



Reduction of salt (sodium) in bread and its contribution to the decrease of blood pressure in Portugal

Health Impact Assessment pilot study
Final report

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Title: Reduction of salt (sodium) in bread and its contribution to the decrease of blood pressure in Portugal: Health Impact Assessment pilot study - Final report

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National Institute of Health
Dr Ricardo Jorge

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Abbreviations and acronyms

AIPAN	Northern Bakery, Patisserie and Similar Industry Association
APED	Portuguese Distribution Business Association
ARSLVT	Regional Health Administration from Lisboa e Vale do Tejo
BP	Blood Pressure
CVD	Cardiovascular Diseases
DALYS	Disability-Adjusted Life Years
DAN	Food and Nutrition Department
DECO	Portuguese Association for Consumer Protection
DEP	Department of Epidemiology
DGE	Directorate-General of Education
DGS	Directorate-General of Health
DPSDNT	Department of Health Promotion and Prevention of Noncommunicable Diseases
EC	European Commission
EIA	Environmental Impact Assessment
EIPAS	Integrated Strategy for the Promotion of Healthy Eating
ENSP	National School of Public Health
EU	European Union
FIPA	Federation of the Portuguese Agri-Food Industry
GDP	Gross Domestic Product
HIA	Health Impact Assessment
HT	Hypertension
IAN-AF	National Food, Nutrition and Physical Activity Survey
IHME	Institute of Health Metrics and Evaluation
INE	National Institute of Statistics
INSA	National Institute of Health Dr Ricardo Jorge
INSEF	National Health Examination Survey
LBD	Learn by doing
NCDs	NonCommunicable Diseases
NHS	National Health System
PNPAS	Portuguese National Programme for the Promotion of Healthy Eating
SG	Steering Group
SPSS	Statistical Package for the Social Sciences
ToR	Terms of Reference
WHO	World Health Organization
YLLS	Years of Life Lost

Introductory notes

The methodology of Health Impact Assessment (HIA) is an essential tool in assessing the potential effects of interventions on the health of a population by its contribution to decision making for health and equity protection.

In Portugal, there is a growing interest in understanding the extent to which health interventions and policies in other sectors have an impact on health and equity. The Portuguese Basic Law on Health, no. 95/2019 from September 4th advocates “that public or private programs, plans or projects that may affect public health shall be subject to impact assessment”. In that sense, there is, between the Health Authorities, a consensus regarding the need to carry out at national level studies to assess the impact on health, from a “whole of government” perspective.

In addition, legal obligations for environmental assessments include the need to assess impacts on human health and on the population, as defined in the European Directives on Environmental Impact Assessment (EIA Directive 2014/52/EU). In this way, Public Health authorities and professionals need to grow capacity for assess impacts of policies, plans, programs and projects of the health sector but also to engage in environmental assessments.

The initiatives that promote technical training and develop technical skills, tools and methodologies for impact assessment are thus of particular importance, namely to the National Institute of Health Dr Ricardo Jorge, IP (INSA) regarding its

mission. As a result, within the scope of the Biennial Collaborative Agreement (BCA) between the World Health Organization (WHO) and the Ministry of Health, INSA is implementing a “Capacity Building HIA Training Program” in collaboration with technical experts from WHO.

In this context, a Workshop on HIA was held in November 2017 in Lisbon with the main objective of training professionals, from health and other sectors, to develop health impact studies and discuss strategies for implementing HIA as a tool to support a “Health in all policies” approach. This strategy is considered essential for governance in health and for equity and well-being, not only for other sectors to recognize their responsibility in Health, but also for Health to recognize the impact of its interventions in other sectors.

Following this initiative, three Pilot studies on HIA were developed based on a “Learn by doing” (LBD) approach, supported by tools described in the HIA Guidance of the Institute of Public Health in Ireland. This report describes the “REDUCTION OF SALT (SODIUM) IN BREAD AND ITS CONTRIBUTION TO THE DECREASE OF BLOOD PRESSURE IN PORTUGAL” study and the main conclusions obtained from this LBD experience.

Context

1



1. Context

1.1. Policy framework

Portugal is one of the European countries with a higher mortality rate due to stroke, while cardiovascular diseases (CVD) represents the main cause of death¹. Hypertension (HT) recognized, as a major risk factor for the development of CVD, is also one of the most relevant modifiable risk factors for reversing this condition². One of the strategies to modify blood pressure (BP) and its impact on HT is the reduction of salt in food³. According to the last National Food Survey - IAN-AF (2015-2016), the Portuguese population has an average daily salt intake of 7.3 g⁴, when World Health Organization (WHO) recommended value is around 5.0 g of salt/day⁵. Moreover, bread and its derivatives, due to their high consumption, are one of the main foods that contribute to Portuguese daily salt intake⁴. This situation may lead to an increase of HT and consequently increase the risk of developing CVD⁶.

Regardless of food choices taken by the population, it is crucial to establish appropriate public health protection measures to set targets for reducing salt content in food³. In 2012, the WHO released its Non-Communicable Diseases Global Monitoring Framework with an ambitious target of 30% mean reduction in population salt intake by 2025⁷.

Thus, the national legislation has approached the strategy of reducing salt consumption advocated by WHO and the European Commission (EC). One of the principal measures was to reduce the salt content in bread, through a co-agreement with some industry representatives⁸⁻⁹.

Retrospectively, in 2009, the **Law no.75/2009** of 12th August stipulated that the maximum salt content in bread after preparation would not exceed 1.4 g per 100 g of bread or the corresponding 0.55 g of sodium per 100 g of bread (i.e. 14 g of salt per kg of bread or 55 g de sodium per kg of bread).

In 2015, the **Order no. 8272/2015**, of July 29th, established the creation of an Inter-ministerial Working Group with the objective of proposing a set of measures for the reduction of salt consumption, providing the population safe and healthy food. From this Working Group emanated a set of measures that constitute the current National Strategy for the Promotion of Healthy Food (EIPAS).

In order to continue the salt content reduction in bread, in November 2017, a collaborative agreement, hereinafter called 'Protocol'⁸, was sign between the General-Directorate of Health (DGS), the National Institute of Health Dr Ricardo Jorge (INSA) and some Associations of Industrial Bakeries, Pastry and Similar. This co-regulation agreement established a phased and progressive reduction of salt in bread, with a final goal of 1.0 g per 100 g maximum salt content in bread, until 2021. This Protocol also provides for a communication/awareness campaign to reduce salt intake and promote bread consumption at national level.

1.2. Project description

The present pilot study, under the coordination of INSA and supervision of WHO, followed a 'learn by doing' (LBD) approach, using Health Impact

Assessment (HIA) methodology. It was carried out over the past 2 years, corresponding to the duration of the "Capacity Building HIA Training Program" in the context of the Biennial Collaborative Agreement (BCA) between WHO and the Portuguese Ministry of Health. Concerning the methodological approach, it is a prospective study.

The main objective of this study is to evaluate the potential impacts of salt (sodium) content reduction in bread on Portuguese population BP with a focus on equity, in line with the goals agreed in the Protocol.

The specific objectives of the project were:

- i) To identify and characterize the potential impact in BP caused by the reduction of salt (sodium) in bread, according to the goals established in the 'Protocol';

- ii) To promote the commitment and involvement of various stakeholders;
- iii) To propose recommendations, based on the produced evidence, for further actions to raise population awareness for the need of salt intake reduction.

1.3. Public health profile

Portugal is a small European country with aging population. In 2015, the socioeconomic factors shows a more fragile situation when comparing with EU average, which can contribute national health inequalities ([Table I](#)).

According the Country Health Profile 2017¹⁰ and the Global Burden Disease Study 2017¹¹, CVD are the leading cause of death in Portugal. In particular, stroke and heart diseases were the main causes of death, in the same year ([Figure 1](#)).

Table I – Country profile looking at demographic and socioeconomic factors, comparing with EU average, in 2015.

		Portugal	European Union
Demographic factors	Population size (thousands)	10 358	509 277
	Share of population over age 65 years (%)	20.3	18.9
	Fertility rate ¹	1.3	1.6
Socioeconomic factors	GDP per capita (EUR PPP ²)	22 200	28 900
	Relative poverty rate ³	13.8	10.8
	Unemployment rate (%)	12.6	9.4

1. Number of children born per woman aged 15-49.

2. Purchasing parity (PPP) is defined as the rate of currency conversion that equalizes the purchasing power of different currencies by eliminating the differences in price levels between countries.

3. Percentage of persons living with less than 50% of median equivalised disposable income.

(Source: State of Health in the EU: Country Health Profile 2017 – Portugal)

Noncommunicable diseases leading by the CVD are also the most responsible causes for premature deaths in the country (Figure 2).

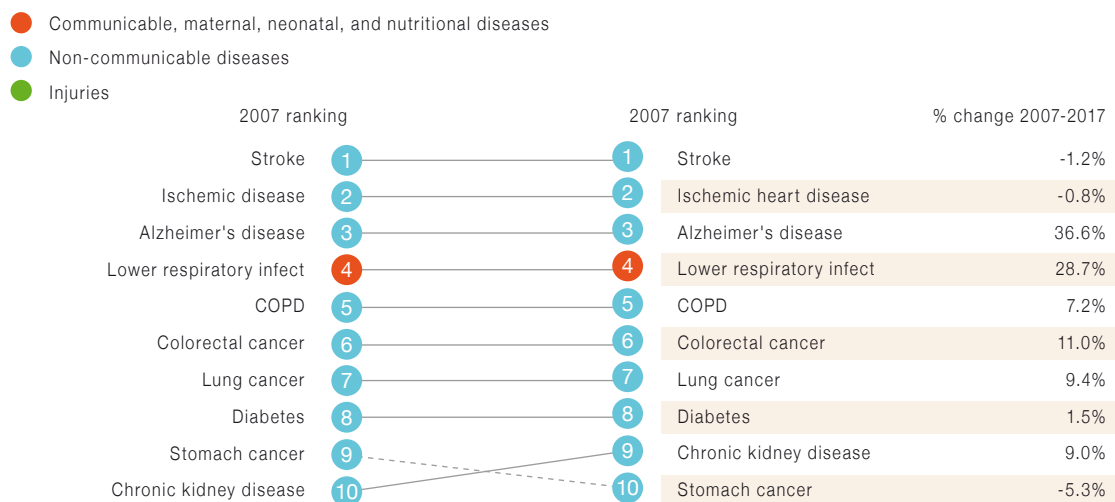


Figure 1 – Top 10 causes of death in 2017 and percent change, 2007 – 2017. Source: Global Burden Disease Study 2017.

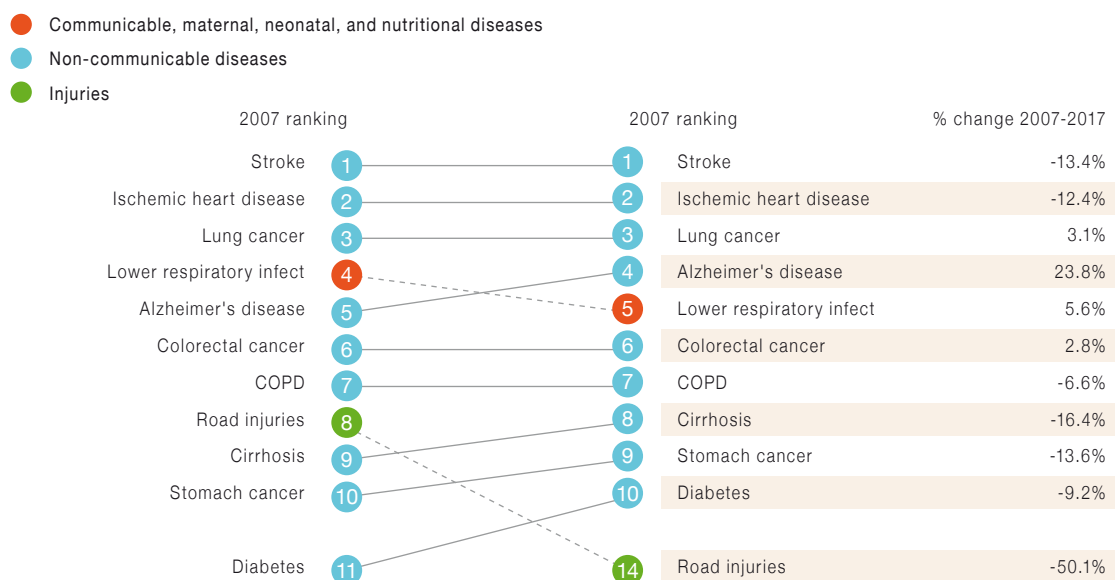


Figure 2 – Top 10 causes of years of life lost (YLLS) in 2017 and percent change, 2007-2017. Source: Global Burden Disease Study 2017.

Also, based on self-reported data from the *European Health Interview Survey* (EHIS), more than a quarter of the Portuguese have HT.

On the other side, wide disparities exist in the prevalence of these chronic diseases by education level, with one in three people with the lowest level of education living with HT, compared with only about one in ten of people with the highest level of education⁽¹⁾ 10.

In this sense and according with the 1st National Health Examination Survey – INSEF¹², a higher prevalence of HT was observed in males compared to females, increases with age (Figure 3)

and also rises with a lower educational level and with poor employment status (Figure 4).

In addition, based on Institute of Health Metrics and Evaluation (IHME) estimations, over 26% of the overall burden of disease in Portugal in 2015 (measured in terms of DALYs) was attributed to risk factors – including smoking, alcohol use, diet, and physical inactivity – with smoking and dietary habits contributing the most¹⁰⁻¹³. The Portuguese Ministry of Health recognized dietary risk factors as the leading preventable cause of noncommunicable diseases morbidity and mortality¹⁴.

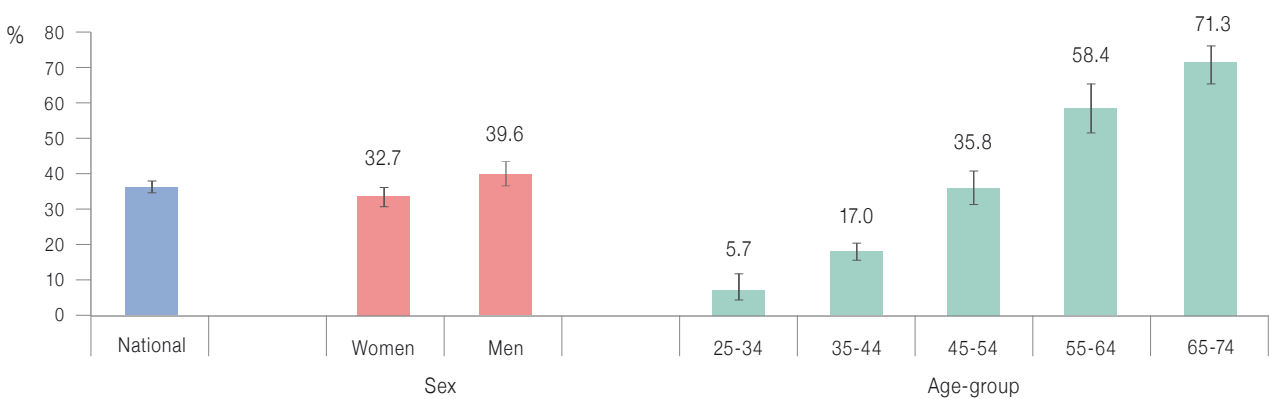


Figure 3 – Prevalence of HT in Portugal according to sex and age, in the Portuguese population aged 25 to 74 years, in 2015. Source: Adapted from 1st National Health Examination Survey (INSEF 2015).

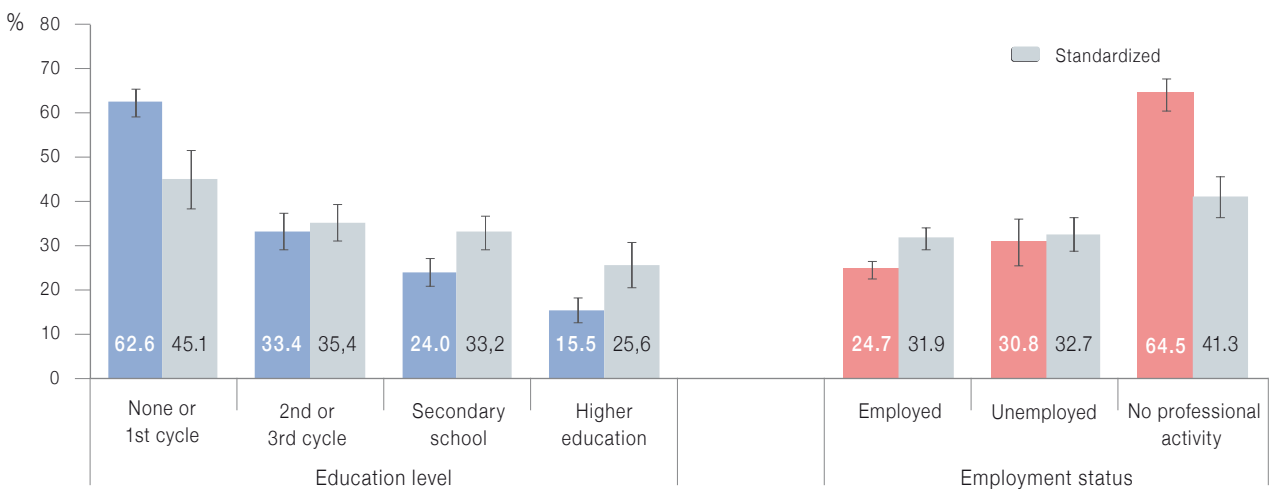


Figure 4 – Distribution of prevalence ratio of hypertension (crude and adjusted) according to education level and employment status in the Portuguese population aged 25 to 74 years, in 2015. Source: Adapted from 1st National Health Examination Survey (INSEF 2015).

(1) Inequalities by education may partially be attributed to the higher proportion of older people with lower educational levels; however, this alone does not account for all socioeconomic disparities.

In summary, the health status of the Portuguese population and health inequalities are linked to a number of determinants of health, including living and working conditions, the physical environment and a range of behavioral risk factors¹⁰. According to the 1st National Health Examination Survey (INSEF)¹² a significant higher prevalence of HT was observed in males, increase with age and with lower educational level, as with poor employment status.

This pilot study considers the main health determinants and risk factors, and the potential impacts associated with the proposal, detailed in the next section.

Management

2



2. Management

2.1. Identification and prediction of health impacts

In order to identify and predict health impacts associated with the 'Protocol', the classical HIA stages were considered in this study. In this context, *Screening and Scoping Tools* developed by the Institute of Public Health in Ireland (IPH)¹⁵ were used and the main findings are described below.

2.1.1. Screening phase

The *Screening* is the initial stage of the HIA process and establish if the impact assessment is an adequate and necessary methodology for the objectives to achieve. In this context, the use of a *Screening tool* was very important to support, in a systematic and oriented way, all the tasks carried out during this initial phase.

Herein, we show the main results obtained from the three separate sections that compose the Screening Tool developed by the IPH¹⁵.

Section 1: Background and context

With regard to the community perspective, it was considered that the proposal is of fundamental importance in relation to the potential health gains for the Portuguese population. In particular, the direct impact on the reduction of HT and CVD was pointed out as a determining factor in reducing the morbidity and mortality associated with these pathologies. The expected effects were considered of relevant magnitude and value.

From an economic perspective, the working group hypothesized that the implementation of the Pro-

tol could have a potential impact on bread and salt producers and sellers. Also, it was considered that the measures envisaged could have an effect on the population consumption profiles directly affecting both producers and sellers of bread and salt. In relation to consumers, it was considered relevant to analyze possible changes in the consumption profile with expected economic repercussions on families, assuming the potential demand for substitute products or, instead, increasing demand for these more healthy "new products".

Concerning the importance of the study from a top-down perspective, the group unanimously agreed that there are strong political support and interest in the proposal, expressed consistently by the presence of this topic on the current political agenda. The expected reduction of the pathologies associated with high salt consumption and its possible economic consequences are the main factors pointed out for a politically support of the proposed measures. There was widespread agreement that the policy-makers are open to receive the recommendations resulting from the HIA in progress on this Protocol.

Finally, in relation to the human and financial resources needed to carry out the proposed HIA study, the working group only accounted with the availability of the eleven pilot study participants, as this pilot is a product of an HIA training program using a LBD approach. As an exercise, a list of financial resources considered important to estimate the costs of this HIA study was discussed.

Details concerning "Background and context" (Section 1 of the Screening Tool) can be found in the [Annex I](#).

Section 2: Potential impacts on health determinants

The second step of the screening tool was to fill in a grid to assess whether the Protocol could have an impact on health determinants that were divided into three categories: i) Economic and social conditions; ii) Structural aspects; and iii) Individual and family aspects (see [Annex II](#)).

Regarding the socioeconomic conditions, «Education, Employment and Interaction with the community» were the determinants of health most likely affected by the measures recommended in the proposal under study. In this context, it was presumed that the entire population that consumes bread might benefit from it, especially all individuals with lower education level. In fact, these groups tend to do not adopt protective health behaviors and generally do not make evidence-based decisions. Previously collected data on health indicators¹² showed that individuals without any degree of education or only with the basic cycle are the ones most affected by HT.

Regarding the employment status, the groups considered most likely to be affected by the reduction of salt added to bread were the unemployed, retired and housewives since these groups are the most affected by arterial HT. On the other hand, it was also agreed that community interaction could be altered with the implementation of the Protocol. The awareness raising campaigns aimed at reducing salt consumption and promoting bread consumption could have considerable effects on changing habits of the population and consequently on how they interact with each other within the community.

For the analysis on the family and individual aspects, the working group agreed that diet and

daily intake of bread would be one of the factors most targeted by the Protocol, with all the bread-consuming population being the most affected group. In particular, males and elderly were expected to be the most vulnerable groups and the ones with most beneficial effects on their health status.

Additionally, giving scientific evidence that shows the association of HT with decreased sexual activity on males¹⁶, the working group considered that this issue would probably be impacted by the Protocol. Also, due to the higher prevalence of HT in the black population¹⁷, it was thought pertinent to consider ethnic groups as important in the impact assessment. In addition, due to the evidence about the differences that exist between the different religions regarding bread consumption habits, it was considered that religious communities could constitute groups to be taken into account for the study of ongoing HIA. Finally, the recognition of a distinct profile of bread consumption between rural and urban population was assumed pertinent to identify the area of residence as one of the factors to be included in this analysis.

Section 3: Screening outcome

The overall conclusion from the Screening phase pointed out for the importance of the 'Protocol' in relation to the potential health gains for the Portuguese population since it could have a direct impact on the reduction of BP. Thus, the working group considered that health impacts were likely to occur and agreed to proceed with HIA (see [Annex III](#)).

2.1.2. Scoping phase

The *Scoping* involves planning and designing the HIA study setting out the most relevant parameters. It identifies key health areas and populations likely to be the most affected by the policy measures, establishes the Terms of Reference (ToR)¹⁸ and set boundaries for the assessment process.

During *Scoping* the Steering Group (SG) was formed, there was an agreement of ToR¹⁸ and Decision-Making Protocol content (see next section “Governance and Stakeholder Engagement”) as well as the selection and prioritization of impacts to be assessed. Finally, there was an overall agreement on the timing (prospective) and level (rapid) of the HIA to be conducted.

In order to select the impacts, a causal chain was drawn. As a result, a pathway between bread consumption and potential health and economic effects was proposed (Figure 5).

Based on the causal chain, the working group proposed to study the following potential impacts to assess, and prioritized them as below:

Impact 1: Study of the impact of salt reduction in bread on BP and CVD, in an equity perspective;

Impact 2: Study of the potential economic impact of health interventions targeting the reduction of BP and CVD;

Impact 3: Study of the impact of families behaviors and dietary habits regarding salt reduction in bread on age schooling children (6-18 years).

The **Table II** lists all the criteria, health indicators and/or units of analysis considered at this stage to assess the identified potential impacts.

Subsequently, other decisions were made during this phase:

1. Due to absence of data at national level including ethnicity and religion options, the population disaggregation considered for further analysis in the following steps of the HIA were limited to sex, age, region of residence, education level and employment status.
2. Stakeholders that represent the salt industry did not subsequently corroborate the potential impact assumption of the Protocol in the salt industry (employment and sales). In fact, they considered negligent the economic effect on the salt industry caused by the Protocol. In view of this, the team decided not proceed with this line of investigation.

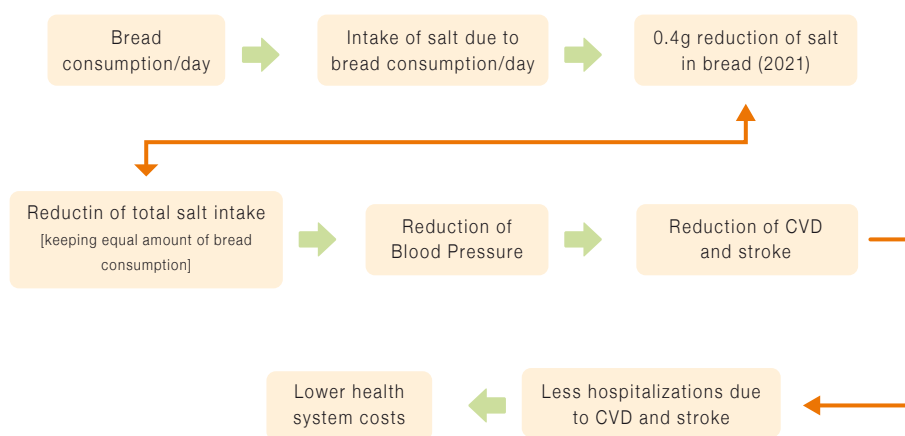


Figure 5 – Causal chain from bread consumption to potential health and economic effects.

Table II – Evaluation criteria and health indicators and/or units of analysis to measure impacts.

Health indicator/unit of analysis	Likelihood	Scale	Timing	Effects distribution
Hypertension				
Incidence	High	High	2018, 2022 and 2024	Sex, age, region, education, income, employment status
Prevalence	High	High	2018, 2022 and 2024	Sex, age, region, education, income, employment status
Proportion of HT people under medication	Intermediate	Low	2018, 2022 and 2024	Sex, age, region, education, income, employment status
Stroke				
Incidence	High	Intermediate/High	2018, 2022 and 2024	Sex, age, region, education, income, employment status
Stroke Mortality	High	High	2018, 2022 and 2024	Sex, age, region, education, income, employment status
Years of life lost (=DALY) ¹	High	High	2018, 2022 and 2024	Sex, age, region, education, income, employment status
Coronary heart disease				
Incidence	High		2018, 2022 and 2024	Sex, age, region, education, income, employment status
Coronary Heart disease mortality	High		2018, 2022 and 2024	Sex, age, region, education, income, employment status
Years of life lost	High		2018, 2022 and 2024	Sex, age, region, education, income, employment status
Employment				
Number of employments	High	Low	2018, 2022 and 2024	Not applicable
Percentage contribution to national employment	High	Low	2018, 2022 and 2024	Not applicable
Sales				
Volume of sales	High	Intermediate	2018, 2022 and 2024	Not applicable
Percentage of market share	High	Intermediate	2018, 2022 and 2024	Not applicable
Health economic impact				
National Health System Costs	High	High	2017, and 2018	Not applicable
Cost-effectiveness	High	High	Not applicable	Not applicable
Family dietary patterns				
Familiar bread consumption	High to Intermediate	Intermediate	2019	Sex, age, education, income, employment status
Enrolled children bread consumption				Not applicable

¹YLD = Number of cases * duration till remission or death disability weight; YLL = Number of deaths life expectancy at the age of death;
DALY = YLD + YLL

Concerning the methods to gather quantitative and qualitative evidence to measure these potential impacts, a literature review strategy was defined and health indicators and/or units of analysis to employ during the assessment were identified as described on ToR¹⁸.

To support the Appraisal phase, the Portuguese salt intake from bread was estimated considering consumption data reported by IAN-AF⁴ (Figure 6) and the full-meet goals for salt reduction in bread agreed in the Protocol as reported.

IAN-AF⁴ reported a mean salt intake of 7.30 g, with males presenting the higher salt intake compared to woman (8.21 g/day vs 6.40 g/day). Salt intake above the maximum tolerated level was described in 65.5% of the women and 85.9%

of the men. This prevalence was higher in adult men (90.6%) and lower in elderly women (37.6%), higher in inhabitants from Alentejo region (8.43g) and lower for Madeira region (5.75g). The results of the IAN-AF⁴ also revealed that the most important foods that contributed to salt intake were bread and toasted bread (18%), charcuterie (8%) and soup (7%).

On the other side, considering the average daily values of bread consumption (total = 101.3 g/day, males = 117.9 g/day and females = 83.9 g/day) and the protocolled limit of salt by 2021, an estimated average daily salt intake from bread was derived (Figure 7), assuming that patterns of consumption remains unchanged.

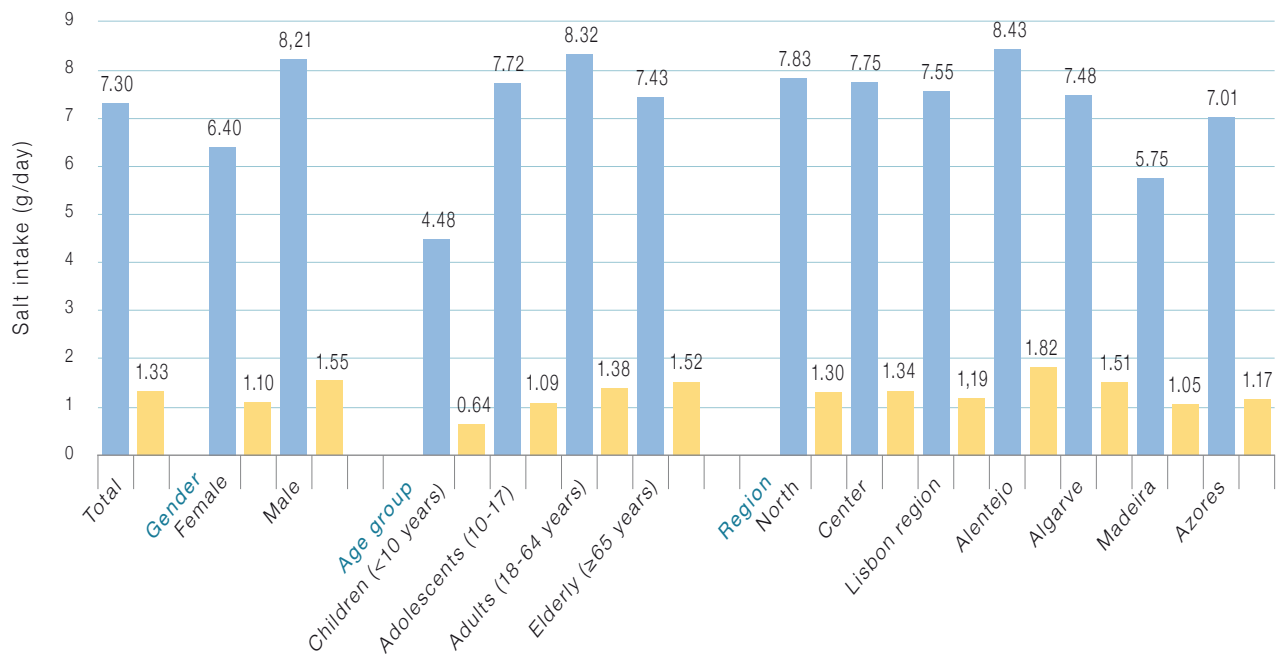


Figure 6 – Distribution of mean salt intake in grams per day (blue bar) and mean salt intake through bread consumption in grams per day (yellow bar), considering gender, age group and region 2015-2016. Source: IAN-AF⁴.

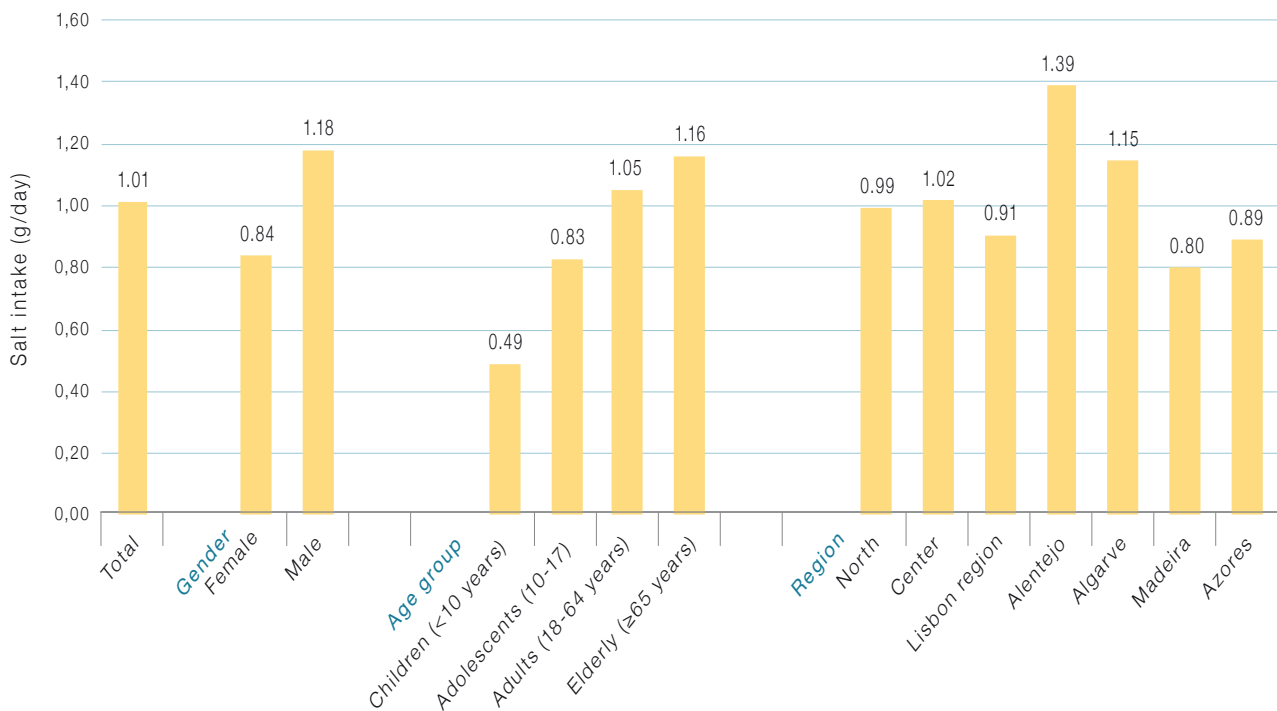


Figure 7 – Salt intake through bread consumption estimative, considering maximum salt content of 1.0 g of salt/100 g of bread, by 2021. Source: IAN-AF⁴.

It is expected a reduction of approximately 5% in the contribution of bread to the average daily salt intake in 2021, when compared to the value of salt in bread according to the current legislation.

2.2. Governance and stakeholders engagement

The SG, as an advisory group of stakeholders, whose mission is to validate the selected HIA parameters and the schedule proposed by the working group, provided guidance, scientific and technical support to this whole process, contributing to the preparation of the final report that should highlight the main conclusions and recommendations.

In this study, the SG included stakeholders from the industry, health institutions and experts from Health and other sectors of society in order to

contribute to a transparent, balanced and well informed process, as below:

- Federation of the Portuguese Agri-Food Industry - FIPA
- Portuguese Company of Sanitized Salt - SalExpor
- National Programme for Cerebro-Cardiovascular Diseases - PNDCV
- Northern Bakery, Patisserie and Similar Industry Association - AIPAN
- Portuguese Association for Consumer Protection - DECO
- Portuguese Distribution Business Association - APED
- Portuguese National Programme for the Promotion of Healthy Eating - PNPAS

Additionally, a 'Decision-Making Protocol' was elaborated to frame the decision-making process of the SG within the framework of the project. In this document the following chapters were pointed out:

1. Explanation of expected outputs and definition of the role of SG members

The tasks to be carried out by the group members, namely the Chairman who preferably in agreement will guarantee the execution of the tasks defined within the scheduled deadlines, were listed as followed:

- 1) Validate specific objectives;
- 2) Discuss HIA values;
- 3) Setting the non-negotiable aspects of the Protocol;
- 4) Analyze collected evidence;
- 5) Pronounce about the impacts that will be evaluate;
- 6) Contribute to final drafting of TOR and Work Plan;
- 7) Make comments on the final recommendations (wording and form of communication of recommendations).

2. Definition of the decision-making process of the SG

It was agreed that the decision-making process would follow 3 phases:

- Phase 1: Individual documentary analysis;
- Phase 2: In-person consensus meeting;
- Phase 3: Elaboration of a document of consensus on issues;

Single point: In the absence of consensus the Chairman makes a decision.

3. Scheduled of the meeting agenda

In particular, a concrete commitment to the proposed plan was achieved between the participants, including a cross-institutional commitment where relevant.

Assessment

3



3. Assessment

In order to identify both beneficial and adverse potential health effects of the project, the working group agreed on the Logical Model presented in a systematic way, as follows (Figure 8).

The identification of potential health impacts of daily salt intake through bread consumption took also into consideration the wider determinants of

health, risk factors and health outputs associated. A causal pathway was proposed (Figure 9).

This pathway framed all the pilot study guiding the work group to look at the main risk factors and health outcomes, in order to produce recommendations to improve and tackle the main determinants of health involved in the daily salt intake pathway.

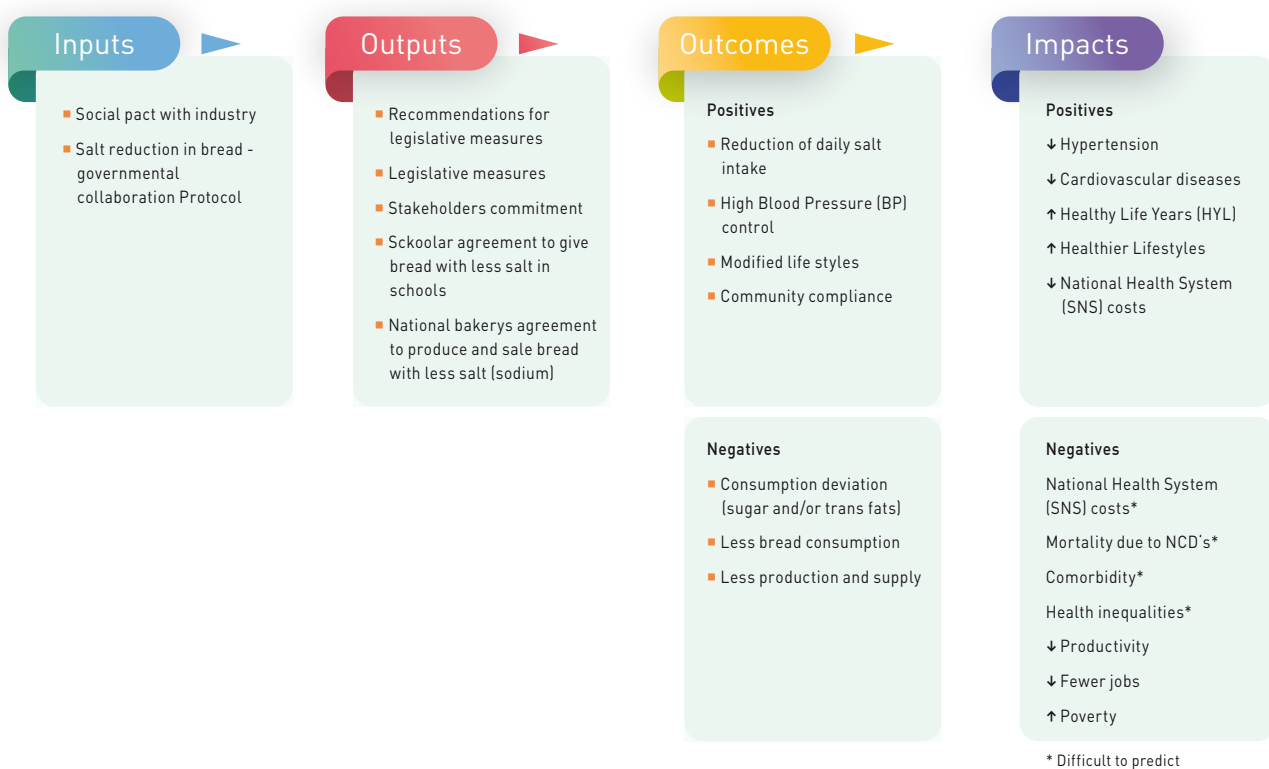


Figure 8 – Impact of Salt reduction in bread logical model.

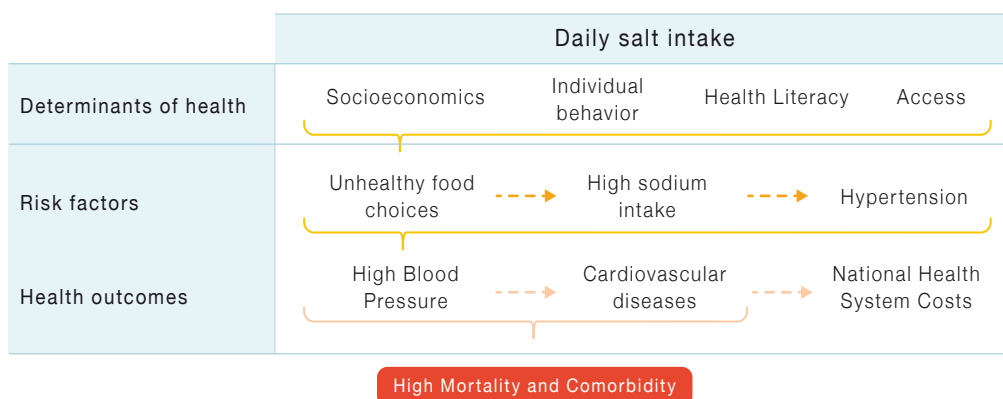


Figure 9 – Daily salt intake pathway diagram.

3.1. Study of the impact of salt reduction in bread on BP, HT and other cardiovascular diseases, in an equity perspective

Background

«Salt» is the commonly used name for sodium chloride, which consists of 40% sodium and 60% chloride by weight. Salt provides about 90% of the sodium in the human diet¹⁹, which is a necessary nutrient for maintenance of plasma volume, acid-base balance, transmission of nerve impulses and normal cell function. However, excess of sodium is linked to adverse health outcomes, as increased BP and HT²⁰. Salt consumption has a positive association with BP levels and this one has a positive association with HT and CVD. There is evidence that reducing daily salt intake will have a beneficial effect on BP, thereby reducing the risk of HT and CVD²⁰.

Objectives

The main objective of this subchapter is to measure the impact of the reduction of 0.4 g of salt per 100 g of bread on BP levels and CVD.

Material and methods

Data from two Portuguese surveys – IAN-AF and INSEF, held in 2015-2016, were used. Detailed information on methodology for both surveys has been published elsewhere^{4,12}. These surveys comprised nationwide representative probabilistic samples and included data regarding sociodemographic information, health status and health access, as well as food intake and physical activity. INSEF¹² has unique data collected regarding health measurements, such as physical examination and assessment of BP and IAN-AF⁴ gathers unique data regarding food consumption.

To estimate the effect of salt reduction in bread a literature review was conducted to understand which effects could occur in health. For that purpose, google scholar was used with descriptors “salt reduction effects”, “salt reduction in health”, “salt reduction interventions”, “salt reduction policies”, “salt reduction in economy”. This was a broad search only for exploratory purposes.

To estimate total daily salt intake, daily salt intake from bread (per day and per person) and to estimate the group average reduction in total daily salt intake, IAN-AF⁴ data were considered. Subsequently, INSEF¹² data were the baseline to estimate the effect of salt in bread reduction in BP. Because the two datasets have different participants age ranges, the inclusion criteria for this working sample was individuals aged between 25 to 74 years old. Since data relates to different individuals, it was necessary to group by sex, age group, education level and residence region to allow us calculate average values for each group, and link both datasets. We estimate daily salt intake from bread and blood pressure averages for each given variable.

The Protocol's main goal is to reduce salt from 1.4 g to 1.0 g, in 100 g of bread, which corresponds to a 29% reduction. This decrease affects total salt intake which can have an effect in BP²⁰. This effect was estimated using results from a meta-analysis which showed that a reduction of 4.4 g in total daily salt intake leads to a decrease of 2.4 mmHg systolic BP in normotensives and 5.4 mmHg in hypertensives²⁰. The potential effects in BP were projected using averages for each group and divided by group standard deviation (size effect)⁽²⁾. Finally, to assess the effect of high BP on CVD, the results of another meta-analysis were considered²¹. According to this

(2) This is a way of quantifying the effectiveness of an intervention relative to a comparison. (Polley, M.J., Fleming, J., Anfilogoff, T. and Carpenter, A. 2017. Making Sense of Social Prescribing. London University of Westminster.)

meta-analysis, a decrease of 10 mmHg in systolic BP reduces the risk of major CVD events by 20%, suggesting that lowering blood pressure leads to wide benefits. No clear threshold value is widely and well-established due to the involvement of other risk factors.

Results

a) Potential effects in total salt intake

The boxplots below show the dispersion of current and expected total daily salt intake according to sex, age, region and education, therefore showing the median, maximum and minimum values as well as interquartile ranges.

Concerning the potential effects of this measure, it is expected a small reduction on total daily salt intake for both sexes, as consequence of the decrease of 29% salt content bread in 2021. In fact, the estimates showed that the average intake might reduce from 6.26 g to 5.94 g in women compared to a decrease from 8.88 g to 8.37 g in men (Figure 10), which would account respec-

tively for a reduction of 0.32 g and 0.51 g on total daily salt intake.

Considering the age groups, the largest daily salt intake reduction will be observed in individuals aged between 55 and 64 years old, showing a decrease from 7.44 g to 6.98 g (corresponding to a reduction of 0.46 g of salt per day), and in the individuals aged between 65 and 74 years old, showing a decrease from 6.75 g to 6.32 g (corresponding to a reduction of 0.43 g of salt per day). This reduction in total salt intake and the current and expected dispersion of the values according to age groups (Figure 11).

Considering educational level, it is estimated that the largest reduction in daily salt intake will occur in individuals with lower education levels. Individuals with primary education are expected to reduce total daily salt intake in 0.44 g (from 7.06 g to 6.62 g), similarly individuals with secondary education showed a reduction of 0.41 g (from 7.83 g to 7.42 g). Less impact of the Protocol measures are expected for the reduction of daily salt intake

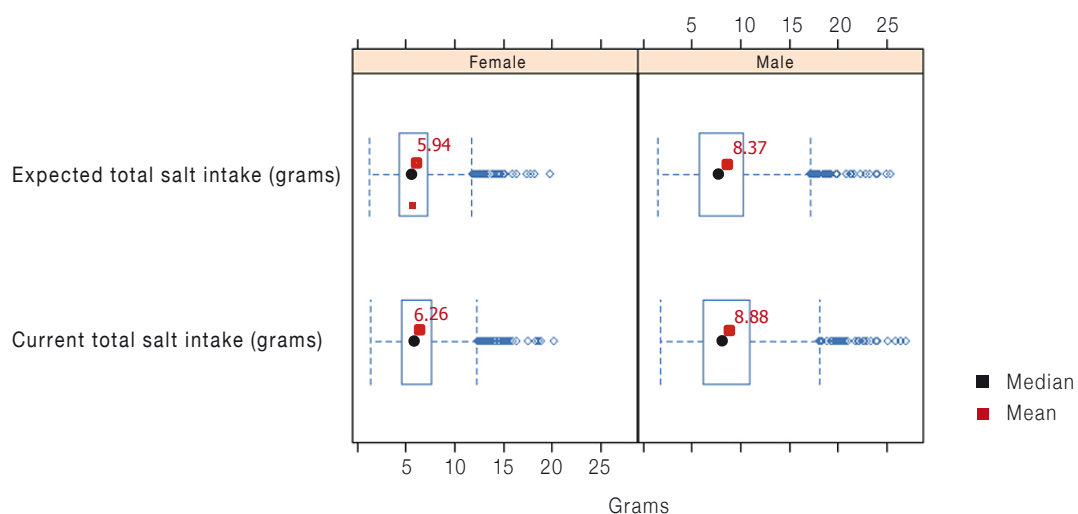


Figure 10 – Current and expected total daily salt intake by sex, using data from the National Food, Nutrition and Physical Activity Survey 2015-2016⁴ in Portuguese population aged 25 to 74 years.

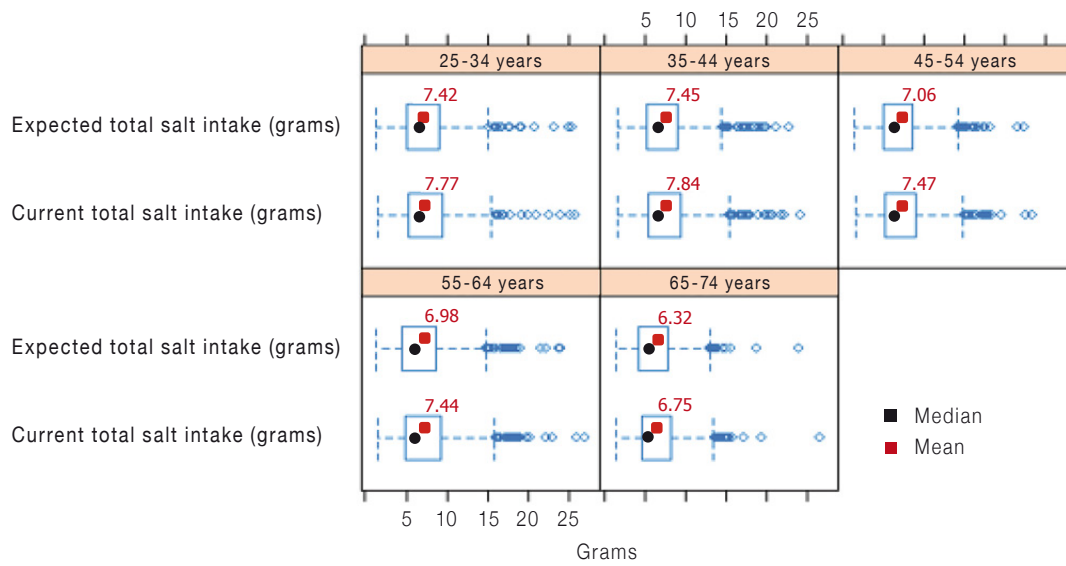


Figure 11 – Current and expected total daily salt intake by age group, using data from the National Food, Nutrition and Physical Activity Survey 2015-2016⁴ in Portuguese population aged 25 to 74 years.

in individuals with a university degree (0.36 g salt/day reduction is expected from the decrease of total salt intake from 7.56 g to 7.20 g (Figure 12).

As expected from IAN-AF results, it is in Alentejo region that the largest reduction in total daily salt intake is expected. In fact, a reduction from 8.55 g to 7.95 g, corresponding to a decrease

of 0.60 g on total daily salt intake is estimated for this region. In contrast in Madeira region it's expected a lower reduction (0.30 g) corresponding to a decrease from 5.58 g to 5.28 g in total salt intake. This is consistent with the different daily salt intake patterns between the two regions (Figure 13).

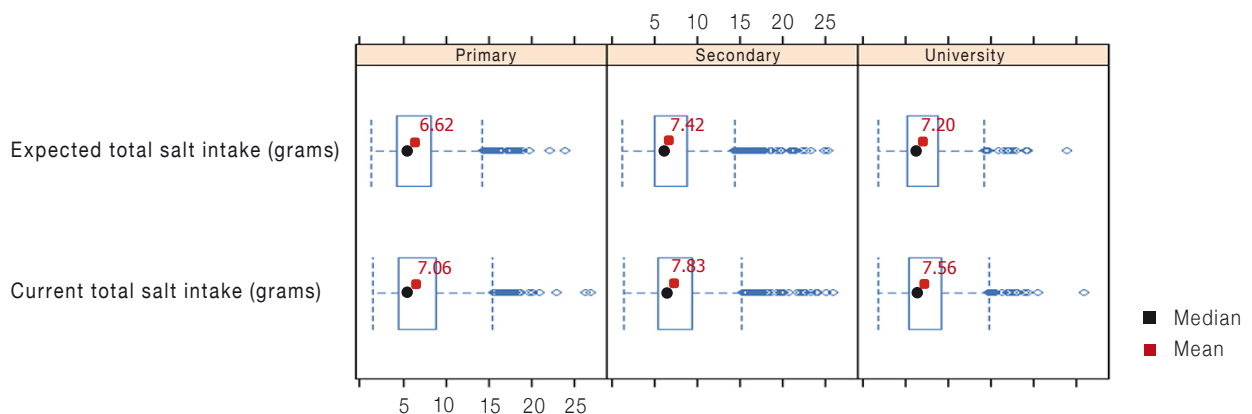


Figure 12 – Current and expected total daily salt intake by education level, using data from the National Food, Nutrition and Physical Activity Survey 2015-2016⁴.

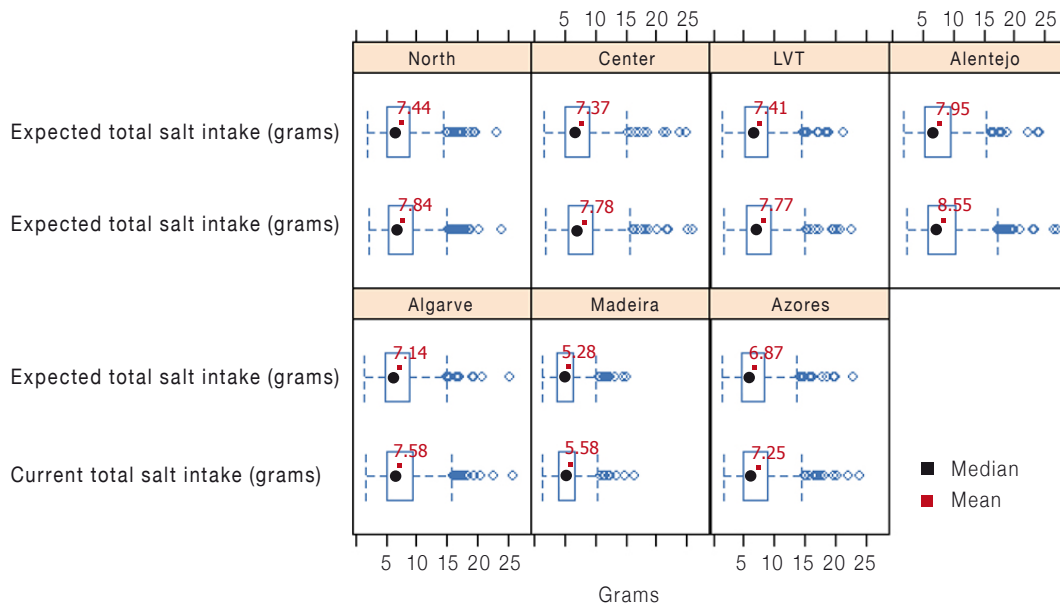


Figure 13 – Current and expected total daily salt intake by region, using data from the National Food, Nutrition and Physical Activity Survey 2015-2016⁴.

b) Potential effects in BP

According to sex:

In hypertensive patients, with a mean daily salt intake decrease of 0.32 g in women and 0.51 g in men, it is estimated that the decrease in systolic BP will be higher in men (0.62 mmHg) than women (0.40 mmHg). However, the effect size was very low for both groups (Table III).

Considering the other variables under study, BP reduction is higher among people aged 55-64 years old (Table IV), individuals with primary and secondary school (Table V) and inhabitants from Alentejo region (Table VI), with a reduction of 0.6 mmHg, 0.5 mmHg and 0.7 mmHg, respectively. In addition, a very small effect size was observed among all groups, as shown below.

Table III – Impact of salt reduction on systolic BP in hypertensives according to sex.

Sex	Salt in bread (g/d-mean) (a)	Current total salt intake (g/d-mean) (b)	29% salt reduction in bread (g/d-mean) (c)	Expected total salt intake (g/d-mean) (d)	Current systolic BP (mmHg) (e)	Expected Systolic BP (mmHg) (f)	Reduction (g) (g)	Standard Deviation (SD) of the group (h)	Effect size (i)
Women	1.11	6.25	0.32	5.94	152.9	152.5	0.4	13.92	0.028
Men	1.75	8.88	0.51	8.37	151.9	151.3	0.6	12.19	0.051

$$g = \frac{c * 5.4}{4.4}; f = e - g; i = \frac{g}{b}$$

Table IV – Impact of salt reduction on systolic BP in hypertensives according to age group.

Age group	Salt in bread (g/d-mean) (a)	Current total salt intake (g/d-mean) (b)	29% salt reduction in bread (g/d-mean) (c)	Expected total salt intake (g/d-mean) (d)	Current systolic BP (mmHg) (e)	Expected Systolic BP (mmHg) (f)	Reduction (g)	Standard Deviation (SD) of the group (h)	Effect size (i)
25-34	1.21	7.77	0.35	7.42	147.3	146.9	0.4	7.06	0.061
35-44	1.34	7.84	0.38	7.45	148.1	147.6	0.5	9.29	0.052
45-54	1.42	7.47	0.41	7.06	153.1	152.6	0.5	12.94	0.039
55-64	1.60	7.44	0.46	6.97	152.8	152.2	0.6	13.63	0.042
65-74	1.50	6.75	0.43	6.32	153.5	153.0	0.5	13.39	0.040

Table V – Impact of salt reduction on systolic BP in hypertensives according to educational level.

Education level	Salt in bread (g/d-mean) (a)	Current total salt intake (g/d-mean) (b)	29% salt reduction in bread (g/d-mean) (c)	Expected total salt intake (g/d-mean) (d)	Current systolic BP (mmHg) (e)	Expected Systolic BP (mmHg) (f)	Reduction (g)	Standard Deviation (SD) of the group (h)	Effect size (i)
Primary	1.50	7.06	0.44	6.62	153.6	153.1	0.5	13.70	0.039
Secondary	1.42	7.8	0.41	7.42	150.0	149.5	0.5	10.86	0.047
University	1.25	7.6	0.46	7.20	149.1	148.7	0.4	10.47	0.042

Table VI – Impact of salt reduction on systolic BP in hypertensives according to region.

Region	Salt in bread (g/d-mean) (a)	Current total salt intake (g/d-mean) (b)	29% salt reduction in bread (g/d-mean) (c)	Expected total salt intake (g/d-mean) (d)	Current systolic BP (mmHg) (e)	Expected Systolic BP (mmHg) (f)	Reduction (g)	Standard Deviation (SD) of the group (h)	Effect size (i)
North	1.35	7.84	0.39	7.44	149.9	149.4	0.5	10.20	0.047
Center	1.41	7.78	0.40	7.37	151.7	151.2	0.5	12.23	0.041
LVT	1.27	7.77	0.37	7.41	152.8	152.3	0.5	12.27	0.036
Alentejo	2.07	8.55	0.60	7.95	154.8	154.1	0.7	15.28	0.048
Algarve	1.51	7.58	0.44	7.14	149.7	149.2	0.5	9.72	0.055
Madeira	1.04	5.58	0.30	5.28	152.9	152.5	0.4	13.70	0.027
Azores	1.33	7.25	0.39	6.86	154.2	153.7	0.5	14.69	0.032

c) Potential effects in CVD

In order to decrease the risk of developing CVD a reduction on systolic BP is needed²¹. According Ettehad *et al.*²¹ a systolic BP below 130 mmHg should be achieved. Given the results previously described, no important effect in reduction the

CVD developing risk was expected with the implementation of the Protocol and for this reason no estimation was made. Moreover, it was not possible to access national data of prevalence, incidence cases and mortality to predict impact in CVD, due to access constraints.

3.2. Study of the potential health economic impact of interventions targeting reduction of salt content in bread

Background

Globally, around 15% of the disability adjusted life years (DALY) are due to CVD²². Some of these are preventable deaths, which could be averted by modifying the main risk factors. Salt intake is one of these risk factors. In 2017, high intake of sodium was responsible for around 3 million deaths and 70 million DALYs among adults aged 25 years or older across 195 countries²³. Since excessive consumption of salt is one of the greatest public health risks in Portugal and because resources are limited, policy makers have to make difficult choices in order to allocate the scarce resources in the most efficient interventions. Economic evaluations can help to inform policies by comparing the costs and consequences of those interventions.

The WHO have alerted for early and better diagnosis, treatment and control of HT, since this could reduce morbidity and mortality, in a cost-effective way²⁴.

Objective

The purpose of this subchapter is to determine whether the implementation of the 'Protocol' is cost-effective as an intervention aimed to reducing salt intake in Portugal.

Methods

In a context of scarce resources, policy makers have to make difficult choices in order to prioritize health spending. Thus, the economic evaluations can help to inform policies by comparing the costs and consequences of those interventions, allowing allocation of resources in the most efficient

interventions. To get an overview on empirical evidence about the economic value of interventions targeting salt reduction, previous literature was search.

Results

Several studies analysed interventions designed to reduce sodium intake, from an economic perspective. A study from Selmer *et al.*²⁵ estimated the health and economic consequences of interventions aimed at reducing the daily intake of salt among the Norwegian population. The authors considered the costs of the interventions (that might be health promotion campaigns, new industry recipes, declaration of salt in the food, or tax/subsidies to food producers), welfare losses from taxation of salty food/subsidising of food products with little salt, cost of avoided myocardial infarction and stroke treatment, cost of avoided antihypertensive treatment, hospital costs in additional life years and productivity gains from reduced morbidity and mortality. Results showed that when the systolic BP was reduced by 2 mmHg there were net savings around \$120 million (discounted), over the whole period analysed (until all persons were deceased). However, the results were sensitive to the reduction of the BP: there were net cost savings above 1 mmHg of BP (Table VII).

Table VII – Cost per life year saved according to systolic BP reduction levels.

Systolic BP reduction (mmHg)	Cost per life year saved (US \$)
1	2040
2	Cost saving
4	Cost saving

Source: Adapted from Selmer *et al.* (2000).

Other study from Joffres *et al.*²⁶, used data from Canadian health surveys to estimate the BP reduction and direct healthcare costs savings associated with lower salt intake. The study considered costs with physician visits, antihypertensive drug use and laboratory costs. According to this study, reducing dietary salt additives may result in a decrease of physician visits by 6.5%, while laboratory costs would decrease by 23%. In addition, fewer treated hypertensive patients would require medications for control of BP. This might result in direct cost savings of approximately \$430 million per year (Table VIII).

Table VIII – Potential direct cost savings after reduction in salt intake in Canadians with HT.

Cost category	No modification Costs, \$	Cost reductions, \$
Physician	555,964,000	36,138,000
Pharmaceuticals	1,684,561,000	387,449,000
Laboratory	92,422,000	6,007,000
Total	2,332,947,000	429,594,000

Source: Adapted from Joffres *et al.* (2007).

Barton *et al.*²⁷ estimated the cases and deaths due to CVD prevented or postponed, and cost savings to the National Health System (NHS), after a reduction of 3 g/day in salt intake. These results might lead to a decrease of the systolic BP by 2.5 mmHg, which could save around £40 million savings per year, and approximately £347 million over 10 years (Table IX).

A more recent study from Webb *et al.*²⁸ aimed to quantify the cost-effectiveness of a government policy combining targeted industry agreements and public education to reduce sodium intake in 183 countries worldwide. They modelled a range of scenarios, achieved over 10 years, including proportional reductions of 10%, 30%, and absolute reductions of 0.5 g/day and 1.5 g/day. The results showed that even moderate interventions targeting 10% reduction in sodium, or reduction of 0.5 g/day were generally cost effective, when considering the WHO benchmarks (cost effectiveness ratios lower than 3 times the Gross Domestic Product (GDP) per capita are considered cost effective).

Table IX – Discounted outcomes according to the reduction (%) in systolic BP over 10 years.

Percentage reduction in systolic BP	Cases prevented (×1000)	Deaths prevented (×1000)	Life years gained (×1000)	QALYs ³ gained (×1000)	Total savings (£m)	Annual equivalent savings (£m)
0.5	8	1.1	24	33	86	10
1	16	2.2	48	65	173	20
1.5	24	3.3	72	98	260	30
2	32	4.4	96	131	347	40
2.5	40	5.5	121	164	435	50
3	48	6.7	145	197	522	61
3.5	57	7.8	169	230	610	71
4	65	8.9	194	263	699	81
4.5	73	10	219	296	787	91
5	81	11.2	243	330	876	102

Source: Adapted from Joffres *et al.* (2007).

³ QALY – Quality-adjusted life year

Additionally, several systematic reviews found economic evidence in favour of interventions to reduce sodium intake. Most interventions evaluated were population-based. The reviews from Hope *et al.*²⁹ and Wang & Labarthe³⁰ confirmed that interventions targeting reductions in sodium are generally cost-effective, and even sometimes cost-saving, *i.e.*, they allow achieving better health at a lower cost.

3.3. Study of the impact and distribution of effects within population regarding salt reduction in bread on enrollment age schooling (6-18 years) children and family behaviours on dietary habits

Background

In order to reduce daily salt intake, the Protocol set not only new targets for salt content in bread sold to the community, but also undertook ways of promoting the nutritional composition of bread available in schools. In this context, it was also agreed that the bread provided in schools should not exceed 1 g of salt per 100 g of bread, by 31/12/2021.

Herein, we describe how qualitative evidence was gathered to assess the potential impact of the measures taken on behaviors and eating habits of participant families and their children. To measure the impact of introducing the goals of the Protocol on family habits, a survey was built for this purpose.

Objective

The general objective of this survey is to measure the level of knowledge and attitudes regarding the amount of bread consumed at home and at school. As a secondary objective, we aim to identify potential changes in bread eating habits.

Material and methods

This is an observational study, direct and cross-sectional targeted to parents or guardians of child/young people (between 6 and 18 years) enrolled in school groups from the ACES Almada Seixal⁽⁴⁾ area of influence.

To meet the the objectives of the current investigation, a questionnaire was built and validated by experts in the field. The survey was drawn using the online platform REDCap³¹ and must be accessed and answered via online interface. For more details please see [Annex IV](#).

The survey and the correspondent methodological note was submitted to the scrutiny of INSA's ethics committee. In addition, an application for authorization to conduct this surveys/a research study in the school groups was submitted for consideration by the Directorate-General for Education (DGE), through the School Surveys Monitoring System (MIME) designed specifically for this purpose. After the collection period, data stored (including gender, educational attainment, age and income) was processed in accordance with current legislation and there is no question, association of questions or link to identify participants. Statistical analysis of these data was performed using a commonly used statistical package (SPSS or Excel).

Results

A sample of 86 valid surveys was gathered. Women were the main respondents (86%) compared to men (14%). From these, the majority of participants (57%) aged 40 to 49 years old.

Importantly, 57% from all the participants with valid answers claimed to have knowledge about the Protocol signature, but only 43% referred to know about its implementation at their residence area.

When asked about 'Did you feel any changes in the bread you eat in the last 12 months?' the majority of the respondents (53%) did not notice

⁽⁴⁾ ACES – Primary Care Group

any changes in bread they usually consume. Between who refers to feel some changes (31%), the major difference noticed concerns to flavor (N=23), durability (or shelf life) (N=7) and texture (N=3) (Figure 14). Only two participants have selected all the above available possibilities of bread changes.

Concerning the current bread flavor (Overall, how do you currently evaluate the taste of the bread you eat?) 69% of the respondents judge it as 'Normal' (neither salty or tasteless). Others, 16% feels it 'unsalted' and 10% tastes a 'slightly salty', the bread they usually consume (Figure 15).

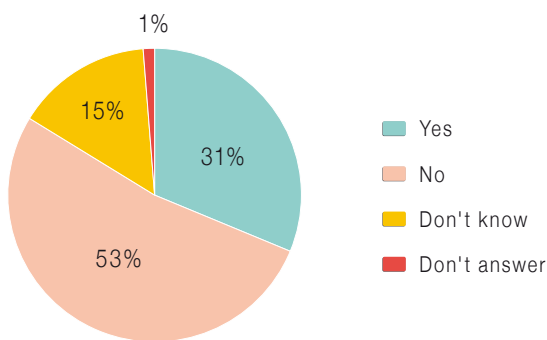


Figure 14 – Distribution of answers to the question 'Did you feel any changes in the bread you eat in the last 12 months?' from the «Knowledge and Attitude towards the Gradual Reduction of Salt in Bread» survey.

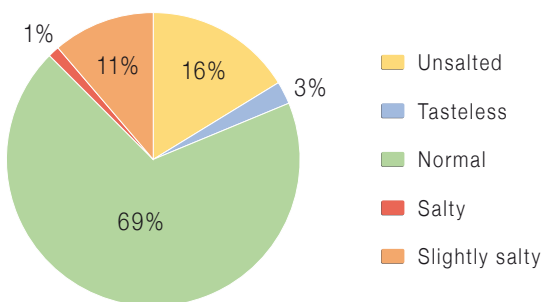


Figure 15 – Distribution of answers to the question 'Overall, how do you currently evaluate the taste of the bread you eat?' from the «Knowledge and Attitude towards the Gradual Reduction of Salt in Bread» survey.

When asked about bread buying pattern for familiar consume, 65% did not change the amount of bread bought in the last 12 months. Among the 31% (N=25) who changed it, 92% (N=21) states 'I bought less bread for home consumption' and 15 participants (71%) didn't substituted it for other products.

Concerning bread consumption in scholar context, 92% of the parents or guardians affirm their child/young didn't told them about any changes in school' bread taste.

Our exploratory results shows the majority of our pilot study participants of the respondents didn't notice any changes in bread reinforced by the fact that 64% classify bread' flavor as Normal (neither salty or tasteless). In schools, the same pattern could be observed, although one can argue that the parents/guardians answers about their kids eating habits could not reflect the real scenario.

Discussion of results

4



4. Discussion of results

The Protocol under study aims to reach a 29% reduction of salt in bread, which leads to an expected reduction of 0.50 g and 0.32 g in total salt daily intake for men and women, respectively. However, these changes seems to have little effect in BP and CVD. This might be due to the fact of our data only allowed us to measure effects with aggregated data, so the potential impact in individuals with higher levels of BP are diluted.

Still, one can expect a larger reduction in salt intake from bread among individuals with higher consumption of bread, namely men, individuals aged 55-74 years old, inhabitants from Alentejo region and those with lower educational attainment. Therefore, these groups showed a higher decrease in systolic BP values following the implementation of the Protocol, for hypertensive individuals. Nevertheless, as far as BP is concerned, the findings from effect size showed systematically values below 0.2, meaning that the magnitude of the effect is very low for all groups considered. Thus, the expected effect in BP seems to be too small to have an important impact in decreasing risk of CVD, according to previous studies²¹. However, this study also suggest that, despite no clear threshold value, due to the involvement of other risk factors, lowering blood pressure leads to wide benefits.

From an economic perspective, although most of the studies found in literature tested for the need of higher reductions in systolic BP to have an impact in CVD, than the observed in this study, results above 0.5 g/day of salt reduction seem already achieve a cost effective impact when considering WHO benchmarks²⁸.

In the same sense, studies that tested for moderate reductions already found that these policies are generally cost-effective. For example, Selmer *et al.*²⁵ observed that a reduction of the systolic BP by 1 mmHg can have a cost of 2040 US\$ per life year saved. This might be considered cost-effective according to the WHO thresholds, since is lower than 3 times the Portuguese GDP per capita. Thus, the putative economic effects related with specific groups of the population (men, elderly, Alentejo residents and less educated individuals) should not be underestimated and more substantial interventions, which aim a reduction of more than 2 mmHg, could be potentially cost-saving.

Looking at the results of the survey, the majority of respondents were aware of the Protocol's existence and its implementation. A good acceptance to a less salty bread flavor and an unchanged consumption familiar bread pattern was found. In scholar context, the same pattern could be observed, although one can argue that the parents/guardians answers about their kids eating habits could not reflect the real scenario. More detailed data and further analysis was needed to better understand and support this exploratory analysis.

Limitations

5



5. Limitations

One of the most important outcomes obtained from using a LBD approach during the development of this Pilot Study was the possibility to get insight about the range and magnitude of difficulties that arise during the development of an HIA study.

Regarding the assessment of Impact 1, several limitations were faced. Initially, was planned to use “DYNAMO MODEL HIA Tool” to model the underlying chain of events. We projected the use of this software once other HIA studies, with similar objectives, used it to model effects that occurred from changes in policies.

However, although free and online access, we faced several technical limitations in its practical application, namely:

- i) Unclear instructions for utilization;
- ii) Lack of technical response when requested;
- iii) Outdated software version and incompatible with the available resources; and
- iv) Prerequisite for individual and disaggregated data for consistent use.

The necessary data for the accurate performance of the model are difficult to access in Portugal (incidence or mortality by age group). Thus, and although the model could operate based on "assumptions", it was decided not to use this tool since all the requirements were not met and the quality and accuracy of results were not guaranteed.

After this first approach to measuring the effects failed, the second approach, which we presented in this study, also had limitations, as follow:

1. At national level, the data required for part of the study are only available from two population-based surveys (IAN-AF⁴ and INSEF¹²) with different samples: one with data on daily salt intake and the other with physical examination and BP measurement. Thus, there was an absence of linkage at individual level because individuals are not the same in both databases. However, it was possible to establish the link between salt intake reduction and BP values based on evidence gathered from a meta-analysis.
2. Access restrictions on CVD prevalence, incidence and mortality data, justified by the National Statistics Institute (INE) as regulatory confidentiality parameters, constituting an additional barrier to assess the potential impact on the risk of developing CVD.

The assessment of Impact 2 also faced limitations. The initial objective was to estimate the potential impact on employment levels and bread sales within the application of the protocol. Though, the data necessary for this analysis was not available, namely information on the reference value of the salt content in bread, and information on breaks and variations specific to the bakery sector, which could affect employment levels and sales. Furthermore, our Steering Group states that the Protocol would not have impact on employment and only a limited impact in sales, so the working group decided to switch

the approach. The WHO technical team, which supported this study, suggested us to look at the potential impact on the economic value of intervention for the National Health System. Technically, we decided to perform a literature review, given the resource limitations of this working group.

Concerning the Impact 3, we experienced some difficulties as well. Given the time-period comprising the HIA, several constraints caused an unexpected delay for the data collection. Essentially, bureaucratic difficulties were encountered related to the authorization to apply the survey in schools, submitted to the Monitoring System for School Subjects (MIME). After obtaining authorization by DGE, several Group-schools were contacted to hear their interest and authorization for the installation of the questionnaire in their online platforms. This process was very time consuming.

Recomendations

6



6. Recommendations

A 29% decrease in salt content in bread, endorsed by this voluntary protocol, contributes to a small decrease in BP values, as shown in this study. However, a positive effect on disease prevention is expected, with a positive impact on health, determinants of health and the well-being of the population if, additionally to this protocol, other complementary and integrated measures are adopted that actively promote the reduction global salt intake, in order to achieve the WHO reference value of 5 g/day.

Moreover, the available evidence demonstrates that voluntary agreements are not sufficiently effective in reducing salt intake consistently by the population^{9,32,33}. In particular, Cobiac *et al.* postulate that mandatory approaches generate greater health gains than voluntary agreements, in a porportion 20 times higher³².

Thus, based on the previous assumptions, the working group recommends:

- 1) The recognition of the negative impact of salt consumption on health by the Government and Assembly of the Republic, as a main risk factor for public health in Portugal.
- 2) The conversion of this voluntary agreement, as a protocol, into an effective legislative measure for all operators in the sector, especially bakery industrialists and large bakery and bread products retailers, including prepackaged bread (safeguarding traditional products with protected names), currently non-signatory.
- 3) The extension and application of the same type of regulation to other categories and food products of high consumption by the Portuguese population, namely:
 - a. meat and meat products;
 - b. soups
 - c. other processed products (chips, snacks, crackers and cereals as an example)
- 4) The adoption of measures to contribute to the consumers' food and nutritional literacy increment, leading to the adherence to healthier habits and food choices (public campaigns, nutrition labeling, among others).
- 5) The close articulation between government agencies, health entities and partners from all sectors, including Industry and Trade stakeholders, to the operationalization of these and others measures that are considered able to contribute to a food supply modification and that generate a healthy eating environment, in the different contexts of action and implementation (school, work, family, among others.)

Final note

7



7. Final note

The HIA pilot study herein described was carried out from an LBD approach. It was an important opportunity to experience the challenges of conducting an HIA, in a real scenario, by professionals from different sectors, with no previous experience in this area. In particular, the pilot team elaborated several documents that embody this experience^{18,34,35}, participated in several scientific activities to disseminate pilot results³⁶⁻⁴² and capacity building training programs in HIA⁴³⁻⁴⁶.

One of the lessons learned from this experience was that focus of action should lead to continuous professional training allocated to this task. For this it is essential to define the core professional skills for the development of HIA studies and allocate resources for this purpose.

Another lesson resulting from this experience was the need to develop a guide for technical support for professionals responsible for the development of HIA, adapted to the national context.

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Annexes

Annex I – Screening Tool Section one

Annex II – Screening Tool Section two

Annex III – Screening Tool Section three

Annex IV – “Knowledge and attitudes toward salt reduction in bread” Survey [PT]

Annex I – Screening tool section one

Title of proposal being screened	Reduction of the salt (sodium) content in bread and its contribution to the reduction of blood pressure in Portugal
Date screening conducted	18 th April 2018
Person(s) involved in the screening process (name, organization represented and job title if applicable)	Teresa Caldas de Almeida Luciana Costa Alexandra Costa Paula Bráz Joana Santos Mariana Santos Ricardo Assunção Roberto Brazão Isabel Lopes Ana Cristina Guerreiro
What stage of development is the proposal at?	Initial phase of implementation of the Protocol.
Briefly outline the importance of the proposal from: An economic/ business perspective	Economic perspective: – Bread producers: reduction of expenses in the acquisition of salt and reduction of profit in the sale of bread. Increase in sales of bread (seal). – Salt producers: reduction of profit in the sale of salt. – Sellers: reduction or increase of profit in the sale of bread. – Consumers: change in consumption; demand for other replacement products.
A political perspective	Political Perspective: – There is support and political interest: the theme is present in the current political agenda. – Reduction of expenses in the treatment and other health care related to the associated pathologies.
A community perspective	Community Perspective: – Health gains for the population: morbidity and mortality.
What resources are available to conduct a HIA? (Consider both human and financial)	– Human Resources: HIA Group – Financial: – person / hour cost – travel costs – organization of meetings (catering, space, audio-visual materials, interpretation, translation, printing, etc.) – collection / access / data transfer / analysis – software – expenditure on international experts – production of documents (graphics, printing and binding) – communication of results – publication of scientific articles
Are decision makers likely to be open to recommendations to amend the proposal?	YES

Annex II – Screening tool section two

Social and economic conditions that influence health		
Likelihood that the proposal will impact on this health determinant (Likely/ Unlikely/ Not known)		Groups most likely to be affected by the proposal
Education	EdL	All the population that consumes bread that will benefit, especially the population with lower literacy.
Employment	L	Retired, housewives, unemployed
Childcare	NK	
Crime and fear of crime	U	
Community interaction	L	Family, school, community
Access to fresh food	U	
Access to sports and other opportunities for physical activity	U	
Access to cultural and other recreational activities	U	
Access to healthcare services	U	
Access to social welfare services	U	
Access to other community services	U	
Access to public transport	U	
Other social or economic conditions (list)		

Structural issues that influence health		
Likelihood that the proposal will impact on this health determinant (Likely/ Unlikely/ Not known)		Groups most likely to be affected by the proposal
Housing	U	
Public buildings	U	
Commercial buildings	NK	
Green space (including parks)	U	
Other public spaces	U	
Road safety	U	
Transport infrastructure	U	
Communications infrastructure (internet/telephone)	U	
Energy sources	U	
Waste management infrastructure	U	
Water quality	U	
Air quality (indoor and outdoor)	U	
Soil quality	U	
Noise	U	
Light	U	
Other structural issues (list)		

Individual and family issues that influence health

Likelihood that the proposal will impact on this health determinant (Likely/ Unlikely/ Not known)		Groups most likely to be affected by the proposal
Diet	L	The whole population consuming bread
Physical activity	U	
Substance use (legal and illegal)	U	
Sexual activity	L	Men
Household income	U	
Family cohesion	U	
Other individual and family issues (list)		Ethnic groups Area of residence (Rural population vs. urban population) Religion (Different religions may have different cultural consumption habits of bread)

Annex III – Screening tool section three

Overall, health impacts are unlikely or relatively minor and easy to address.	Where appropriate, make recommendations to decision makers on how such impacts may be addressed. Do not proceed with HIA.	
Overall, health impacts are likely or unknown.	Taking into account issues raised in section one, proceed with HIA.	X

Annex IV – “Knowledge and attitudes toward salt reduction in bread” survey [PT]



Conhecimento e atitude face à redução gradual da quantidade de sal no pão

O interesse em compreender em que medida as intervenções e as políticas de todos os sectores têm impacto na saúde das comunidades é cada vez maior e necessário. Neste sentido, o Instituto Nacional de Saúde Doutor Ricardo Jorge (INSA) tem vindo a desenvolver atividades e estudos no âmbito da avaliação de impactos em Saúde, com o apoio da Organização Mundial de Saúde (OMS).

Este questionário, elaborado pelo grupo de trabalho que inclui membros de diferentes Departamentos do INSA, da Escola Nacional de Saúde Pública (ENSP), bem como representantes da Administração Regional de Saúde do Algarve (ARS Algarve) e da Direção-Geral da Educação (DGE), tem como objetivo fazer uma avaliação de conhecimento e atitude face à quantidade de sal no pão consumido, em casa e na escola, e eventual mudança de hábitos no consumo de pão.

Este inquérito é anónimo e deve ser respondido por uma pessoa adulta (encarregado/a de educação, parente ou tutor/a) responsável pela(s) criança(s) ou jovem(s). As questões colocadas pelo inquérito a aplicar em meio escolar serão respondidas através da ligação da plataforma a utilizar, utilizando-se um ou mais computadores a disponibilizar para o efeito no Agrupamento de Escolas, ou outra forma considerada adequada a este propósito.

Os dados recolhidos (entre eles sexo, habilitação literária, idade e rendimento) serão tratados de acordo com a legislação em vigor, não havendo nenhuma questão, associação de questões ou ligação que permitam identificar os/as participantes. Os dados serão guardados até dezembro de 2021. Os resultados serão reportados numa publicação científica.

Este inquérito foi submetido e aprovado pela Comissão de Ética do INSA, bem como pelo sistema de Monitorização de Inquéritos em Meio Escolar (MIME) da DGE.

A sua participação neste questionário, que demora a preencher aproximadamente 8 minutos, é muito importante.

No caso de lhe surgir alguma dúvida, por favor entre em contacto connosco através do endereço eletrónico: alexandra.costa@insa.min-saude.pt.

Muito obrigada pela sua colaboração.

A Saúde das crianças e jovens é muito importante para nós!

Se concorda em responder e participar neste estudo, por favor assinale a opção abaixo:

- Li e entendi a informação disponibilizada sobre o inquérito a realizar. Percebi que todos os dados recolhidos neste inquérito são anónimos, não serão disponibilizados a terceiros nem utilizados para qualquer outro fim, serão processados informaticamente, armazenados de acordo com a legislação em vigor e será elaborado um documento público com a análise global da informação recolhida. É de minha livre vontade que aceito colaborar neste trabalho.

A. Conhecimento e Literacia gerais

	Concordo totalmente	Concordo parcialmente	Nem concordo, nem discordo	Discordo parcialmente	Discordo totalmente
1. Os portugueses consomem sal em excesso.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. O consumo de sal em excesso pode aumentar o risco de aparecimento e/ou avanço de diversas doenças.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. O consumo de sal em excesso é uma das principais causas de hipertensão arterial.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. O consumo de sal em excesso é uma das principais causas da diabetes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. O consumo máximo diário de sal por pessoa é o equivalente a uma colher de sopa por dia.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Na dieta portuguesa, o pão é um dos alimentos que mais contribui para o consumo de sal diário.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

B. Protocolo de colaboração para a redução gradual da quantidade de sal no pão

1. Tem conhecimento da assinatura de um Protocolo de Colaboração entre a Direção-Geral da Saúde (DGS), o INSA e as Associações dos Industriais da Panificação, Pastelaria e Similares para a redução gradual da quantidade de sal no pão, no final do ano de 2017?

- Sim
- Não
- Não sei
- Não respondo

1.1. Se sim, como teve conhecimento:

- Direção-Geral da Saúde (DGS)
- Administração Regional de Saúde (ARS)
- Algarve Instituto Nacional de Saúde (INSA)
- Agrupamento escolar do meu educando Padaria/Panificadores locais
- Outra

Qual?

2. Tem conhecimento da implementação deste Protocolo, e consequente redução da quantidade de sal no pão, nas panificadoras/padarias da sua zona de residência?

- Sim
- Não
- Não sei
- Não respondo

C. Consumo doméstico

1. Nos últimos 12 meses sentiu alterações no pão que come?

- Sim
- Não
- Não sei
- Não respondo

1.1. Se sim, qual ou quais?
(pode seleccionar mais que uma opção)

- Sabor
- Textura
- Durabilidade (nº de dias adequado para o consumo)
- Outra não referida

Qual?

2. De uma maneira geral, como avalia actualmente o sabor do pão que come?

- Salgado
- Um pouco salgado
- Normal: Nem salgado, nem insosso
- Com pouco sal
- Insosso

3. Alterou-se, nos últimos 12 meses a quantidade de pão que compra?

- Sim
- Não
- Não sei
- Não respondo

3.1. Se respondeu sim:

- Comprei mais pão para consumo familiar
- Comprei menos pão para consumo familiar

3.1.1. Substituiu por outros produtos similares?

- Sim
- Não

Diga quais:

4. Devido ao sabor, nos últimos 12 meses mudou de local de compra de pão?

- Sim
- Não
- Não sei
- Não respondo

D. Consumo de pão na escola

1. Neste ano lectivo de 2018/2019, o(s) seu(s) educando(s) educanda(s) tem comido pão no refeitório ou no bufete da escola que frequenta?
 - Sim
 - Não
 - Não sei
 - Não respondo

2. Neste ano lectivo de 2018/2019, o(s) seu(s) educando(s) educanda(s) falou-lhe de alguma alteração no sabor do pão que come na escola?
 - Sim
 - Não
 - Não sei
 - Não respondo

3. Teve conhecimento que neste ano letivo de 2018/2019, no âmbito do protocolo de colaboração, a escola do(s) seu(s) educando(s) educanda(s) passou a disponibilizar pão com menos sal?
 - Sim
 - Não
 - Não sei
 - Não respondo

E. Caracterização sociodemográfica

1. Quem responde às questões gerais deste questionário?

- Mãe
- Pai
- Outro cuidador

Qual?

2. Qual o seu sexo?

- Feminino
- Masculino
- Não respondo

3. Qual o grupo etário em que se insere?

- 20 - 29 anos
- 30 - 39 anos
- 40 - 49 anos
- 50 - 59 anos
- Mais de 60 anos

4. Qual foi o grau de escolaridade mais elevado que completou?

- Ensino básico 1º ciclo (4ºano, antigo ensino primário, 4ª classe).
- Ensino básico 2º ciclo (6ºano, antigo ciclo preparatório).
- Ensino básico 3º ciclo (9ºano, antigo 5º ano do liceu).
- Ensino secundário (12ªano, antigo 7º ano do liceu).
- Ensino Pós-secundário Não Superior (ex. curso profissional).
- Ensino Superior (Bacharelato, Licenciatura, Mestrado, Doutoramento).
- Sem escolaridade.
- Não sei.
- Não respondo.

5. Como define a sua condição perante o trabalho?

- Trabalhador(a) por contra própria ou por conta de outrem.
- Desempregado(a) (sem emprego no período de referência, disponível para trabalhar e a procura de emprego).
- Outro (reformado(a), permanentemente incapacitado(a), estudante, trabalhador doméstico(a)).
- Outra situação.

Qual?

6. Qual dos seguintes grupos representa o rendimento mensal total líquido do seu agregado familiar (incluindo vencimentos, subsídios, abonos, pensões e outros benefícios/rendimentos patrimoniais regulares após deduções para impostos, segurança social, etc.)?

- Menos de 600€
- 601 - 970 €
- 971 - 1455 €
- 1456 - 1940 €
- 1941 - 2425 €
- 2426 - 2910 €
- 2911 - 3395 €
- 3396 - 3880 €
- 3881 - 4365 €
- Mais de 4365 €
- Não sei
- Não respondo

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