Cardiovascular disease in South Africa

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Editorial

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Are we doing enough to prevent a heart disease epidemic?
The Lancet “Health in South Africa”-series

“Call for action to the South African Government, universities, training institutions, health councils, researchers and civil society.”
South Africa faces colliding epidemics

- Explosive HIV and TB epidemics
- A high burden of chronic illness
- Mental health disorders
- Injury- and violence-related deaths
- Silent epidemic of maternal, neonatal and child mortality.
World Health Organization (WHO) – Non-communicable diseases

• More than half of the world’s non-communicable diseases (NDC) occur in developing countries.
• Non-communicable diseases tend to be chronic diseases of lifestyle (CDL).
• Heart disease and stroke are the number one killers in South Africa.
HOW LARGE IS THE PROBLEM OF CARDIOVASCULAR DISEASE IN SOUTH AFRICA?
THE HEART AND STROKE FOUNDATION SOUTH AFRICA

HEART DISEASE IN SOUTH AFRICA

MEDIA DATA DOCUMENT

Compiled by
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Mortality caused by heart disease

- Between 1997 and 2004, 195 people died per day because of some form of heart and blood vessel disease (CVD) in South Africa.
- About 33 people die per day because of a heart attack, while about 60 die per day because of stroke.
- For every woman that dies of a heart attack, two men die.
- About 37 people die per day because of heart failure.
- Despite the high death rates caused by AIDS in South Africa, actuarial projections suggest that the rate of chronic diseases, including heart disease, is also going to increase by 2010. The models suggest that chronic disease death will increase from 565 deaths per day in 2000 to 666 deaths per day in 2010.
Mortality caused by heart disease – cont.

- More than half the deaths caused by chronic diseases, including heart disease, occur before the age of 65 years. These are premature deaths which affect the workforce and have a major impact on the economy of the country.

- Premature deaths caused by heart and blood vessel diseases (CVD) in people of working age (35-64 years) are expected to increase by 41% between 2000 and 2030. The negative economic impact of this will be enormous.

- The highest death rates for heart and blood vessel diseases in South Africa are found in Indian people, followed by the coloured people, while the white and black African people have the lowest rates.

- Although the white and black African people have similar rates for these diseases, their patterns differ considerably. White people mainly reflect a pattern of death caused by heart attacks, while the black African people reflect that of death caused by stroke, and diseases of the heart muscle and high blood pressure.
Mobidity caused by heart disease

• The prevalence and treatment status of common heart conditions, such as ischaemic heart disease, heart failure, rheumatic heart disease, and diseases of the heart muscle, the heart valves and heart disease caused by high blood pressure is unknown in South Africa. However, the available data suggest that these conditions are poorly managed.

• A plan has recently been launched to control rheumatic fever and rheumatic heart disease in Africa.

• No data exist on the number of heart attacks or strokes that South Africans suffer from daily. However, there is a rule of thumb suggesting that for one death caused by a heart attack or stroke three persons will survive such an event, this suggests that ± 130 heart attacks and ± 240 strokes occur daily in South Africa.
LIFE-COURSE PERSPECTIVE ON HEART DISEASE

• The known risk factors for a heart attack are present in all South Africans and have been shown to occur in the black population groups as well.

• Effective prevention of heart disease should start early in life (even before birth) and should continue throughout a person’s.

• Effective prevention of heart attacks should target the whole population. Every opportunity via the media and every regulation is needed to support people to adopt and maintain a healthy lifestyle throughout their lifespan.

• People should also be informed about the early signs and symptoms of risk factors and heart disease to enable them to seek the necessary help to diagnose their conditions. When treatment is started early, serious long-term complications can be prevented.
LIFE-COURSE PERSPECTIVE ON HEART DISEASE - cont.

- Seventy five percent of cardiovascular events (heart attack or stroke) occur in 5%-10% of people who have suffered a previous event or in persons who have many risk factors.

- People should be motivated to ask for an absolute heart attack risk assessment. An absolute risk assessment approach moves away from treating only one risk factor at a time. This involves promoting a healthy lifestyle and addressing all the risk factors present in a person. This approach can have an enormous impact on heart disease in a population and is very cost-effective.

- To assess the absolute risk for a heart attack, a person’s age, gender, smoking status, blood pressure level, diabetes status and total blood cholesterol level should be considered.

- The calculations of absolute risk for heart attacks using the risk factors mentioned in the Scheme above are now available and can easily be done at a clinic or doctor’s practice.
Hypertension: a major risk factor and causally linked to

- Stroke
- Myocardial infarction
- End-stage renal disease
- Congestive Heart failure
- Peripheral vascular disease
- Blindness

Non-optimal BP responsible for about 60% of stroke globally and 50% of ischaemic heart disease (WHO 2004)
First National BP Survey in South Africa

- First Demographic and Health Survey 1998. (SADHS)
- 13 249 Adults 15 years and older.
- BP ≥ 140/90mmHg and/or using medication
- Prevalence- age standardised against to World population: Equal to 6.3 million adult South Africans.

<table>
<thead>
<tr>
<th>MEN</th>
<th>WOMEN</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>21%</td>
<td>15%</td>
<td>24.4%</td>
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</table>
Prevalence of hypertension in African-origin populations

Cooper et al., 1997; Steyn et al., 2001.
## Impact of Hypertension on Mortality in People ≥30 Years in South Africa in 2000

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>% of Deaths Due to Hypertension</th>
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<tr>
<td>Ischaemic Heart Disease</td>
<td>41.7</td>
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<tr>
<td>Stroke</td>
<td>49.6</td>
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<tr>
<td>Hypertensive Disease</td>
<td>71.5</td>
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<tr>
<td>Other CVD</td>
<td>21.6</td>
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</table>

Norman et al 2007. BOD at the MRC
Deaths attributable to high blood pressure in males, South Africa 2000

Norman et al. 2007  BOD at the MRC
Deaths attributable to high blood pressure in females, South Africa 2000

Normalization at the MRC
What happened to the prevalence of hypertension since 1998?

Comparison of the hypertension prevalence measured in 1998 in SADHS and the National Income Dynamic Survey (NIDS) conducted in 2008 (UCT)
Trends in the prevalence of Hypertension (BP ≥ 140/90 mmHg and/or medication) in SA in men.
Trends in the prevalence of Hypertension (BP $\geq$ 140/90 mmHg and/or medication) in SA in women.

Bradshaw et al. MRC and CDIA 2011
Many Participants with Optimal BP at baseline followed for 5 years developed hypertension during this period. (PURE Study)

Schutte et al. Inter J Epidemiol. 2012;41;114-1123. Hypertension in Africa Research Team (HART) North-West University
Which lifestyle population characteristics are associated with higher levels of hypertension and can they be modified?
LIFESTYLE RISK FACTORS ASSOCIATED WITH HYPERTENSION

• HIGH SALT INTAKE – 1) DISCRETIONARY SALT (added during food preparation and a table)
  2) FOOD INDUSTRY ADDITIONS

• EXCESSIVE ALCOHOL USE

• OVERWEIGHT AND OBESITY
Are behavioural risk factors to be blamed for the conversion from optimal blood pressure to hypertensive status in Black South Africans? A 5-year prospective study

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Prospective Urban Rural Epidemiology (PURE) study: N=2021
North West Province (black South Africans older than 35 years)
Conclusions of Schutte et al 2012

By simply focussing on conventional risk factors: the data confirm the importance of especially alcohol intake and abdominal obesity in contributing to cardiovascular changes over 5 years.

To highlight CVD prevention, our results specifically support legislation on increased alcohol taxes, banning alcohol advertisements and advertising of unhealthy foods (fat tax?)
High salt and low potassium intake in South Africans

Urinary Na equates to a salt intake of:
- Black = 7.8 g/day
- Coloured = 8.5 g/day
- White = 9.5 g/day

All groups exceed WHO guidelines of < 5 g salt/d

Urinary K equates to a potassium intake of:
- Black = 55.6 mmol/day
- Coloured = 54.3 mmol/day
- White = 61.9 mmol/day

No groups meet JNC 6 guidelines of >= 90 mmol/d

(Charlton et al., 2005, CDL, MRC)
Intervention and control diets

**Control**
- Salt (4 g/day)
- Sasko Sam bread
- Rama margarine
- Regular stock cubes
- Regular soup mixes
- 500 ml cooldrink/day

**Intervention**
- Solo® (4 g/day)
- Reduced salt bread
- Reduced salt margarine
- Reduced salt stock cubes
- Reduced salt soup mixes
- 500 ml maas/day

Charlton et al, 2008. Chronic Diseases of Lifestyle Unit, MRC
Change in BP (Pre to Post salt reduction)

Systolic BP
Between-diet difference (mean (SE)) = -6.19 (2.63) mmHg (P<0.05)

Diastolic BP
Between-diet difference (mean (SE)) = -0.59 (1.22) mmHg

Charlton et al 2008
THE ECONOMIC IMPACT OF REDUCING SALT IN BREAD, MARGARINE, SOUP MIX AND SEASONING

• Salt reduction in the 4 products is estimated to result in 7 400 fewer deaths due to cardiovascular diseases and 4 300 fewer non-fatal strokes compared with number of events in 2008.

• Cost saving of up to R300 million would also occur

Bertram et al, 2012. WITS
Trends in the Prevalence of BMI ≥ 25 kg/m²

Trends for high BMI

- Women
- Men
Comparison of the rates of obesity (BMI ≥ 30) in SA men in 1998 and 2008

Bradshaw et al 2011. BOD, MRC and CDIA
Comparison of the rates of obesity (BMI ≥ 30) in SA women in 1998 and 2008

Bradshaw et al 2011  BOD, MRC and CDIA
WHAT QUALITY OF CARE ARE PEOPLE WITH HYPERTENSION RECEIVING IN SOUTH AFRICA?
Treatment status of hypertensive South African women (BP ≥ 140/90 mmHg) in 1998 SADHS

Steyn et al 2001, Chronic Diseases of Lifestyle Unit, MRC

[Graph showing the treatment status of hypertensive South African women by race and awareness, treatment, and control.]
Treatment status of hypertensive South African men (BP≥140/90mmHg)

Steyn et al. 2001, Chronic Diseases of Lifestyle Unit, MRC

<table>
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<th></th>
<th>Aware</th>
<th>Treated</th>
<th>Controlled</th>
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<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Coloured</td>
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<td>19</td>
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</tr>
<tr>
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<td>46</td>
<td>43</td>
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</tr>
<tr>
<td>White</td>
<td>26</td>
<td>21</td>
<td>17</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>
Poverty and Awareness of Hypertension

MEN AND WOMEN

Asset Index Quintiles

Steyn et al 2008, Chronic Diseases of Lifestyle Unit, MRC
Poverty and Hypertension Medication

Steyn et al 2008, Chronic Diseases of Lifestyle Unit, MRC
Poverty and Control of Hypertension

Steyn et al 2008, Chronic Diseases of Lifestyle Unit, MRC
Hypertension

• Hypertension is asymptomatic. The BP needs to be measured at a clinic, pharmacy or in a doctor’s surgery with the necessary equipment.

• Hypertension occurs more frequently in older people and is more common in people who are overweight or obese, or in those who use too much salt (sodium) and too little potassium (in fruit and vegetables). People who use a lot of alcohol also tend to have higher blood pressures.

• About a quarter of all South Africans, 15 years and older, suffer from hypertension. Overall, there are no marked differences between the rates of hypertension among the different population groups.

• The rural black Africans had significantly less hypertension than the urban black African people.
Hypertension – cont.

• South Africans with tertiary education had less hypertension than those with 12 years or less education.

• People with a family history of hypertension or stroke were more likely to have hypertension than those without such a history. This suggests that hypertension in some way may be inherited.

• About 6 million South Africans 15 years and older suffer from hypertension, of whom millions were not diagnosed and even more inadequately treated. Of all these people only 26% of men and 51% of women knew that they had hypertension.

• Only 21% of men and 36% of women were taking drugs to reduce their BP, while only 10% of men and 18% of women had their BP levels sufficiently reduced to the level that would eliminate the risk to their hearts, brain and kidneys.
It has been estimated that in 2000, 8% of deaths in men and 11% of deaths of women 30 years and older was caused by a high BP.

It is estimated that in 2000 in people 30 years and older that 53 men and 78 women a day died as a result of the impact of high blood pressure.

Much of the damage caused by hypertension can be prevented if diagnosed early and treated adequately. This will reduce costs to patients, the health services and the economy.

An effective approach to the management of hypertension involves, in addition to taking medication the promotion of a healthy lifestyle for all South Africans. The prevention of hypertension should include eating more fruit and vegetables and less salty food, using less alcohol, and achieving and maintaining normal body weight. Regular exercise and no smoking will also be beneficial.
Economic impact of heart disease

• In 1991, the cost of CVD was between R4.135 and R5.035 billion, which did not include the costs of rehabilitation and follow-up. This expenditure reflects 2%-3% of gross domestic product (GDP) or roughly 25% of all healthcare expenditure.

• South Africa is already losing more people in the work-force age group (35-64 years) because of CVD compared to countries such as the USA and Portugal. These premature deaths have a major economic impact on the economy of the country.

• Projections are that cardiovascular deaths will increase by 41% in this age group between 2000 and 2030.

• Estimates are that in 2000, the cost of cardiovascular disability payments in South Africa equalled US$ 70 million.

• The drug costs for CVD and its risk factors vary widely among different countries. These costs are usually much less if generic medications of commonly used drugs are available.
The most cost-effective interventions to reduce CVD are those which target the population as a whole and include education through the mass media to promote a healthy diet, regular physical activity, along with legislation targeting tobacco control and the reduction of salt in commercial food products.

When treating individual patients the most cost-effective approach is the absolute risk approach where the total cardiovascular risk is determined by considering the impact of all the risk factors present in a patient.

There is good evidence that it is cost-effective to combine a number of effective medications into one single tablet. This idea of a 'polypill' containing low doses of multiple drugs has generated much interest, with proponents arguing that, given the high prevalence of CVD risk factors and the effectiveness of pharmacologic interventions, such a drug combination would reduce CVD mortality by 88%.

The 'polypill' would be particularly cost-effective in developing countries as patients take single-pill combinations more religiously than several tablets at a time. This approach would also reduce the supply and transport costs.
NON-COMMUNICABLE DISEASES
— A race against time

Debbie Bradshaw,¹ Krisela Steyn,² Naomi Levitt,² and Beatrice Nojilana¹

1. BURDEN OF DISEASE RESEARCH UNIT, SOUTH AFRICAN MEDICAL RESEARCH COUNCIL
2. CHRONIC DISEASE INITIATIVE FOR AFRICA, DEPARTMENT OF MEDICINE, UNIVERSITY OF CAPE TOWN
What are the patterns of tobacco and harmful alcohol use, diet intake and physical inactivity?
THE HEALTH SECTOR RESPONSE TO NCDs

Policy and programmes
- South Africa has been a global leader in adopting legislation for tobacco control.
- Since 1994, alcohol policy development has taken place in a piecemeal fashion
- The Food-based Dietary guidelines developed in 2001, have been used for education purposes for prevention of chronic NCDs and food labelling regulations are currently being revised.

Health Services
- Primary health care is not well programmed to deliver preventive or treatment services for NCDs and South Africa has some way to go to provide integrated primary health care.

Human Resources
- The general shortage of health-care professionals, particularly in rural areas, impacts across all aspects of health care.

Surveillance and Information Systems
- The national NCO surveillance system, which is essential to inform strategic planning and policy, is currently rudimentary.

Financing
- South Africa has a public and private sector resulting in considerable inequalities in access to health care.
A NATIONAL POLICY AND STRATEGY FOR NCDS
Population-wide interventions to promote healthy diet, physical activity, healthy environment and no smoking or harmful alcohol use

- Strengthen tobacco control, particularly among young people and decrease passive smoke exposure of children in the home
- Support smoking quitting programmes
- Promote healthy eating patterns that are low in fat and sugar and high in fruit and vegetables, in part, by addressing access, through inter-sectoral programmes involving the agricultural sector
- Reduce salt in foods
- Reduce trans-fat in foods
- Restrict access to alcohol (through addressing physical availability and pricing) and extend alcohol control legislation (particularly in the areas of alcohol marketing, and drinking and driving)
- Promotion of physical activity in schools and workplaces, and through urban planning for active commuting and access to safe public green space
- Reduce exposure to biomass pollutants through electrification of households
- Control air pollution including review and enforcing legislation related to polluted places of work
- Media and communication strategies to prevent NCDs
Strengthen primary health care

• Strengthen district-based primary health care by implementing the integrated World Health Organization chronic disease model of care
• Use the absolute risk approach to identify those at highest risk for NCDs
• Develop community-based care to support primary health-care centres and people with NCDs
• Introduce realistic guidelines for managing and treating NCDs and their risk factors
• Train health-care providers and managers in optimal NCD care
• Train health-care providers in patient-centred communication styles
• Implement appropriate referral systems
• Ensure constant supply of medications needed for NCDs and their risk factors
• Ensure cost-effective interventions are fully implemented
• Foster collaboration between public and private sector
Strengthen quality assurance

• Develop an NCD surveillance system including information to monitor quality of care
• Develop evaluation capacity
• Develop capacity to review evidence and identify best-buy options
• Strengthen health research focused on identifying effective interventions for prevention and management of NCDs
Cardiovascular disease burden

This represents a demand on the health services of South Africa far beyond the scope of its limited resources.

There is a dearth of facilities and adequately trained personnel especially in the public sector to deal with advanced interventions and rehabilitation.

It is critical that South Africa utilizes its limited resources optimally and implement cost-effective health-promoting interventions to stem the predicted epidemic of chronic diseases of lifestyle in the face of all the other health challenges in our country.