REPORT OF THE 2nd EXPERT STAKEHOLDERS GROUP LINKS GRANT

HIGH LEVEL SALT REDUCTION MEETING

Date of meeting: **Monday 29th November 2021**

Venue: **Garden Court OR Tambo International airport,**
2 Hulley road, Isando, Jhb, South Africa

Time: **10h30 – 13h30**

Host: **Heart & Stroke Foundation South Africa (HSFSA)**

Date of Final Report: 10th March 2022

Report compiled by:

Lynne van Zyl (RD) SA, the LINKS Grant Heart and Stroke Foundation South Africa Team

CONTENTS: Page:

1. EXECUTIVE SUMMARY:

The second stakeholder meeting of the South Africa LINKS-funded salt reduction project took place on 29th November 2021. The main purpose was to establish a mechanism for monitoring compliance of the country's Sodium Reduction legislation.

Twenty-six participants attended – some virtually and some in person.

There were a series of presentations to update attendees on the current situation related to salt reduction in South Africa, global progress on salt reduction and an overview of activities and preliminary findings from the current LINKS project that confirmed compliance with salt targets is generally good across most categories of food, except for the processed meat (uncured) category.

The main take-home messages that emerged from the meeting were: (1) the South African Government currently lacks the technical capacity and political leadership to monitor the salt legislation adequately; (2) greater priority needs to be given to NCDs (Non-Communicable Diseases) in general; and (3) the mandatory salt reduction targets need to be expanded to other sectors such as the quick service industry and to informal food vendors.

Participants agreed that a call to action to the South African government is required to advocate for ongoing commitment and allocation of resources for an ongoing program to monitor salt reduction activities in South Africa.

The meeting concluded with suggestions for leveraging existing activities and data collection sources that could be included in a salt reduction monitoring framework for governmental consideration.

LINKS study investigators will incorporate these ideas into a more detailed proposal which will be presented at the third and final stakeholder meeting in May 2022.

2. ATTENDANCE REGISTER AND AFFILIATIONS:

In total there were twenty-six attendees – ten of whom attended in person and sixteen virtually, as summarised below:

STAKEHOLDER:	ORGANIZATIONAL AFFILIATION
In-Person:	
Prof Pamela Naidoo	CEO: Heart & Stroke Foundation South Africa (HSFSA), Co-Investigator for the LINKS grant project
Ms Hayley Cimring	HSFSA: Registered Dietitian and Nutrition Science Team Leader
Ms Emmah Siluma	HSFSA: Office Administrator, Johannesburg
Ms Kinza Hussain	HSFSA: Registered Dietitian
Ms Lynne van Zyl	Report writer
Ms Maria van der Merwe	ADSA (President: Association of Dietetics, SA)
Ms Sandhya Singh	Director NCDs: NDOH (National Department of Health)
Prof Ali Dunsay	NSSA (Nutrition Society of SA)
Mr Nigel Sunley	SAAFOST (SA Association of Food & Science Technology)
Dr Vicki Pinkney-Atkinson	Director, SANCDA (SA Non-Communicable Diseases Alliance)
Virtual Attendees:	
Prof Karen Charlton	University of Wollongong, Australia, Lead Investigator for the LINKS grant project
Dr Rhoda Shakhane	University of Wollongong, Australia
Prof Jacqui Webster	The George Institute for Global Health, Australia
Ms Jessica Byrne	Association for Dietetics in South Africa (ADSA)
Ms Terry Harris	Discovery Vitality, Co-Investigator for the LINKS grant project
Dr Lynn Moeng Mahlangu	Chief Director: Health Promotion and Nutrition, NDOH (National Department of Health)
Ms Maude De Hoop	NDOH (National Department of Health) – Nutrition
Ms Malose Matlala	NDOH (National Department of Health)
Prof Edelweiss Wentzel-Viljoen	NWU (North-West University) and HSFSA Board
Dr Averalda van Graan	MRC (Medical Research Centre)
Dr Cindy George	MRC (Medical Research Centre)
Prof Alta Schutte	University of New South Wales, Australia
Dr Beulah Pretorius	University of Pretoria, South Africa, Co-Investigator for the LINKS grant project
Prof Hettie Schonfeldt	University of Pretoria, South Africa
Ms Anna Godzwana	Directorate: Food Control, Department of Health

3. WELCOME:

Prof Pamela Naidoo (HSFSA) welcomed everyone – all those in attendance in person, as well as those attending virtually via Zoom – to the 2nd Expert Stakeholders Group LINKS Grant High Level Salt Reduction Meeting. The 1st meeting was held on 1st March 2021 - the primary purpose of which was to explain the nature of the grant funding which specifically focuses on monitoring compliance with South Africa's salt reduction policies.

Prof Naidoo acknowledged the good governmental representation from the National Department of Health (NDOH). The slight delay in holding the 2nd Expert Stakeholders meeting resulted from COVID-19 disruptions, but has been fortuitous in its timing as there are learnings from countries such as Jamaica in terms of their experiences in implementing front-of-pack labelling and contentious issues with food industry engagement associated with conflicts of interest.

Prof Naidoo provided a brief overview of the main goal of the meeting which was to develop an evidence-based, but pragmatic, framework for monitoring compliance of the salt reduction legislation in South Africa for submission to the NDOH.

4. PROJECT AIMS & OBJECTIVES:

Prof Charlton **(University of Wollongong)** provided a brief summary of the LINKS funded project for the benefit of those participants who had not attended the 1st stakeholder meeting in March 2021. Funding of US $101 000 has been made available by the **LINKS Resolve to Save Lives Project.** LINKS is a collaborative, philanthropic effort between:

- World Health Organization;
- US Centres for Disease Control & Prevention through CDC Foundation; and
- Resolve to Save Lives, an initiative of Vital Strategies.

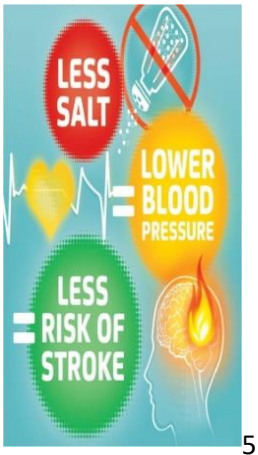
The key grant **partners in the awarded LINKS grant** are:

- University of Wollongong.
- Heart and Stroke Foundation of SA (HSFSA);
- Discovery Vitality;
- The George Institute (THE GEORGE INSTITUTE); and the
- University of Pretoria;

The main purpose of the 2nd LINKS Grant meeting is to establish a mechanism for monitoring compliance of sodium reduction legislation in South Africa.

Key messages on Salt:

The adverse health effects of excessive salt intake are well known, namely raised blood pressure and increased risk of stroke and cardiovascular disease**.**



Great strides in reducing salt intake have been made globally, and much of this progress has been spear-headed by THE GEORGE INSTITUTE. There is evidence that salt reduction strategies are effective in reducing population level salt intake, but that this requires strong governmental leadership with multi-stakeholder buy-in, with multi-faceted implementation strategies. Key to a well-functioning salt reduction strategy is a mechanism for robust monitoring of compliance by the food industry with mandated salt targets.

South Africa, despite being a world leader in implementing mandatory salt targets across many categories of processed foods, does not presently have a monitoring system in place to assess effectiveness of the legislation in changing the food supply nor to assess its impact on population health outcomes.

Why target Salt intake? Excessive sodium intake is associated with increased blood pressure and is a risk factor for both stroke and coronary heart disease, both of which are highly prevalent in South Africa and place a huge burden on the health system. The WHO recommends < 5g of salt per person per day, while the global salt reduction goal is 30% by 2025.In South Africa, the prevalence of hypertension in those older than 15 years is 35.1%, of which 91% are undiagnosed, untreated or uncontrolled. The average salt intake in SA substantially exceeds the WHO target with reported median intakes of 7.7g per day in young adults, with the biggest contributors being: bread, along with discretionary foods ("extras") such as pies, salami, sausages, chips, potato crisps, and both canned and powdered soup. The South African population also consumes relatively high amounts of discretionary salt (i.e., salt added to foods at the table and in cooking), possibly contributing as much as 40% of total salt intake.

Summary of SA's Salt legislation to date: SA has been an example to the rest of world, as it was the first country globally to develop and implement mandatory sodium reduction legislation for a wide range of processed foods, as part of its initiative to reduce salt intake among its population. The legislation was expected to:

- Decrease nationwide salt intake by 0.85 g per person/day ;
- Reduce annual CVD deaths by 11%;
- Save the SA government US$ 51.25m/year in health care costs; and
- Prevent 2000 cases of poverty/year by saving households >US$ 4m/year in out-of-pocket medical expenses.

Does mandatory sodium reduction legislation work?

To answer this, reliable baseline data on salt intake was needed to assess the effectiveness of the legislation.

- External to the LINKS Grant Project, Prof Charlton has, for the past 5 years, been leading a large Bloomberg Philanthropy funded project in Ghana and South Africa to assess effectiveness of the interim salt reduction programme.
- The programme consisted of 2 phases: 1st Phase: 2015/early 2016 (pre legislation); 2nd Phase: 2018/early 2019 (post legislation).
- Effectiveness was determined by measuring the 24-hour urinary excretion of large samples from both South Africa and Ghana (control country with no legislation).
- The findings published in *Preventive Medicine Reports*[1] demonstrated that:
  - *"Salt intake reduced by 1.16 g salt per day between 2015 and 2018/19, with **older adults** having **significantly lower salt intakes** than younger South Africans".*

- ❖ In all comparisons made (eg. Male vs Female, Urban vs Rural) an effect was seen in individuals both **with and without high BP**;
- ❖ Despite overall salt intake reduction in the South African sample over time, of concern is the reported frequent addition of salt added to food **during** cooking (60% of participants in 2015; 65% in 2018/19). Fewer individuals reported frequent addition of salt to food at the table over time (22.2% and 17.6 %, respectively)
- ❖ This requires ongoing educational strategies to change behaviour, as was shown to be effective in the SaltWatch mass media campaign[2]

– This data has been confirmed by another study conducted in the North-West province[3] in a younger sample which found:
  - ❖ South Africa's salt regulation has been effective in lowering salt intake in young adults (Average age of 25 years) by ~0.82g salt/day between 2016 and 2018.
  - ❖ Greater salt intake reductions for vulnerable groups (i.e., lower socio-economic status) who typically consume more processed foods.
– It remains to be determined if the legislation has had the anticipated population health gains in terms of reduced levels of hypertension, stroke and cardiovascular disease.

The LINKS Grant Project:
Prof Charlton summarised the aim and methodology of the LINKS Grant Project.

***Aim**:*

- ❖ **To develop a FRAMEWORK for monitoring and surveillance of the Sodium content of the food supply in SA.**

***Action plan / Steps**:*

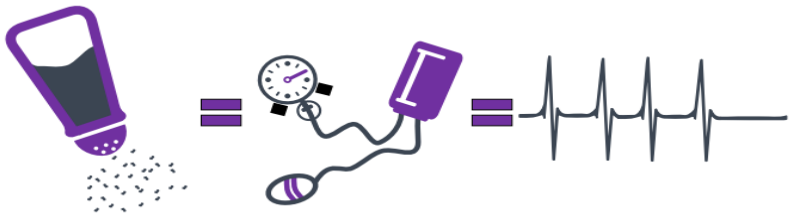
- ❖ Identify a **mechanism** by which the SA government can monitor compliance of the food industry SA sodium reduction policy, to be informed **through stakeholder engagement and co-design principles**;
- ❖ Compare the actual sodium content of key foods in 7 food categories (**chemically analyzed** using accepted methods by accredited laboratories) with the sodium content information provided on **food labels (**collected using FoodSwitch smartphone application);
- ❖ The findings will be presented to the LINKS Expert Stakeholder Group today to develop recommendations **for a feasible and sustainable monitoring process**, for uptake by the SA government.

5. KEYNOTE ADDRESS: PROGRESS GLOBALLY ON SALT REDUCTION – Old Challenges + New Opportunities:

Prof Jacqui Webster, Head of Advocacy and Policy Impact at The George Institute for Global Health and Conjoint Professor at the University of New South Wales, Sydney, Australia, welcomed participants to the meeting and expressed her support for collaboration on this important project.

Prof Webster acknowledged that South Africa was one of the first countries to legislate for sodium reduction, and so it is right that it should be leading the way in developing a framework for monitoring and accountability regarding this legislation She said the aim of her keynote address was to update on global progress and to outline some key opportunities regarding salt reduction strategies.

Prof Webster stated that the evidence for reducing salt consumption is strong and increasing but that current implementation of strategies is patchy, particularly in low-and middle- income countries (LMICs), where most of the disease burden lies. Strong government leadership with multi-stakeholder and multi-faceted implementation strategies are required to redress this, accompanied by relevant technical support and resources to support adoption, particularly in LMICs



Too much salt increases blood pressure which increases the risk of cardiovascular diseases.

The totality of the evidence is convincing - SALT REDUCTION WILL REDUCE RISK:

Questions that remain unanswered are:

- *What are the most effective strategies to reduce salt in different settings?*
- *Can programmes that have worked in high income countries be adapted to low- and middle-income countries?*
- *Can voluntary approaches work? Or do we need governments to regulate as in South Africa?*

Prof Webster reported on a recent systematic review[4] that **showed that:**

- From 2014 to 2019, there was an increase from 75 to 96 countries adopting salt reduction initiatives, representing a 28% increase.
- More strikingly is the number of countries now using legislative processes (such as here in South Africa) - an increase from 33% of the initiatives in 2014 to 60% (almost double);
- Almost double (8 to 16%) the number of countries is now using multi-legislative approaches (such as front of pack labelling and setting of salt targets in processed foods).
- The majority of programs are still in high/upper middle-income countries (such as Europe, Western Pacific and Americas) as opposed to lower income countries in the Eastern Mediterranean, South-East Asia and Africa;
- In Africa specifically, little progress is evident with South Africa being one of the only countries with a national sodium reduction program.

Data on program impact is limited but few countries have demonstrated reductions in salt intake. From those that have, characteristics of successful interventions are:

- Multi-faceted –combine reformulation, behaviour change, work in settings etc;
- Mostly include targets for reformulation;
- Mostly include interventions in settings (public procurements policies for schools, hospitals etc);
- All but four include front of pack labelling;
- Most (but less than previously) include consumer education programs;
- Increasing in the number of countries regulating.

A further systematic review identified 32 studies of salt reduction interventions in low- and middle-income countries, most of which demonstrated a positive effect based on a range of outcome measures[5].

Effects of interventions:
The magnitude of interventions varied and showed there was a difference between non-randomized clinical, and randomized clinical trials. **The main conclusions of this study were** that both clinical trials and intervention research projects demonstrated that interventions could also be effective in LMICS. The challenge is how to support scale-up of these strategies at national level.

A subsequent policy analysis based on desk review and qualitative interviews in 4 low- and middle-income countries identified regional and global support, pilot funding, local research and advocacy and political leadership as the main drivers for success. Conversely, lack of locally specific data, poor multi-sectoral collaboration, changes in government leadership, lack of commitment for monitoring and lack of incentives or resources were identified as key barriers.

Prof Webster identified two new opportunities to strengthen implementation of all salt reduction policies:

Firstly, the WHO Global Sodium Benchmarks were launched in May 2021 and can be adopted by countries or used to update their existing targets, where more stringent targets are needed.

Secondly, new evidence to support the use of reduced-sodium salts including a recent study published in the New England Journal of Medicine[6] entitled 'New causal evidence on CVD and death'. The study was conducted over 5 years in China on 20 000 participants had astounding results:

- Risk of stroke reduced 14% in the salt substitute group;
- Risk of major cardiovascular events were reduced by 13% in the salt substitute group;
- Risk of death reduced by 12% in the salt substitute group - this was much greater than anticipated;
- Modelling shows 10% of current events (CVD deaths or non-fatal strokes/heart attacks) could be averted.

Prof Webster said that these two opportunities had the potential to expedite salt reduction efforts globally. She concluded by highlighting the importance of monitoring and evaluation to ensure that salt reduction strategies were having an impact and countries were making progress towards the UN targets for reducing population salt intake by 30% by 2030.

6. LINKS GRANT PROJECT: Methods

Mrs Terry Harris **(Discovery Vitality)** provided a re-cap of the methods used by Discovery Vitality and The George Institute to collect food labelling information on sodium content of foods. An update was provided on the methods used to collect nutritional panel data and what has been achieved since the 1st Expert Stakeholder LINKS Group meeting.

a. Recap the Technology Used:

As Discovery Vitality and The George Institute in Australia are long-standing partners, the technology developed by The George Institute is able to be utilized by Discovery Vitality to capture and establish relevant much-needed data for the LINKS Grant Project.

The George Institute has developed a **TGI Data Collector App** based on Smart phone technology to Capture and Upload Data.
Although the TGI Data Collector App has the ability to take multiple photos (Capture) of each Food Product, the four specific photos needed for each Food Product are:

- Front of the Food Product;
- Ingredient list;
- Nutritional information;
- Barcode.

Photos of Food Products are sent to a central holding area and uploaded, following which the nutrition information is entered into the database by trained researchers.
All data is quality checked and strict protocols are adhered to.
Although results are not available in 'real-time', the maximum delay is 1-2 weeks, before one can see what is available (in terms of nutritional information) on SA shelves.

Discovery Vitality (DV) has 2 retail partners they work closely with, namely Pick n Pay and Woolworths, and data collection took place in these retail environments.

b. Process:

The following process was followed:

- Permission was granted from Discovery Vitality's 2 retailer partners:
  - ❖ Pick n Pay;
  - ❖ Woolworths.
- Data was collected from both retailers from the following stores (all in Gauteng):
  - ❖ Pick n Pay – Pick n Pay on Nicol;
  - ❖ Woolworths - Woolworths Nicolway and Woolworths Sandton City.
- Data was collected between February and July 2021, by 2 trained part-time data collectors.

Table 2.1 below shows the **Number of Products Uploaded each Month across the 13 Categories**:

Month:	Number of Products across 13 Categories
February 2021	426
March 2021	1602
May 2021	58
	41 (cross checking foods used by UP sample)
June 2021	18

- The following was done to ensure standardization and consistency:
  - ❖ The George Institute did spot checks on the image quality received from the uploads, and reported back to Discovery Health;
  - ❖ The George Institute provided weekly reports on number of products scanned in that week;
  - ❖ Discovery Health used a tracking system on MS Teams which detailed:
    - ✓ Name of Collector;
    - ✓ Date of data collection;
    - ✓ Store data collected from;
    - ✓ Hours worked;
    - ✓ Number of images uploaded (including time of upload);
    - ✓ Food category;
    - ✓ Aisle number;
  - ❖ Regular check-in meetings between the data collectors and DSY;
  - ❖ A WhatsApp group was also created for urgent queries and regular check-ups

FoodSwitch Nutritional Data:
Data Classification:
The classification of products followed the categorisation system of the Global Food Monitoring Group which is a:

- **Hierarchical system:**
  - ❖ 15 food groups;
  - ❖ 57 food categories;
  - ❖ Up to 3 more specific sub-categories.

- **Identifying targeted products:**
  Foods targeted by the sodium legislation were identified by mapping the applicable sub-categories to the categories set out in the legislation.

The Data Fields used included the Barcode (very important), Package size, Date of photo (this allowed for comparison), and the following Nutrients: KJ, Protein, Sodium, Saturated Fat, Total Sugar. University of Pretoria product number was also used which is linked to the unique product barcode.

c. Limitations and Conclusions:
The following limitations were noted:

- Variable barcode items (those food products sold according to weight so unable to track nutrient content)
- Database comprised of foods available to middle-higher socio-economic urban population due to the physical location of Discovery Vitality's retail stores;
- Not necessarily representative of all packaged foods within the 13 legislated food categories.

Conclusions:

- 2021 data collection has been completed;
- Due to the longstanding partnership between Discovery Vitality and The George Institute, Discovery Vitality is happy to continue to support this partnership going forward.

7. LINKS GRANT PROJECT: Sampling, Chemical Analysis & Laboratory Work

Dr Beulah Pretorius expanded on the process of the Sampling, as well as on the Chemical Analyses done at the ***University of Pretoria*** to determine the Salt content of various Food Products.

SAMPLING:
Key foods in 8 of 13 Food Categories included in the mandatory sodium reduction legislation were sampled.
To remain in line with International Network of Food Data Systems (INFOODS) guidelines to ensure validity of the data obtained, the following were looked at:

- Various Brands were used;
- Sampling units;
- Different batch numbers;
- Different retailers;
- Manufacturing date (to ensure that a sample food product is not manufactured only once);
- Samples were coded to ensure anonymity.

CHEMICAL ANALYSES:
Samples were analysed in duplicate using accepted accredited methods for:

- Moisture (using oven drying)
- Sodium (using dry ashing and ICP-OES)

Table 6 shows the **Foods Chemically Analyzed**: **16 different food products from 26 different brands (including smaller brands found nationally) - 540 data points for sodium + 540 data points for moisture**

	Brands		Brands		Brands
Processed Meat products		**Bread**		**Margarine**	
Red Viennas	4	Brown bread	6	Medium fat spread	5
Chicken Viennas	3	White bread	6		
French Polony	4	**Soup powder**		**Gravy powder**	
Chicken Polony	5	Brown onion soup	3	Brown onion gravy	3
Russians	3	**Instant Noodles**		**Instant Noodles**	
Beef sausages	1	Beef flavour	3	Beef flavour	2
Burgers	3				
Nuggets	3				
Bangers/pork sausages	3				

8. LINKS GRANT PROJECT: Data and Results

Following on from Sampling and the Chemical analyses of food products for sodium content, ***Dr Rhoda Shakhane***, University of Wollongong, provided preliminary results of the comparative analyses between food labelling information and actual sodium content of food products in the South African food supply.

DATA ANALYSIS
Data analysis was conducted in 2 steps:

1. Analysis of sodium levels in the FoodSwitch data (from nutrition labels)
2. Comparison of sodium levels in the FoodSwitch data with chemical analysis

Descriptive Statistics (Mean, Medians, Minimum and Maximum) of sodium levels per 100g were obtained for the 13 food categories targeted by the sodium legislation from the FoodSwitch data.

A total of 2089 Food Products were available from The George Institute's FoodSwitch data.
966 food products were excluded from the analysis due to the following reasons:

- Not part of the food categories targeted for sodium legislation (n=546);
- Missing sodium values (n=412);
- Variety packs (n=8);

1123 food products were therefore available for analysis.

RESULTS:

Most Food Categories are below the Phase 2 salt targets (implemented June 2019) except for the processed meat (uncured) category. It is important to note that every food category had some products remaining above the salt targets.

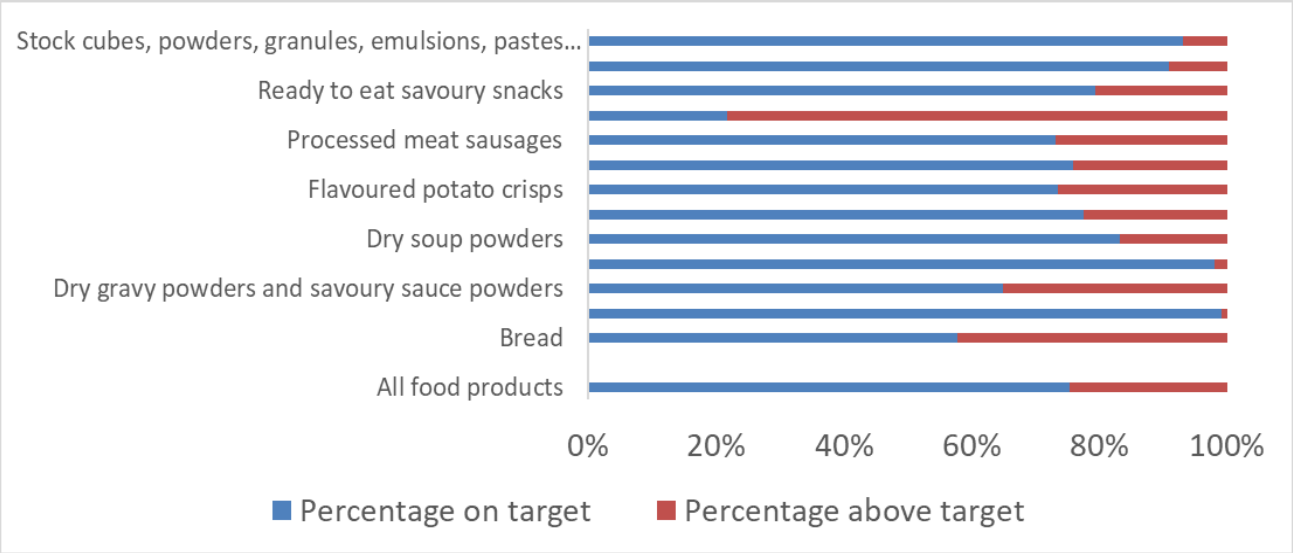


Figure 7.1: Proportion of Food Products meeting salt reduction targets

Comments on Figure 7.1:

Food categories with most products above target included processed meat (uncured), followed by bread, dry gravy powders and savoury sauce powders.

Sodium levels for the Bread Category from NIP:

The previous graph (Figure 7.1) did not show values according to different brands of bread. An additional analysis showed that both Pick N Pay and Woolworths Breads have many products still above the target sodium legislation target and the highest sodium content was found in especially breads (pita bread, bread rolls, wraps, buns, flat breads), but not in white or wholemeal breads.

Comparison of Mean Sodium levels in mg per 100g declared on the Nutrition Information Panel (NIP) with chemically analyzed Sodium levels

For the categories of dry soup powders, fat and butter spreads, processed meat (cured), stock cubes/powders/granules/emulsions/pastes or jellies, food labels had higher sodium content compared to the analytical values. The only food category that had a labelling value that was less than the analytical value for sodium was processed meats (uncured).

9. QUESTIONS:

Nigel Sunley (SAAFOST) *commented that sampling of food products was done at the 'top-end' of retailers (i.e. highest socio-economic level) that tend to be more law-abiding and have a cleaner record.*

The reality is that the 'bottom end of the market' is serviced by smaller and less sophisticated companies that do not always have the technological knowledge, may not even be aware of legislation around sodium reduction and tend to be less law-abiding. This is generally where the 'cowboys are'.

He feels that if we had to go to these wholesalers, we would get a more realistic overview of what is happening.

Comments:
Terry Harris (Discovery Vitality, Co-Investigator for the LINKS grant project) reiterated that where the sampling was done was due to the nature of Vitality's retail partnerships (ie. Pick n Pay and Woolworths in 'high-end' areas of Jhb).

Prof Charlton (University of Wollongong, Australia, Lead Investigator for the LINKS grant project) stated that this was always going to be problem/limitation, but that a few products (meat products mainly) not sold at Pick n Pay or Woolworths were also sampled.

Dr Pretorius (University of Pretoria, South Africa, Co-Investigator for the LINKS grant project) confirmed that most of the samples analyzed were not from Pick n Pay and Woolworths, but from smaller retailers such as OK, Savemor, Shoprite, and other retailers found near stations or taxi ranks. This was to get products that lower end will buy.

Prof Ali Dunsay (NSSA) *addressed a question to Terry Harris, Dr Pretorius or Dr Shakhane asking if the nutritional information obtained from analysis of the food products would be given/shared with MRC in terms of the Food Composition Tables?*

Terry Harris (Discovery Vitality, Co-Investigator for the LINKS grant project) stated that The George Institute own the database (globally) but that Discovery Vitality has the license and right to collect and use this information in SA, therefore permission would need to be obtained from The George Institute for the nutritional information data-set to be used in updating the Food Composition Tables.

Prof Webster (The George Institute for Global Health, Australia), commented that the evidence that sodium reduction was higher than predicted was promising, and expressed interest in knowing which foods were driving the reduction.

Prof Charlton (University of Wollongong, Australia, Lead Investigator for the LINKS grant project), responded to say that the limitation in the WHO-SAGE study was that no dietary data was collected, so it was not possible to determine which foods contributed to overall total salt intake. Only the total salt intake is known, from 24hr urinary Na analyses. This is a limitation when only the biomarker of urinary-analysis is used.

Prof Edelweiss Wentzel-Viljoen (NWU and HSFSA Board), said the results were similar to previous results from their group. Although most of the food categories achieved the sodium reduction legislation level overall, some individual food products had not. In the PREDICT study, dietary data was obtained using 3x24-hr food recalls, but they were unable to obtain sodium levels from this data, as Food Composition Tables do not provide accurate sodium values.

Dr Lynn Moeng Mahlangu (Chief Director: Health Promotion and Nutrition, NDOH), expressed concern about the sodium content in both processed meats and bread, as these are two of the main products used in sandwiches for school-going children. She questioned whether there was data on sodium intake in school-going children.

Prof Charlton (University of Wollongong, Australia, Lead Investigator for the LINKS grant project), agreed that this was an important age group but that data was in children was not available, to her knowledge. In the WHO-SAGE study and African-Predict studies, younger adults had considerably higher urinary sodium excretion values compared to older adults.

Dr Mahlangu (Chief Director: Health Promotion and Nutrition, NDOH) *also asked (regarding Prof Dhansay's question) if, as there are so many other variants/shops/ producers, could the results from the data obtained from food products from Pick n Pay and Woolworths not be used as an indication of the average sodium level, and therefore used in Food Composition Tables. She added that butcheries prepare their own meat products for sale, and that data may be misleading if we use these products as there is so much variety.*

Prof Charlton (University of Wollongong, Australia, Lead Investigator for the LINKS grant project) stated that the main purpose of this study is not to provide information on Food Composition Tables, and she stands to be corrected, but she does not think that Food Composition Tables are based only on food labels.

Dr Pretorius (University of Pretoria, South Africa, Co-Investigator for the LINKS grant project) confirmed that even now the amount of data on processed meats in Food Composition Tables currently is limited.
She added that another study investigated nutritional data for processed meats from Food Composition Tables, and that preliminary results show that the data in the Food Composition Tables indicates a higher fat content than the products analyzed. There may be more forthcoming information from that analysis.

Nigel Sunley(SAAFOST) *said we also need to look at other areas where results are 'out of line', and the way to do this is to look at the areas where there are the greatest amount of transgressions. The main one is processed meat. There are 2 main reasons for this:*

1. *This is a very complicated industry from a regulatory point of view.*
   There is a lot of confusion and misunderstanding as to what must be included into which category, and what is the definition of each category

2. *The degree of fragmentation within industry producing these categories. The more fragmented the more problems. e.g. spreads and breakfast cereals are focused on a lot, but in these industries (unlike the processed meat industry) there are a lot of 'big players'/industry but NOT a lot of 'smaller players' . The more fragmented the industry, the more problems, the smaller players are involved.*

As stated earlier, industry is more compliant than the smaller players. For example, there are a large number of smaller players/operators/producers that produce snacks such as crisps but Nigel shudders to think what these snacks contain.

Meat is another example of a fragmented industry even with the big players like Renown and Enterprise, but here are a large number of small operations.

Regarding future monitoring, one must consider the degree to what are likely to be non-compliant based on the nature of the industry itself.

Prof Naidoo (CEO: HSFSA, Co-Investigator for the LINKS grant project), The results from the LINKS study indicating good compliance by food industry were not surprising but she reiterated the importance of ongoing monitoring.

Hayley Cimring (Registered Dietitian and Nutrition Science Leader, HSFSA) *asked, as most food products fell within the targets, is this an indication that industry and government are working together?*

Prof Charlton (University of Wollongong, Australia, Lead Investigator for the LINKS grant project), said that sodium reduction legislation has been discussed since 2013 (although it only came into effect in 2016), so industry had already started making changes/complying with government since 2013.
The problem that may arise is that if there is no monitoring, will industry go back to their 'old ways' as that is a much cheaper option and therefore more profitable.

Dr Mahlangu (Chief Director: Health Promotion and Nutrition, NDOH), said that there had been regular meetings between food manufacturers/industry since 2013, where industry had informed government of possible challenges that may arise which were then discussed. It would therefore be a "disaster" if there was non-compliance going forward. She also reiterated that over the last 2 years, monitoring of compliance had not been regular due to Covid-19 restrictions, yet it appeared that industry had still been compliant.

10. EXPERIENCE WITH ACCURACY OF FOOD LABELS IN CANADA:

Prof Charlton invited Prof Norman Campbell (Professor of Medicine, University of Calgary, Canbada and Senior Consultant with RTSL) – an influential figure in salt reduction around the world - to share his experience with the accuracy of food labeling in Canada, and to introduce a new resource from RTSL that the project may find useful going forward.
He provided a recorded presentation virtually due to time differences and personal commitments.

Prof Norman presented findings from a study ***"Sodium label Accuracy in Canada"*** conducted by the Canadian Food Inspection Agency (CFIA) which was published in 'Nutrients' in 2014.
In that study, CIFS tested 1000 foods and beverages between 2006 and 2010 and compared the food label of each with the recommendations for sodium, trans fats and a few other nutrients. At the time of the survey, the food industry was aware that trans-fats were being monitored but not sodium. Results showed that:

- ❖ 18.4% of products had >20% sodium then stated on the food label;
- ❖ 4.3% of products had >20% trans fats than stated on the label.

– These findings indicated statistically significant under-reporting of both sodium and trans-fat on Canadian food labels.

The Canadian (Harper-run at that stage) government's response was to stop the monitoring and decline implementation of a sodium reduction strategy. As Harper was not re-elected in 2015, the sodium-reduction strategy was partly reinstated in 2015.

The **RTSL-LINKS Sodium Reduction Framework** is on the LINKS website which is now freely available[7] The webpage links to different sections of the Framework, namely:

1. Governance;
2. Surveillance;
3. Interventions for:
   - ❖ Packaged Foods;
   - ❖ Foods Prepared Outside the home;
   - ❖ Sodium Added in the Home.;
4. Appendices and Acknowledgements.

Under **Governance**, the first aspect is to '*Develop a Comprehensive Strategic Plan'*:

– The steps on how to develop a comprehensive strategic plan are then detailed.
– There are also links to other resources under each "aspect".
eg. one can click on SHAKE or Pan American Health Organization to get more information.

Other useful tools further down on the webpage include:

- Implementation tools. eg. WHO: The SHAKE Technical Package for Salt Reduction 2016 or John Hopkins University-Online course on Global Sodium Strategies.
- Other Resources;
- Examples (of studies done in other countries);
- A Brief Survey.

Under **Surveillance**, the steps are to:

- 'Develop Surveillance, Monitoring and Evaluation Plans', then;
- Collect Sodium Indicator Data;
- Program Transparency and Accountability;
- Regular Program Review – see what is and isn't working to enhance the program.

Under **Interventions**:

- For ***Packaged Foods***:
  - ❖ Nutrient Profiling Models;
  - ❖ Labelling Interventions for Packaged foods;
  - ❖ Government-led Sodium Targets for Packaged Foods;
  - ❖ Marketing Restrictions to Children;
  - ❖ Fiscal Policies;
  - ❖ Innovative/Other Policies for Packaged Food;

- ***Foods Prepared Outside the Home***:
  - ❖ Healthy Public Food Procurement Standards;
  - ❖ Restaurant and Street Food Interventions;

- ***Sodium Added in the Home***:
  - ❖ Behaviour Change Interventions:
    - ➢ Media Campaigns;
    - ➢ Social Marketing;
    - ➢ Settings-based Education.
  - ❖ Increase Uptake of Low-Sodium Salt;
  - ❖ Innovative/Other Policies to Decrease Use of Sodium at Home.

Appendices[7]

Appendix 1 provides a Sodium Reduction Program Checklist that can be downloaded as an Excel spreadsheet on how to evaluate a program and to complete an annual review of a salt reduction program.

- Appendix 2: Situational Analysis and Example Questions;
- Appendix 3: Instructions for Developing a Food Database;

11. DEVELOPING A FRAMEWORK FOR MONITORING SALT CONTENT IN FOODS:

The WHO SHAKE Framework[8](https://apps.who.int/iris/bitstream/handle/10665/250135/9789241511346-eng.pdf) is relevant for consideration when developing a salt reduction monitoring system.

The **SHAKE Salt Framework**:

- ✓ Identifies key evidence-based policies / interventions for salt reduction;

- ✓ Gives guidance on how to develop a national salt reduction strategy, as well as how to implement key interventions;
- ✓ Has global applicability; and
- ✓ Has been field-tested in all regions.

SHAKE:

The '**S-Surveillance**' and the '**H-Harness Industry**' of the SHAKE package was discussed in detail at the 1st Expert Stakeholder Group Meeting held on 1st March 2021:

- In SA, **H-Harnessing of Industry** has already been completed as they have already reformulated mandated categories of foods;
- **S – Surveillance** is the relevant aspect for this point in the LINKS project.

At the 1st Expert Stakeholder Group Meeting held on 1st March 2021, participants broke into two groups to address the topics of:

- **Monitoring and Evaluation of Salt Use;** and
- **Industry compliance**.

Recommendations that resulted from each group discussion are noted in the Report on the 1st Expert Stakeholder Group meeting (please refer to the attached).

Timeline:

The timeline for the LINKS Grant Project is provided below:

Activity	Timeline					
	Year 1				Year 2	
	Q1	Q2	Q3	Q4	Q1	Q2
Step 1: Development of monitoring framework						

1. Stakeholder consultation meetings		X		**X**	X	
2. Draft framework, public consultation					X	
3. Finalization of framework for monitoring salt content of South African foods						X
Step 2: Na analysis						
1. Protocol finalization, approval, laboratory and food sampling protocol, equipment purchase	X					
2. Sampling of food products for chemical analysis	X					
3. Analysis of Na content of test foods		X	X			
Step 3: Food labelling						
1. Scanning of food labels using FoodSwitch	X					
2. FoodSwitch database update and extraction	X	X				
3. Development of Foodswitch smartphone application database	X	X				
4.Statistical analysis (comparison between Foodswitch data and analytical Na values)			X	X		
Step 4: Dissemination of findings						
1. Report/manuscript writing					X	X

The project is on target, but needs to be finalised by June 2022. The third and final Expert Stakeholder meeting will be held in the 1st quarter of 2022 by which time a draft sodium monitoring framework will be produced by the research team, for consideration by the expert stakeholders for finalisation before submission to the NDOH.. The final framework needs to be relevant and feasible within the current economic and health services climate in South Africa.

12. GROUP DISCUSSION:

Prof Prof Charlton (University of Wollongong, Australia, Lead Investigator for the LINKS grant project) and Prof Naidoo (CEO: HSFSA, Co-Investigator for the LINKS grant project) proposed the following **group discussion topics**:

- Barriers & Opportunities for Evaluating Food Supply in SA
- Inter-sector Collaboration
- Policy window / advocacy / competing health interests
- Expansion to Other Sectors (eg. street food / informal stalls / quick-service restaurants etc);
- Funding / piggybacking with other Monitoring Initiatives

Lively discussion resulted from the group discussion topics, as summarised below:

Ms Sandhya Singh (Director NCD's, NDOH):
The NDOH are in the process of finalising a new National Strategic Plan (NSP) for NCDs (including Hypertension and Diabetes mellitus) approves nationally following a fully consultive process that included Dr Atkinson from SANCDA. It will be important for the sodium monitoring framework to be aligned to the NSP and other initiatives being updated by the Minister of Heath. Another relevant initiative is the NCD campaign which the main focus is to strengthen the capacity of health-care workers in SA that work in promotion of health and wellness.

- The progress of finalising the revised NSO has been severely affected by the COVID-19 pandemic that has led to delays in work of the NDOH. Consideration should also be given to the national obesity strategy and other strategies around Health Promotion, etc. Please see the link to 2015-2020 strategy[9]

- It is important that the initiatives are coordinated so that there is cohesion between sectors. For example, the e revised Hypertension Guidelines have been approved and will be implemented soon, but no one strategy will be effective in reducing the burden of NCDs on its own. Chronic diseases need policy cohesion with other related programmes. NDOH would also like to see incorporation of information related to allocation of funds from the sugar and sweetened beverages taxation and see this as an opportunity to work with other sectors to see how money can be used. In summary, there is much happening at NDOH at the moment, but a gap remains for work specifically addressed towards prevention and management of NCDs.

Prof Webster (The George Institute for Global Health, Australia) – What is the current position/role of the DOH on salt and the monitoring of the legislation? How could this group help them to progress this agenda?

Dr Mahlangu (Chief Director: Health Promotion and Nutrition, NDOH), Dr Mahlangu explained the key responsibilities related to monitoring and surveillance of the food system. The monitoring of sodium regulations is done by Environmental Health Practitioners (EHPs) who take samples and send them for laboratory analysis.
The two main issues are:
Limited capacity of EHPs (in terms of numbers and the effect of Covid-19);
A need to budget for laboratory analyses as the budget for this activity has been significantly reduced by the government. As a result, when there is an emergency, all else is dropped, and the regular activities do not take place as they should. The EHPs also need to prioritise which samples should be sent for laboratory analyses. There is also a capacity problem in health promotion, as there are a limited number of people (some provinces don't even have EHPs) and limited expertise with a national shortage of staff. Funding is also an issue. There is not necessarily a shortage of money, but rather a capacity issue on how to use funds in disperse funds to various sectors on behalf of NDOH.

Dr Mahlangu also recommended expansion **of salt legislation to other sectors**, including quick-service restaurants and street-food vendors that are highly variable in food preparation recipes. Potentially, educational interventions are required for street-food vendors rather than regulatory approaches.

In response to Dr Mahlangu, **Prof Webster thanked her for providing useful** feedback that was helpful in understanding some of the challenges. The plan of action going forward neds to be clearly outlined, with consideration of how the stakeholder group can help overcome existing challenges. Government commitment and leadership is required to adopt sustainable strategies for monitoring implementation of the sodium legislation. She commented that she found it interesting that NDOH has the funding, but that allocation of funds is more of a capacity issue.

Prof Naidoo (CEO: HSFSA, Co-Investigator for the LINKS grant project):

- Perhaps we should have smaller group discussions as M&E is reliant not just on having resources but also need specific type of skills. It goes beyond just having people out in the field to run MNE.
- She feels there are other pillars from a policy perspective that need to be addressed that are beyond the scope of this meeting.
- We cannot continue to say 'these are the barriers', and in 5 years' time, still have the same challenges.

Prof Wentzel-Viljoen (NWU and HSFSA Board):
Expressed support for expansion of salt reduction strategies to other food sectors and additional categories of foods. She posed the question of how foods commonly consumed by lower socio-economic groups can be included in sodium reduction policy including the informal street vendor sector. The example of cheese was provided which is not included in the salt targets and cheaper types of cheeses and processed variants are consumed by a large majority of the population

Prof Naidoo (CEO: HSFSA, Co-Investigator for the LINKS grant project)

- Suggested contacting Prof Nelia Steyn who has done research on street-foods.

Prof Wentzel-Viljoen (NWU and HSFSA Board) knows about the study and commented that one of the studies on breakfast cereals showed that breakfast cereals are a major source of sodium intake in children. However, the sugar content may have been the main focus of her study, not salt. She confirmed that Prof Steyn is still appointed part-time at UCT.

- ✓ **Prof Naidoo stated that Prof Nelia Steyn should be invited to the next meeting.**

Prof Naidoo (CEO: HSFSA, Co-Investigator for the LINKS grant project):

- Commented on a survey on bread conducted by the 'World Action on Salt, Sugar and Health' (WASSH). Many countries participated and when the analysis was done, SA did very well on the packaged breads. A subsequent survey was done by WASSH to establish the level of salt in breakfast cereal. The results of this survey are still outstanding.

Prof Charlton (University of Wollongong, Australia, Lead Investigator for the LINKS grant project):

- A study conducted in China by Prof Bruce Neal, TGI recently published in New Eng J Med demonstrated that the use of a salt replacement resulted in significant reductions in deaths from CVD and stroke over 5 years. Given a high use of discretionary salt in South Africans, there may be learnings that are relevant to trail in South Africa.

Work of Charlton from 1995 found that the use of salt and flavourants at home is high, contributing around 45% of total salt intake, because of the bland taste of staple foods[10]

Previous discussions between Prof Charlton and Prof Neal that generated ideas such as using a low salt replacement instead of salt in street foods, the substitution of low salt replacement instead of regular salt in salt cellars in quick-service restaurants. A benefit of this approach would be additional intake of potassium, which is very low in the South African population.

Dr Mahlangu (Chief Director: Health Promotion and Nutrition, NDOH)

- In response to Prof Charlton's comment above, education to the public regarding limiting discretionary salt use is not as aggressive as it should be.
- Telling people therefore to substitute salt with a low-salt alternative may sound like we are giving up, and therefore may not be effective.

There are good practices that could be expanded on, such as in Limpopo province where salt is not added to staple foods in cooking.

Dr Mahlangu also wanted to comment on expansion to other sectors that had been suggested by Prof Wentzel-Viljoen. There has been a delay in the intended national dietary intake study, but when the results are available, government is hoping they can identify foods that are consumed the most in each age group according to socio-economic group. The intention is to take samples from each age-group and socio-economic group and check the salt (and sugar) content of these foods.

Mr Malose Matlala (NDOH):

- Prof Naidoo read out comments from Malose Matlala who was having issues with his microphone. He suggested that there may be a need for a presentation to be given to industry (e.g. Consumer Goods Council of South Africa on the results/data from the study done by University of Pretoria.
- He feels that what is needed by street-food vendors is education and awareness on importance of salt reduction.

Prof Naidoo commented that if funding is available, perhaps another education campaign is needed such as SaltWatch that was conducted in 2014 and funded by the NDOH. The campaign was successful in improving population level knowledge and attitudes related to discretionary salt use[11]

Prof Naidoo and Dr Mahlangu will have further discussions.

Prof Charlton (University of Wollongong, Australia, Lead Investigator for the LINKS grant project)

- After today we need to have some recommendations from this group, as many of the participants are experts in food policy, chronic disease prevention, salt reduction, etc.
- She suggested a Call to Action (CTA) from this group, as has been developed by the World Hypertension league (led by Prof Norman Campbell) and signed by many organizations around the world.

Prof Charlton asked participants whether they supported this suggestion

Dr Mahlangu (Chief Director: Health Promotion and Nutrition, NDOH)

- A Call to Action is needed, but this Call to Action needs to come from external sources/ organizations and not from government itself.

Prof Charlton (University of Wollongong, Australia, Lead Investigator for the LINKS grant project) agreed that this is a good point.

- She also pointed out that it has been helpful to hear about the National Strategic plan, as it sounds like it is quite far down the line and provides an opportunity for salt reduction to be revisited within this plan.
- She asked whether some of the professional organizations represented at the Stakeholder meeting would be willing to give input and be signatories on a Call to Action? Some organizations represented here today include:
  - ❖ MRC; ADSA; SAFOST; NSSA.

Maria van der Merwe (President, ADSA):

- ADSA is the professional association for Dietetics in SA, and their vision is ‘Optimal Nutrition for all Sas’.
- ADSA will support a Call to Action.

Other comments:

- Even in planning a framework, the jurisdiction, authority and responsibilities of organisations involved must be seen, as well as the role of local government.
- Regarding compliance – 2 binary approaches, there should be ‘incentive’ compliance, as well as a response to non-compliance. i.e. carrot vs stick. Harness relationship with industry.
- In terms of the current food regulations, it is not compulsory to state all the nutritional information on food labels.

Prof Hettie Schonfeldt: (University of Pretoria, South Africa)

- She commented on some of the results and stated that we need to keep in mind the range that the average was compliant, but that many products did not comply.
- The message communicated to industry must be that there is an ongoing need to improve on performance.
- She agrees with **Dr Mahlangu** that we should look at data from the next intended National Nutrition Survey to decide on which other food products need to be included under sodium regulations, as these change constantly.
- Organizations should be working together under the leadership of HSFSA.
- The University of Pretoria will support HSFSA to take a lead in education campaigns.
- Consumers have forgotten the salt messages from the SaltWatch campaign, and need a lot more education.

Prof Naidoo (CEO: HSFSA, Co-Investigator of the LINKS grant project):

- HSFSA did monitor national campaigns with NDOH, University of Pretoria and other partners a few years ago as part of the SaltWatch initiative.
- She stated this was a welcome suggestion and agreed to talk to Dr Mahlangu about resources.

Dr Vicki Pinkney-Atkinson (Director, SANCDA):

- She congratulated all for being involved in today.
- Dr Pinkney-Atkinson works with many organizations/civil society organizations representing real people who are the target of the health system, and so she is not as positive on hearing how government regarding food policy implementation and funding available for education campaigns.
- Money has never been put into education campaigns on Non-Communicable Diseases (NCDs) except for a mass media campaign in 2013. This campaign was for the SaltWatch campaign.
- She stated that funding is always a problem when it comes to education on NCDs, generally.
- She is concerned about the lack of data on food industry and lack of clear and transparent monitoring information available in the public domain.
- Education/information should be done at provincial level, and must be realistic. This is because provinces and health districts provide care and services.
- Funding must go to provinces and local authorities for Prevention and Control in local language.
- Call to Action must be realistic when it pertains to prevention. A Call to Action alone will be effective in implementing change. Therefore, a Call to Action must hold government to account.
- The health system has been in trouble for many years and NCDs services shut down completely during COVID-19 unlike the HIV/AIDS and Tuberculosis (TB) services, where there are provisions for receiving medicines, e.g. CCMDD
- People living with NCDs are in bad situation and there needs to be a paradigm shift. It is not adequate to talk only about behaviour and lifestyle. NCDs need to be looked at more holistically. We need to consider other factors such as financial drivers.
- Currently, there is a Human Rights Case against government for its failure to provide Prevention and Control work for NCDs.
- The only areas that are funded are Communicable Diseases and the National Health Insurance (NHI).
- **All diseases are interlinked whether it be obesity, diabetes mellitus, hypertension etc, and what you do for one you should do for *all.***

Prof Naidoo (CEO: HSFSA, Co-Investigator of the LINKS grant project):

- This is an important voice from civil society and she agrees that we cannot see any of these issues in isolation.

Comment from Malose Matlala (NDOH) read out by Prof Naidoo:

- The 2021 WHO guidelines on Sodium Global benchmarks have even stricter levels, and it is worrying that there is still non-compliance on the 2019 targets. How can this group help?

Prof Naidoo (CEO: HSFSA, Co-Investigator of the LINKS grant project):

- Prof Naidoo reiterated that monitoring and surveillance are critical.
- A Call to Action is important, however it must be realistic – how would accountability be included into the equation?
- How can this group make a difference?

Prof Charlton (University of Wollongong, Australia, Lead Investigator for the LINKS grant project):

- Highlighted the complexity of the issue, with competing priorities including y Covid-19. The group were reminded of past successes of South Africa in its bold move to legislate maximum salt levels in a wide range of processed foods. Promising data showing that the legislation has led to reduced salt intakes is emerging.
- The SA government has been progressive to get to this point, although it may still be too early to see reductions in disease outcomes such as hypertension, heart disease and stroke.

13. NEXT STEPS: Stakeholder Buy-In for Framework and Call to Action:

Prof Charlton closed the meeting by summarising that a number of suggestions had been made by participants related to various focus points, including:

- A Call to Action may be an idea, but there were both positives and negatives to this approach.
- All the Stakeholders are encouraged to think about and mull over the discussion points from today.
- There is general support for monitoring and surveillance, as well as additional salt reduction strategies that could accompany the sodium legislator approach. Local government needs to take responsibility, but the entire responsibility should not fall solely to Environmental Health Workers (EHW).
- The major outcome from the Links project is to develop a framework for monitoring the sodium reduction strategy in South Africa. This requires input from all stakeholders to ensure that the final product will be achievable, feasible and acceptable to be adopted by government.
- Participants were encouraged to talk to others outside of the meeting, and to communicate ideas to Prof Charlton directly.
- Prof Debbie Bradshaw from MRC will be contacted by Prof Charlton, as she may have valuable insights into leveraging data from existing surveys in SA The unsatisfactory ‘siloed’ approaches to NCDs are acknowledged but no solutions had been offered in the meeting as to how these could be streamlined to be more effective and prevent duplication of services.

The important role of the HSFSA in terms of advocating for a healthier food system that has health benefits for South Africa’s population was highlighted.

14. CONCLUSION, VOTE OF THANKS AND DATE OF NEXT MEETING:

All participants were thanked by Prof Charlton and Prof Naidoo for their commitment of time and for their valuable contributions.

The next meeting will be in Quarter 1 of 2022 – date to be confirmed.

15. KEY REFERNCES

[1] Charlton KE, Corso B, Ware L, Schutte AE, Wepener L, Minicuci N, Naidoo N, Kowal P. Effect of South Africa's interim mandatory salt reduction programme on urinary sodium excretion and blood pressure. *Prev Med Rep* 2021; 23: 101469. https://www.sciencedirect.com/science/article/pii/S2211335521001595?via%3Dihub

[2]Wentzel-Viljoen E, Steyn K, Lombard CJ, Villiers AD, Charlton K, Frielinghaus S, Crickmore C, Mungal-Singh V. Evaluation of a mass-media public awareness campaign to reduce discretionary salt use in the South African population. *Nutrients* 2017;9(11):1238; doi:10.3390/nu9111238

[3] Strauss-Kruger M, Wentzel-Viljoen E, Ware LJ, Van Zyl T, Charlton K, Ellis S, Schutte AE. Early evidence for the effectiveness of South Africa's legislation on salt restriction in foods: the African-PREDICT study. *J Hum Hypert* 2022; DOI: 10.1038/s41371-021-00653-x

[4] Santos JA; Tekle D; Rosewarne E; Flexner N; Cobb L; Al-Jawaldeh A; Kim WJ; Breda J; Whiting S; Campbell N; Neal B; Webster J; Trieu K, 2021, 'A Systematic Review of Salt Reduction Initiatives around the World: A Midterm Evaluation of Progress towards the 2025 Global Non-Communicable Diseases Salt Reduction Target', *Advances in Nutrition*, vol. 12, pp. 1768 – 1780, http://dx.doi.org/10.1093/advances/nmab008

[5] Tekle DY; Santos JA; Trieu K; Thout SR; Ndanuko R; Charlton K; Hoek AC; Huffman MD; Jan S; Webster J, 2020, 'Monitoring and implementation of salt reduction initiatives in Africa: A systematic review', *Journal of Clinical Hypertension*, vol. 22, pp. 1355 – 1370, http://dx.doi.org/10.1111/jch.13937

[6] Neal B et al. Effect of Salt Substitution on Cardiovascular Events and Death.N Engl J Med 2021; 385:1067-1077
DOI: 10.1056/NEJMoa2105675

[7]https://linkscommunity.org/toolkit/sodium-framework.

[8]https://apps.who.int/iris/bitstream/handle/10665/250135/9789241511346-eng.pdf

[9]https://extranet.who.int/ncdccs/Data/ZAF_B10_National%20Strategy%20for%20prevention%20and%20Control%20of%20Obesity%204%20August.pdf

[10]Charlton KE, Steyn K, Levitt N, Nel H. Diet and blood pressure in South Africa: Intake of foods containing sodium, potassium, calcium, and magnesium in three ethnic groups. Nutrition 2005; 21(1):39-50

[11]https://pubmed.ncbi.nlm.nih.gov/29137143/