

## Africa

# Innovative strategies targeting obesity and non-communicable diseases in South Africa: what can we learn from the private healthcare sector?

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## Summary

Over 50% of South African adult women and 30% of adult men are either overweight or obese, and nearly half of all adults are insufficiently active, with major increases in obesity-associated healthcare expenditures since 1980, a high proportion of which are paid by private health insurance. In this paper, we describe the Vitality programme, an incentivized health promotion programme from South Africa's largest private health insurer, Discovery Health, with over 2.5 million beneficiaries. Wellness activities of the programme include health risk assessments, subsidized gym memberships and smoking cessation or weight loss programmes with many incentives, including cash back on purchases of healthy foods. This incentive-based programme has shown a significant relationship between levels of engagement in wellness activities, in particular increasing participation in fitness-related activities, with lower healthcare expenditure and an increase in the overall ratio of healthy foods to total food purchases. This programme demonstrates that incentives may reduce the barriers for entry into care, increase preventive screening and increase engagement in healthy behaviours for prevention and management of obesity. This 'carrots versus sticks' approach may have implications for public health policy even in lower- and middle-income settings and underserved communities.

**Keywords:** Financial incentives, health insurance, lower- and middle-income countries, wellness programmes.

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## Scope of the problems of obesity and inactivity

Chronic non-communicable diseases (NCDs) account for more than two-thirds of global mortality, at least 50% of which is preventable on the basis of common, modifiable risk factors, including an unhealthy diet, obesity, tobacco use and lack of physical activity (1). Obesity has been described as a global pandemic that affects 500 million persons worldwide and is predicted to increase to 1 billion by 2030 (2). Moreover, the global prevalence of physical

inactivity is 31% (3) and has recently been shown to account for a similar number of deaths annually to that of smoking (4). The United Nations High-level Meeting on NCDs in 2011 recognized the need for global, regional and national strategies for the prevention and management of the problems of obesity and inactivity (1). Furthermore, there was recognition that the economic, social, political and environmental determinants of health, such as poverty and the uneven distribution of wealth, lack of education, rapid urbanization and population aging, contribute to the rising incidence and prevalence of NCDs.

South Africa, a country of more than 50 million persons, has one of the largest income inequalities in the world (Gini coefficient of 0.68). Against this backdrop, at least one in six South African adults is estimated to be human immunodeficiency virus (HIV)-positive, and approximately 40% of adult mortality is attributable to four chronic conditions: cardiovascular disease, diabetes, chronic lung disease and certain cancers. More than one in two adult women and one in three adult men are either overweight or obese (5). Nearly one in three adolescents watch more than 3 h of television daily, and nearly half of all adults are insufficiently active (6,7). In 2007, obesity and inactivity together were estimated to account for 4% of disability-adjusted life years in adult South Africans (8). Of particular concern is that the prevalence of obesity and overweight in adolescents has increased by more than 20% between 2002 and 2008 and inactivity rose measurably during the same time period (6,9). Thus, there is a pressing need to better understand the drivers of these emerging epidemics of obesity and inactivity and associated comorbidities and to develop and evaluate interventions aimed at both the individual and the ecological levels.

### **Economic impact of obesity and implications for health care**

The Global Burden of Disease Study 2010 has estimated that approximately 3.8% disability-adjusted life years may be attributed to overweight and obesity (10). In a recent commentary, Yang and Nichols (11) highlighted the devastating and growing impact of obesity on the US healthcare system and economy. In 1980, obesity-associated healthcare expenditures accounted for about 9% of the US gross domestic product (GDP), rising to almost 18% of the GDP by 2011. Finkelstein *et al.* determined that the annual medical costs associated with obesity were approximately \$147 billion, half of which was paid for from private healthcare funders or insurance. Ultimately, these costs are transferred to employers and individuals through increased premiums, co-payments and deductible expenses in health plans (12,13).

Consequently, funders of health care, such as health insurance plans and employers, are increasingly adopting incentivized and/or subsidized health promotion programmes or values-based benefits designs (14–18), the structure of which increase the likelihood that members will make positive lifestyle and healthy behaviour choices (18). The incentives may take the form of a differential premium for participation in health promotion or wellness activities, such as preventive screening or a health risk appraisal (HRA), adherence to treatment regimens, use of high-performance providers ('a preferred network of practitioners who adhere to evidence-based treatment guidelines') or the adoption and maintenance of healthy

behaviours (17). Incentives may also be based on reimbursement for participation only in health promotion activities (engagement) or for attainment (meeting targets for health risk) irrespective of engagement (19).

### **Comparative regulatory environment and wellness incentives**

To some extent, the regulatory environment informs the implementation and structure of values-based benefits designs and the nature of incentive-based health promotion programmes. For example, in the United States, the Health Insurance Portability and Accountability Act (HIPAA) ensures that plans cannot discriminate against members on the basis of their current health status by offering differential or discounted premiums (19). However, insurers are not prevented from offering reimbursements in the form of wellness or health promotion programmes. To ensure fairness, attainment incentives (for meeting targets) cannot exceed 20% of the total cost of coverage (combined employer and employee contributions).

In a consensus statement, the American College of Occupational and Environmental Medicine outlined guidance for employer-sponsored wellness programmes using outcomes-based incentives (20). In terms of HIPAA-compliant benefits design, it was highlighted that 90% of companies with outcomes-based incentives used a weight-related target (overweight and obesity defined by body mass index [BMI]), whereas 75% used blood pressure, cholesterol concentrations or tobacco use as targets. This is in line with the regulatory requirements that attainment-based incentives be linked only to modifiable lifestyle behaviours. While the effectiveness of interventions for entry into care or the initiation of lifestyle behaviour change is not under question (15,21,22), these guidelines raise the issue that financial incentives have the potential to erode intrinsic motivation for sustained behaviour change. Moreover, they emphasize that attainment incentives must not be so large as to result in cost shifting, in which those individuals who either do not participate or do not attain the targets bear the burden of payment or cross-subsidize those who achieve or maintain the required health status (20).

From a South African perspective, clause 29 of the 1998 Medical Aids Act prevents medical schemes from offering a differential premium on the basis of age, gender, the past or present state of health of the applicant, 'the frequency of rendering of relevant health services to a person or the extent of benefits to which a person becomes entitled' (23). This is similar to the US HIPAA and the Patient Protection and Affordable Care Act of 2010. South African health plan contributions are community rated, which prevents insurers from varying the premiums based on health status

or claims history. This is, in part, a response to the legacy of apartheid and goes some way towards narrowing the enormous gap between the private and the public healthcare systems in South Africa (24). Furthermore, South African health insurers are obliged to provide a minimum of prescribed benefits for a number of common chronic medical conditions to all members.

However, this dual healthcare system in South Africa has led to innovation in values-based benefits designs offered by private healthcare funders. 'For example, wellness programmes may exist as separate legal entities, but integrate seamlessly with the health plan' (25). The end result of this integration is that there will be a broader base of healthy members taking advantage of the engagement and attainment rewards with a targeted high-risk, secondary prevention strategy aimed at members with established lifestyle risk factors, such as obesity, or chronic conditions, such as hypertension, often identified through preventive screening.

### Discovery Health and Vitality: a case study

One such example is Discovery Health, the largest private health insurer in South Africa with over 2.5 million beneficiaries. About 40% of total healthcare expenditure in South Africa comes from the public sector, while the remainder comes from private-sector service providers. However, only 15% of South Africans have access to private health insurance and Discovery Health accounts for more than one-third of the private health insurance market. Since its inception, Discovery Health has expanded its operations to the United States, UK and China.

There is some indication that the health status and claims profiles of Discovery Health members in South Africa are comparable to those in the United States. For example, just under 17% of members are hypertensive, and approximately 4% are reportedly diabetic. Groups differ somewhat with respect to elevated serum cholesterol concentrations (9% in South African vs. 19% in American members) (25). Discovery Vitality, offered by Discovery Health, is a comprehensive, integrated and incentivized health promotion programme with more than 1.4 million members in South Africa alone. Membership in Vitality is voluntary and offered separately from the health plan for a nominal monthly fee of approximately ZAR 115–50 (US\$15–20) per member or per family. In the United States, nearly 90% of Vitality membership is offered as part of an employer-sponsored benefit.

Participation or engagement in the various wellness activities of the Vitality programme is undertaken in one of four categories including assessment and screening, healthy choices, health knowledge and fitness-related activities. Members accumulate points for participating in the various wellness services and programmes, such as health-risk assessments, subsidized gym memberships; pharmacy-

based health checks involving biometric measures of weight, height, cholesterol and plasma glucose, and blood pressure; visits to dietitians and exercise specialists; smoking cessation and weight reduction programmes; access to online or in-person risk assessments; and online and print materials for health and wellness. Points determine tier status (blue, bronze, silver, gold and diamond), which is a measure of the level of participation with the health promotion programme. Status, in turn, allows members to claim substantial discounts (15%–45%) on a range of store purchases and services, including airline flights and subsidized gym memberships and cash back on purchases of healthy food (25,26). In 2009, Vitality South Africa introduced the HealthyFood™ benefit, offering a cash rebate of up to 25% on more than 10,000 healthy food items at a major national retail supermarket chain. In this review, we have interrogated the programme components targeting physical activity, healthy eating and preventive screening, as these have the potential to impact on obesity prevention and management directly.

It has been well established that regular physical activity is associated in a dose-response manner with reduced risk for chronic NCDs and all-cause mortality (27) and is inversely associated with obesity (28). As a result, physical activity interventions are commonly included in employer-sponsored health promotion programmes and have been shown to be effective in increasing physical activity levels, changing health-risk status and reducing BMI (29–31). The Vitality physical activity benefit allocates points for fitness centre or gym visits (150 points per visit up to a maximum of 15,000 points per year, or one-third of the points required to achieve the highest status); fitness assessment and meeting age- and gender-standardized fitness targets (annual subsidized fitness assessment through a network of service providers similar to clinical exercise physiologists or exercise specialists in the United States); use of downloadable heart rate monitors or step counters to document physical activity participation; and completion of accredited fitness-related events, such as fun runs, bicycle races or triathlons (16).

Fitness centre membership is discounted up to 80%, after a nominal registration fee of approximately US\$80–\$120, in any one of three national fitness centre chains, including more than 110 centres nationwide. Currently, more than 330,000 members are registered for the physical activity benefit (close to one-third of Vitality members) with the proportion of members actively engaged increasing over time. This may be due, in part, to a modification in the benefits design that now requires a rolling average of at least three gym visits per month to maintain the subsidy. Once attendance falls below this average, the discount is reduced.

Poor food choices are also implicated in chronic NCDs and in the pathogenesis of obesity (32,33). Changing

dietary habits is made more difficult by the perceived cost of healthy food and secular trends in food prices (34,35). Financial incentives may be one strategy for influencing food choices. The Vitality HealthyFood™ benefit is a health promotion initiative offering a rebate of up to 25% on purchases of healthy foods at a national retail supermarket chain. Thus this benefit combines strategies of reduced food prices and in-store identification of healthier food items with wide accessibility on a national scale.

A scientific advisory panel was involved in establishing the guidelines for selection of foods for inclusion as HealthyFood™ items, and thereby eligible for discount. The criteria for selection are in line with the South African Food-based Dietary Guidelines (36), the World Health Organization's guidelines for prevention of diet-related chronic disease and the American Heart Association Dietary Guidelines (37). For the purpose of this programme, HealthyFood™ items are defined as foods that are low in saturated fat, added sugars, sodium, and cholesterol and do not contain trans-fatty acids. These foods are typically rich in vitamins, minerals and fibre and usually have a low-calorie density. Examples of common foods included in the list are fresh fruits and vegetables, fat-free dairy products, trimmed poultry and whole-grain breads.

The HealthyFood™ benefit requires activation by members either online or by telephone. Upon activation, members are issued a HealthyFood™ card that identifies them at the point of sale when purchasing food items from the partnering national retail supermarket chain. Activated members receive a savings of 10% on all HealthyFood™ items purchased. The HealthyFood™ items are also identified on the cashier's receipt. An additional savings of 15% (total of 25%) is contingent on the member having completed a health-risk assessment in the previous 12 months. The savings are in the form of a cash rebate paid into the member's elected bank account at the end of every month. Further, Vitality points are allocated per HealthyFood™ item purchased, which in turn allow members to claim greater discounts for purchases or services from more than 800 retail supermarkets. More than 215,000 members have activated this benefit.

### **Incentive-based health promotion, does it work? The Vitality experience**

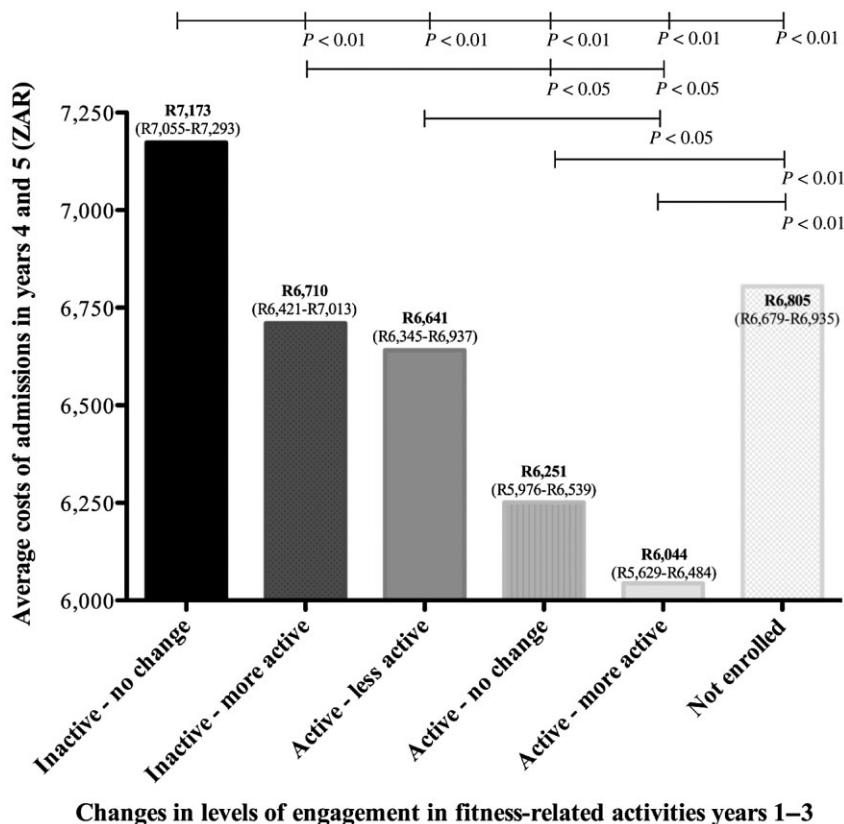
In 2010, in the first of a series of cross-sectional studies of more than 940,000 Discovery members, a significant and inverse relationship was demonstrated between the overall level of engagement in all four components of the Vitality health promotion programme and medical claims (26). Furthermore, levels of participation in fitness-related activities alone were inversely associated with medical claims

and hospital admissions. Highly engaged members, defined on the basis of at least one gym visit per week or 48 per year, who were hospitalized had average claims ZAR 5,025 (US\$632) lower than inactive members and reduced lengths of stay (16).

In 2012, a retrospective longitudinal analysis interrogated changes in participation in the fitness-related activities over 5 years and in-patient health claims after a period of 3 years among more than 300,000 Discovery members (38). Participation in fitness-related activities increased over time in the Vitality programme, as demonstrated by an increase in gym membership from 24% to 33% of Vitality members, a reduction of inactive members from 76% to 69%, and an attendant increase in low, moderate and highly active members over a 5-year period, from 2001 to 2005. Further, increasing engagement in fitness-related activities, particularly the gym-based activities of the programme, over the first 3 years was associated with a significantly lower probability of hospital admissions and in-patient claims in the subsequent 2 years (Fig. 1). The study demonstrated that a comprehensive incentive-based health promotion programme, offered as part of a health insurance plan, may increase participation in physical activity and result in a concomitant decrease in claims and the probability of hospital admissions.

Despite these promising trends, more than two-thirds of members still fail to use the gym benefit in a meaningful way for health, suggesting that the incentives and subsidy are not sufficient to overcome behavioural inertia. The programme as it is currently designed is 'low touch', relying on web-based communication and a fairly uniform choice architecture for the incentives (38). Further behavioural economics research is under way to determine if the manner of communicating with members (framing), the size of the incentive (increased in proportion to the frequency of gym visits), or the motivation behind the incentive (personal gain, altruism or chance) influence participation or engagement more than the standard-of-care model or communication only. Preliminary evidence suggests that enhanced member communication was effective in increasing the likelihood of participation in physical activity and the other differential incentives, and all are better than standard-of-care (25). Thus there is a need for evaluation of the impact of varying incentives on sustained physical activity in targeted or at-risk communities.

The HealthyFood™ benefit has been evaluated in two recent publications in 2013 (39,40). The first examined the relationship between activation of the benefit and self-reported dietary behaviours based on the results of the HRA (consumption of fruits and vegetables, whole grains, salty foods, cakes and confectionaries, sugar-sweetened beverages, high-fat and fried foods, processed meats and fast foods) and self-reported weight and height in more than 500,000 members. Those members who activated the



**Figure 1** Cost of hospital admissions in years 4 and 5 based on changes in levels of engagement in fitness-related activities in years 1 to 3 (38).

benefit reported a higher intake of fruits and vegetables and whole grains and a lower consumption of foods high in salt and sugar, fried and processed foods and fast food. In addition, those members who received a 25% discount had significantly lower odds of obesity (odds ratio:  $0.856 \pm 0.025$ ,  $P < 0.001$ ) (39).

In the second study, household purchases by members who activated the HealthyFood™ benefit through their Discovery credit cards were compared to those members holding a credit card who did not activate the benefit (40) from 2009 (prior to the initiation of benefit) to 2012. Rebates of 10% and 25% for healthy foods were associated with an increase in the ratio of expenditure on healthy foods to total food expenditure of 6.0% (95% confidence interval [CI]: 5.3, 6.8) and 9.3% (95% CI: 8.5, 10.0), respectively. Activating the benefit was associated with an increased relative expenditure on fruits and vegetables and a decreased relative expenditure on less desirable food items, which were similar in magnitude to the overall changes in healthy food purchases.

Taken together, these studies provide the first example of a novel health insurance benefit based on the discounting of predefined healthy food items in a retail supermarket setting implemented on a national scale. In this natural experiment, discounting the purchase of healthy foods was associated with a significant increase in the proportion of

healthy food purchased over time. These results provide encouraging evidence for the role of financial incentives in promoting healthy behaviour change.

### Lessons learned from the private sector: translation to policy and programmes

There is a growing recognition concerning the cost-effectiveness of values-based benefits design, focusing not only the effective management of chronic disease conditions, but targeting and incentivizing healthy lifestyle behaviours and disease prevention initiatives (41,42). One example of this type of intervention programme, for lower- and middle-income countries, is that of Conditional Cash Transfers (CCT) (43,44). These are similar to attainment incentives, and provide for a conditional social grant on the basis of meeting certain predetermined, programme-specific requirements. These may range from immunization visits for children, to counselling for sexually-transmitted diseases, HIV-testing or pre-booking for antenatal care. These transfers may act as a ‘nudge’ by addressing the potential direct and indirect barriers for entry into care (fees, transport costs, lost wages, etc.). Moreover, they may help to overcome cultural barriers to preventative health visits or a failure to appreciate the value of such visits long-term (hyperbolic discounting).

Mexico and Brazil were among the first countries to introduce CCTs towards the end of the 1990s which have since been implemented in many more countries, particularly in Latin America. In Mexico, the Oportunidades programme targets the extreme poor, and low-income households are given a monthly subsidy, contingent upon regular family attendance at healthcare clinics and health information sessions (44). In a 'natural experiment' of the programme, with staggered and discontinuous eligibility of the programme in some communities in Mexico, Andalon modelled the effects of Oportunidades programme on overweight and obesity in women and men. Although there were no apparent effects of participation in rates of obesity in men, women and adolescent girls who had access to the programme were less likely to be overweight or obese. Interestingly, this effect was most notable in families at the cut-off point for participation (higher income).

One example of a South African-based CCT was an incentivized mobile HIV counselling and testing programme targeting unemployed men in Cape Town, South Africa between August 2008 and August 2010 (45). The men in the incentivized group received a food voucher valued at ZAR80 (USD 10.30) irrespective of their HIV status, after volunteering for HIV counselling and testing (HCT). The number of men seeking HCT for the first time was higher in the incentivized group than the control, and overall HIV infection rate (the case finding) was threefold higher in the incentivized group (46).

There is much debate about the positive and negative implications concerning the use of conditional cash transfers in economically disadvantaged populations (45,47). Cookson (47) argues that individuals from lower socioeconomic status (SES) groups are less likely to participate in health screening activities and are also less likely to be responsive to health promotion messages. Thus, incentivizing screening and similar activities is likely to increase uptake in these communities and thereby promote equity. Indeed, evidence supporting CCTs has shown that it is an effective means of increasing uptake in screening and preventative services with subsequent improvements in health status. Factors that should be considered prior to implementing CCTs includes considering the possible social stigma that might be associated with participation, in addition to evaluating the cost of compliance. Therefore, CCTs should be considered if the health and associated cost savings outweigh the cost of the programme and if there is assurance that the benefits outweigh the cost and potential negative effects.

In contrast, Popay (45) contends that CCTs imply that lower SES groups are irresponsible and actually broadens the gap between rich and poor, thus 'double stigmatizing' the poor. This author states that the benefits of CCTs are related specifically to utilization of healthcare services and

not necessarily associated with improved health or lifestyle behaviours. Furthermore, simply providing cash does not change the broader context of the recipient's life, thus they might not be able to sustain the desired healthy lifestyle behaviour. This is particularly important when considering behaviours aimed at reducing obesity, which are complex and thus harder to change.

Although the problems of obesity and inactivity in South Africa are multisectoral in scope and are jointly mentioned in the National Strategic Plan for NCDs, no specific policy actions have been directed at reducing the disease burden associated with these risk factors. In the South African primary care environment, the main modes for service delivery include district-based clinical specialists, school health services and municipal ward-based primary healthcare clinics. These facilities, and some form of incentive subsidy programme, could therefore play a role in promoting healthy lifestyle choices. The increase in healthcare access and coverage might be the catalyst to incentivize healthy behaviours with the long-term aim of reducing healthcare expenditure.

Another strategy that may be adapted from the private sector initiative of the Vitality HealthyFood™ benefit is that of preferential pricing of healthier food options. In the public sector, the most logical extension of this strategy is that of zero-rating certain healthy food items or giving value-added tax (VAT) exemption to healthy food products. For example, in South Africa, certain basic household items are zero-rated or tax exempt, including food items such as: brown bread, dried mielies (corn), dried beans, lentils, canned pilchards, rice, fresh fruit and vegetables, vegetable oil, milk, eggs and edible legumes. Although this zero-rating was introduced in 1984 as a means of promoting equity and poverty alleviation, the policy may be regarded as regressive (48).

There has been much debate and research investigating which food items are best suited for zero-rating, so that the benefit to poorer households is maximized. For example, the poorest 40% of the population receive 65.4% of the exemption on the maize VAT, but this group receives only 15.3% of the exemption on fresh milk. Thus, the benefits of the VAT exemption on milk are regressive in South Africa and represent, in part, differences among income groups in market utilization and in access to refrigeration (48). Therefore, it is the more affluent homes that are benefitting from these discounts, particularly, as both exemptions cost the South African government an equal amount to implement. The selection of food items for zero-rating or the eligibility for this benefit, should ideally be based on principles of equity, poverty alleviation and on maximizing health benefits.

A similar argument may be made for the Supplemental Nutrition Assistance Program (SNAP) in the United States. In a recent study by Leung *et al.* in 2013 (49), they demonstrated that children from households receiving

SNAP assistance had significantly higher intakes of sugar-sweetened beverages, high-fat dairy products and processed meats, and a lower intake of nuts, seeds and legumes, in comparison to the non-participant households. There is much interest in and advocacy for policies regarding foods for which the subsidy should be eligible, for example, limiting or restricting the purchase of sugar-sweetened beverages or additionally discounted fresh produce items. Modelling suggests that these policies may favourably impact on chronic, NCDs (50).

Another example of preferential pricing comes from the Supermarket Healthy Options Project trial conducted in lower- and middle-income neighbourhoods in New Zealand (51). This 6-month intervention compared price discounts on healthy food purchases, alone or combined with educational messages. The main finding was that participants receiving the price discount purchased significantly healthier foods (all foods purchased) at 6 months, and this was maintained at 12 months, when compared to the controls. None of these benefits were observed when comparing participants receiving educational messages to the control group. Ultimately pricing strategies to encourage healthy food intake and thereby reducing the burden of disease and obesity, involving taxes, subsidies and discounts, require further evaluation, to assess effectiveness and to avoid unintended consequences (52).

## Summary

In South Africa, as in other lower- and middle-income countries, there is an urgency to increase access to healthcare services that are efficient and that meet the changing needs of populations in transition. Further policies and programmes are needed that promote social justice with respect to access to healthy food and opportunities for physical activity to reduce the rising tide of obesity. Incentives, such as those found in private sector health promotion programmes, may reduce the barriers for entry into care, increase preventative screening, and engagement in healthy behaviours for the prevention and management of obesity. However, the 'carrots versus sticks approach' may also have positive implications for public health policy, even in lower- and middle-income settings and underserved communities. Well-intentioned policy makers need to be aware of the potential unintended consequences such as regressive tax policy, social stigma and behavioural inertia.

Consequently, promoting and incentivizing healthy lifestyle behaviours, along with the strategic introduction of conditional cash transfers for healthy behaviour or clinic attendance, and the effective use of nutritional subsidy programmes or tax exemption, have the potential to make the healthy choice the easy choice, and thereby impact on obesity and associated comorbidities. Further research and pragmatic evaluation of existing programmes and interven-

tions is needed, to explore the utility and cost-effectiveness of these interventions on a large scale, and in under-served settings.

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## Conflicts of interest

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