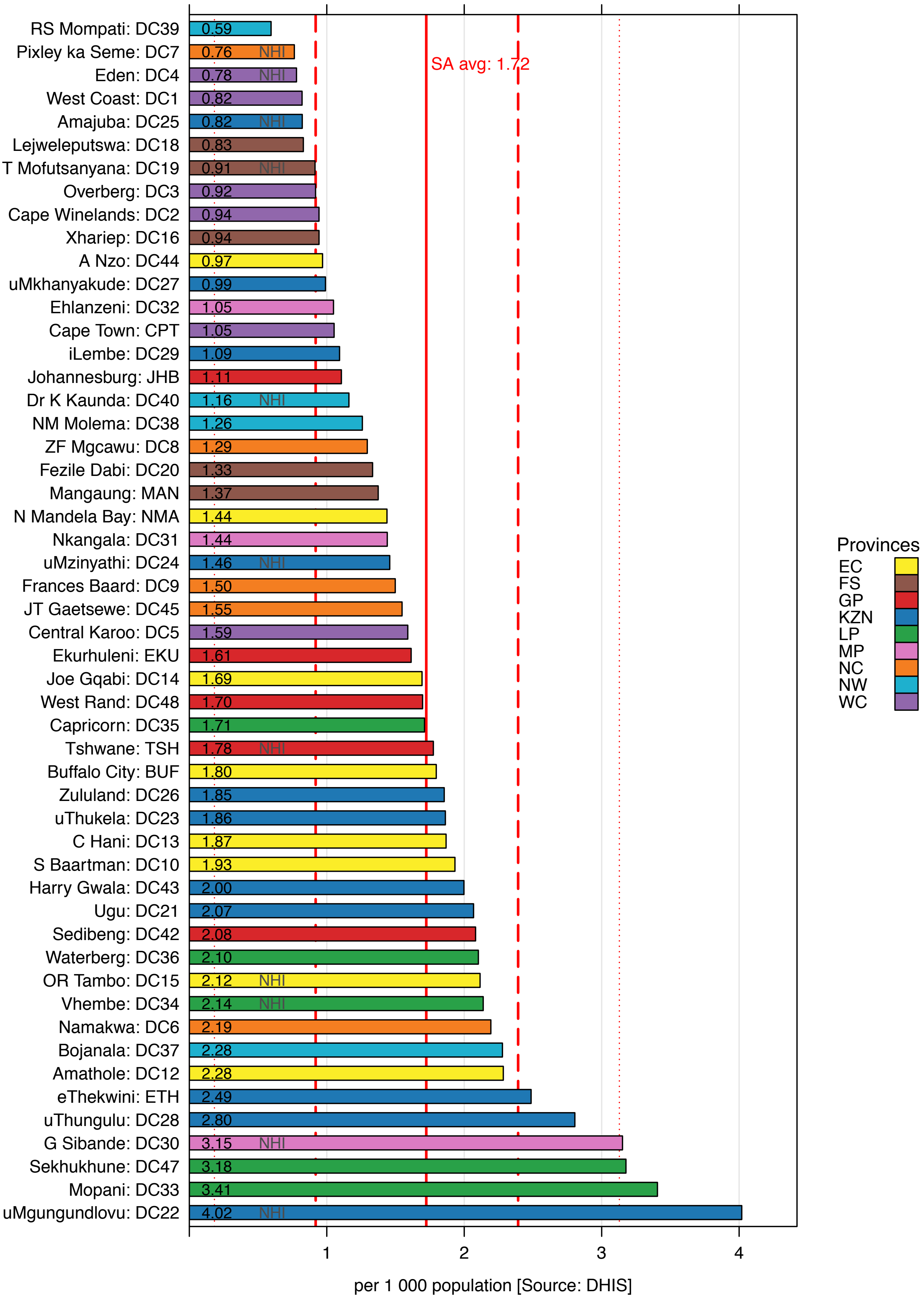
In 2015/16, the national average was 1.7 cases per 1 000 total population. At provincial level, the incidence ranged between 1.0 case per 1 000 population in the Western Cape to 2.2 cases per 1 000 population in KwaZulu-Natal (KZN) and 2.5 cases per 1 000 population in Limpopo (Figure 10).

Figure 10: Diabetes incidence by province, 2015/2016



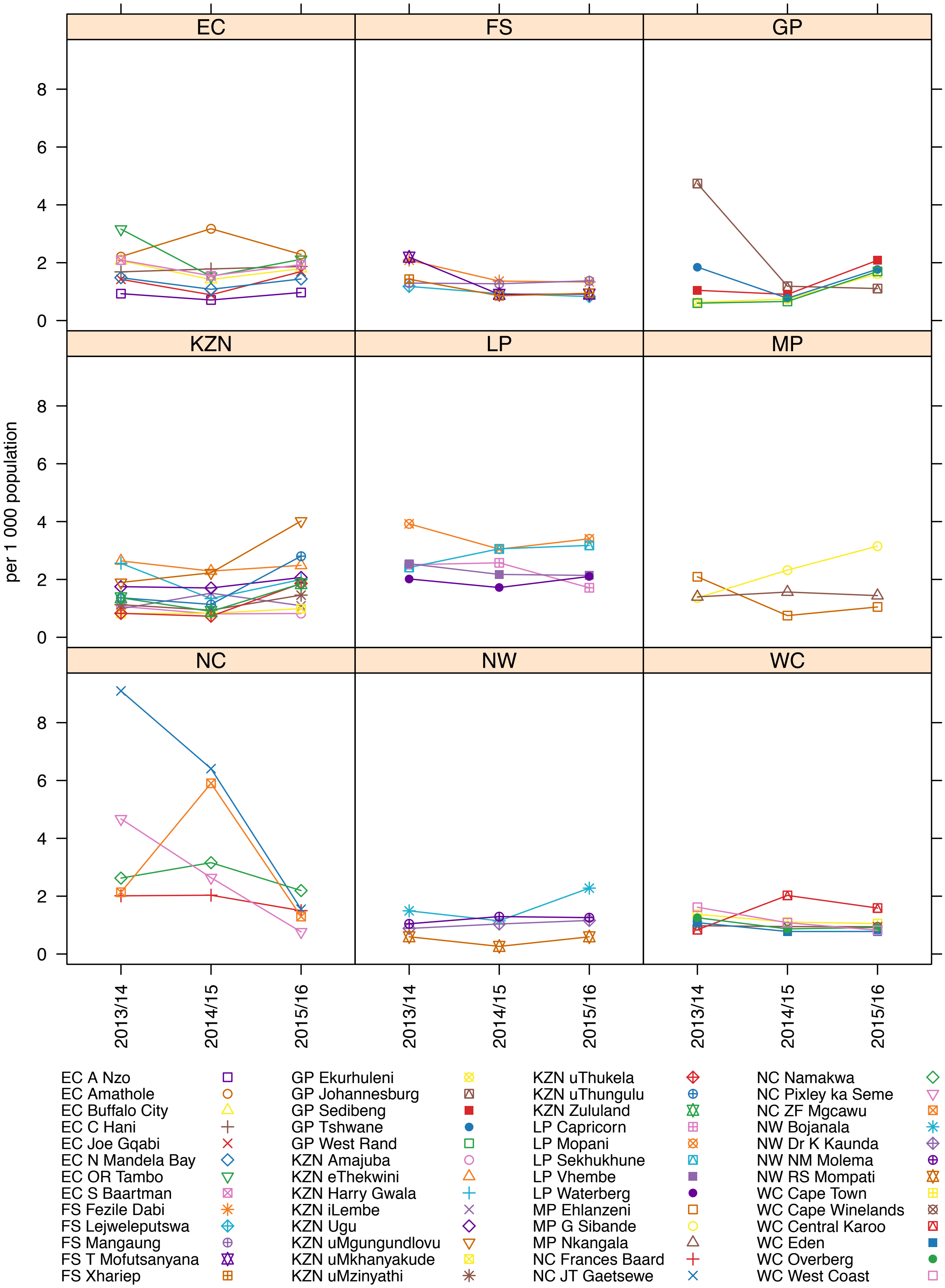
At district level (Figure 11), the incidence varied between 0.6 cases per 1 000 population in RS Mompati (North West (NW)) and 4.0 cases per 1 000 population in uMgungundlovu (KZN).

Figure 11: Diabetes incidence (annualised) by district, 2015/2016



At national level the incidence increased from 1.4 cases per 1 000 population in 2014/15 to 1.7 per 1 000 in 2015/16. Trends at district level were varied (Figure 12), but in most cases data seem to indicate an increase in the incidence in 2015/16 compared with 2014/15.

Figure 12: Annual trends for diabetes incidence



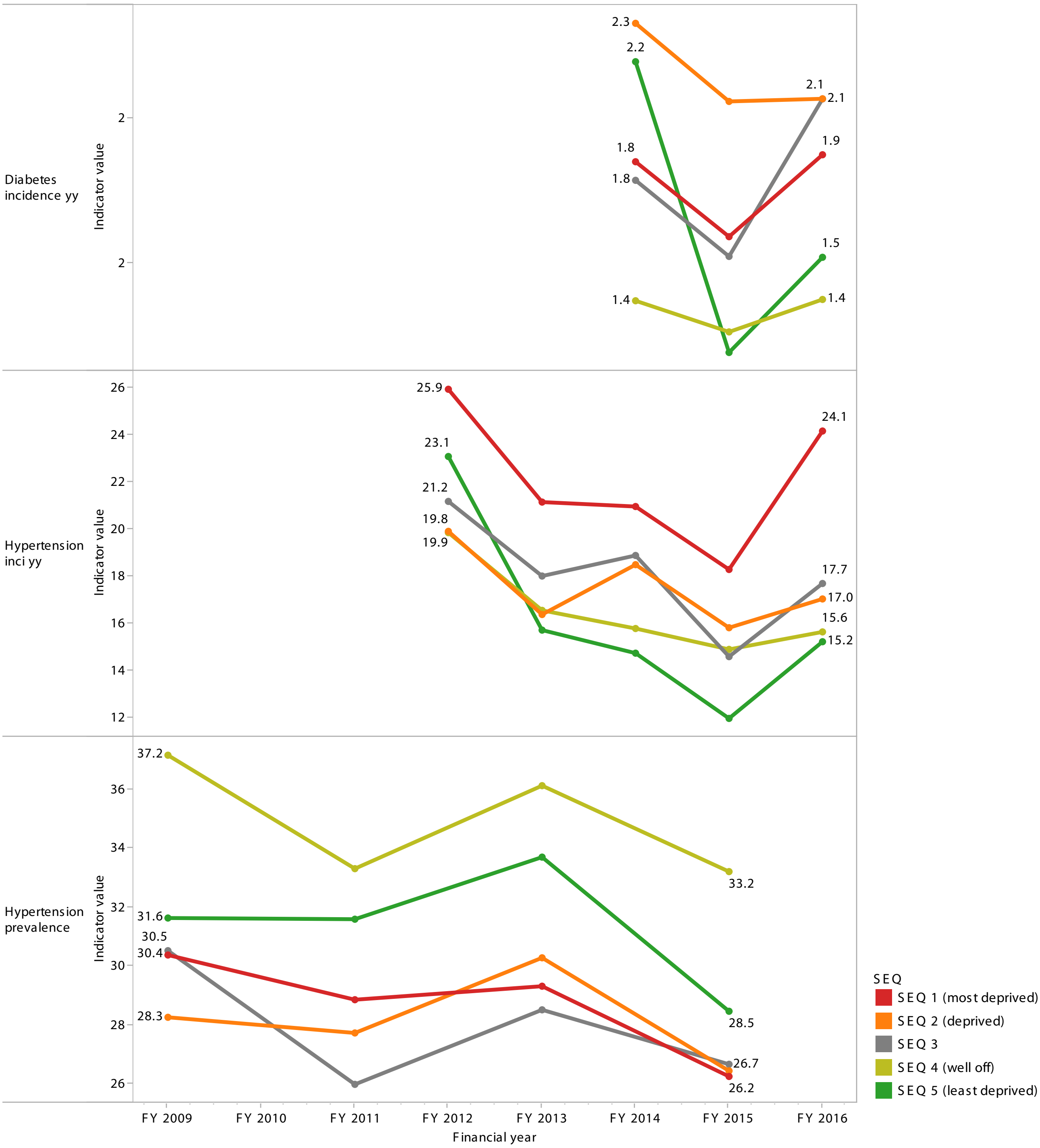
Hypertension and diabetes indicators per socioeconomic quintiles

Figure 13 shows the values of the three indicators analysed in this chapter, with districts grouped according to socio-economic quintile (SEQ).

The crude hypertension prevalence was higher in districts in SEQs 4 and 5 (less deprived). Hypertension prevalence clearly declined within each group of districts, but possibly more rapidly in the wealthiest districts. The incidence of new cases of hypertension showed a reverse relationship with SEQ, with incidence increasing as SEQ decreased.

The relationship between SEQ and diabetes incidence was less clear, but in each year the most deprived districts tended to have higher incidence.

Figure 13: Trends in average district values by socio-economic quintile for hypertension prevalence and incidence and diabetes incidence



Discussion

In all South African districts, the estimated hypertension prevalence in the general adult population is higher than the average prevalence in other countries in the sub-Saharan Africa region, where the rate is estimated at 16.3%.[m] However, data from the NiDS survey indicate that South Africa's high prevalence rate is decreasing in almost all districts, with few exceptions.

Treatment coverage and the proportion of controlled hypertension have increased substantially in the last year across all provinces. It is worth noticing that differences in coverage and control between provinces have been reducing over time. The increase in coverage between 2008 and 2015 has been generally higher in provinces such as the Eastern Cape where the initial values were low. This observation may suggest a trend towards greater homogeneity of access to adequate treatment across provinces.

Data on diabetes incidence are more difficult to interpret. The large decreases in incidence over a short time period observed in the Northern Cape and Gauteng are unlikely to reflect real changes in the underlying prevalence in the population. The decreases are more plausibly the result of incongruences in reporting, or specific and localised events such as campaigns or temporary increased efforts to find new cases. In the remaining provinces, changes over time were more modest. Considering that only three time points were available, and the level of uncertainty associated with the population total that constitutes the denominator for this indicator, any conclusion regarding population trends is unwarranted.

Data quality considerations

The considerations presented in the previous sections must take into account the limitations of the data upon which they are based. Both the survey estimates from the NiDS and surveillance indicators from the DHIS are affected by a substantial amount of uncertainty.

The potential magnitude of the error associated with blood pressure measurement in large-scale surveys, even studies conducted with great attention to quality, has been of concern for many years, and is a known problem, especially when comparing results from different surveys.[n,o] The estimates discussed here come from repeated waves of the same survey, which ensures the comparability of the methods and instruments. However, the seasonal distribution of measurements differs greatly across waves, but as seasonal blood pressure change is a known phenomenon, this may explain some of the differences from year to year.[p] More importantly, the NiDS protocol establishes that individuals whose blood pressure is found to exceed the hypertensive cut-off must be referred to a clinic for further evaluation. This awareness of subjects' possible hypertensive condition, introduced by the survey itself, may have artificially inflated the estimates of treatment coverage and hypertension control and deflated the estimates of hypertension prevalence in the waves subsequent to the first. That is, the trends observed in the sample might overestimate both the decrease in hypertension prevalence and the increase in coverage and control in the South African population.

The quality of the DHIS indicators, on the other hand, is affected by reporting incongruences and by imprecision in the estimates of population totals used as denominators in the calculation (total district population for diabetes incidence and total district population aged 40 years and older for hypertension incidence). These incongruences may be the cause of the large and substantively unlikely year-to-year variations in some districts.

Key findings

- The decreasing prevalence of hypertension in the general adult population across all provinces and most districts, accompanied by the generalised increase in treatment coverage and level of control and a possible trend towards a reduction in socioeconomic differences in access to treatment for both hypertension and diabetes, are all positive indicators.
- Hypertension prevalence in South Africa remains high compared with most African countries, and the current rate of decrease is unlikely to be able to compensate for the increased number of hypertensive subjects due to population growth and ageing.
- The predicted further spread of urban, westernised lifestyles in rural areas is bound to increase hypertension prevalence, and even more, the number of subjects with diabetes and related pathologies.

m Ogah OS, Rayner BL. Recent advances in hypertension in sub-Saharan Africa. Heart. 2013; 99(19):1390–7.

n Rosner B, Polk BF. The implications of blood pressure variability for clinical and screening purposes. Journal of Chronic Diseases. 1979; 32:451–61

o Hense HW, Stieber J, Kuch B, Keil U. Blood pressure measurements in epidemiological surveys – time to change? Zeitschrift für Kardiologie. 1996; 85(Suppl 3):66–70.

p The current edition of the South African hypertension guidelines acknowledges the effects of temperature on blood pressure measurement, but makes no provision for the modification of diagnostic criteria and treatment in relation to season.

Recommendations

- The legislative and regulatory interventions recommended by the Strategic Plan for the Prevention and Control of Non-communicable Diseases should be implemented.
- In particular, rapid interventions are needed to strengthen the PHC system and adapt its organisation to the country's changed needs. This is an important priority and needs to be taken into consideration in NHI policy and implementation in terms of prevention and control of NCD's.
- Finally, knowledge on distribution, trends and likely determinants of hypertension, diabetes and other NCDs is still extremely limited, especially at local level. This knowledge is much needed to promote targeted interventions, and inform planning.