

INHERIT

BARRIERS AND POTENTIAL FOR ADOPTING HEALTHIER, MORE EQUITABLE AND ENVIRONMENTALLY FRIENDLY SOLUTIONS IDENTIFIED IN A FIVE-COUNTRY SURVEY

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Content

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Executive Summary

As new or improved policies, interventions, and innovations can facilitate lifestyle and behavioural changes, we investigate the potential effects of several policy instruments on behaviours. We examine attitudes, preferences and behaviours of inhabitants of five European countries related to consuming, moving and living.

The aim of the research is to improve understanding of how different policy instruments can influence lifestyles and behaviours to be healthier and more environmentally friendly, and support health equity.

Methods

Own questionnaire survey was conducted in the Czech Republic, Latvia, Portugal, Spain, and the United Kingdom in 2018. The country subsamples are representative of national populations aged 18 to 65 years in terms of several sociodemographic characteristics.

Discrete choice experiment was used to elicit preferences for lifestyle changes. We depart from socio-psychological theoretical models to analyse capability, motivation, and opportunity of change of dietary patterns.

Results

I. Current trends in consumption, travel and housing

- car use dominates for commuting to and from work and shopping in all survey countries, which are the two most frequently performed activities in a typical week; walking dominates for commuting to sport and leisure activities, while public transport dominates commuting to school or university (except in the UK where walking prevails). Cycling is frequently chosen as a means of transport to sport and leisure activities;
- almost half of British and Portuguese respondents report less than 1 hour of physical activity per day. In the most educated tercile only 7-14% of respondents indicated no physical activity, while in the least educated tercile 25-35% are not physically active;
- the most common frequency of fruit consumption is 1-2 portions a day in all 5 countries, but overall Czech and Latvian respondents consume fruits slightly less frequently compared to their counterparts from the UK, Spain and Portugal. Vegetables are also most frequently eaten in 1-2 portions a day and overall somewhat more by British respondents. The majority of people eat less than the recommended 5 portions of fruit and vegetables a day.

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- only small shares of respondents use renewable energy sources (about 20% in the UK, Portugal, and Spain, but only 16% in Latvia) and even fewer people bought solar panels to produce energy (8-11% in the UK, Portugal, and Spain, but only 4% in Latvia and in the Czech Republic). Thus, there is significant potential for increasing use of renewable energy in households.

II. Change in food consumption: Vouchers for local, organic, or all fruit and vegetables?

- vouchers for fruits and vegetables with a co-payment rate in the vicinity of 60% could be a sustainable and effective option, i.e. limiting the impact on public funds without discouraging consumers;
- vouchers for all fruits and vegetables and those from the country of the respondent are preferred over vouchers for organic fruits and vegetables by respondents from all the surveyed countries;
- if vouchers were provided, 50-60% of respondents indicated that their household would eat at least slightly more fruits and vegetables and almost all remaining respondents indicated that their household would eat the same number of portions.

III. Change in dietary patterns

- respondents who do not comply with dietary recommendations would be willing to change their diet on average by one portion from each of the five food groups by decreasing their consumptions of sweets and meat and increase their intake of fruits, vegetables, fish, and pulses.

IV. Change in lifestyles: Information, subsidies and taxes

- in a discrete choice experiment, we introduced several choice situations where respondents were asked to choose the best from three lifestyles presented. Included among these three lifestyles was the respondent's current lifestyle, while the two new lifestyles were healthier or more environmentally-friendly. Each lifestyle was described by a different diet, health risks, monetary costs, level of physical activities or environmental impacts;
- most respondents prefer to keep eating meat, even though we informed them that plant-based eating is recognized not only as nutritionally sufficient but also as a way to reduce the risk of many chronic illnesses, and that the recommended number of portions of meat per week is a maximum of five. The Czechs prefer eating meat the most, Spanish the least;
- Czechs and Latvians would be willing to pay for increase in their fish consumption most. Respondents from Spain and Portugal are less sensitive to changes in their fish consumption, while people from the UK are least sensitive to changes in their fish consumption;
- respondents are ready to pay to increase their consumption of fruit and vegetables and pulses. The British present a different case as their preference for fruit and vegetables is weaker, and even more so for pulses.
- the cost of the lifestyle program is the key factor of people's choice. The lower cost, the higher the likelihood of choosing the healthier lifestyle. The effect of price is asymmetric (except in the

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UK), meaning that lowering the costs of the healthy lifestyle below the current cost has a larger effect than changing costs that are above the current cost level.

- reducing health risk significantly increases the probability of accepting a new alternative lifestyle program. Respondents from Spain and Portugal prefer to reduce the risk of cardiovascular heart disease the most.
- respondents also tend to prefer lifestyles with a lower impact on the environment expressed as CO_2 reduction, even though the environmental impact reduction is valued as less important than health risk reduction
- increasing physical activity tends to be preferred by the Latvians and Portuguese, but not by respondents from the other countries

V. Public support for policy instruments

- several policy instruments can influence lifestyle changes, but not all of them are easy to introduce, as they are considered by politicians to be publicly unacceptable. What instruments would be more acceptable?
- people from all the surveyed countries showed the greatest support for the introduction of subsidies for fruit and vegetable production and for cycling and walking among policy instruments
- sugar tax on soft drinks is supported to a greater extent than a meat tax in all countries. In Portugal, the UK, and Spain, the share of respondents who would support a sugar tax (43% to 46%) is much larger than share of respondents who oppose it (12% to 16%).

VI. The INHERIT scenarios: the future of green spaces, transport system, housing, and food consumption

- people from all the surveyed countries would strongly prefer to experience real, tangible green spaces rather than augmented reality;
- in contrast augmented reality is among the most preferred scenarios for the future of active mobility
- people from all the surveyed countries except Latvia most preferred the scenario of developing the 'energy efficient housing' domain through renewable energy and bio-based solutions. According to the scenario, this switch to renewable energy will be achieved by a collaboration between energy companies, public administration and citizen groups;
- the scenario emphasising self-grown and seasonal food from the region called 'One for all, all for one' is the most preferred scenario of future food consumption in all survey countries except Spain.

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Introduction

The EU-funded project INHERIT aims to investigate the possibilities of changes in lifestyles and behaviours to support the transition to healthier, more equitable and sustainable societies (see Staatsen et al., 2017).

This report contributes to reaching the aim of the INHERIT project by an examination of policies, interventions, and innovations that can initiate change by providing people with the opportunity, motivation, and capability to change their lifestyles and behaviours.

As explaining behaviour requires a multidimensional view (Jackson, 2005), we take several theoretical approaches stemming from social-psychology, sociology and economics as out point of departure. We briefly introduce these approaches in Chapter 1.

The analysis in this report is based on a questionnaire survey the current authors conducted in the Czech Republic, Latvia, Portugal, Spain, and the United Kingdom in 2018. The country subsamples are representative of national populations aged 18 to 65 years in terms of several sociodemographic characteristics. The survey methods and data are described in Chapter 2.

The survey builds upon research conducted in other work packages of the INHERIT project. The hypotheses and survey questions were formulated based on a literature review (see Staatsen et al., 2017), INHERIT conceptual model development (van der Vliet et al., 2018) and INHERIT scenarios (see Guillen-Hanson, Strube, & Xhelili, 2018). Thus, it was not within the remit of this report to include a literature review. This report includes only a brief additional literature to provide an overview of theoretical approaches that we use to design the survey (see Chapter 1) and literature directly related to the specific research questions in order to interpret the survey results in Chapter 3. The conclusions of the report are presented in Chapter 4.

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Chapter 1 Aim and Background of the Research

The aim of this research is to examine current trends in consumption, travel and lifestyle of the inhabitants of five European countries and to improve understanding of how lifestyles and behaviours might be changed to become healthier and more environmentally friendly, and to support health equity. As new or improved policies, interventions, and innovations can facilitate lifestyle and behavioural changes, we investigate the potential effects of several policy instruments on behaviours. We examine preferences and factors that influence the behaviours of people from the Czech Republic, Latvia, Portugal, Spain, and the United Kingdom.

In particular, the objectives are to answer the following research questions:

- What are the preferences of inhabitants of these five European countries in terms of healthier and more sustainable lifestyles?
- Would people from these countries be willing to change their dietary patterns or physical activity to lead a healthier lifestyle, and if so, under what conditions?
- What policy instruments would be more likely to change lifestyles to be healthier and more sustainable? To what extent does providing information, financial incentives, or levying taxes play a part in motivating change?
- Would information on health and environmental risks be more effective in changing intentions, if self-affirmation is used in the campaign?
- In terms of changes in food consumption: What would happen if vouchers for local, organic, or all fruit and vegetables were offered to citizens for a fraction of their monetary value? Would people use them? And if so, how would this affect their consumption of fruits and vegetables?
- How do current consumption, travel and lifestyle of inhabitants differ between countries?
- Do attitudes and behaviours differ according to the respondents' socio-demographic characteristics? Are high income people more likely to apply for vouchers for fruit and vegetables than low income people?
- What future scenarios for the development of green spaces, transport systems, housing, and food consumption do respondents prefer?

To achieve this aim we conducted a questionnaire survey in the Czech Republic, Latvia, Portugal, Spain, and the United Kingdom. We combined social-psychological, sociological and economic approaches to both the survey design and data analysis. In this chapter, we introduce the theoretical approaches which served as the point of departure for in our research.

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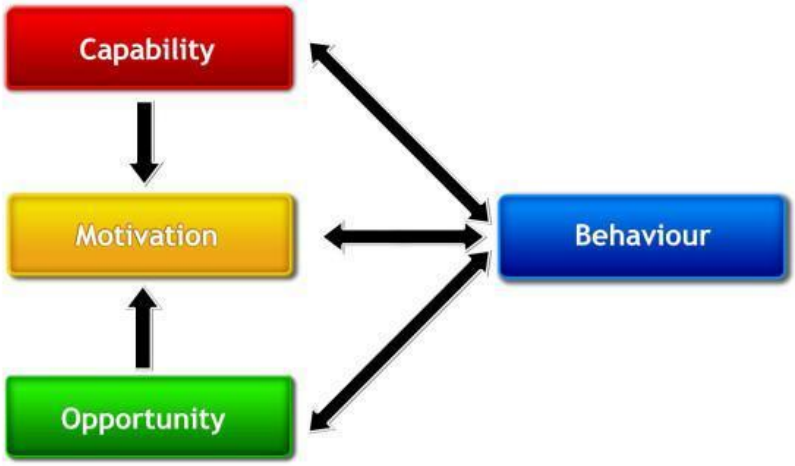
Theoretical approaches

Capability, opportunity, and motivation

To understand environmentally significant and health-related behaviours, we began with **the COM-B system** (Michie, van Stralen, & West, 2011). However, such a complex model of behaviour requires the inclusion of many measures in a questionnaire. Therefore, we could only apply this complex model to analyse one specific behaviour: we opted to focus on dietary patterns and willingness to change them.

There are three components of behaviour in the COM-B system: capability, motivation, and opportunity (see Figure 1).

Figure 1: The COM-B system - a framework for understanding behaviour



Source: Michie, van Stralen, & West, 2011

To be able to examine motivation in detail, we employed two well established theories, specifically the Theory of Planned Behavior (TPB; Ajzen, 1985) and Value-Belief-Norm Theory (VBN theory; Stern, 2000). As neither of these theories include a construct of habit, we integrated the COM-B system into our conceptual model. The measurement of habit is based on a short version of the Self-Report Habit Index (SRHI) (Verplanken & Orbell, 2003).

Value-Belief-Norm Theory was developed by Stern and his colleagues in order to explain environmentally significant behaviour (Stern et al., 1999). Stern later identified several types of environmentally significant behaviour, among them private-sphere behaviour, such as consumer behaviour, or lifestyle changes (Stern, 2000). The VBN model integrates three existing theoretical concepts in a causal order: value theory, the NEP scale (New Environmental/Ecological Paradigm,

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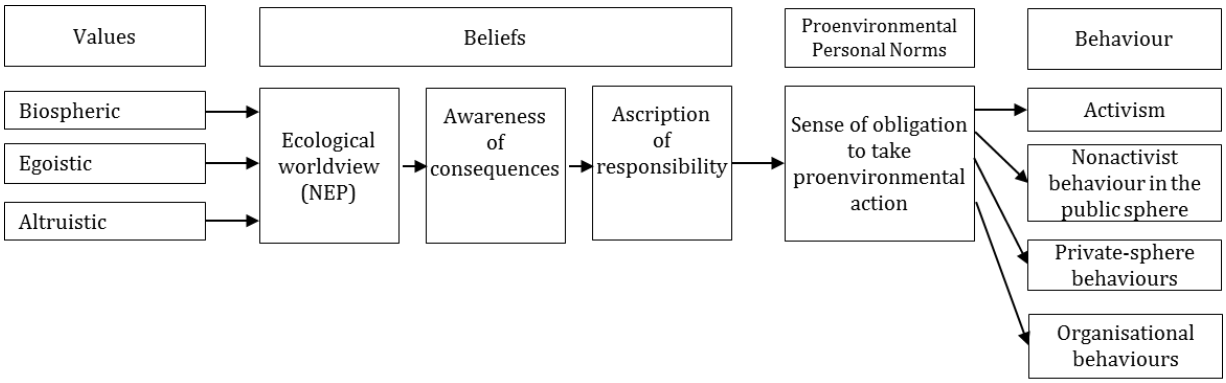
(Catton & Dunlap, 1978), and norm activation theory represented by Schwartz's (Schwartz, 1977) Norm Activation Model (NAM).

The causal chain (Figure 2) leads from values (biospheric, altruistic or egoistic) to beliefs about human-environment relations, measured by the NEP scale (Dunlap & Van Liere, 1978; Dunlap, Van Liere, Mertig, & Jones, 2000). Based on these values and ecological worldview, individuals consider the consequences of their environmental conditions on themselves, others or their natural environment (awareness of consequences). If individuals believe that their environmental conditions significantly and negatively affect their lives, the lives of others or their environment, and at the same time that their actions can prevent these consequences (in other words they ascribe responsibility to themselves), a set of norms for protection of (at least their own) living environment is activated, accompanied by sense of obligation. These norms and feelings consequently lead to the performance of the behaviour (Stern, 2000).

Figure 2: Value-Belief-Norm Theory



Source: adopted from Stern 2000, p. 412

The Theory of Planned Behaviour (see Figure 3) was proposed by Icek Ajzen (1985; 1991) as a modification of the earlier theory of reasoned action (Fishbein & Ajzen, 1975). In order to improve prediction of behaviour that is under limited volitional control, Ajzen (1985; 1991) added to the theory of reasoned action a construct of perceived behavioural control and related beliefs. Thus, behaviour can be directly predicted from the intention to act and perceived behavioural control, i.e. perception of the factors facilitating or inhibiting the performance of the behaviour. Perceived behavioural control can serve as a proxy for actual control to the extent that respondents are able to report accurately on these non-motivational factors (Ajzen, 1991; 2006). The intention to act is influenced by attitudes, subjective norms, and perceived behavioural control related to a given behaviour. Intention to perform the behaviour is strengthened when attitudes and subjective norms towards behaviour are more favourable and perceived behavioural control is greater (Fishbein & Ajzen, 2010, p. 21). Finally, TPB presumes that attitudes, subjective norms, and perceived behavioural control are formed based on beliefs regarding the probable outcomes of the behaviour

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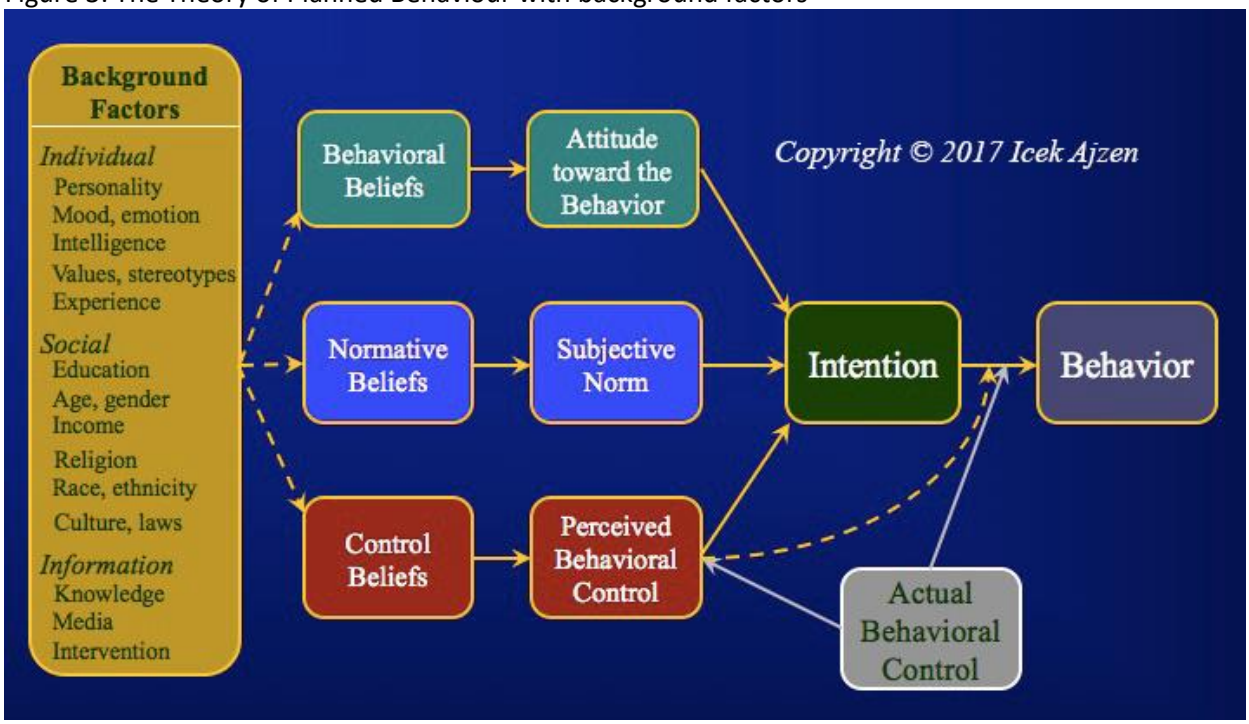
and their respective evaluations (behavioural beliefs), beliefs regarding whether significant others approve or disapprove the performing of the behaviour and motivation to comply with their expectations (normative beliefs), and beliefs regarding the existence and the perceived power of factors that may enable or inhibit realization of the behaviour (control beliefs) (Ajzen, 2006; Fishbein and Ajzen, 2010).

Figure 3: The Theory of Planned Behaviour with background factors



Source: adopted from Ajzen (2017)

Regarding opportunities, we are able to control for an economic situation (using a variable of income) that can be either a barrier or facilitator of behaviour change. We gathered respondents' postcode area, thus statistics about the region that describe physical and social opportunities can be added to the analysis. Different people perceive opportunities differently; therefore we included also a measure of perceived behavioural control, which is part of the theory of planned behaviour and belongs under the motivation component. As psychological capability can also influence behaviour, we work with the concept of self-efficacy that is the conviction that one can successfully perform the behaviours required to be able follow a healthy diet (Bandura, 1998).

Self-affirmation theory

According to self-affirmation theory, when a piece of information endangers perceived adequacy or integrity of the self, self-affirmation processes are activated and continue until this perception is restored through explanation, rationalization, and/or action (Steele, 1988). However, people do not

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need to use these dissonance reduction strategies and can handle such information less defensively if they can affirm their self-concepts before being exposed to the threatening information. Information about health risks, which we provide in our survey, is a typical example of such threatening information. Thus, risk messages used in health promotion campaigns can be better accepted if the self-affirmation intervention is applied (Arpan, Lee, & Wang, 2017; Sherman & Cohen, 2006).

A well-examined self-affirmation intervention consists of two steps. First, participants are asked to choose one or a few values most important to them from a list prepared by researchers. If the threatening information is related to health, it is recommended not to include health and rationality in the list of values. Second, participants write a short paragraph about their most important values (Cohen & Sherman, 2014).

Several empirical studies have demonstrated that self-affirmation interventions improve education, health, and relationship outcomes and that the positive effects can last for months and years (Cohen & Sherman, 2014).

Hence, we hypothesize that self-affirmation can mitigate negative responses when challenging respondents' current diets by providing information on the health risks of dietary choices. To control for separate effects of self-affirmation and the feedback on health risks, three treatment groups and one control group are proposed (see Chapter 2 for details of the experiment).

Random Utility Model

The Random Utility Model (RUM) is the basis for analysing the (discrete) decisions of consumers taken either in real life situations (revealed preferences) or intended to be taken in a hypothetical situation in a contingent market (stated preferences). The RUM is based on the notion that an individual chooses the alternative with the highest utility. The utilities are latent variables and the observable preference indicators (choices) are manifestations of the underlying utilities (Walker & Ben-Akiva, 2002).[1]

In the economic version of the RUM framework, people's preferences contain some components that analysts cannot observe, and therefore, are treated by the analysts as random. Respondents' uncertainty, learning and other forms of dynamic behaviour are not excluded from this framework. However, there are no agents who make optimisation errors, a typical explanation for error terms in most economic models. That having been said, optimisation errors may emerge, as people may base

[1] This model stems from microeconomic consumer theory (Marschak, 1960), psychometric literature (Luce, 1959; Thurstone, 1927) and includes the concept of specifying utilities developed by Lancaster (1966) and McFadden (1974).

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a decision on a rule from a set that is different from the one assumed by (and hence not known to) the analyst (Carson & Czajkowski, 2014).

Following the Lancasterian view of utility (Lancaster, 1966), the good (for example lifestyle in our survey) is described in terms of a collection of its characteristics (attributes). In our survey, the characteristics are dietary patterns described by five food categories; duration of physical activity; impact of diet on health and the environment; and monthly costs in the next six months. Selected combinations of levels of these attributes constitute alternatives presented to respondents, who are asked to select the one which they consider the best (the most preferred). This is a basic feature of a stated preference technique called discrete choice experiments that we utilise in our survey. Discrete choice experiments can simply be thought of as a decision-making situation among two or more alternatives which differ in the levels of characteristic attributes of non-market goods being valued.

The repeated choices of each respondent observed in hypothetical choice situations with varying levels of characteristic attributes make it possible to apply statistical methods to estimate utility parameters related to particular attributes of a good, and hence to formally model consumers' preferences.

As a result, this approach enables evaluation of the changes in consumer welfare upon implementation of a particular scenario. In our survey, we inform respondents that public policies may promote healthier and more sustainable lifestyles. For example, policies may subsidise healthier and environmentally friendly goods (vegetables and pulses) and increase taxes on unhealthy and environmentally unfriendly goods (reducing meat subsidies or imposing a sugar tax).

Furthermore, this approach facilitates the prediction of consumers' behaviour with respect to new goods or alternatives (alternative lifestyles in our survey). In addition, identifying the marginal rates of substitution between particular characteristics of a good (including the pecuniary attribute – e.g. the cost of provision) makes it possible to estimate respondents' willingness to pay for such non-market goods and their characteristics and also the probability of choosing certain alternatives (Ryan, Gerard, & Amaya-Amaya, 2008).

Consumer preferences can be also elicited within a simplified version of contingent choices. Instead of describing a good by several attributes, consumers can be asked to take-or-leave a good that is generally described. However, the costs of the good are specified. This version of experiment, i.e. contingent behaviour, is used in this study to examine preferences for changing diets through accepting vouchers for fruits and vegetables. In order to estimate demand, we vary the number of vouchers given for a month and the financial contribution provided by the government, keeping the cost of one voucher as fixed.

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Chapter 2 Developing the Survey

Survey methods and measures

Physical activity

As a measure of physical activity, a standardized short-form version of the International Physical Activity Questionnaire (IPAQ-SF) (Craig et al., 2003; Lee, Macfarlane, Lam, & Stewart, 2011) was used. The IPAQ-SF records the activity of four intensity levels – vigorous, moderate, walking and sitting – over the last 7 days. Due to time constraints, two questions related to sitting (the last in IPAQ-SF) were excluded. Based on the pre-survey results, we also slightly modified the wording of the questions concerning the length of time spent on the activities. The IPAQ scoring may be used to derive a Metabolic Equivalent of Task to measure the intensity of physical activity of each respondent to be potentially used in subsequent econometric modelling.

Dietary patterns

Respondents' eating patterns were elicited using the Short-Form Food Frequency Questionnaire (SFFFQ). The SFFFQ is a standardized tool and has been validated against an extensive FFQ and a 24 h diet recall for the UK (Cleghorn et al., 2016). We removed three food groups suggested in Cleghorn et al. (2016) in the original SFFFQ due to time constraints and merged two food groups ("salad" and "vegetables") into a single category labelled "vegetables", as pretesting revealed that respondents found it difficult to distinguish between them. Also based on respondents' reflection in the pre-survey we adapted the frequency questions to ask directly about portions (i.e. "How many portions of [a food group X] do you eat?") rather than the somewhat ambiguous "(...) how often you eat at least one portion of …?". In order to accommodate the frequency option in the adapted question we split the "never/rarely" option into two separate options "none" and "less than one portion a month". The consumption frequency for each food group was asked on a separate screen and complemented by visual depiction of a typical portion (see Figure 4).

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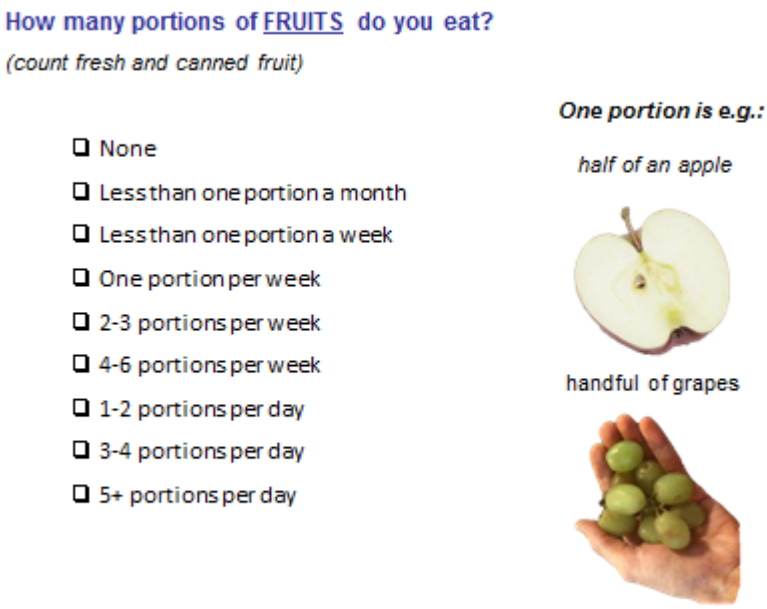
Figure 4: Example of a question on food consumption frequency



Food consumption: vouchers for local, organic, or all fruit and vegetables

In this contingent behaviour experiment, we examine whether people would change their diet if a new system of vouchers for fruits and vegetables was introduced. Similar food voucher schemes have already been widely used in many countries. For instance, employers provide subsidized food vouchers to their employees in the Czech Republic. The UK government provides food vouchers to vulnerable pregnant women and mothers. Specifically, the UK's Healthy Start Scheme[2] provides vouchers to pregnant women and women who have a child under four years of age to help buy milk, fresh and frozen fruit and vegetables in supermarkets, pharmacies, greengrocers, and convenience stores. However, only families that receive income support, income-related allowances, or tax-credits and have a low income are eligible. In our survey, each resident (including children, retired people and the unemployed) is eligible in order to gather information from all respondents.

Specific characteristics of a new food voucher system were provided in detail prior to the experiment. We programmed three randomized treatments: vouchers for fruits and vegetables, organic fruits and vegetables, and fruits and vegetables grown in the respondent's country. We randomly assigned the number of vouchers to each participant, either 10 or 20 vouchers per month. We chose to offer more vouchers with a lower value to having one voucher with larger value so that

[2] https://www.healthystart.nhs.uk/

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these vouchers can be used even for small (daily) purchases. Each voucher is of £3 value in the UK, 3 € in Portugal and Spain, 2 € in Latvia, and 50 CZK in the Czech Republic. We used purchasing power parity to convert the 3 € value of voucher into national currencies and rounded the resulting value. In order to ensure the incentive-compatibility of our experiment, these vouchers were not provided for free. The financial contribution of the survey participant varied, ranging from 20% to 60% of the total value of the vouchers. We hypothesise that the likelihood of participating in this program would decline with the increasing share of financial contribution. Those who didn't agree to participate in the program were offered a cost-free option in the second step. We then asked both groups (those willing to pay and those who would participate only for free) how these vouchers would be used – whether they would buy larger variety of fruits and vegetables, or higher quality, and where they would use these vouchers (e.g., supermarkets or farmers' markets). We also asked about reasons for not wanting to participate in such a program.

We are thus able to analyse the preferences of respondents including their willingness to change their diet, and to discern the impacts of costs on diet choices and the likely benefits of introducing subsidies.

Eating: Dietary recommendations

In this section, respondents are presented with a recommended healthy diet issued by a public health authority. Subsequently, their willingness to change their current diet to healthier one is elicited and barriers to such change are probed. The recommended dietary patterns come from the Dutch “Wheel of Five” (Brink, Postma-Smeets, Stafleu, & Wolvers, 2016). In general, at least 5 portions a day of fruits and vegetables are recommended daily, moderate consumption of confectionery, ice-cream and sugar-sweetened drinks, 1-2 portions a week of fish (preferably oily fish), a maximum of 5 portions of meat a week, at least 2 portions of pulses a week. An important advantage of the Wheel of Five is that it takes sustainability into account. For instance, maximum limits for the use of animal products such as meat (including red meat), milk products and fish are provided. It encourages people to adopt a dietary pattern with less meat but with more pulses and nuts (Brink, Postma-Smeets, Stafleu, & Wolvers, 2017).

Indicators of capability, opportunity and motivation to follow the recommended diet are included. To explain people's motivation to act, we operationalized the Theory of Planned Behaviour (intention, attitudes, subjective norm, perceived behavioural control, and beliefs) and therefore the measures included are based on recommendations by Ajzen (2006). We use seven-point Likert scales to measure these constructs. Knowledge of a healthy diet is measured by combining information about the health assessment of one’s personal diet (healthy or unhealthy evaluation) and food frequency information diet (following the healthy diet recommendations or not). Perception of the healthiness of current food consumption is measured on a seven-point Likert scale from very unhealthy to very healthy.

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The strength of healthy and unhealthy habits is measured based on a short version of the Self-Report Habit Index (Verplanken & Orbell, 2003). The habit measures are focused on the consumption of fruit or vegetables and of desserts as part of main meals on weekdays and weekends. To assess the actual physical availability of fresh fruit and vegetables, a household availability scale was adapted from the Home Food Assessment tool (Nepper, Ludemann, & Chai, 2014) only for the Portuguese version, and a set of questions concerning perception of availability of vegetables and fruits, local and organic food is included.

Measures of life satisfaction and happiness were included based on one item scales validated by several international surveys to assess wellbeing. We adopted these measures from the European social survey[3]. Diet-related environmental and health benefits are estimated based on the revised SFFFQ, and therefore calculated based on the specific diet pattern of each participant to derive (i) a dietary quality score, in accordance with averaged scores collected by Cleghorn et al. (2016), and (ii) attribute dietary CO_2-eq emissions by assigning each dietary pattern to one of 4 diet groups defined in Scarborough et al. (2014). Additionally, beliefs about human-environment relations and pro-environmental personal norm were operationalized.

Self-affirmation, health and environmental information

The second experiment in the questionnaire examines the effect of self-affirmation and health or environmental information related to diets on choosing healthier or more sustainable diet recommended by the public health authority.

We use a positive traits affirmation approach where respondents evaluate their personality. People are asked whether they are: enthusiastic, keen, conscientious, hardworking, intelligent, open-minded, responsible, and determined. We adopt measure developed by Jessop, Simmonds and Sparks (2009).

We carried out a 4-arm experiment comprising three treatment groups and one control group. A randomised experimental design (see Table 1) was implemented as follows:

Respondents in Treatment Group 1 were exposed to a self-affirmation exercise prior to being provided with feedback on the health risks of their current diet to a person of the same age and gender (e.g. risks of cardiovascular diseases) and a comparison of their current diet with a healthy diet as recommended by a public health authority. Subsequently, their willingness to change to a healthy diet recommended by the public health authority was elicited.

[3] http://www.europeansocialsurvey.org/data/country.html?c=source

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Respondents in Treatment Group 2 were exposed to a self-affirmation exercise prior to being provided with a comparison of their current diet with a healthy diet as recommended by the public health authority. Subsequently, their willingness to change to a healthy diet as recommended by public health authority was elicited.

Respondents in Treatment Group 3 were exposed to feedback on the health risks of their current diet to a person of same age and gender (e.g. risks of cardiovascular diseases) and a comparison of their current diet with a healthy diet as recommended by the public health authority. Subsequently, their willingness to change to a healthy diet as recommended by the public health authority was elicited.

Respondents in the Control Group were presented with a comparison of their current diet with a healthy diet as recommended by the public health authority. Subsequently, their willingness to change to a healthy diet as recommended by the public health authority was elicited.

Table 1: Experimental design

Treatment	Experimental group 1	Experimental group 2	Experimental group 3	Control group
T1: Self-affirmation	yes	yes	no	no
T2: Information on environmental risk	yes	no	yes	no

Discrete choice experiment

The discrete choice experiment (DCE) aims to analyse individuals' choices between discrete alternatives, in response to hypothetical programs (products, or scenarios) related to the several aspects of lifestyle explored in the previous part of the questionnaire. To address the INHERIT goal of promoting transition to healthy and sustainable lifestyles, this DCE aims to analyse trade-offs between lifestyle choices in terms of diet and physical activity, and corresponding impacts on personal health risk, on the environment, and on personal expenditures.

Respondents were asked to choose the best option from several hypothetical lifestyle programs, or to choose the lifestyle they lead now (a status-quo option, SQ). In order to provide respondents with credible, meaningful but not overwhelming information, the status-quo option extensively builds upon respondents' responses in previous sections of the questionnaire, in terms of current diet, physical activity level, health risk and environmental impact associated with their diet.

The DCE scenario is inspired by a previous study by Grisolía et al. (2013; 2015) that analysed trade-offs between dietary choices (focused on fats), physical exercise and risks of cardiovascular disease on a representative sample of the Northern Ireland population aged 40-65 years. The primary aim of

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the study by Grisolía et al. (2013; 2015) was to reduce consumption of fats (among adults of 40-60 years old), thus they selected 5 out of the 17 most frequently eaten food items (according to respondents' answers to a question about many portions they eat) that they used in their experiment. A reduced number of portions for each of the 5 food items was set given the sum of fats over the five items that were a certain percentage (by design) lower than the fat volume in the reference case (status quo). In our survey, we aim to reduce the risk of cardiovascular disease and environmental impacts of lifestyles, thus we include different dietary characteristics and environmental impacts.

In our choice experiments three different lifestyles were described by eight characteristics (attributes of the choice experiments), including five different food items, health risk, physical activity, impact on the environment, and cost. We use a split-sample treatment to apply either the physical activity attribute or the environmental attribute in the choice experiment.

We decided to avoid showing alternatives that would increase negative health risk or environmental impact, as these options are not desirable and not in line with the INHERIT objectives. Thus the diet presented in the alternative does not have more portions of meat and free-sugar foods and fewer portions of vegetables and legumes. Physical activity in the alternative lifestyles is also always presented as having an increased length of time.

The attributes and their levels used in the discrete choice experiments are as follows.

<u>Diet:</u>
Diet consisted of following five different food items

- fruits and vegetables,
- meat (not including fish),
- fish,
- legumes,
- confectionery, ice-cream and sugar-sweetened drinks,

and each of these food items is presented as a number of portions eaten per week, except portions of fruits and vegetables that were shown instead per day.

The status quo option represents the number of portions eaten on average by the respondent, as indicated by their previous responses.

In the alternatives, portions of food items that improve health -- pulses and fruits & vegetables were always larger (+1, +2, +3) than the current level or the same. Meanwhile, portions of confectionery, ice-cream and sugar-sweetened drinks and meat were either reduced (-25%, -50%, -75%, and 0

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portions) or were the same as in the current diet. Only the amount of fish eaten could go either way; higher (+2, +1 portions), or lower (a half, or zero), or remain the same.

Physical activity:
The level of physical activity was shown on the choice card as total time (in minutes) spent by the respondent per day on vigorous, moderate, and walking physical activity, following the IPAQ-SF classification.

For the status quo, this length was set as the sum of time spent on each of these three activities on average day within the last seven days as stated by the respondent in the survey, with a median time of 90 minutes a day. This time was increased by 10, 20, or 30 minutes a day in the choice alternatives, or remained as at the current state (status quo).

Environmental impacts:
GHG emissions as equivalents of carbon dioxide (CO_2eq) are used as a proxy for environmental impacts. In the status quo option, GHG emissions are based on current dietary patterns as reported by respondents in the SFFFQ section and approximated to a typology of diets (heavy, medium and low meat-eater, fish-eater, vegetarian, vegan) devised for the UK by Scarborough et al. (2014) study. Since vegetarians and vegans were filtered out in the experiment, we used the following four levels of emissions: 50, 40, 33, and 27 kg CO_2 a week. In the alternative options, the environmental impact only improved (GHG emissions might be reduced by 20%, 33%, 50%, or 66% compared to the status quo), or stay at the current (status quo) level. To better comprehend information provided on the choice card, emission volumes were always presented in absolute terms, i.e. in kilograms of CO_2 emissions per week.

On average, current respondents' diet was responsible for 40.7 kg CO_2 a week and the status quo level ranged between 27 and 50 kg.

Health risk reduction:
Individualised 10-year, 20-year or 30-year risks of cardiovascular disease (CVD) were displayed in the SQ (reference) option (R_0). This risk was calculated for each respondent using 10-year and 30-year CVD risk formulas from the Framingham Heart study (D'Agostino et al., 2008; Pencina et al., 2009); a mean of these two was used as a proxy of 20-year CVD risk. We opted for the Framingham risk models rather than available alternatives (QRISK2, SCORE) since these functions use simple office-based non-laboratory predictors of CVD (gender, age, systolic blood pressure, treatment for hypertension, smoking, diabetes and body mass index). For the sample, the mean value of the risk is 16.3% (median being 12%) and the risk increases as the respondent ages.

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We offer various risk reductions (Rx=20%, 33%, 50%, 67%) in choice alternatives independent of the features of the proposed diet and physical activity (and other attributes). The health risk reduction was graphically depicted (baseline risk in a population of 100 and risk after the reduction) before the first choice task was shown. Since the 10-year CVD risk is very small (0-1%) the majority of the younger population of respondents was shown a 30-year CVD risk with randomized variation of the risk shown to the 30-39 age group (30-year or 20-year risk), the 40-49 age group (30-year, 20-year or 10-year risk) and 50-59 age group (20-year or 10-year risk). As a default, the baseline risk was shown as a percentage (i.e. risk rate) in the SQ. In the choice alternatives, new levels of risk, i.e. $R_1=R_0*(1-Rx)$ were shown.

Cost:
A respondent's current living expenses (the status quo) is based on the respondent's current expenditures on food and physical activities. Cost in both alternatives may be lower (-15%, -30%), higher (+15%, +30%), or the same as in the current situation.

Costs were shown in total per month as well as the differentiation from the status quo (for instance, 15€ more). They were presented in national currencies rounded to the closest integer. We use PPS Euro exchange rates to transfer cost values national currencies (16.51 CZK, 0.666 PPS EUR for Latvia, 0.814 for Portugal, 0.9215 for Spain, and 1.0022 GBP for the UK).

Each respondent was asked six times to choose the best alternative out of three presented options.

This experiment was designed for the meat-eating population and hence vegetarian and vegan respondents were filtered out.

Our design allowed the reduction of meat or fish to zero, but never at the same time, so as to avoid pushing our respondents to become vegetarians. In about 11% of cases, one of the alternatives does not include any meat or fish (while the second one contained at least one portion of meat or fish). We decided on this approach because many pre-survey participants claimed that they do not want to stop eating meat completely. Had most respondents chosen the status quo, we would not have been able to analyse the potential changes and estimate willingness to pay.

The design contained 60 choice tasks and we selected at random six to each respondent. The D-efficient design was prepared by NGENE software (Choicemetrics, 2012). We use the estimates from the pilot study (N=900) to set the priors for the design that was optimised for the main wave of data collection.

INHERIT scenarios

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Four different future scenarios of the development of green spaces, the transport system, housing, and food consumption in 2040 are presented and respondents are asked to choose their preferred option from among them.

The future scenarios were developed in WP3 of the INHERIT project and a detailed description of the scenarios can be found in the report by Guillen-Hanson, Strube, and Xhelili (2018). As the original scenario descriptions were too long for the purpose of a questionnaire survey, we had to significantly shorten them and split them into four parts according to the different domains (green spaces, transport system, housing, and food consumption). We also simplified the texts to be easily comprehensible to lay people.

Developing the questionnaire

The survey is theoretically embedded in the theory of normative conduct through the use of the modified Value-Belief-Norm model (Stern 2000; Stern et al., 1999), in the Theory of Planned Behavior (Ajzen, 1985), and in utility theory by using the choice experiments (see Chapter 1). The theory constructs were operationalised in accordance with the literature and the results of the pre-survey.

Pre-survey

First, we developed an outline for the pre-survey, which took the form of one-on-one semi-structured interviews. The pre-survey was conducted in April 2018 and consisted of 27 interviews in total (8 interviews in the Czech Republic, 6 interviews in Portugal, 5 interviews each in Latvia and in the UK, 3 interviews in Spain). The interviews were carried out using laptop or desktop computer to observe people's reactions to the programmed survey and were also audio recorded.

The interviews contained open-ended questions focused on participants' beliefs and ideas related to changing their lifestyles to be healthier and more environmentally friendly in order to primarily explore the original ideas of the respondents and to propose new hypotheses and corresponding questions. The elicitation of readily accessible beliefs was done according to guidelines established by the author of the Theory of Planned Behavior (Ajzen, 2006).

We also included closed-ended questions developed based on the operationalisation of the theoretical constructs. The objective was to test the preliminary formulation of the closed-ended questions that constituted the draft questionnaire considering their wording and clarity.

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Translations

The translation process included several checks and tests. First, the English master version of the outline for the pre-survey was translated by native speakers to other languages. Some of the socio-demographic and attitudinal questions were adopted from questionnaires applied in comparative panel surveys, such as the European Social Survey and the European Value Survey. Several questions were tailored to the country-specific conditions. Most of the socio-demographic questions have country-specific response options. For example, we do not show the category of civil partnership in the question on marital status in Latvia. The wording and comprehensibility of translated questions were checked by several native speakers in the face-to-face interviews in the pre-survey in all countries. The revisions were incorporated in the language versions of the questionnaire. Second, the closed-ended questions that were added after the pre-survey were translated or adopted from questionnaires applied in comparative panel surveys. All language versions were double-checked and comprehensively revised by native speakers. Third, the language versions were checked against the English version and comprehensively revised by different persons than those who translated the original version.

Pre-testing

Pre-testing included the language and translation checks, as well as testing the programmed instrument, including screening, filter questions, and randomised treatments.

Pilot

The pilot survey was carried out at the beginning of July 2018 in all surveyed countries. In total, we gathered 1,378 questionnaires in the pilot (see Table 2 for number of questionnaires per country).

The data collection process and sample recruitment, including the quota control and screening, were the same as in the main wave in order to avoid any problems in the main wave. The data collection process has been tested and evaluated. Data from the pilot were checked and analysed (using descriptive and regression analysis) in order to test data entry, coding of the items, and appropriateness of statistical models (Hassan, Schattner, & Mazza, 2006; Lancaster, Dodd, & Williamson, 2004).

The pilot has shown that the time to complete questionnaire needs to be slightly reduced. We introduced a new split sample treatment. A new efficient design of discrete choice experiment was prepared using the priors of the utility parameters that were estimated from the pilot data. A new design for the food vouchers experiment was also prepared for the main wave.

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Questionnaire structure

The questionnaire was composed of the following parts:

INFORMATION CONSENT and INFORMATION SHEET

Respondents are provided with an information sheet to ensure that they understand the purpose of their involvement and asked their consent to participate in the survey or not. If a respondent does not give their consent, we thank the respondent and terminate the questionnaire.

SECTION 0. Quota questions

In this part of the questionnaire, socio-demographic characteristics of the respondents were gathered to allow the monitoring of quota attainment:

- gender,
- age,
- education (highest completed country-specific level),
- region of residence,
- size of municipality of residence.

Further, we asked two socio-demographic questions to filter out questions not relevant for some population segments:

- number of household members,
- number of children under the age of 18.

Instructions for completing the questionnaire

The questionnaire starts with a few technical notes on how to complete the questionnaire, how to understand rating scales and a reminder to read informative texts carefully.

This introductory section comprises also questions on life satisfaction and happiness.

SECTION I. Travel mode choices

This section comprises questions on travel mode choices for the respondent's regular journeys and questions on physical activity (IPAQ-SF).

SECTION II. Dietary patterns

This section covers frequency of eating meat or fish, food consumption frequency (SFFFQ), eating habits, and a question on subjective perception of own health.

SECTION III. Food consumption: vouchers for local, organic, or all fruit and vegetables

In this section, a contingent behaviour is explored using a hypothetical scenario of public policy that would subsidize vouchers in order to promote consumption of fruits and vegetables. Three types of vouchers are evaluated: vouchers for local, organic or all fruits and vegetables. Perception, and purchase frequency, of local food and organic food are elicited.

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SECTION IV. Eating: Dietary recommendations

Section IV provides information about what constitutes a healthy diet as recommended by a public health authority and respondents' willingness to change their current diet to a healthier one is elicited, and barriers to such change are probed. This section includes measures of the constructs of Theory of Planned Behavior (Ajzen, 1985).

SECTION V.a Framingham CVD risk scores

To be able to estimate risk of cardiovascular disease, we ask about weight and height, systolic blood pressure, treatment for hypertension, smoking, and diabetes. Respondents always have the option not to answer these questions or select the option "don't know". In this case we use an average value instead of the respondent-specific value in the estimate of risk of cardiovascular disease.

SECTION V. Change of lifestyles: Healthier and more environmentally friendly lifestyles

First, we explain public policies that would be introduced to promote healthier and more sustainable lifestyles and describe lifestyle characteristics. Second, people are asked six times to choose among different lifestyles (discrete choice experiment on the change of lifestyles). Debriefing questions related to the discrete choice experiment are placed at the end of this section.

SECTION VI. Environmental concern and behaviours

This section includes the attitudes and concerns of respondents towards the environment and measures of environmental behaviour, such as energy conservation, transportation and food consumption.

SECTION VII. INHERIT Scenarios

In this section, four different future scenarios of the development of green spaces, the transport system, housing, and food consumption in 2040 are presented and respondents are asked to choose their most preferred scenario.

SECTION VIII. Socio-demographic information

The final section covers the following socio-economic and demographic information about the respondents:

- employment status,
- marital status,
- perception of the household's financial situation
- household income,
- organization of the income in the household
- postcode area

A question inviting comments on the questionnaire is placed at the end of the instrument.

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Data

The questionnaire survey was conducted in the Czech Republic, Latvia, Portugal, Spain, and in the United Kingdom. The five countries were selected based on their different political and socio-economic contexts for the purpose of comparison. We surveyed inhabitants of these countries aged between 18 and 65.

Incomplete and test observations were excluded from the data that is further used for analysis. Numbers of completed questionnaires in the pilot and in the main wave are depicted in Table 2.

Web-based instruments were chosen, as they provide both the possibility for more complicated experimental designs and randomisations. However, some respondents may flip through the questions without properly reading them in the self-administered mode. Therefore, data quality was monitored with regard to the length of the questionnaire. According to the recommendation of Survey Sampling International (Mitchell, 2014), speeders are defined as those respondents who completed the questionnaire in 48% of the median time. However, the length of the survey differs before and after the questionnaire shortening done based on the pilot and socio-demographic segments. Thus, we decided to calculate median duration of survey completion for respondents segmented by country, category of age (18-34, 35-50, 51 and more), education (primary, secondary, and tertiary), and whether they participated before or after the questionnaire was shortened. Respondents who completed the survey in less than 48% of median time for their segment were denoted as “speeders” and are excluded from further analysis. The number of excluded “speeders” per country is shown in Table 2. After excluding the speeders, the median time to complete the questionnaire was 37 minutes in the main wave.

The final data excluding speeders consists in a total of 10288 observations. In this report, we use only this final dataset for statistical analysis.

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Table 2: Sample sizes: number of completed questionnaires in the pilot, in the main wave and in the final sample excluding speeders, number of speeders that were excluded

	Pilot	Main wave	Excluded speeders	Final sample (excluding speeders)
Czech Republic	212	1926	119	2019
Spain	323	1960	220	2063
Latvia	282	1642	146	1778
Portugal	246	1577	172	1650
United Kingdom	315	2660	197	2778
Total	1378	9765	854	10288

The country subsamples are representative of national populations aged 18 to 65 years in terms of gender, age, region, and education. Sample proportions deviated from few quotas set. Based on the population shares (see Appendix, Table 1), we derived the weights to make the country subsamples representative with respect to gender, age, education, and region. For data analysis we always use the weights.

We conducted descriptive analysis of household income. We use the information on household income for our analyses in two forms. In the first one, we adjust reported household income (i.e. midpoints from 12 income brackets shown in the questionnaire) by purchasing parity power to 'generic' euros that can be conveniently used for analyses of pooled data as it equalises purchasing power across survey countries. Distribution of household incomes in 'generic' euros across survey countries is shown in Figure 5.

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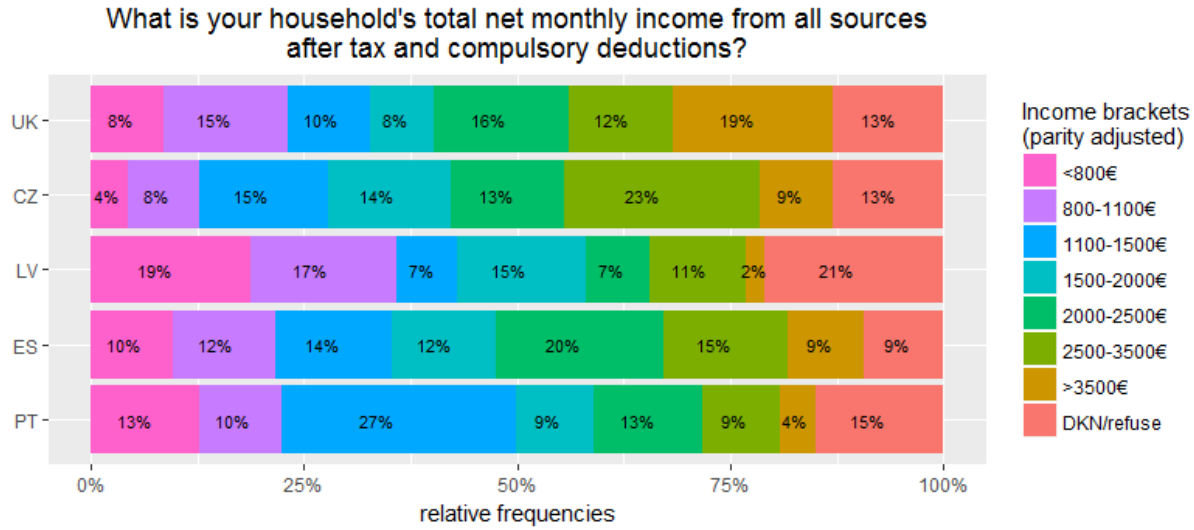
Figure 5: Respondents' household income (adjusted by purchasing parity to 'generic' euros)



The second form we use in our analyses is a relative measure of income level within survey country that is primarily used to explore differences in responses to survey questions and decision situations of low-income groups. To this end we divided respondents in each country by household income to three roughly equally sized groups (i.e. terciles; with the fourth group consisting of those who didn't know or refused to specify their household income).

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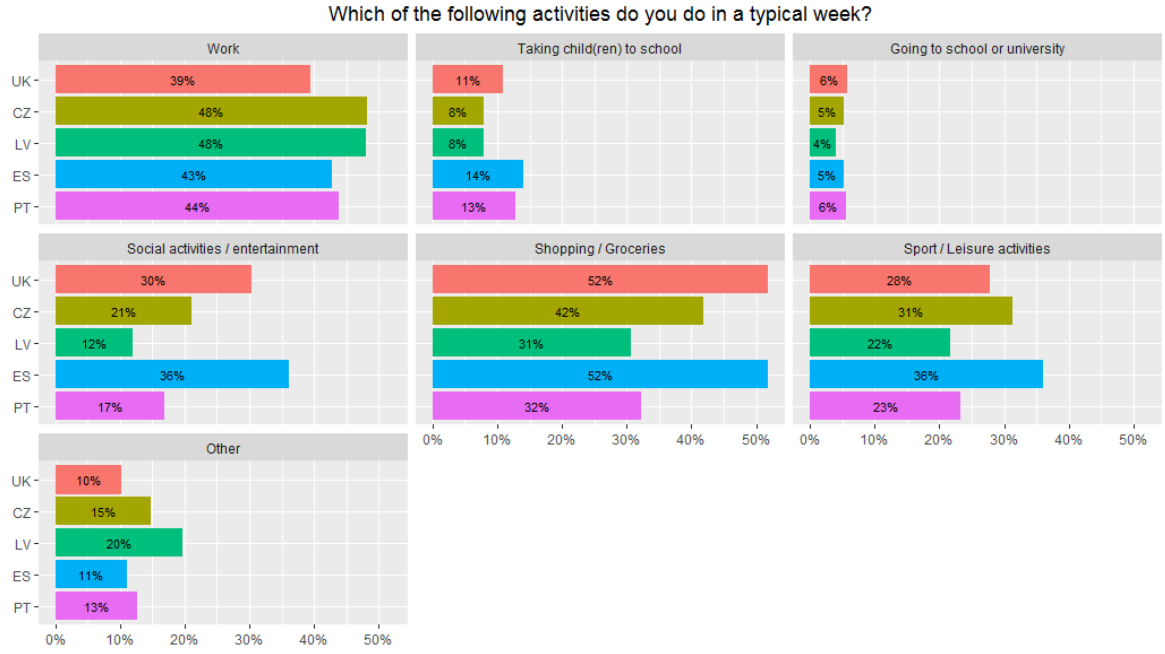
Chapter 3 Survey Results

Current trends in consumption, travel and housing

Mobility and transportation

The typical mobility pattern of each respondent was explored using a multiple-choice question about activities performed in a typical week. Work and shopping are two most frequently reported activities, with some differences among survey countries (see Figure 6). For example, almost half of Czech and Latvian respondents reported work as a typical activity compared to mere 39% of respondents from the UK. Shopping were reported as a typical activity by more than half of British and Spanish respondents, but less than one third of Latvian and Portuguese respondents. Going to school or university is a typical activity for only about 5% of respondents, but this is accounted for by the fact that only an adult population is being surveyed.

Figure 6: Activities performed by respondents in a typical week



Note: multiple option question, totals over different activities may exceed 100%.

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Travel mode choices

When asked about transport modes used to travel to these typical activities, we see that car-use dominates for commuting to and from work and shopping in all survey countries, but the picture is more diverse for other activities (see Figure 7). Walking is prevalent for commuting to sport and leisure activities, while public transport dominates commuting to school or university (except in the UK where walking prevails over public transport). Cycling was also frequently chosen as a means of transport to sport and leisure activities. Taxi and similar services are used relatively infrequently, most often for getting to social activities and entertainment (at least by UK, Czech and Latvian respondents). Carpooling is mostly used for getting to social activities and entertainment among Latvian respondents, while for getting to school among UK and Portuguese respondents. Bike-sharing is used to only a limited extent, most often by British and Spanish respondents for commuting to school/university.

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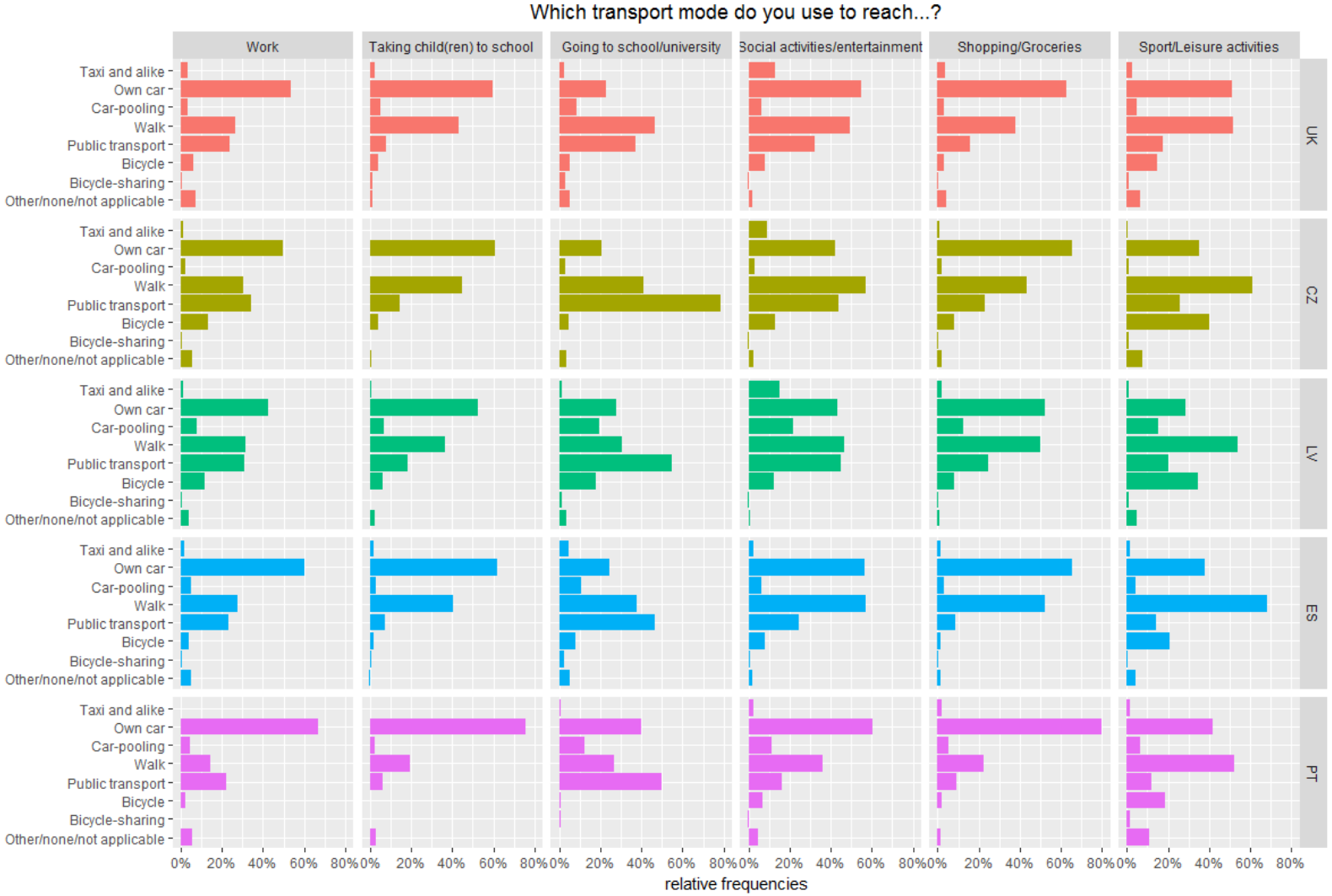
Figure 7: Transport modes used for reaching daily activities (i.e. by those performing the respective activity)



Note: multiple option question, totals over different transport modes exceed 100%.

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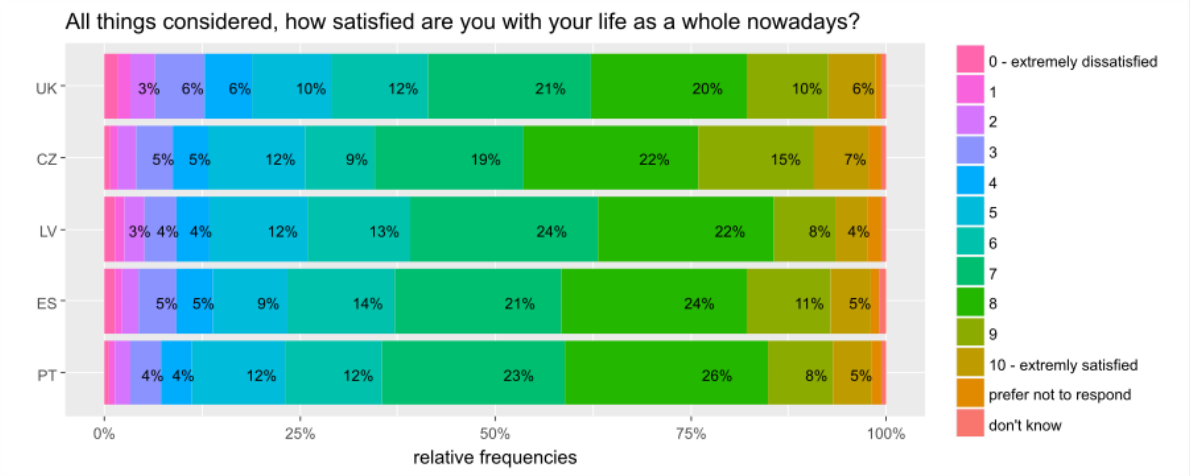
Health and physical activity

The World Health Organization defines health as a multidimensional construct that includes physical, mental, and social domains. As such there is no common universal measure and various concepts are used to evaluate these domains or some related aspects. Positive and negative aspects of life are often measured using Quality of Life measures such as a one-dimensional scale of life satisfaction or happiness that is simple, validated and widely used.

When asked about their satisfaction with life as a whole, 70-75% of respondents indicated positive satisfaction (i.e. a score of 6 or higher on a scale of 0-10, see Figure 8), and 5-7% reported the highest level, extreme satisfaction. Less than 2% of respondents indicated extreme dissatisfaction, and only around 13% of respondents (18% in the UK) were more dissatisfied than satisfied (i.e. a score of 5 or lower on a scale of 0-10).

Figure 8: Respondents' life satisfaction with their life as a whole



Unlike life satisfaction, happiness is an immediate measure of experience. Responses recorded on a happiness scale (see Figure 9) show that 70-80% of respondents are more happy than unhappy (i.e. a score of 6 or higher on a scale of 0-10) all things considered, and around 6% (and even 10% in the Czech Republic) were extremely happy. A mere 1% of respondents reported extreme unhappiness.

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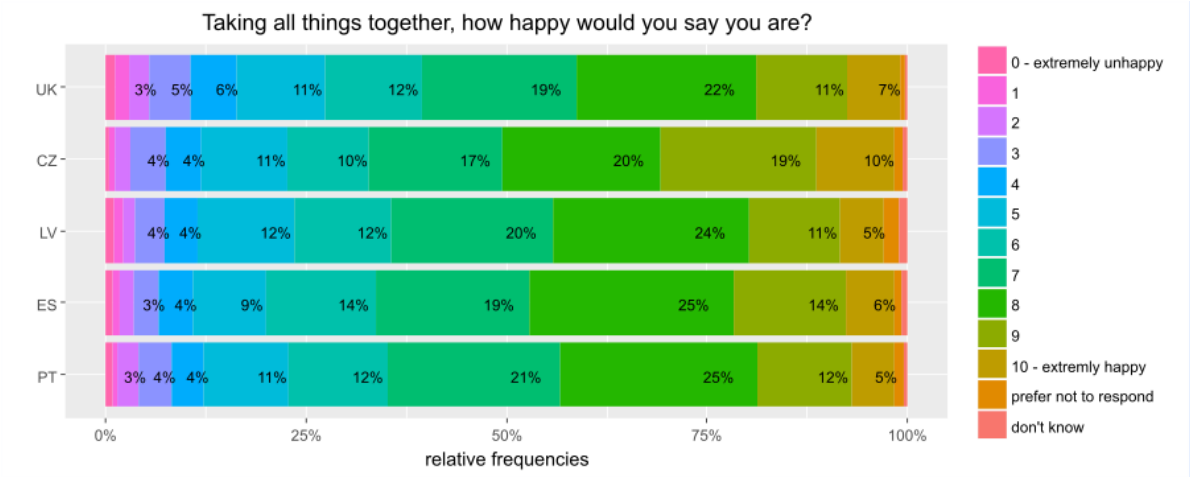
Figure 9: Respondents' perceived happiness



A set of questions related to the respondent's physical health were asked during the survey in order to establish the approximate individual risk of cardiovascular disease that was used as an attribute in discrete choice experiment. We asked respondents about items that were needed to operationalise the office-based calculation version of 10- and 30-year Framingham risk scores (D'Agostino et al., 2008; Pencina, D'Agostino, Larson, Massaro, & Vasan, 2009): height, weight, existing chronic illnesses, blood pressure and any treatment thereof, and smoking status.

Height and weight information were used to calculate respondents' BMI (cf. Figure 10). With outlying values excluded,4 the following figure suggests that around 50% of respondents (and over 60% in the Czech Republic) have a BMI above 25, a commonly used indicator of being overweight (or worse). Around ⅓ of respondents fall in the overweight category (BMI between 25-30) and between 15-25% are in the obese category (BMI over 30).

[4] Unrealistic values of height and weight were controlled for in the survey and replaced by threshold values (135 and 220 centimetres or 40 and 170 kilograms for height and weight, respectively) and an average BMI was used when respondent refused to provide either height or weight or both (n=600). Presented values are trimmed using three times median absolute deviation (MAD).

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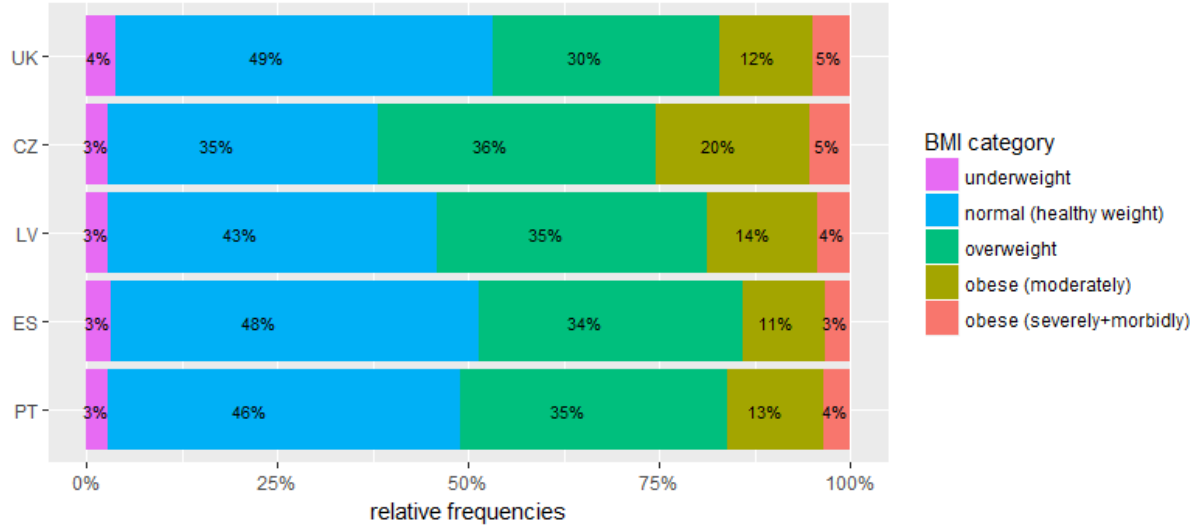
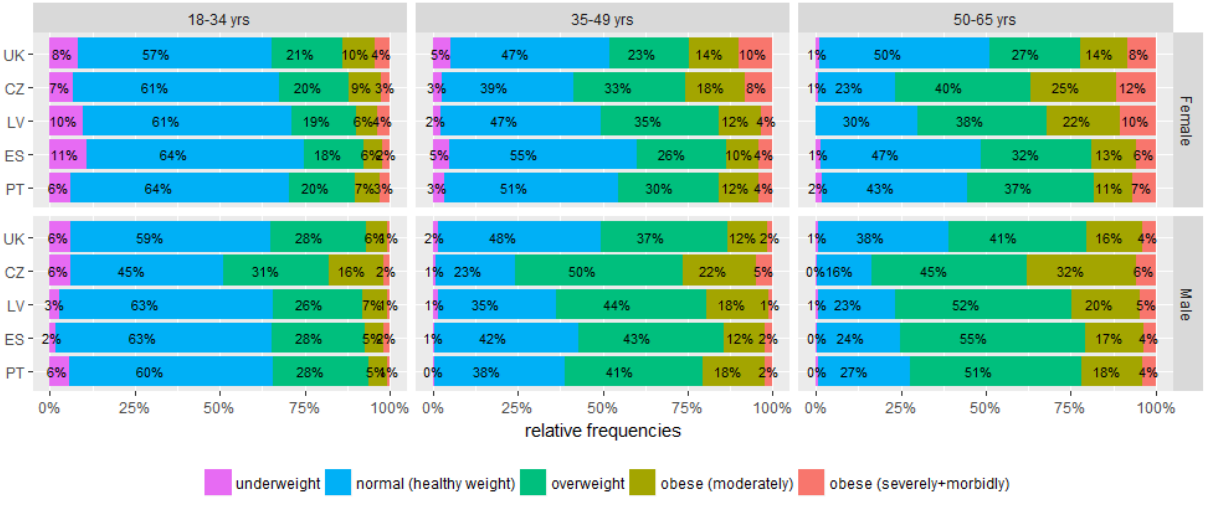
Figure 10: Respondents' BMI (outliers excluded)



There is a clear pattern linking unhealthy BMI to age with some differences between genders (see Figure 11). About two thirds of younger respondents (18-34 years) are underweight or in a normal weight range (but only 51% of Czech young male respondents), while in the category of older respondents under 50% are underweight or within a normal weight range except for UK females who have a 51% share. Being underweight is more common among young females, but almost non-existent in older respondent groups.

Figure 11: respondents' BMI by gender and age (outliers excluded)



Smoking, as a contributing factor to cardiovascular risks, is more prevalent among Spanish and Czech respondents (about ⅓ of the respondents currently smoke), while in the UK only 20% do so (see Figure 12).

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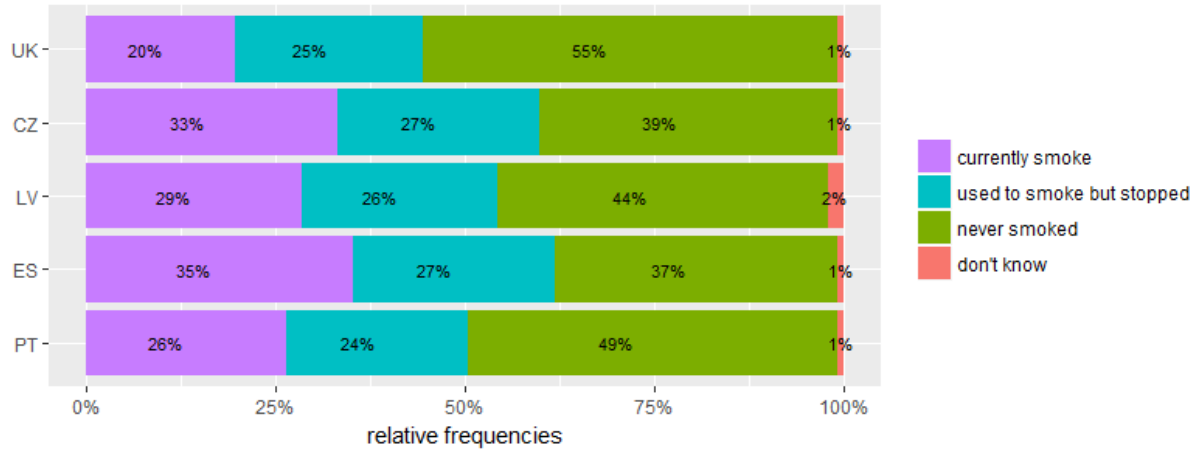
Figure 12: Present and past smoking



Smoking patterns differ according to gender and education level as Figure 13 illustrates. Among females with tertiary education, at most 21% currently smokes (and just 13% in the UK), but among those with primary or lower secondary education this share is much higher, from 23% (UK) to 46% (Czech Republic).

Figure 13: Smoking by gender and education level

Furthermore, respondents were asked about the prevalence of various chronic health conditions that may influence their responses in the survey due to their restricted ability to change lifestyle. As one would expect, the prevalence of chronic health conditions tends to increase with age, especially in case of cardiovascular and other chronic diseases. Prevalence of cardiovascular diseases is considerably high among older respondents in Latvia (around 22%), and prevalence of hypertension treatment is as high as 45% among older respondents in the Czech Republic (see Figure 14).

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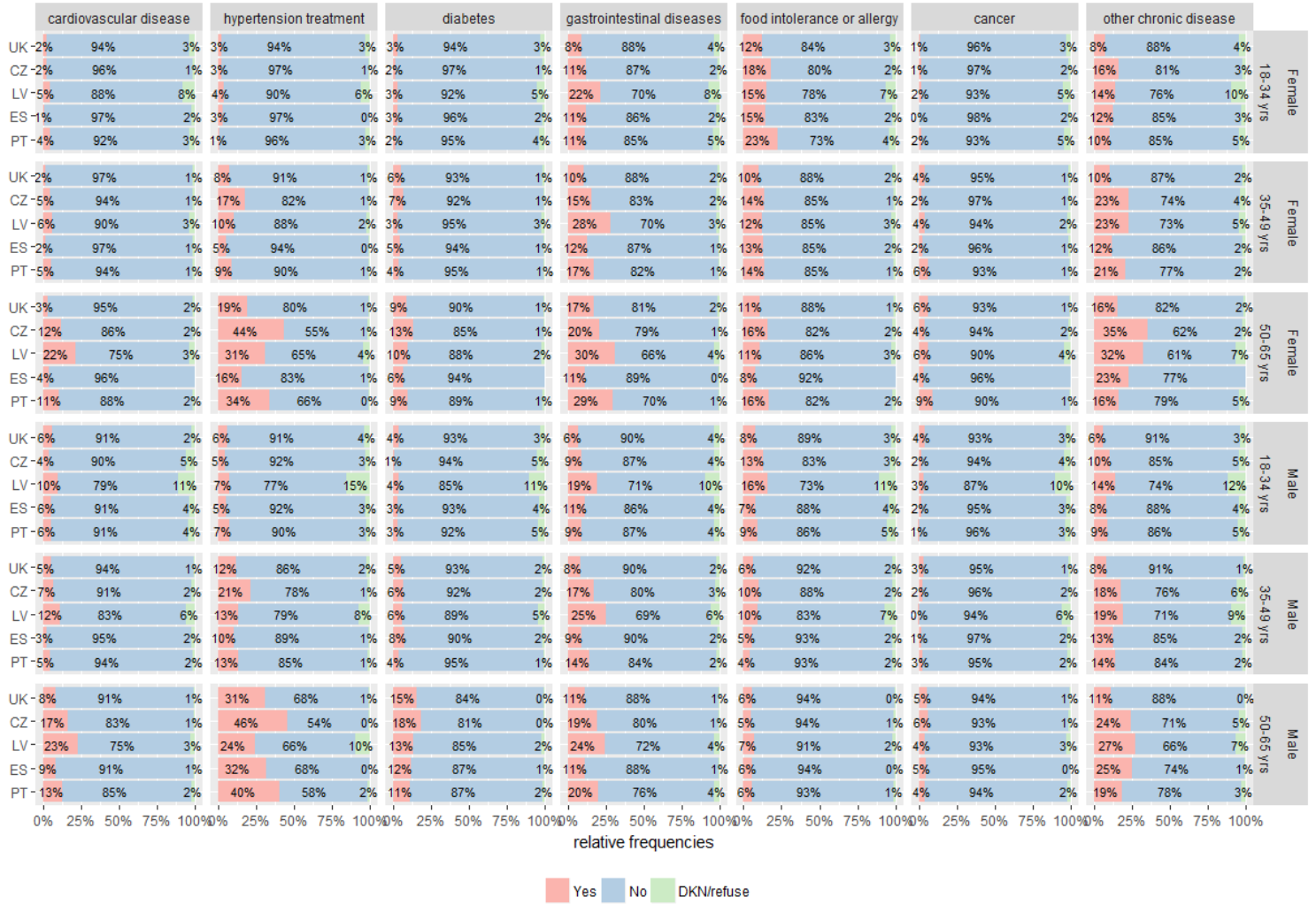
Figure 14: Chronic health conditions by gender and age group



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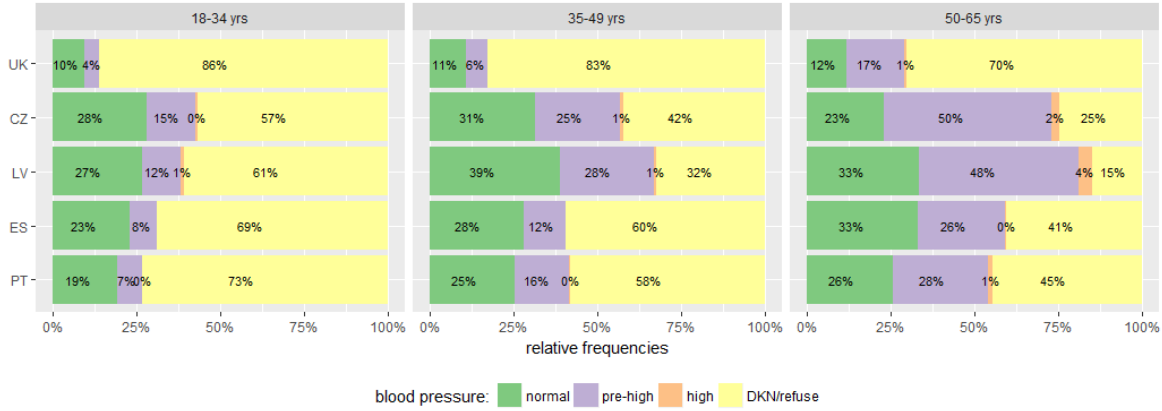
Over half of the respondents do not know (or declined to state) their systolic blood pressure, knowledge of which rises with age but very differently across survey countries. Czech and Latvian respondents are more often aware of their pre-high (over 120 mmHg) or high (over 140 mmHg) blood pressure (see Figure 15).

Figure 15: Respondents' blood pressure levels (without outliers)



Physical Activity

Respondents' levels of physical activity, measured by the short-form IPAQ, show that around one fifth of respondents were not physically active in the 7 days preceding our survey (see Figure 16). Some physical activity (lasting at least 10 minutes without interruption) but amounting to less than 1 hour per day was reported by further 15-28% of respondents. The country differences are also interesting - around half of Czech and Latvian respondents reported more than 2 hours of physical activity per day, while almost half of British and Portuguese respondents report less than 1 hour of physical activity per day.

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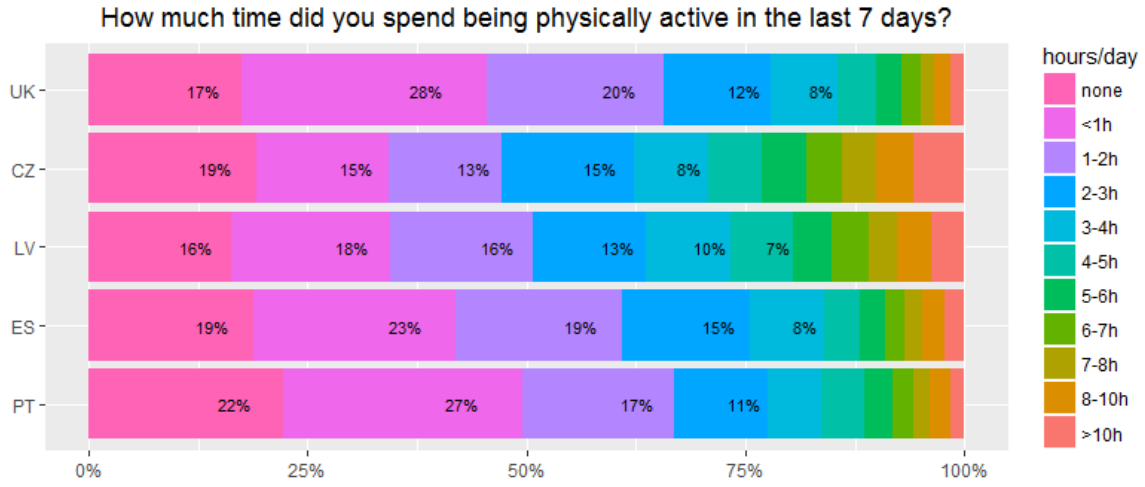
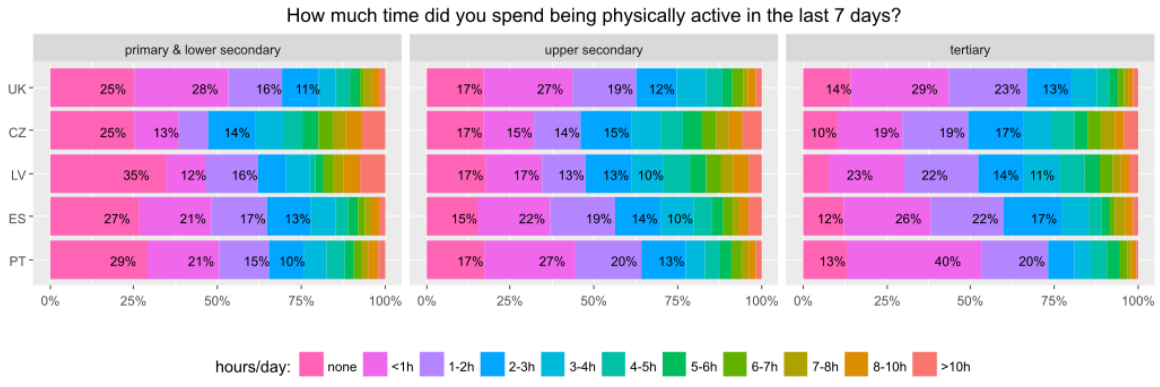
Figure 16: Time spent on physical activity in the last seven days



We can observe differences in levels of physical activity not only by country of residence, but there is a strong effect of education level as well. In the most educated tercile only 7-14% of respondents indicated no physical activity, while in the least educated tercile 25-35% are not physically active (see Figure 17).

Figure 17: Time spent on physical activity in the last seven days by education level



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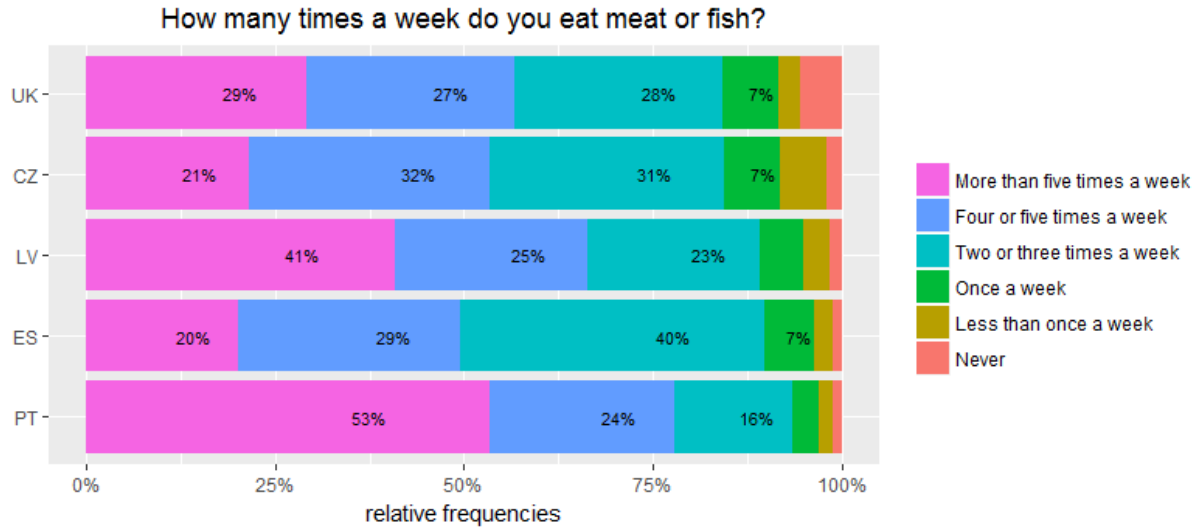
Food consumption

This part of questionnaire on dietary patterns started with a question on food and fish consumption frequency. Figure 18 shows significant differences in reported meat and fish consumption frequencies among survey countries. In Portugal more than half of respondents stated that they eat meat or fish more than five times a week, while it was around 40% in Latvia, 30% in the UK and just 20% of respondents from Czech Republic and Spain.

Figure 18: Frequency of meat and fish consumption



Apart from country differences, household income is among the most significant factor affecting meat or fish consumption frequency in three of the survey countries - Czech Republic, Latvia and Portugal - the higher the respondent's household income, the more often meat or fish is eaten (see Figure 19). As these three countries have lower purchasing power compared to the UK and Spain, this may indicate that consumption of meat (and fish) is linked to social status.

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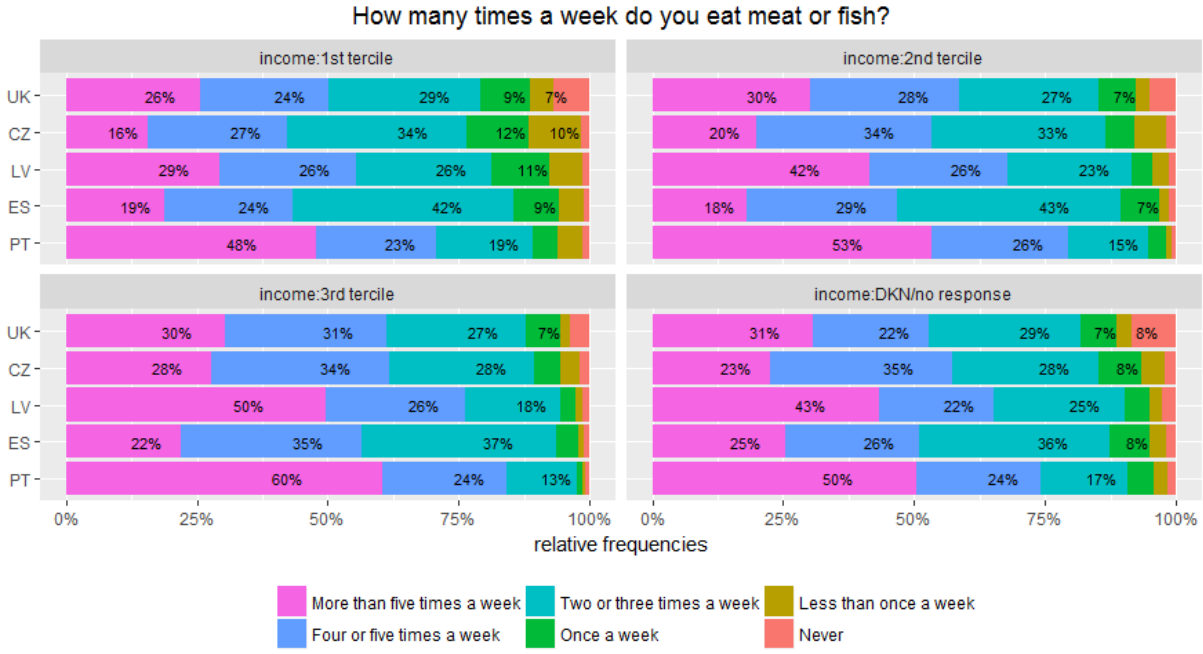
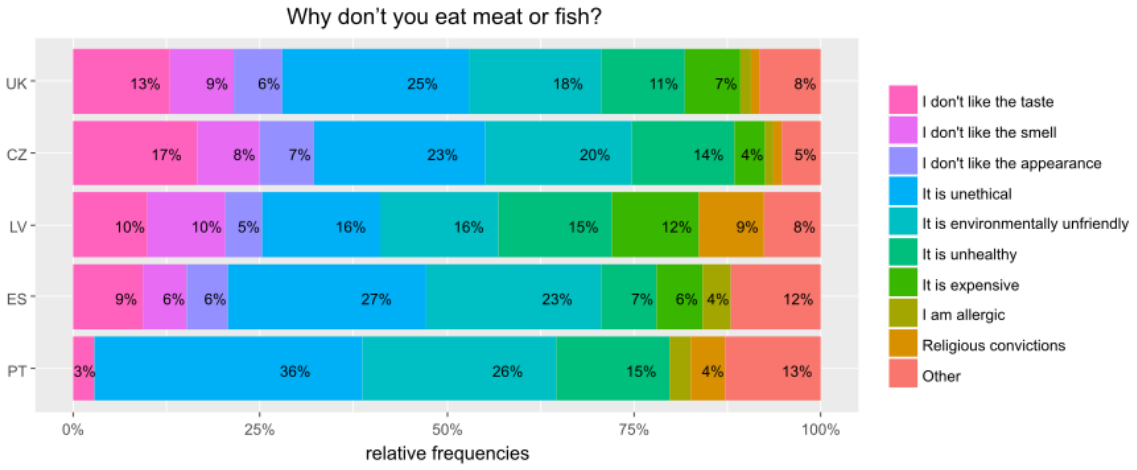
Figure 19: Meat and/or fish consumption frequency by household income



We also asked those who indicated that they eat meat or fish rarely (i.e. 'once a week' or 'less than once a week' options) or 'never' for the main reason. Among those who stated that they never eat meat/fish, the most frequented response was 'it is unethical' in all survey countries (see Figure 20).

Figure 20: Reasons for not eating meat or fish



Among those who rarely eat meat or fish the most frequented response, again in all survey countries, was that 'it is expensive' (see Figure 21).

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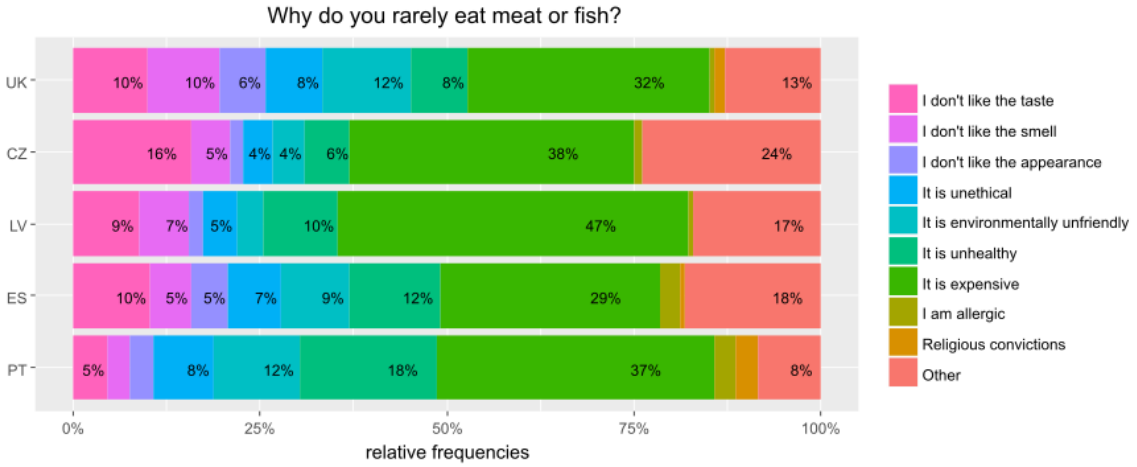
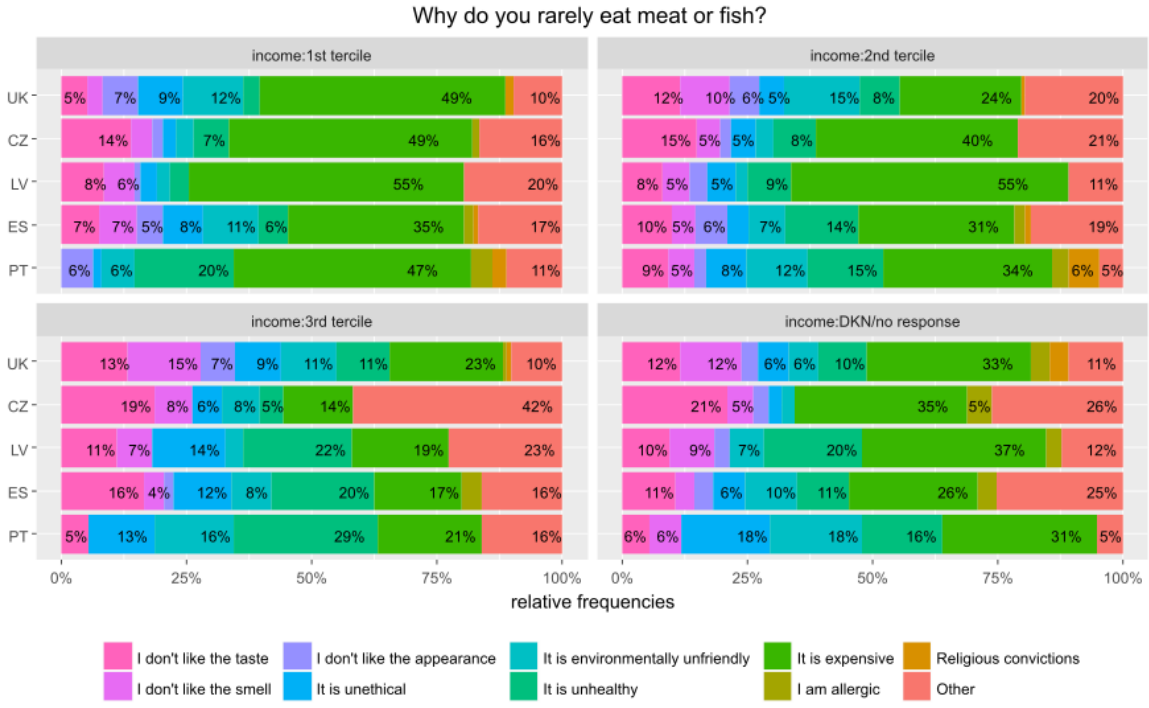
Figure 21: Reasons for eating meat or fish rarely



Elaborating further on this notion of the affordability of meat, we observe that this reason is much less often stated by the respondents from highest income tercile (around 20% compared to roughly 50% in remaining income groups), but still in the UK it is the most frequented reason (see Figure 22).

Figure 22: Reasons for eating meat or fish rarely by income terciles



Using items from the short-form food frequency questionnaire we surveyed frequency of consumption of 16 food groups: fruits, vegetables, chips and fried potatoes, beans and pulses, wholemeal breads, crisps and savoury snacks, ice cream and cream, sweets, non-alcoholic fizzy

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drinks (see the first part of Figure 23), and 7 types of meat and fish dishes (see the second part of Figure 23).

The most common frequency of fruit consumption is 1-2 portions a day in all 5 survey countries, but overall Czech and Latvian respondents consume fruit slightly less frequently compared to their counterparts in the UK, Spain and Portugal. Vegetables are also most frequently eaten in 1-2 portions a day and overall somewhat more often by British respondents. One portion of fried potatoes/chips per week is eaten by British and Spanish respondents most often, they are consumed less in other countries - e.g. almost half of Czech respondents eat less than one portion a month. One portion of beans and pulses is most often eaten once a week (in the UK and Spain) or less than once a week (Czech Republic, Latvia, Portugal). Interestingly though, in the UK there is also the highest share of those who never eat beans and pulses (18% of respondents).

Wholemeal bread is most frequently eaten in 1-2 portions a day (UK, Latvia and Spain), 2-3 portions a week (Czech Republic) or not at all (Portugal; but we observe similar share of non-eaters in Spain). Crisps and savoury snacks are most popular among UK respondents - more than half of them eat at least 2-3 portions a week, and only 9% of them never eat savoury snacks. In the remaining 4 countries less than one portion a month is the most often reported frequency and the share of non-eaters in Latvia is as high as 22%. Britons are slightly in the lead in ice-cream and whipped cream consumption, but these are most often eaten in 2-3 portions a week in all survey countries. Latvian respondents seems to consume sweets most often, but 2-3 portions a week is the common eating frequency also in Spain. In contrast about two fifths of British respondents eat less than a portion a month or none. Around half of respondents in the UK, the Czech Republic and Spain drink at least one portion of non-alcoholic fizzy drink a week, in Latvia and Portugal it is just about 35-40%.

Four items were used to estimate meat consumption: whole red meat consumption is most often consumed in Portugal and Latvia, while the least often in the UK. Portuguese respondents also reported comparatively high consumption frequencies of unprocessed white meat, closely followed by Spanish respondents. Sausages and other processed red meat products are favoured the most by Latvian respondents and the least by Portuguese. Processed white meat is most often consumed in the UK and less often in the Czech Republic, but the differences in frequencies of consumption are relatively small. Fish consumption was divided into three subcategories: battered white fish is most frequently eaten in Spain, followed by Portugal, and least often in the Czech Republic and Latvia. The same holds for non-battered white fish and oily fish. The low fish consumption among Latvians is somewhat striking, given that Latvia, unlike the Czech Republic, is bordered by the sea.

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Figure 23: Frequency of consumption of 16 food groups

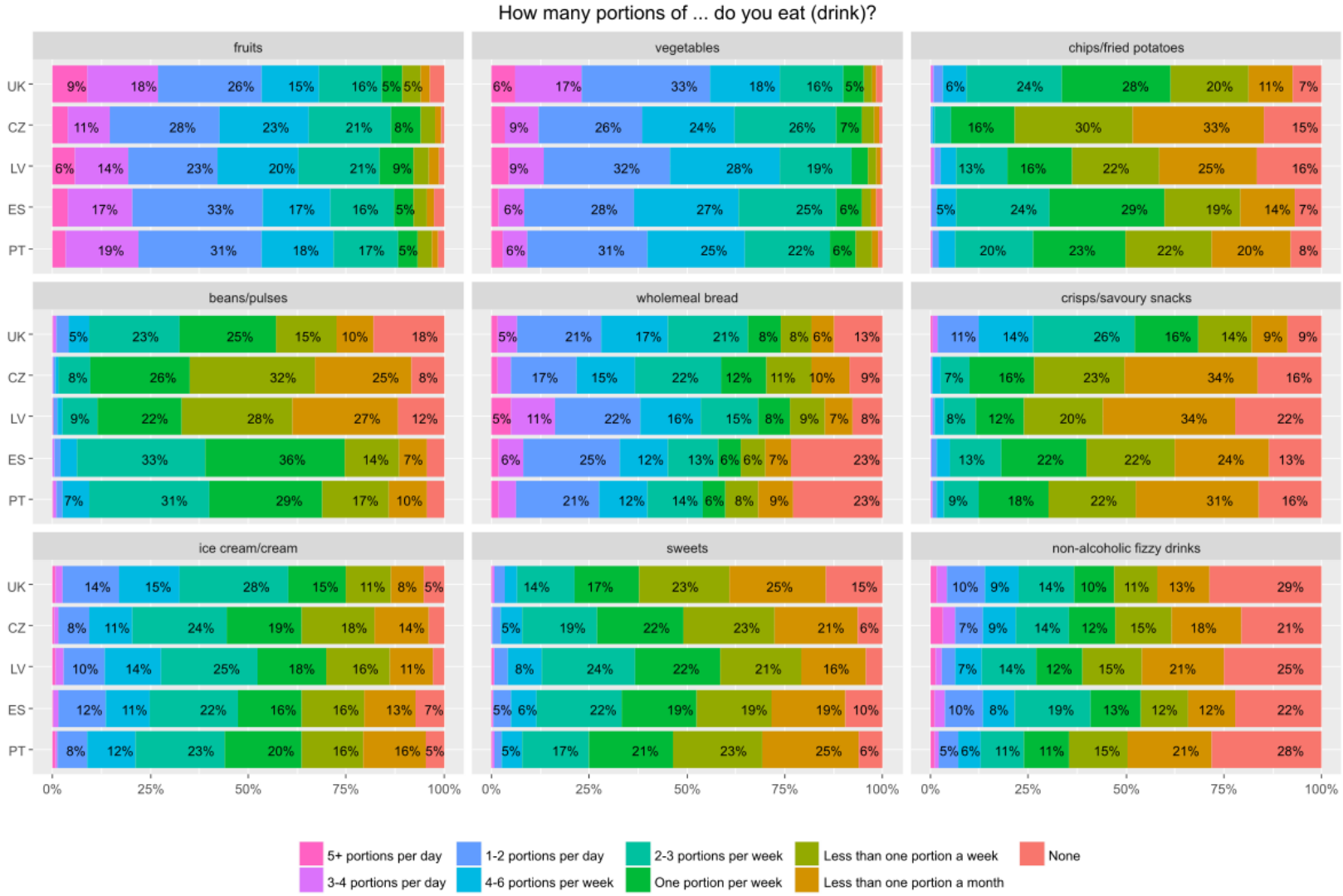

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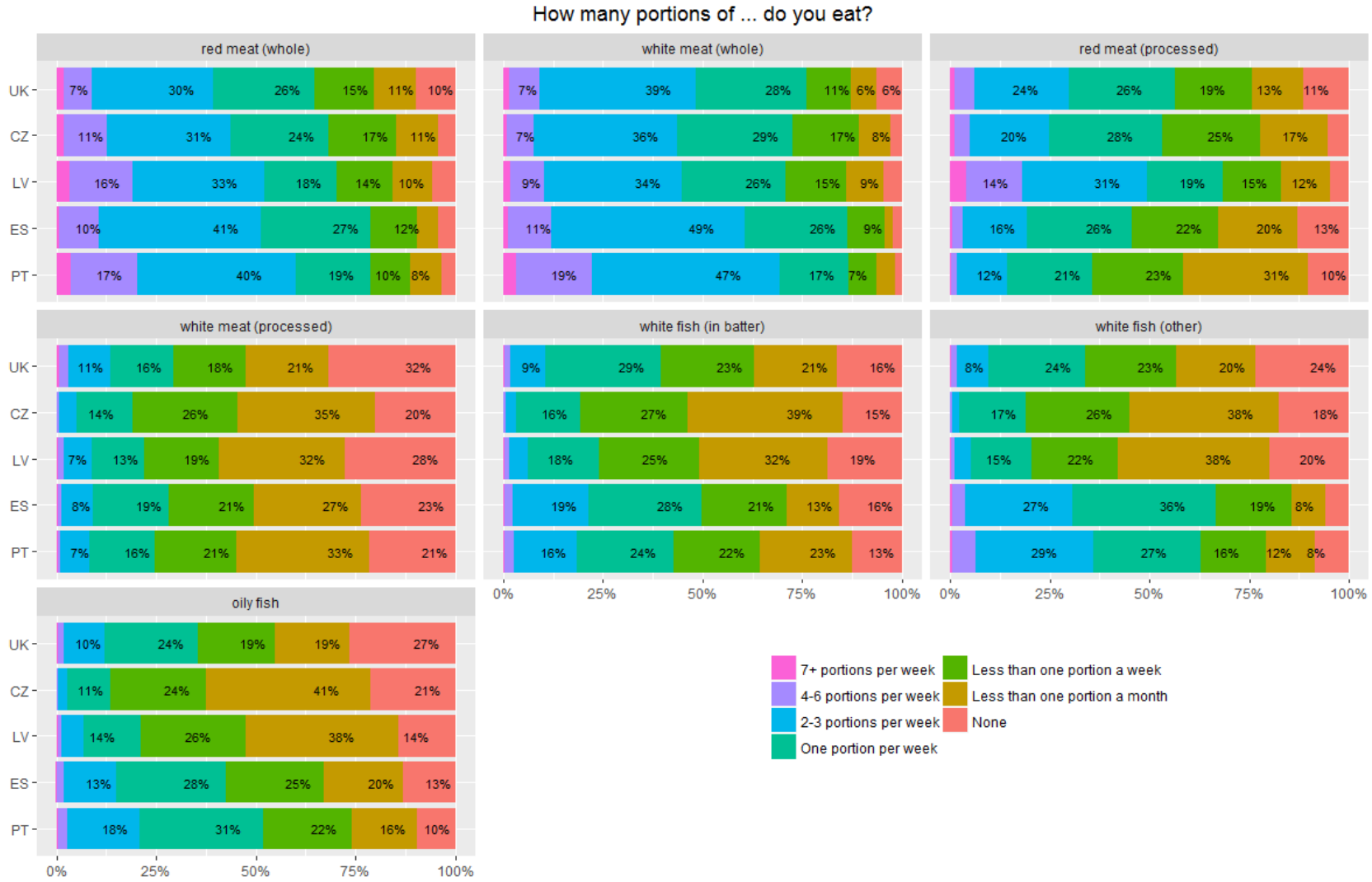
Figure 23 (continued): Frequency of consumption of 16 food groups



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Energy conservation

The majority of Czechs (79%), Portuguese (68%), British (60%), and Spanish (61%) respondents own some energy efficient appliances. In Latvia, the share of ownership of energy efficient devices is much lower (49%). Therefore there is still the potential for energy savings from the further spread of efficient devices in Latvia.

However, only small shares of respondents use renewable energy sources (about 20% in the UK, Portugal, and Spain, but only 18% the Czech Republic and in 16% in Latvia) and even fewer people bought solar panels to produce energy (8-11% in the UK, Portugal, and Spain, but only 4% in Latvia and in the Czech Republic). Thus, there is a huge potential for increasing use of renewable energy in households (see Figure 24).

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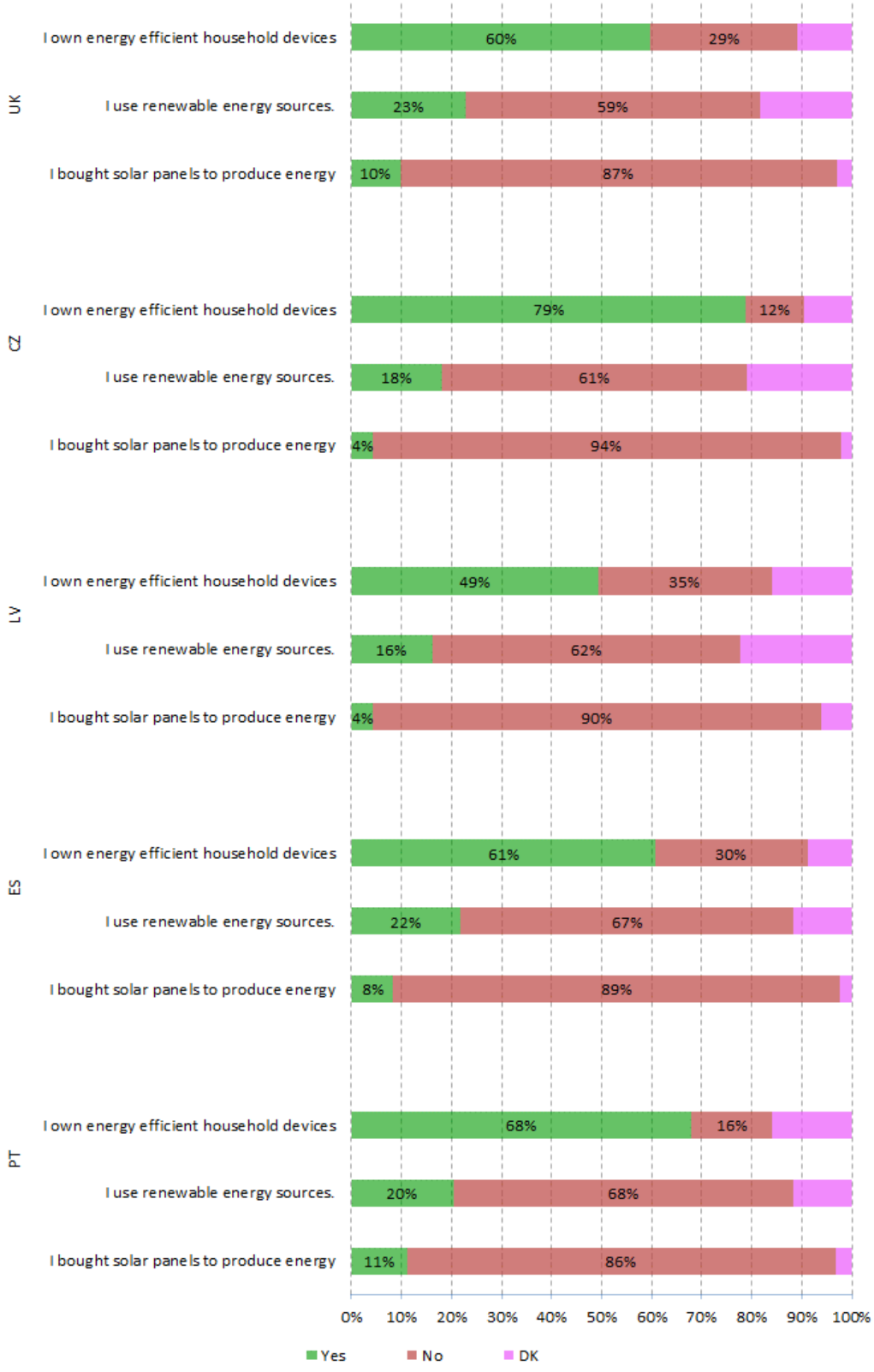
Figure 24: Energy efficiency actions taken by respondents in the surveyed countries



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Change in food consumption: Vouchers for local, organic, or all fruit and vegetables

A recent literature review (Aschemann-Witzel & Zielke, 2017) concluded that price is the most important perceived barrier to the purchase of organic food. Consumers with limited budgets, such as low-income households or households with children, are less likely to buy organic food. This barrier calls for policy action if policymakers aim to increase organic food consumption. At the same time, the globalisation and "conventionalisation" of the organic food market has led to a "local" trend among consumers. In Germany for example, 92 % of respondents prefer local to organic food, while 77% of respondents value organic, locally grown produce (Hempel & Hamm, 2016). However, apart from the preferences of Germans, little is known about consumer attitudes and preferences for interaction between organic label and origin in EU countries (Thøgersen, Pedersen, Paternoga, Schwendel, & Aschemann-Witzel, 2017).

Among the policy options available to 'pull' consumers is a provision of food vouchers that has been shown to stimulate the consumption of the given foods among low-income households, but also to improve availability and variety in the foods on offer (Hawkes et al., 2015).

Therefore, we identify segments of the populations of the five countries that would apply for vouchers for fruit and vegetables, organic or local fruit and vegetables. To fulfil the first task - who would apply for vouchers for fruit and vegetables - we use a contingent behaviour experiment on willingness to apply for vouchers varying in type of eligible fruits and vegetables, co-payment rate and vouchers quantity.

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Figure 25 shows the willingness of respondents in the five survey countries to apply for the vouchers by type of vouchers offered (i.e. for organic, local and all fruits and vegetables, respectively).

Figure 25: Willingness to apply for vouchers for fruit and vegetables by voucher type

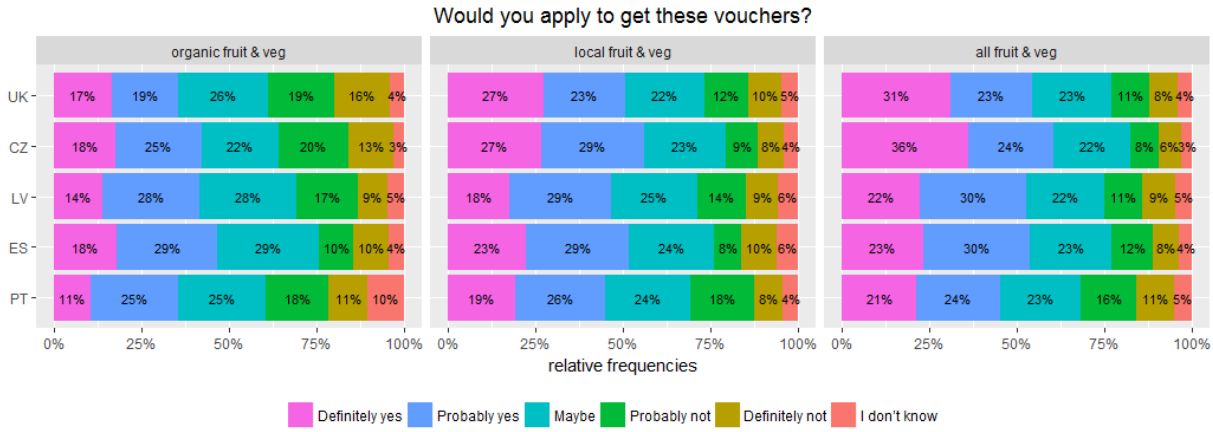

Figure 25 suggests that the interest in vouchers varies according to the type of voucher offered. To further investigate this notion we explore the data using a logistic regression. We use type and number of vouchers provided and rate of co-payment as explanatory variables and the likelihood to apply for vouchers as the response variable (i.e. merged into a binary yes no options). The results from a regression model confirm that - compared to vouchers for organic fruits and vegetables - respondents are more likely to apply if the vouchers are for all fruits and vegetables or for local fruits and vegetables and there is not a statistically significant difference of likelihoods to apply between these two (cf. overlapping confidence intervals in Figure 26). There seems to be no significant effect of how many vouchers are offered to respondents on the likelihood to apply for them. In contrast - as one would expect - the likelihood to apply decreases with the rising rate of co-payment needed to obtain the vouchers. This is illustrated by predicted probabilities of applying for vouchers by voucher type and rate of co-payment in the following figure.

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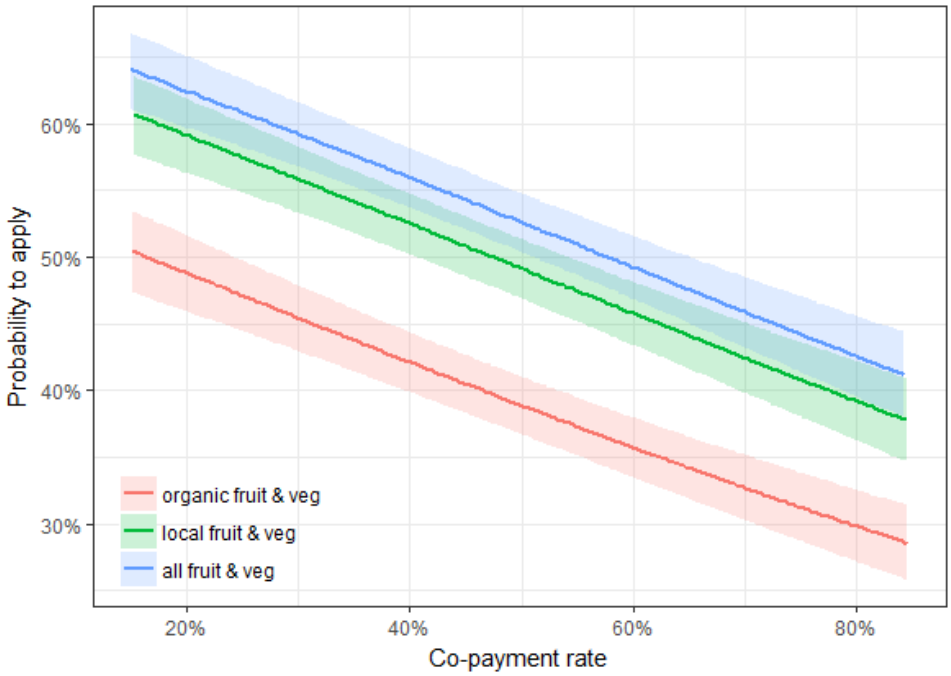
Figure 26: Predicted probabilities of applying vouchers by voucher type



In a slightly differently formulated logistic regression with co-payment rates used as an ordinal rather than continuous variable, the relation between co-payment rates and the probability to apply for vouchers is not strictly proportional - there is hardly any statistically significant difference in probabilities to apply between co-payment ranging from 33% to 60% (i.e. their 95% confidence intervals overlap).

As one of the INHERIT key topics is health equality we were interested to see how the willingness to apply for vouchers differs by the respondent's household income. Figure 27 shows this by household income terciles and type of vouchers. It is rather surprising to see that respondents from low income groups have significantly lower willingness to apply for vouchers (i.e. either "definitely yes" or "probably yes" choice) compared to high income group respondents (by approx. 15 percentage points in all survey countries except for Portugal where it is a huge 35 percentage points gap) for all fruit and vegetables vouchers. Still, about 50% of low income respondents would definitely or probably apply for the vouchers in all survey countries except for Portugal. This gap in willingness to apply between low and high income respondents is somewhat smaller for local fruit and vegetables vouchers but still about 15 percentage points in three countries (Latvia, Portugal and Spain), but virtually none in the UK. For organic fruits and vegetables vouchers the gap in willingness to apply between low and high income respondents is again significant at around 10-20 percentage points difference.

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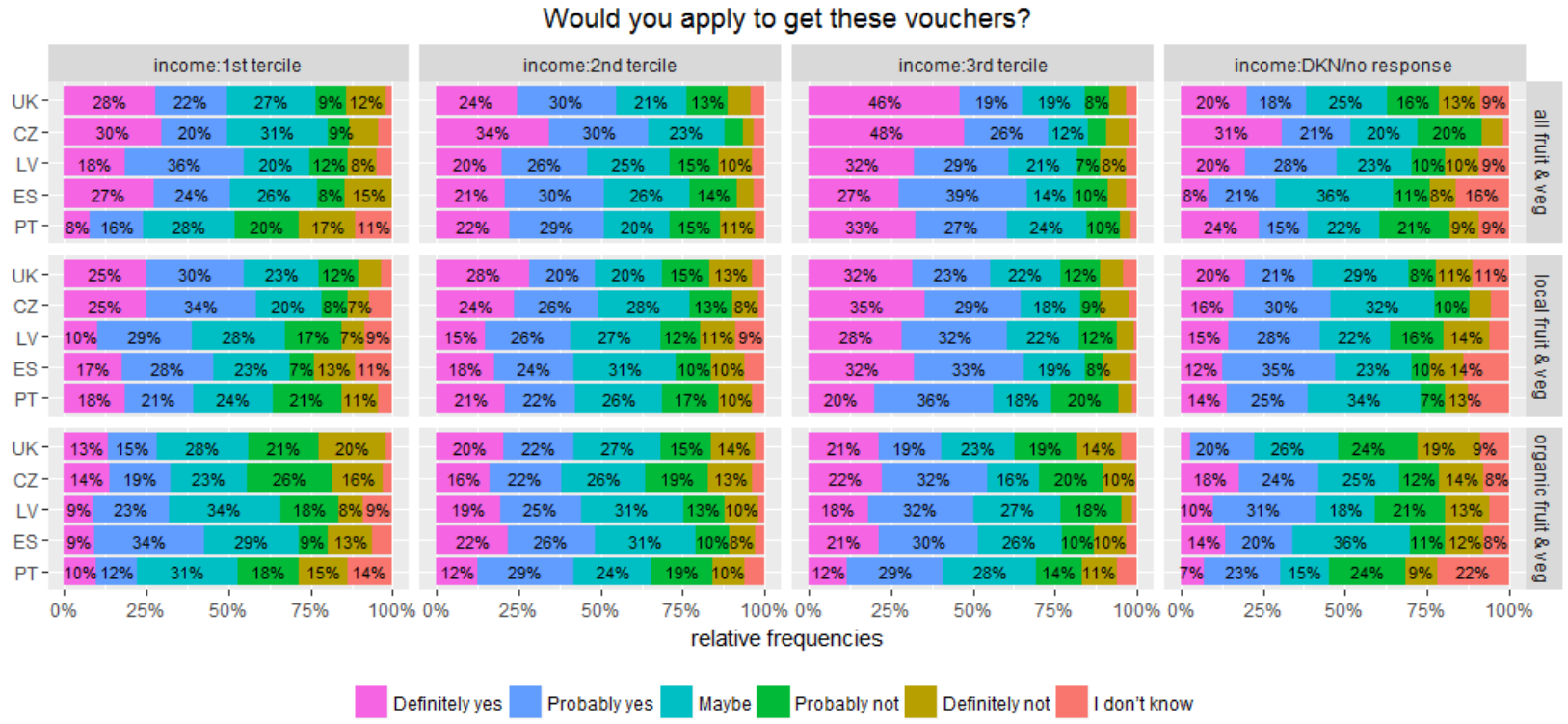
Figure 27: Willingness to apply for vouchers by household income



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We also tested for differences among respondents by the country of residence (with UK as comparator) but this effect is bordering on statistical significance, except for Czech respondents who are significantly more likely to apply for the vouchers than the respondents from the other four countries.

Although we measure respondents' behavioural intention (rather than real behaviour), our findings may be interpreted as such that respondents tend to prefer vouchers for all or local fruit and vegetables rather than for organic produce and that a co-payment rate in the vicinity of 60% could be an effective rate that ensures a balance between sufficiently attracting people's interest and limiting the impact on public funds from subsidising the vouchers.

This takes us to the question of how effective such policy can be, or in other words, how consumption of fruits and vegetables might change in respondents' households. To elucidate this we asked how the consumption of these items will change in terms of quantity and quality in the respondent's household, for the respondent personally and for his child/children (if present in the household). As Figure 28 suggests, around 50-60% of respondents indicated that their household would eat at least slightly more fruits and vegetables and almost all the remaining indicated that their household would eat the same number of portions. Almost the same picture holds for the question concerning the variety of fruits and vegetables, with around 50-60% of respondents indicating that their household would eat a greater variety and the remainder would keep the same variety.

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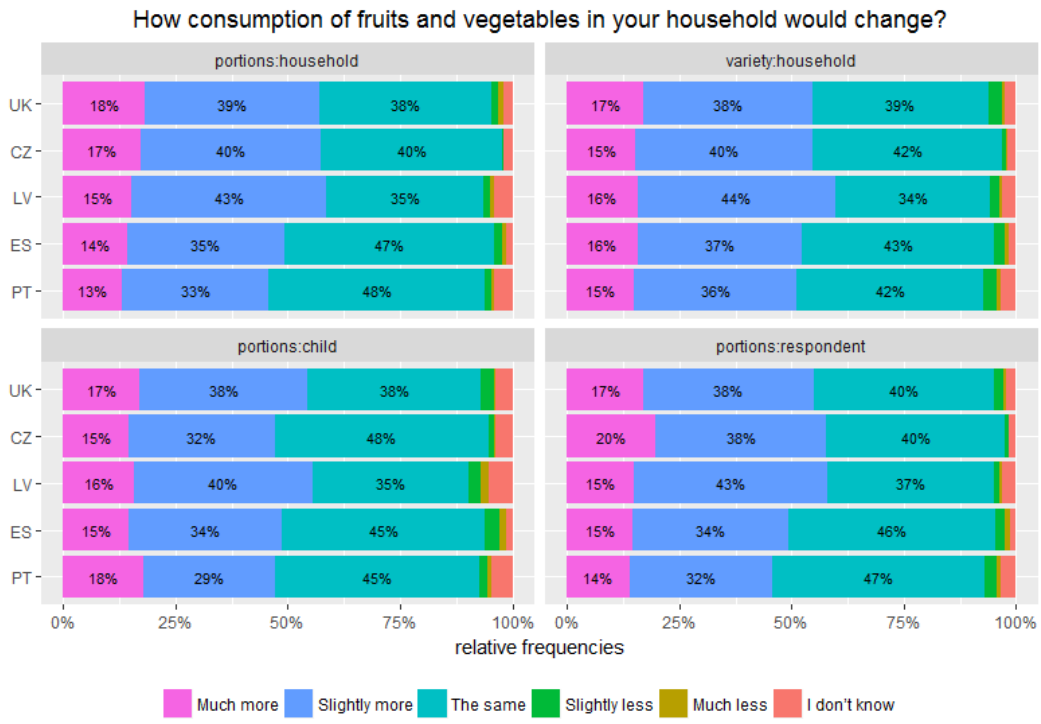
Figure 28: Change in quantity of fruits and vegetables consumption



As regards the quality of fruits and vegetables consumed in respondents' households, the expected change is depicted in Figure 29. Roughly half of the respondents think that the quality would be slightly or much better, and the remaining respondents mostly think that the quality would be the same. There is however a difference in perceived quality related to voucher type - in the subsample of respondents faced with vouchers for organic fruits and vegetables the share of those who think that the quality would be better is higher by 4-11 percentage points depending on respondents' country.

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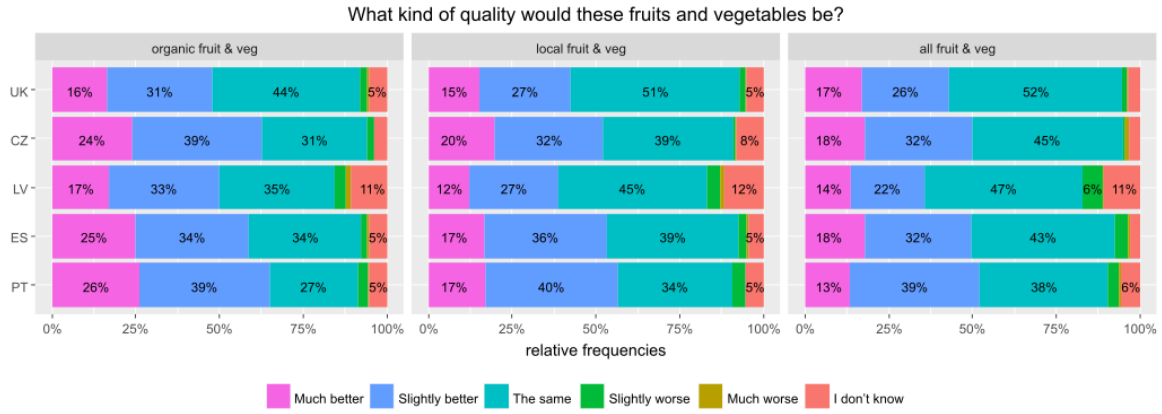
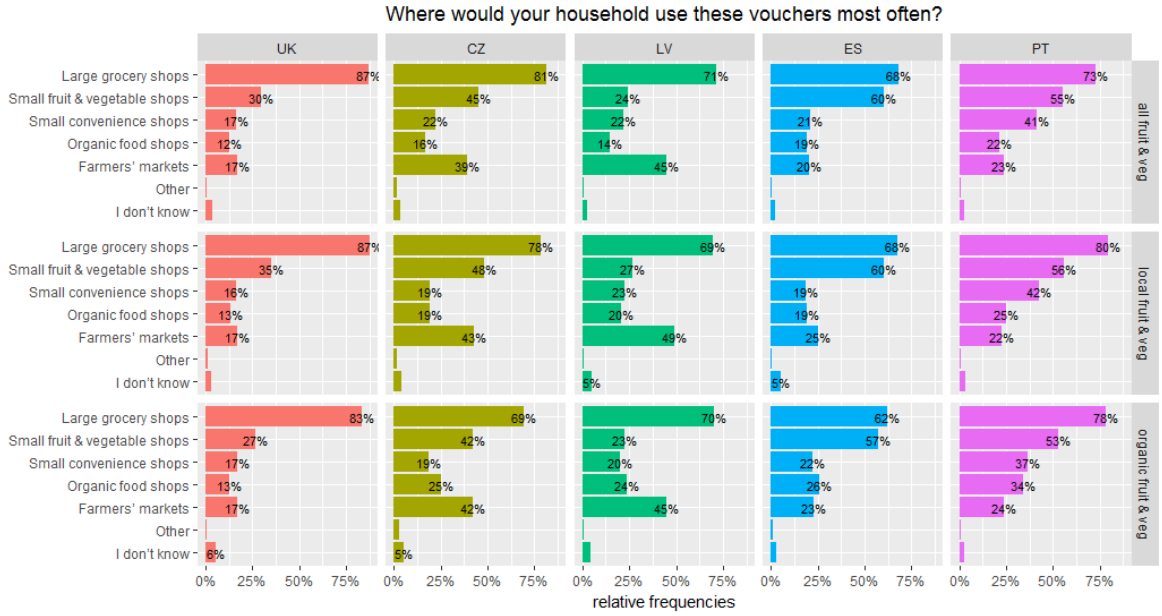
Figure 29: Change in quality of consumed fruits and vegetables



When asked where the respondents would use the vouchers most often, the majority of respondents chose large grocery stores, between 63% and 85% depending on country of residence and type of voucher (see Figure 30). Perhaps not surprisingly, respondents offered vouchers for organic fruits and vegetables would more often use them in organic food shops (except for the UK respondents).

Figure 30: Tentative use of vouchers per type of retail outlet



Note: multiple option question, totals over different stores may exceed 100%.

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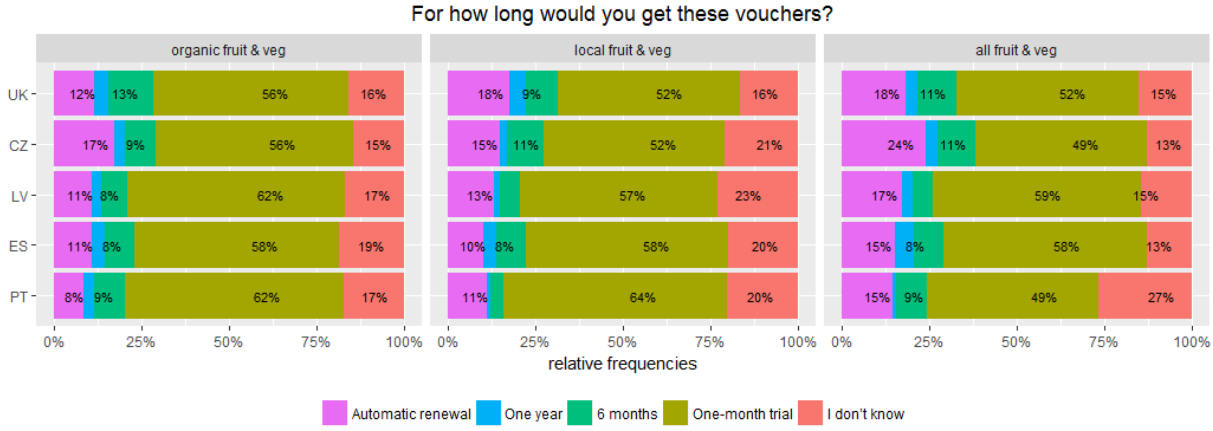
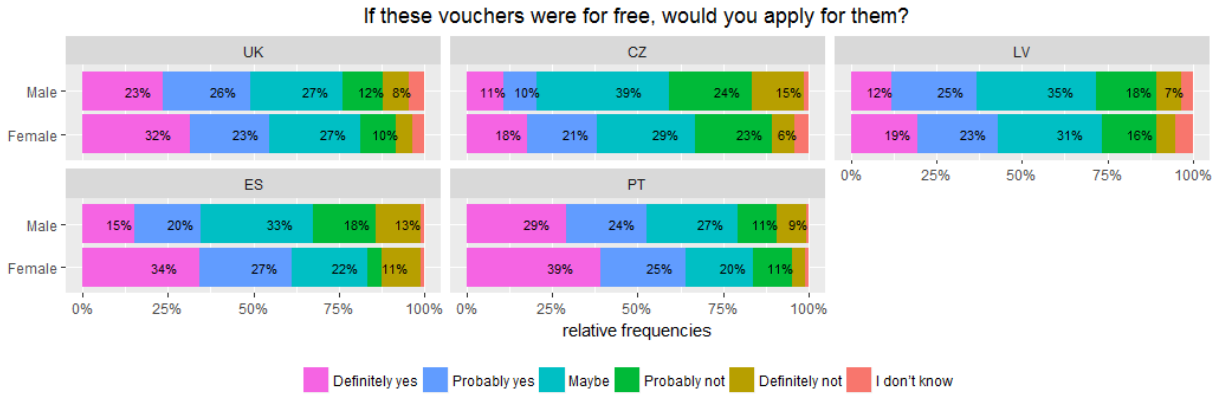
We also enquired for how long would the respondents apply for these vouchers - they were offered various options from a one-month trial to yearly automatic renewal (see Figure 31). There are statistically significant differences by countries and co-payment rates, perhaps the most interesting is a slightly higher uptake of automatic renewal for all fruits & vegetables type of vouchers in all countries but the UK.

Figure 31: Time span of applying for vouchers



Still, about 23% of respondents expressed no interest in applying for the vouchers in the version presented to them. We asked those respondents if they would apply if the vouchers were provided for free (see Figure 32). We may add that the interest in complimentary vouchers is consistently lower among male respondents and in two of survey countries - Czech Republic and Latvia.

Figure 32: Willingness to apply for complimentary vouchers (respondents who previously chose not to apply)



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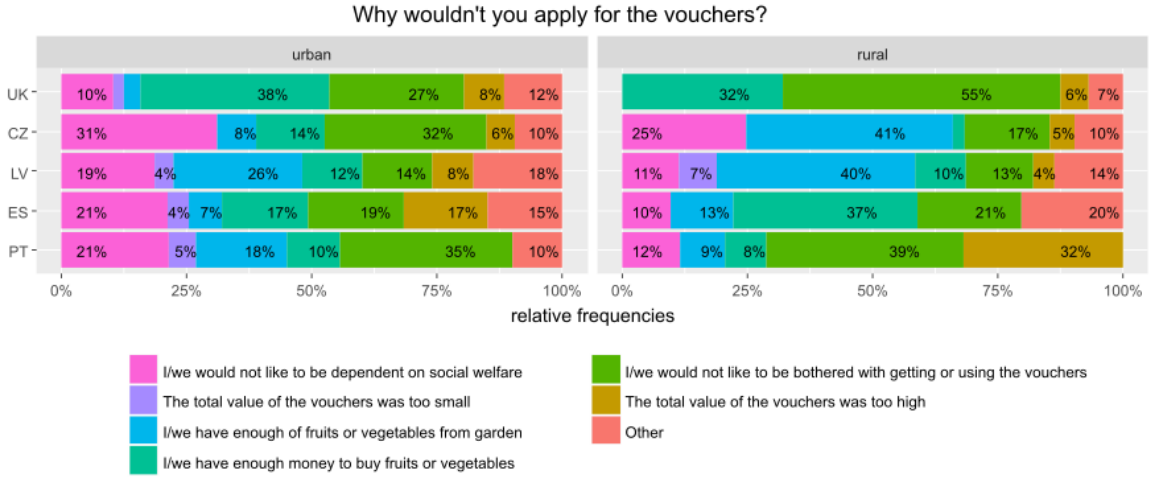
Furthermore, those who would not apply even for complimentary vouchers were asked to choose the most important reason. Here, alongside the significant differences among survey countries, we also observe significant difference between respondents from urbanised vs. rural areas (see Figure 33). The first group sees the vouchers more often as social stigma, while the latter group indicated more often that they have enough fruit or vegetables from (their own) garden.

Figure 33: Reasons for not applying for complimentary vouchers



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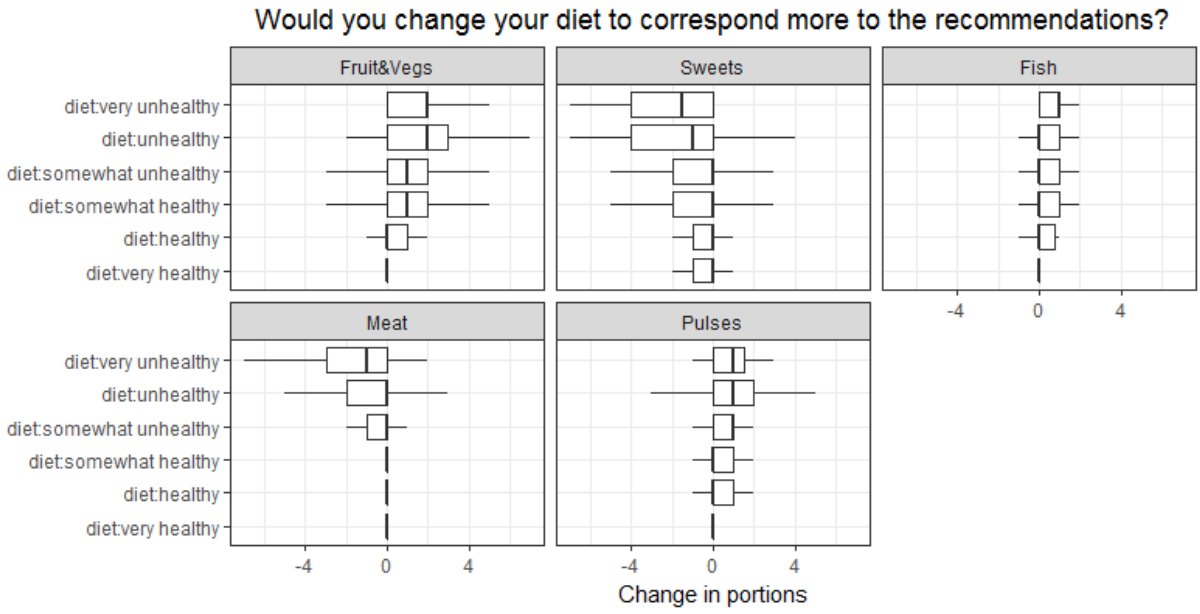
Change in dietary patterns

In the subsequent section of the survey, respondents were asked whether they would be willing to change their diet so that it would correspond more to the diet recommended by a public authority for five food groups. We plot the differences in the number of portions respondents indicated in comparison to their current diet separately by the level of compliance to recommended number of portions in five food categories (i.e. ranging from complete non-compliance - denoted as very unhealthy diet - to complete compliance in all the five groups - denoted very healthy; see Figure 34 below). It is perhaps no surprise that the less are respondents complying to the recommended diet the more they are willing to change their diet as indicated by boxplots in the following figure. Respondents who fully comply to the recommended diet in general would not change their diet any further, except for a slight tendency to decrease consumption of sweets.

Figure 34: Willingness to change diet according to the recommendations



Note: the band inside the box is the median (the 50th percentile), lower and upper hinges correspond to the first and third quartiles (the 25th and 75th percentiles).

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Perceived barriers and enabling factors (control beliefs)

We were interested in what factors people think may enable the realisation of their dietary changes[5] (see Figure 35). In all surveyed countries, respondents agreed that eating a healthy and sustainable diet would be easier for them, if the prices of vegetables and fruit were lower and prices of foods high in sugar and salt were higher (42% in Latvia, 44% in the Czech Republic, 45% in the UK, 47% in Spain, 54% in Portugal), and fresh vegetables and fruit were more easily available in stores, restaurants and public places (39% in the UK, 44% in Latvia, 47% in the Czech Republic and in Spain, and 50% in Portugal).

The decrease in prices of vegetables and fruit combined with an increase in prices of foods high in sugar and salt was broadly accepted as an enabling factor. However, when a decrease in prices was combined with an increase in the prices of red and processed meat, the perception that it would make eating a healthy and sustainable diet easier declined significantly, most of all in Latvia and in the Czech Republic. In these two countries, only 22% of respondents perceive it as an enabling factor.

On the contrary, smaller portions served in restaurants were perceived as a factor that promote the eating a healthy and sustainable diet by the smallest share of respondents (13% in Latvia to 25% in the UK and in Portugal). A mobile or web-based application with tips for healthy and sustainable eating provided by a health authority would make the dietary change easier for 19% of the Czechs, 22% of the British, 23% of Latvians, but for more than 30% of the Spanish and the Portuguese.

[5] The question was formulated as follows: "How much do you agree or disagree that the following situations would make it easier for you to follow the recommended diet in the next 6 months?". Respondents were asked to evaluate statements on a 7-point Likert-type scale from strongly disagree to strongly agree. We code the first two extreme points (1 and 2) as *disagree*, and the two points on the other extreme for the category *agree* (6 and 7); the middle category *Neither* comprises the three middle points of the scale (3, 4, and 5).

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Figure 35: Disagreement and agreement with statements related to factors that may make eating a healthy and sustainable diet easier

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Change in lifestyles: Information, subsidies and taxes

Public support for policy instruments

The most strongly supported policy instruments are subsidies for fruits and vegetables production and subsidies for biking and walking in all the surveyed countries (see Figure 36)[6]. More than half of respondents who think that the government should use these subsidies for promoting healthier and more sustainable lifestyles in most of the countries. However, there are statistically significant differences among the countries. The most popular are both these subsidies in Portugal where the majority of respondents (68 % and 69 %) are in favour of their usage. Less supported were subsidies for biking and walking in Latvia (49 % in favour) and in the UK (44 % in favour).

In all the surveyed countries, people opposed the meat tax policy instrument most strongly. However, the level of opposition significantly differs among the countries. The strongest opposition can be found in Latvia (49 %) and in the Czech Republic (44 %). On the other hand, the opposition is weaker in Spain (29 %) and in Portugal (27 %).

This result can be partially explained by 'tax aversion' found in previous studies. Several studies found a negative effect of 'tax' label on the public acceptability of a policy instrument (Brännlund & Persson, 2012; Cole & Brännlund, 2009; Hardisty, Johnson, & Weber, 2009; Kallbekken, Kroll, & Cherry, 2011). A policy instrument labelled as a 'tax' is significantly less acceptable than an unlabelled policy instrument, even though they have the same characteristics (Brännlund & Persson, 2012; Cole & Brännlund, 2009). Moreover, subsidies were supported more than taxes and taxes more than regulation by participants of a non-hypothetical choice experiment (Cherry, Kallbekken, & Kroll, 2012).

However, sugar tax on soft drinks is more strongly supported than the meat tax in all countries. In Portugal, in the UK, and in Spain, the share of respondents who support the sugar tax (43 % to 46 %) is much larger than share of respondents who oppose it (12 % to 16 %). Thus, the sugar tax on soft drinks seems to be quite acceptable in these countries. Interestingly, British respondents supported this instrument, even though it was already in force when the survey was conducted. The "Soft Drinks Industry Levy" has already been imposed on soft drinks in the UK since 6th April 2018 (HM Treasury, 2018).

[6] The question was formulated: "In your opinion, which of the following policy instruments should the government use for promoting healthier and more sustainable lifestyles?". We code first two extreme categories (1 and 2) on a 7-point Likert-type scale, from strongly oppose to strongly support, as *oppose*, and the two points at the other extreme for the category *support* (6 and 7); the middle category *Neither oppose nor support* comprises the three middle points of the scale (3, 4, and 5).

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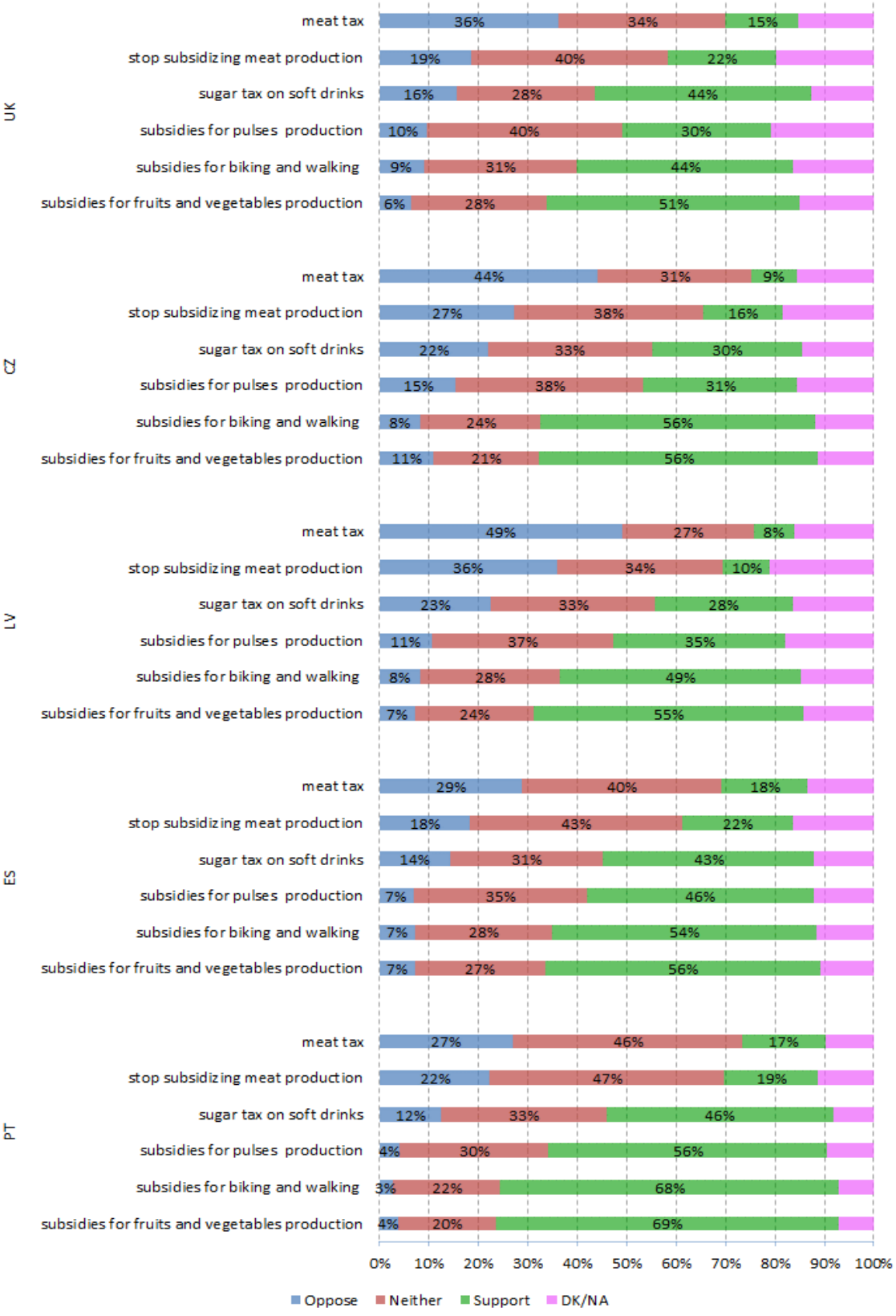
Figure 36: Public support for different policy instruments in the surveyed countries



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Lifestyle choices

Apart from investigating the effect of information and other factors on behaviour, we analyse the trade-off among lifestyles in the discrete choice experiments. Lifestyles may be to different extents healthier or more environmentally-friendly, and might be less or more costly. We analyse in this chapter how all these characteristics are important in lifestyle choice.

We introduced several choice situations where each respondent was asked to choose the best from three lifestyles presented. Figures 37 and 38 display examples of choice situations with the physical activity attribute and the attribute on environmental impact, respectively. One of these lifestyles described the respondent's current lifestyle ("Lifestyle as you lead now"). Each lifestyle has been described by a different diet (e.g. different number of portions of food groups), health risks, and monetary costs. Furthermore, lifestyles have been described by either various levels of physical activities (ACT split-sample treatment) (Figure 37) or environmental impacts expressed in kg CO_2 emissions (ENV split-sample treatment) (Figure 38). Half of the respondents evaluated the lifestyles with physical activities while the other half of respondents evaluated those with environmental impacts (For detailed description of the discrete choice experiment see Chapter 2).

Figure 37: Example of a choice card with physical activities

Please have a look at the example card. We will explain the characteristics of the lifestyles in the next few steps.

1. CHOICE	Lifestyle as you lead now	Lifestyle A	Lifestyle B
Fruits & Vegetables	**1** portions a day	**1** portions a day	**4** portions a day
Confectionery, ice-cream and sugar-sweetened drinks	**2** portions a week	**2** portions a week	**0** portions a week
Fish	**1** portions a week	**1** portions a week	**3** portions a week
Meat (not including fish)	**1** portions a week	**1** portions a week	**0** portions a week
Pulses	**1** portions a week	**4** portions a week	**1** portions a week
Physical activities (including walking)	**0 minutes** a day	**20 minutes** a day	**10 minutes** a day
Your 30-year risk of cardiovascular heart disease	**9%**	**2.9%**	**9%**
Difference in cost to you in total (£ per month)	no change **£100**	£15 more **£115**	£30 less **£70**

continue

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Figure 38: Example of a choice card with impact on the environment

About a quarter of respondents received additional information about the impacts on the environment (TB=1), a quarter were treated with self-affirmation (TA=1), a quarter were both informed and self-affirmed and about a quarter belonged to a control group that was neither informed nor self-affirmed. By varying the levels of each attribute on the choice card, we can examine the trade-offs among the attributes, estimate underlying utility parameters, or derive the willingness to pay (WTP) estimates.

The WTP estimates are reported in Appendix in tables 2-4, while underlying utility parameter estimates are provided in an online supplementary document (https://www.researchgate.net/profile/Milan_Scasny). All estimates are based on mixed logit with all attributes random normally distributed, estimated in a preference-space. All WTP values are expressed in PPS Euro.

We find that all lifestyle attributes are significant and hence important for people's choice. However, the cost of the lifestyle expressed as total respondent expenditures on food and physical activities per month is significant, indicating that lower costs lead to a higher probability of choosing the

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alternative lifestyle in each experiment, treatment group, and country[7]. Thus, providing a subsidy could change people's lifestyle to be healthy and less damaging the environment.

The cost of an alternative lifestyle could be greater or lesser relative to the cost of the current lifestyle. Thanks to this design, we can examine whether reducing costs that are above the current expenditures (as might be the case in many countries) or below the current expenditures would create a greater motivation to change one's lifestyle. This result is striking, but only in some cases. We find that changing the cost attribute has an asymmetric effect. Reducing the cost of the alternative lifestyle below the current expenditures affects the likelihood of choosing it much more strongly than changing the costs by the same amount that are above the current level. This is the case of the Czech Republic and Spain where the effect of reducing costs below the current level is about 40–50% stronger than the effect of changing cost above the current level. British respondents chose differently, since they responded to the cost changes in the opposite way, with about a 50% stronger effect of changing costs that are above the current level. In other words, a subsidy that would lower the cost of a healthier and sustainable lifestyle might change behaviour particularly among British, while in other countries a higher cost implied most often choosing the status quo. Making a bigger change in lifestyle would have to be accompanied by large reduction in the costs that would be below the cost of the current lifestyle.

Reducing health risks motivated respondents to choose an alternative lifestyle. The more the risk of cardiovascular disease is reduced over a 10/30-year long period[8], the higher the probability of choosing a healthier lifestyle. The British valued the health risk reduction slightly less.

Reducing emissions of CO_2 also increases the probability of choosing the alternative lifestyle. The average implicit value of the willingness to pay is in a range of 1 to 5 Euro a month per each kg of CO_2 emissions abated each week, implying 270–1100 Euro per each tonne of CO_2 abated. Czechs and Portuguese have the strongest preference for carbon emission reduction due to change in lifestyle (3.8 and 4.9 Euro), while Latvians and particularly the British are willing to pay the least (1.8 and 1.2 Euro).

It seems that increasing physical activity increases the likelihood of changing lifestyle in Latvia and Portugal only. On average, respondents from the other three countries are not willing to pay

[7] The cost of the current lifestyle (i.e. expenditures on food and physical activity) is in a range of 20 to 1,020 PPS Euro a month, with the mean of 262.4 PPS Euro. Following the design, the cost may vary between -30% and +30% from the current level. The cost difference was in a range of -307 and +301 Euro, the implied cost range for the mean expenditures on the current lifestyle was ±79 Euro from the mean.

[8] The risk was reduced during 10-, 20-, and 30-year long period in the alternative lifestyles, depending on respondent's age. The most frequently the risk was reduced over 30-years, the median was about 20 years.

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anything, while Latvians and Portuguese are willing to pay about 15 Euro for each 10 minutes of activity.

Most respondents prefer to keep eating meat, even though we informed them that plant-based eating is recognized not only as nutritionally sufficient but also as a way to reduce the risk of many chronic illnesses, and that the recommended number of portions of meat per week is a maximum of five. Our experiment thus confirms a general tendency of people to prefer meat-based diet, although this preference varies across the countries. Czechs and Latvians prefer eating meat the most, with an average WTP at 19 Euro and 20 Euro per portion a week, respectively.

This strong preference for meat weakens when an alternative lifestyle with physical activity is presented (ACT split-sample) and this holds for all five countries. In the Czech Republic and Latvia, the average WTP is reduced to 17 Euro and 19 Euro, respectively. The British and Spanish are willing to pay about 8 Euro per meat portion, and Portuguese 13 Euro. However, in the ACT split-sample, the Spanish and Portuguese became indifferent with respect to meat portion reduction. In all the surveyed countries except the UK, if we show physical activity reduction on the choice card, the reduction of the number of portions of meat does not discourage people from choosing an alternative lifestyle, or at least this negative effect is considerably weaker.

A strong preference for meat is also revealed when we control separately for meat 'elimination' (i.e. the effect of reducing the number of portions of meat to zero) and meat 'reduction' (i.e. reducing consumption by several portions). A meatless lifestyle (elimination) is associated with very strong resistance towards acceptance of alternative lifestyle. In fact, marginal WTP for a meatless lifestyle is up to several hundreds of Euro a month (see Table 3). It seems therefore that meat reduction could be acceptable when changing lifestyle, however it might be completely unacceptable to require meatless diet.

The preferences for fish consumption are very similar to those for meat. The willingness to pay is large and positive for each portion of fish. Czechs and Latvians are even willing to pay more for each fish portion a week – 52 Euro and 40 Euro a month. The Spanish and Portuguese are willing to pay 21 Euro and 18 Euro, the British would pay 8 Euro. As in the case of meat, if we show the physical activity reduction, preference for fish portions weakens and hence the WTP decreases by about half, except in Latvia where WTP is the same between the two split-sample treatments.

We find different patterns in changing fish consumption when we control for elimination and reduction. A fishless diet would have a very strong negative effect on accepting an alternative lifestyle for the Czechs. The same pattern was found among the Portuguese, but there are still also willing to pay for increasing the number of portions of fish. Latvians are also willing to pay for

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increasing the number of fish portions (38 Euro and 26 Euro), but they also very strongly dislike reducing the amount of fish currently eaten, especially in the ACT treatment (-165 Euro).

Respondents have a positive preference for both health-improving food items (pulses, and vegetables and fruits). On average, they are willing to pay between 5 and 30 Euro a month for increasing the total consumed by one portion each day. This is however not true for pulses, as only the Czechs, Latvians, and Spanish share a positive preference for pulses and only in the ACT treatment, with the mean at 14–21 Euro. In the ENV treatment, however, respondents from all five countries are indifferent with respect to portions of pulses (the coefficient is even negative, but not statistically significant, in Portugal and in the UK for the ENV treatment).

Reducing the number of portions of confectionery, ice-cream and sugar-sweetened drinks ('sweeteners') did not have either a positive or negative effect on changing one's lifestyle, although we find a negative tendency that was not statistically significant. There is one exception; reducing sweeteners reduces the probability of changing lifestyle in Spain (ENV treatment) and reducing their portions would imply a negative benefit of almost 3 Euro a month for each portion reduced per week.

Next, we examine the effect of two information treatments, specifically whether providing detailed information about the impact on the environment (TB) or self-affirmation treatment (TA) could lead to a change of lifestyle.

The self-affirmation treatment and providing information on environmental impacts both enhance respondent's change in lifestyle, but this effect is not systematic across countries and attributes.

The self-affirmation treatment increases importance of CO_2 emission reduction in the Czech Republic, Portugal, and Spain, of physical activity in the Czech Republic and Spain, and decreases preference for eating meat and fish in the Czech Republic and Latvia.

Provision of information about the environmental impacts increases importance of carbon emission attribute (ENV sample) in the Czech Republic, Latvia, and Portugal. Meat and fish consumption is also less preferred but only in the Czech Republic. Vegetables and fruits become more preferred in Latvia, Portugal and Spain, while sweets become less preferred in the same three countries.

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The INHERIT scenarios: future of green spaces, transport system, housing, and food consumption

In this part of the survey, respondents were asked to choose from four scenarios how their country might look like by the year 2040. The goal of this part is to complement qualitative analysis aiming at understanding and depicting European citizens' interpretations about the different possibilities of achieving a healthier, more equitable and sustainable Europe by 2040 presented in the first part of this Deliverable by a quantitative insight into acceptability by general public.

Brief description of the scenarios

*'**My life between realities**': "Interconnectivity is the trend that frames this scenario in which everything is digital, connected and personalised" (Guillen-Hanson, Strube, & Xhelili, 2018). "Big data drive efficiency and performance and enable high-quality and personalised products and services for a better and healthier living. This scenario is business-driven and complemented by mild but effective governmental intervention that ensures egalitarian, ethical and non-disruptive economical operations" (Guillen-Hanson & Strube, 2018).*

*'**Less is more to me**': "The government, while also collaborating with the private sector, takes the main role in ensuring the provision and management of products and services as well as the access to and affordability of health care services and education" (Guillen-Hanson, Strube, & Xhelili, 2018). "Society has developed towards less material ownership and a tendency towards greater sufficiency" (Guillen-Hanson & Strube, 2018).*

*'**One for all, all for one**': "Localism is the distinguishing feature of this scenario and it is reflected in community interactions, local diets, as well as work and leisure activities and living conditions. Technological innovation facilitates local development, whilst policy makers provide rules and regulations to ensure healthy and sustainable living environments" (Guillen-Hanson & Strube, 2018).*

*'**Our circular community**': "Companies, governments and citizens work together to create a closed-loop economy with business models in place that emphasise services over product ownership. Citizens are highly connected and dependent on technology for making most of their decisions, but societies are more aware of the importance of commonly-owned and created goods and advocate for more efficient services and products" (Guillen-Hanson & Strube, 2018).*

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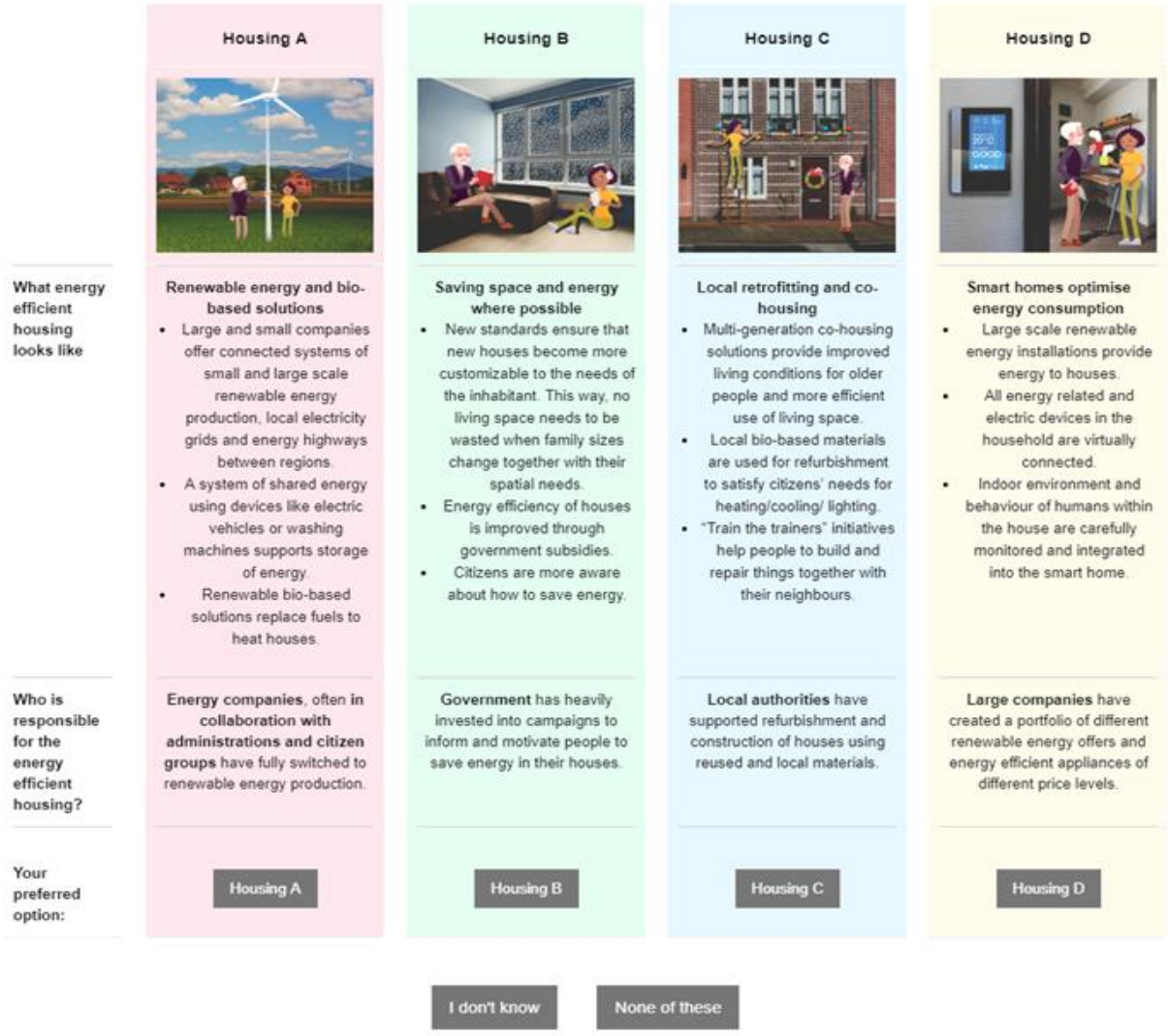
In spite of survey time constraints each respondent was asked about preferred scenario in only one domain - either green spaces, active mobility, energy efficient housing or consumption of food and beverages (see Figures 39 to 42 for descriptions of the scenarios as presented to respondents). The choice card described key features of the domain under each scenarios and how responsibilities are shared between private and public sectors.

Figure 39: Example of a choice card - INHERIT scenarios, Energy efficient housing domain



Note: Housing A corresponds to the "Our circular community" scenario, Housing B to the "Less is more to me" scenario, Housing C to the "One for all, all for one" scenario, and Housing D to the "My life between realities" scenario.

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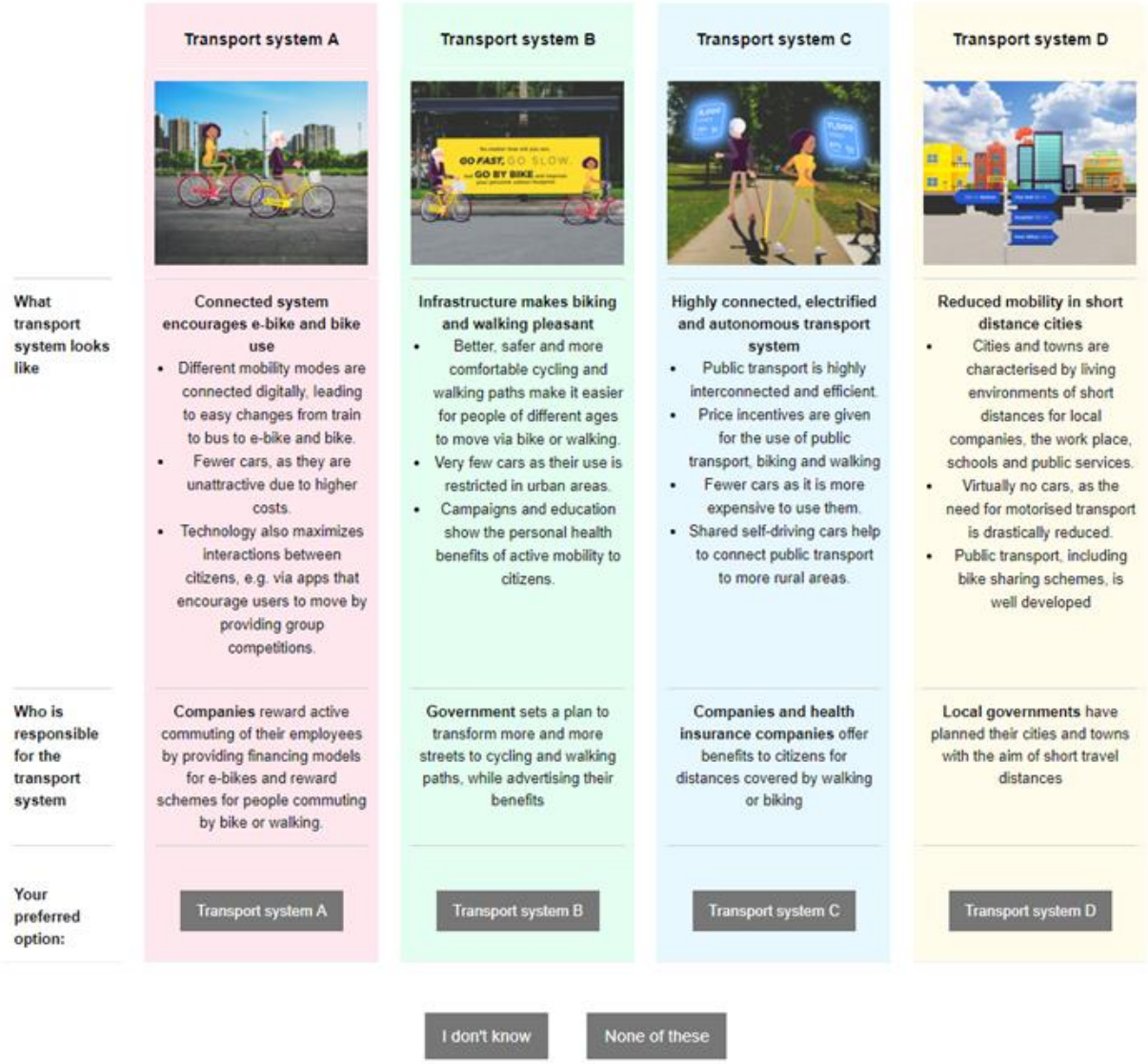
Figure 40: Example of a choice card - INHERIT scenarios, Active mobility domain



Note: Transport system A corresponds to the "Our circular community" scenario, Transport system B to the "Less is more to me" scenario, Transport system C to the "My life between realities" scenario, and Transport system D to the "One for all, all for one" scenario.

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Figure 41: Example of a choice card - INHERIT scenarios, green spaces domain

	Green spaces A	Green spaces B	Green spaces C	Green spaces D
				
What green spaces look like and how they are used	**Outdoor gyms in parks and forests** • Most parks and some popular spots in nature are equipped with outdoor gyms, fostering joint sport activities. Users are informed what health benefit they gain from their activities. • It is also possible to connect e.g. to spinning classes in the park virtually via virtual reality glasses.	**Green spaces are going virtual** • Many companies provide virtual reality glasses, which people can use at home to virtually experience green space and relax. • This makes it easier to enjoy green space for people who don't have a park or forest close to their homes. • People go to the "real" green spaces just from time to time.	**Community gardens and parks** • In cities, what used to be streets before is now used as community gardens and parks. • These are used by local citizen groups that jointly do sports, arts or social activities.	**Green corridors and parks** • In cities, many streets and parking lots have been transformed into parks and green corridors. • People use them for relaxing outdoors and also for getting from A to B via bike, inline skates or walking.
Who is responsible for green spaces	**State, municipalities, companies and citizens** • Green spaces are created and equipped through joint efforts of governments providing space, companies supporting financially and citizens engaging in their design.	**Companies and state** • Virtual spaces are sponsored by companies, physical green spaces are created by state and companies	**Local communities** • Citizen groups define the characteristics of green spaces and built them through community activities supported by local governments	**Government** • Government sets minimum share of green spaces and subsidizes their creation by professional gardeners
Your preferred option:	Green spaces A	Green spaces B	Green spaces C	Green spaces D

I don't know | None of these

Note: Green space A corresponds to the "Our circular community" scenario, Green space B to the "My life between realities" scenario, Green space C to the "One for all, all for one" scenario, and Green space D to the "Less is more to me" scenario.

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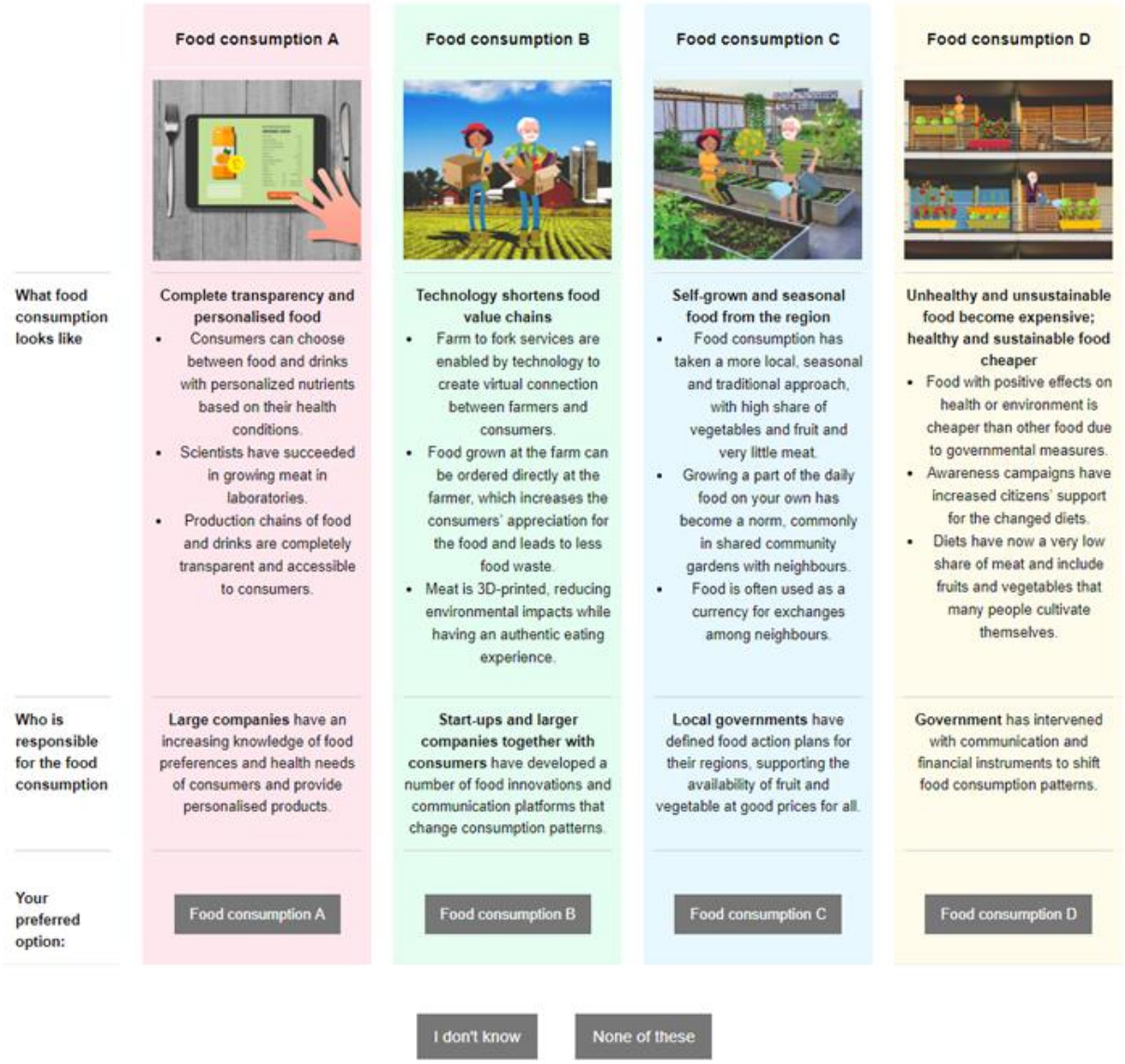
Figure 42: Example of a choice card - INHERIT scenarios, food consumption domain



Note: Food consumption A corresponds to the "My life between realities" scenario, Food consumption B to the "Our circular community" scenario, Food consumption C to the "One for all, all for one" scenario, and Food consumption D to the "Less is more to me" scenario.

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Figure 43 shows which scenarios are preferred by respondents in each of the domains. In the 'Green spaces' domain 'Our circular economy' scenario is preferred the most in all survey countries, and 'My life between realities' is by far the least preferred scenario. This seems to convey a clear message that respondents prefer real green spaces over augmented reality, or at least have considerable difficulty to imagine that augmented reality can provide what they expect from green spaces.

In contrast 'Active mobility' domain is where 'My life between realities' scenario is the most preferred in three countries and second most preferred in remaining two countries (only by a margin after 'Less is more to me' in the UK and 'Our circular economy' in the Czech Republic'). This may very well reflect general dissatisfaction with currently often clogged transport networks and (perhaps desperate) hope that technologies are the solution.

In the 'Energy efficient housing' domain the 'Our circular economy' scenario is the most preferred in all survey countries except Latvia (where 'My life between realities' is the most preferred one). This may indicate that respondents view favourably a foreseen substantial increase in renewable energy production and use as well as increased sharing of energy using devices.

In the 'Food consumption' domain the 'One for all, all for one' scenario is the most preferred in all survey countries except Spain (where 'Less is more to me' scenario is the most preferred). This seems to correspond well to a 'local' trend among consumers we are at present witnessing. Also this indirectly supports our findings on vouchers for fruits and vegetables - vouchers for local fruits and vegetables were preferred (together with vouchers for all fruits and vegetables) more than those for organic fruits and vegetables.

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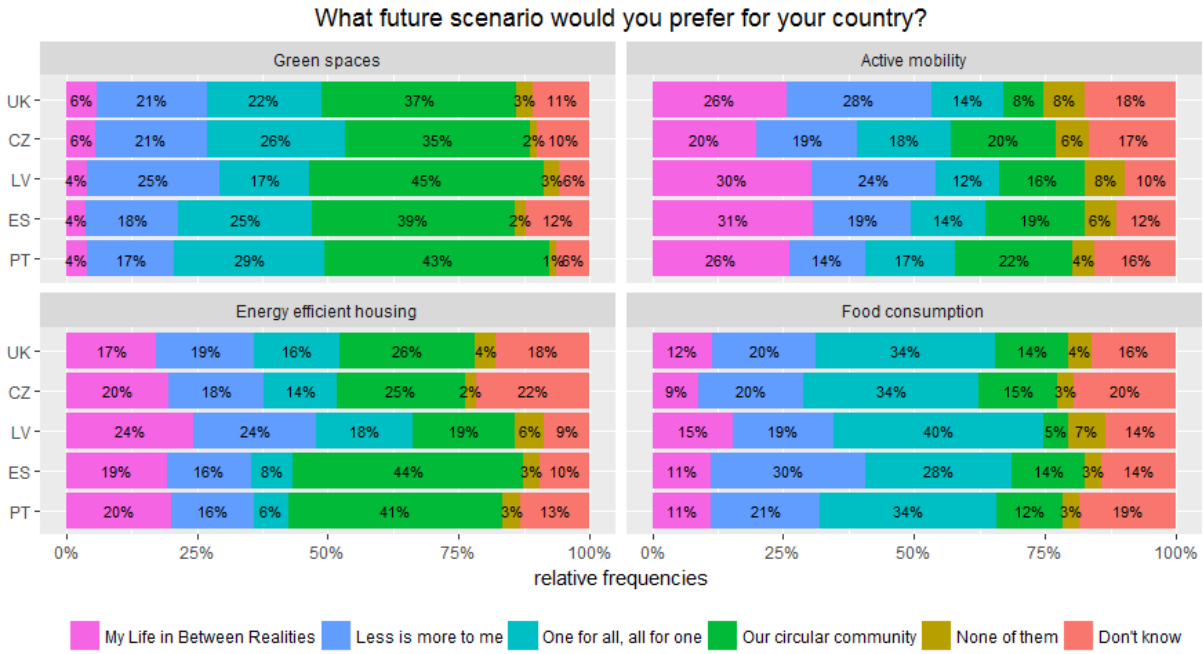
Figure 43: Preferences for INHERIT scenarios according to domains



Those respondents who have chosen one of the scenarios presented were asked why they chose that particular scenario (see Figure 44). More than 40% of respondents indicated that they liked the main characteristics of the scenario in all survey countries. Whether the scenario is good for society followed closely in importance, yet slightly so in Latvia, where this consideration was as important as to what degree the scenario is good for the respondent and their family. Who is responsible was by far the least important aspect from those enlisted.

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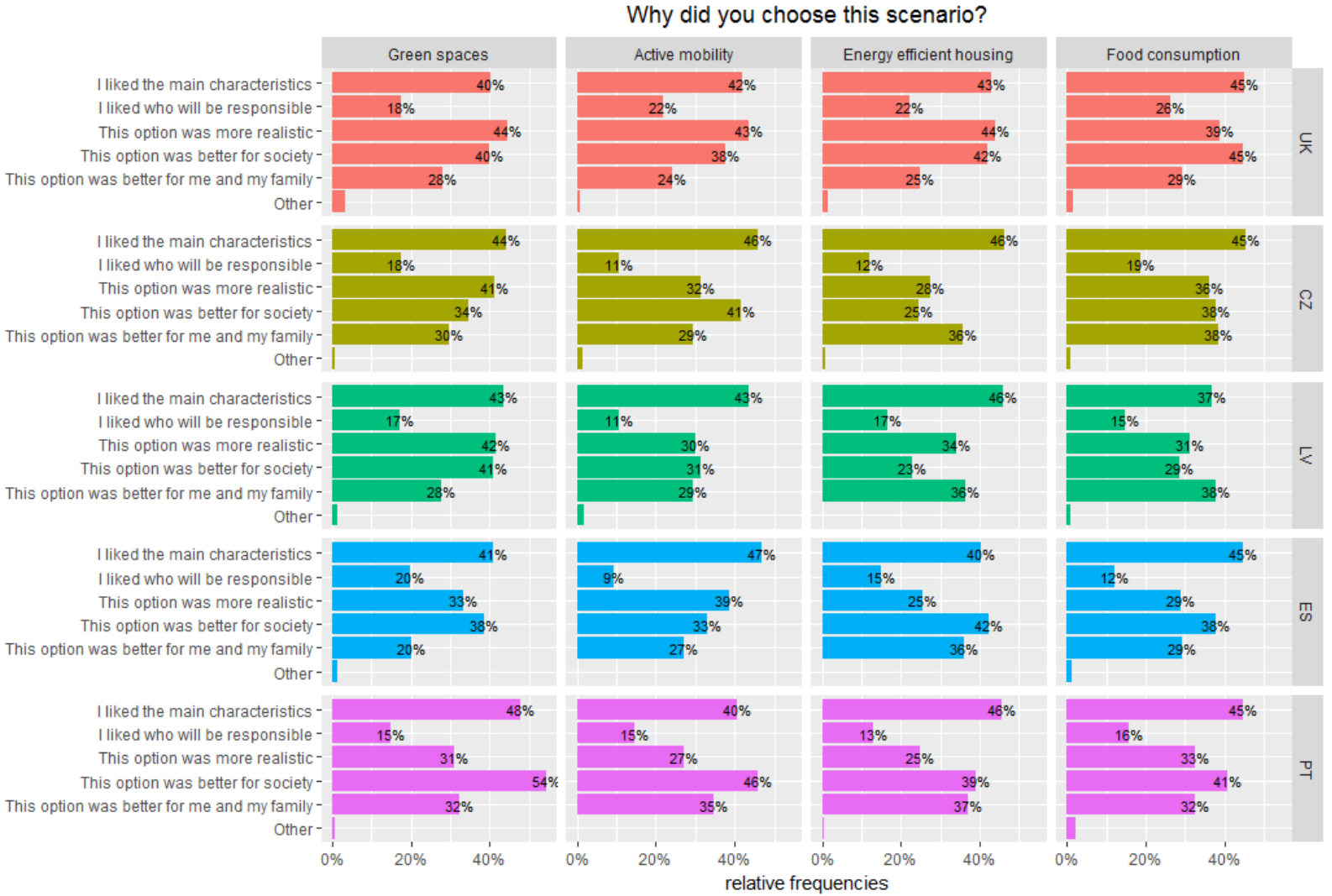
Figure 44: Reasons for the choice of INHERIT scenarios



Note: multiple option question, totals over different activities may exceed 100%

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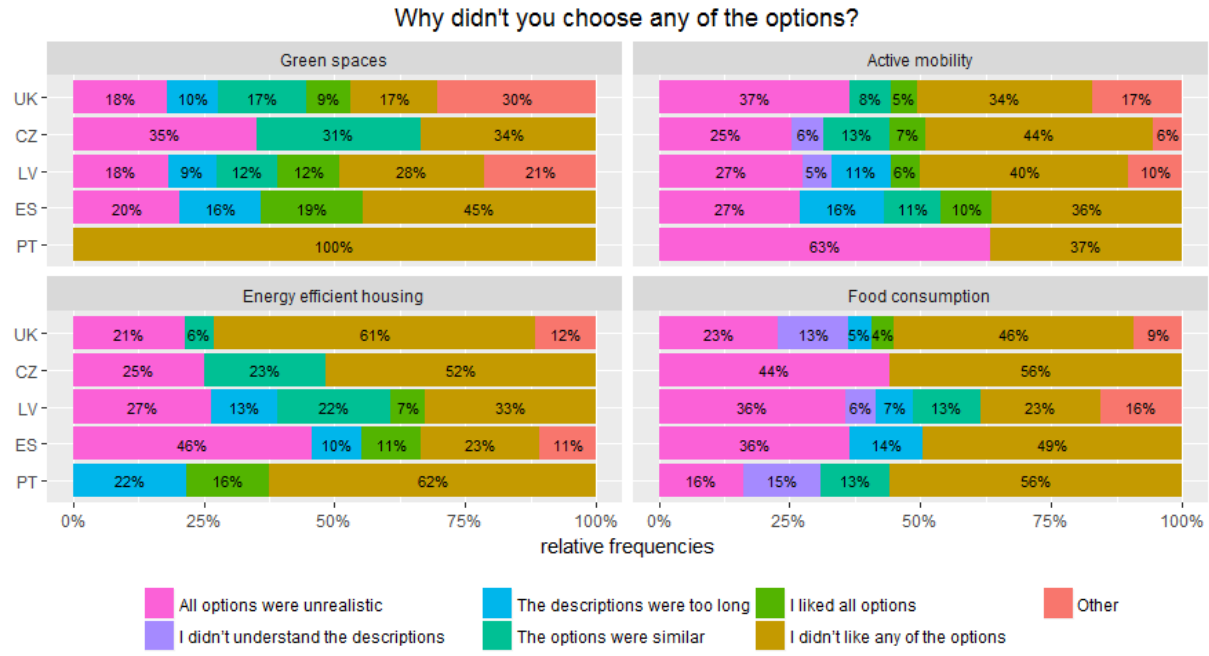
About 4% of respondents chose the 'none of these' option. When asked about the reason for their choice, 'I didn't like any of the options' and 'all options were unrealistic' were the most frequented answers (see Figure 45).

Figure 45: Reasons for not choosing any scenario (respondents who opted for the 'none of these' option)



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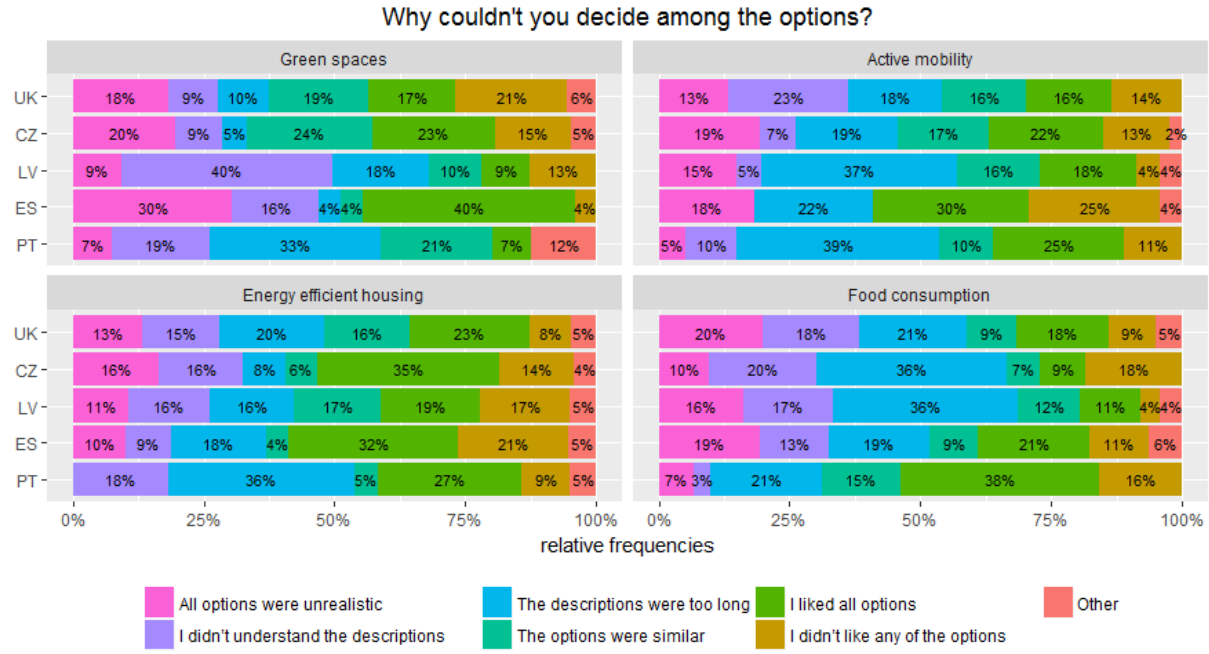
Overall almost 14% of respondents chose 'I don't know'. When asked about the reason for their choice, 'I liked all options', 'The descriptions were too long', and 'All options were unrealistic' were among the most frequently indicated reasons (see Figure 46).

Figure 46: Reasons for not choosing any scenario (respondents who opted for the 'I don't know' option)



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Chapter 4 Conclusions and discussion

Current transport, food and energy consumption patterns and lifestyles in Europe are to a large extent unhealthy and unsustainable (see Staatsen et al., 2017 for a literature review). There are several policy options to support behaviour change to be healthier and more sustainable:

- information and marketing campaigns, informational input when habits are vulnerable to change;
- change of incentive structures with taxes, subsidies, penalties;
- change of facilitating conditions and situational factors (access to healthy, sustainable food, public transport etc.);
- change in institutional context (rules, regulations, market structures),
- change in social and cultural context (strength of community, family stability etc.), helping communities to help themselves; and
- the environmental and social performance of governmental institutions (Jackson, 2005).

In this report, we investigated the potential effects of information provision and change of incentive structures on behaviours and public support for several policy instruments in order to promote healthier and more environmentally friendly lifestyles. We examined the attitudes, preferences and behaviours of the inhabitants of five European countries related to food consumption, travel, physical activity and energy efficient housing.

We conducted nationally representative questionnaire surveys in the Czech Republic, Latvia, Portugal, Spain, and the United Kingdom in 2018. The final data excluding speeders analysed in this report consists of a total of 10288 observations.

Current trends in consumption, travel and housing

Our survey results document current unsustainable travel mode choices, unhealthy physical inactivity, unsustainable and unhealthy dietary choices, and the slow uptake of renewable energy and energy efficiency in the housing sector:

- In all survey countries, car-use dominates commuting to and from work and for shopping purposes, these being the two most frequently performed activities in a typical week. Walking dominates for commuting to sport and leisure activities, while public transport dominates commuting to school or university (except in the UK where walking prevails). Cycling is frequently chosen as a means of transport to sport and leisure activities.
- Almost half of British and Portuguese respondents report less than 1 hour of physical activity per day. In the most educated tercile only 7-14% of respondents indicated no physical activity, while in the least educated tercile 25-35% are not physically active.

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- The most common frequency of fruit consumption is 1-2 portions a day in all 5 countries, but overall Czech and Latvian respondents consume fruits slightly less frequently compared to their counterparts from the UK, Spain and Portugal. Vegetables are also most frequently eaten in 1-2 portions a day and overall somewhat more by British respondents. The majority of people eat less than the recommended 5 portions of fruit and vegetables a day.
- Only small shares of respondents use renewable energy sources (about 20% in the UK, Portugal, and Spain, but only 16% in Latvia) and even fewer people bought solar panels to produce energy (8-11% in the UK, Portugal, and Spain, but only 4% in Latvia and in the Czech Republic). Thus, there is significant potential for increasing use of renewable energy in households.

In spite of these worrying tendencies, we find that people are willing to change their behaviours to be healthier and more sustainable under new incentive structures and when we provide them with information on health risks and environmental impacts. Furthermore, the majority of respondents can imagine that they would live a healthier and more sustainable lifestyle in the year 2040. We explore what policy instruments may serve to nudge people along pathways to healthy and sustainable lifestyles, and provide quantified potentials of lifestyle changes for establishing successful public policies. We are interested not only in the separate effects of information provision and modification of incentive structures but in joint effects, as several policy instruments can in fact be introduced at the same time and thus enforce each other.

Change in dietary patterns

Provision of information on a healthy, sustainable diet

Would be respondents willing to change their diet, when they see the contrast in their diet with the dietary patterns recommended by a public authority?

Our results show that respondents who do not comply with dietary recommendations would be willing to change their diet on average by one portion from each of the five food groups, i.e. decreasing their consumptions of meat and sweets and increase their intake of fruits, vegetables, fish, and pulses. The less are respondents complying with the recommended diet the more they are willing to change their diet.

Contrasting the individual diet with the recommended diet was successful in changing intentions. However, good intentions can fail to materialise if people do not have the skills, resources, and other prerequisites needed to change their behaviour (Ajzen, 1991; 2006).

Based on a comprehensive literature review aiming to identify specific policy interventions that are better suited to improving diets, Brambila-Macias et al. (2011) concluded that information provision

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has a mixed and limited effect on behavioural change. Public information campaigns achieved raising awareness of health impacts of diets but have failed to change dietary patterns. On the contrary, policy instruments targeting incentive structures and institutional context, such as fiscal measures and nutrient, food, and diet standards, are less often applied but in general more effective. There is also recent evidence from Mexico, where purchases of taxed sugar sweetened beverages decreased by an average of 6% one year after implementation of the sugar tax with a larger reduction among low socioeconomic status households (Colchero, Popkin, Rivera, & Ng, 2016). Thus, we focused further on investigating the effect of decreasing or increasing the lifestyle cost and provision of vouchers for healthy foods.

Vouchers for local, organic, or all fruit and vegetables

There are early signs that food vouchers for the poor or vulnerable population segments may be highly effective, according to the literature review (Brambila-Macias et al., 2011). Such a measure can facilitate health equity. For instance, The UK government provides food vouchers to vulnerable pregnant women and mothers (Healthy start, 2018). However, food vouchers can be provided to employees, other population segments, or even to all inhabitants. For example, employers provide subsidised food vouchers to their employees in the Czech Republic.

We therefore elicited the willingness to apply for different types of vouchers for fruit and vegetables and found that vouchers for all fruit and vegetables and those originating from the respondent's country are preferred over vouchers for organic fruit and vegetables by respondents from all the surveyed countries. If such vouchers were offered, 50-60% of respondents indicated that their household would eat at least slightly more fruit and vegetables and almost all the remaining respondents indicated that their household would eat the same number of portions.

However, there are significant differences in willingness to apply for such vouchers among income segments. Respondents from the low income segment are significantly less willing to apply for such vouchers compared to the high income segment of respondents (by approx. 15 percentage points in four survey countries and by 35 percentage points in Portugal). Still, about 50% of low income respondents would definitely or probably apply for the vouchers in all survey countries except for Portugal. With an effortless acquiring process, there seems to be a small loss of potential users with a co-payment rate up to 60% of the voucher's value that could be sustainable and effective also from a public finance perspective.

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Change in lifestyles: Information, subsidies and taxes

Using a discrete choice experiment, we presented several choice situations where respondents were asked to choose which of three lifestyles would best correspond to their preferences if new policies promoting healthier and sustainable lifestyles were adopted. One of these three lifestyles was respondent's current lifestyle, while the two new alternative lifestyles were healthier or more environmentally-friendly. Each lifestyle was described by a different diet, health risks, monetary costs, level of physical activities or environmental impacts.

Most respondents prefer to keep eating meat, even though we informed them that plant-based eating is recognized not only as nutritionally sufficient but also contributes to reducing the risk of many chronic illnesses, and that the recommended number of portions of meat per week is a maximum of five. The Czechs and Latvians prefer eating meat the most. The strong preference for eating large quantities of meat weakens when the alternative lifestyle with physical activity is presented, a trend that holds for all five countries. A strong preference for meat-eating is revealed when we control separately for meat 'elimination' (i.e. the effect of reducing the number of portions of meat to zero) and meat 'reduction', as the prospect of a meatless lifestyle is associated with a very strong resistance to an alternative lifestyle. It seems that meat reduction could be partly acceptable when changing lifestyle. However, it might be unacceptable to switch to a meatless diet.

The Czechs and Latvians would be willing to pay for increase in their fish consumption most (consumption of fish is currently the lowest in these two countries from among the survey countries). Respondents from Spain and Portugal are less sensitive to changes in their fish consumption, while people from the UK are the least sensitive to changes in their fish consumption.

Increasing the number of portions fruit and vegetables increases probability of accepting an alternative lifestyle. However, preference of the British respondents for fruit and vegetables is weaker than in other countries.

Reducing the number of portions of confectionery, ice-cream and sugar-sweetened drinks doesn't have any effect on choosing a new lifestyle with exemption of Spanish respondents who tend to keep their current lifestyle, when the consumption of sweets is reduced.

The cost of the lifestyle is the key factor of people's choice. The lower cost, the higher the likelihood of choosing the healthier lifestyle. The effect of price change below and above the cost of the current lifestyle is asymmetric in some countries. While respondents from the Czech Republic and Spain are more sensitive to changes in the costs that are below the current level, the British show the opposite, paying more attention to changes in costs that are above the current level. This means that a subsidy which lowers the cost of a healthier and sustainable lifestyle might change the behaviour particularly

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of British people. In other countries a greater change in lifestyle would have to be accompanied by a large reduction in the costs that would go below the cost of the current lifestyle.

Health risk reduction significantly increases the probability of accepting a new alternative lifestyle in all countries. However, the effect of health risk reduction is smaller in the UK in comparison to the other countries.

Respondents also tend to prefer lifestyles with a lower impact on the environment expressed as CO_2 reduction, even though one unit of the environmental impact reduction (1 kg CO_2) within the lifestyle program is valued 3 to 6 times less important than health risk reduction by one unit (% point). Still, the implied WTP for CO_2 abatement is very large, in a range of 300–1100 Euro per tonne of CO_2. The Czechs and Portuguese have the strongest preference for environmental impact reduction due to change of lifestyle, while Latvians and particularly the British are willing to pay the least.

Increasing physical activity tends to be preferred by the Latvians and Portuguese, but respondents from other countries are, on average, not willing to pay anything for an increase in their physical activity.

The self-affirmation treatment and providing additional information on environmental impacts both enhance respondent's likelihood of changing their lifestyle, but this effect is not systematic across countries and attributes. The former increases the importance of emission reduction in Latvia, of physical activity in the Czech Republic and Spain, and decreases preference for eating meat and fish in the Czech Republic and Latvia. The latter intervention increased the importance of the carbon emission attribute (ENV sample) in the Czech Republic, Latvia, and Portugal. Meat and fish consumption is also less preferred but only in the Czech Republic, whereas vegetables and fruit become more preferred in Latvia, Portugal and Spain, and sweets become less preferred in these same three countries.

Public support for policy instruments

Several policy instruments can influence lifestyle changes, but not all of them are easy to introduce, as they are considered by politicians to be publicly unacceptable. An example of a policy instrument that is typically perceived as unacceptable is tax regulation. What instruments would be supported?

As expected, people from all the surveyed countries showed the greatest support for the introduction of subsidies for fruit and vegetable production and for cycling and walking among policy instruments. Surprisingly, sugar tax on soft drinks received quite strong support in Portugal, the UK, and Spain. In these countries, the share of respondents who would support a sugar tax on soft drinks (43% to 46%)

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is much larger than share of respondents who oppose it (12% to 16%). Sugar tax on soft drinks is supported to a greater extent than a meat tax in all countries.

The INHERIT scenarios: the future of green spaces, transport system, housing, and food consumption

Complementing the qualitative analysis of 2040 future scenarios described in detail in the first part of this deliverable, we asked respondents to pick their favourite scenario in one of four domains. People from all surveyed countries would strongly prefer to experience real, tangible green spaces rather than augmented reality, which was the least favoured option. In contrast augmented reality is among the most preferred scenarios for the future of active mobility in all survey countries.

Respondents in all the surveyed countries but Latvia tend to prefer developing the 'energy efficient housing' domain through renewable energy and bio-based solutions. According to the scenario, this switch to renewable energy will be achieved by a collaboration between energy companies, public administration and citizen groups.

The scenario emphasising self-grown and seasonal food from the region called 'One for all, all for one' is the most preferred scenario of future food consumption in all survey countries except Spain. This seems to resonate with the current 'local' trend among consumers in the EU.

Limits of the study

We present a contingent behaviour scenario using stated preference methods to analyse choices in hypothetical situations. The hypothetical nature of the stated preference approaches may lead to "hypothetical bias". Even though many laboratory experiments were conducted and different estimates were found to the stated preference studies, it is not clear to what extent laboratory experiments are relevant for the evaluation of the performance of stated preference studies because these experiments are often conducted on small samples of (most often) students, the survey instruments are different and are not consequential in the sense of potentially having a policy impact, thus, creating another type of bias. On the other hand, many studies confirmed that results from stated preference surveys are not statistically different from actual referenda votes (see literature review by Carson and Czajkowski 2014). The comparison is further complicated by the fact that the results of a non-hypothetical treatment are also affected by the elicitation mechanism (Gracia et al., 2011). The absence of evidence from natural field experiments remains a barrier to concluding whether hypothetical bias exists and if so what direction it takes (Hensher, 2010).

Since we analyse cross-sectional data from a stated preference survey, we can't analyse effects of real time variant changes on actual real behaviour. Our study does not also include a randomized control

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trial, although several randomized treatments (two split-sample treatments, and an intervention based on information about the impacts and self-affirmation) are used.

From a socio-psychological perspective, the willingness-to-pay measure may be viewed as a behavioural intention rather than behaviour itself (Ajzen, 1991). Acknowledging this parallel, when we conclude in this report that people are willing to change a specific behaviour (for example to increase their consumption of fruit and vegetables), we need take into account that they might still fail to realize their intention. To be able to prevent the hypothetical bias or reduce the intention-behaviour gap, policy instruments helping people to translate their intentions into action need to be introduced. Thus, policy options that change not only incentive structures, but also facilitating conditions and situational factors, institutional context, and change in social and cultural context, should be considered. However, interventions can also utilize if-then plans, strategies that prompt progress monitoring, and training approaches that have been found to reduce the intention-behaviour gap (Sheeran & Webb, 2016).

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Appendix

Table 1: Proportion of people according to sociodemographic characteristics in national populations aged between 18 and 65[9]

	CZ	UK	LV	ES	PT
Gender					
Male	51%	50%	49%	50%	48%
Female	49%	50%	51%	50%	52%
Age					
18-34 y.o.	32%	36,2%	33%	29%	30%
35-50 y.o.	38%	34%	34%	41%	38%
51-69 y.o.	30%	30%	33%	30%	32%
Education					
primary and lower secondary	43%	19%	11%	40%	49%
upper secondary	37%	41%	57%	26%	28/%
tertiary	20%	40%	31%	34%	23%

[9] *Sources for setting the national quotas:* EUROSTAT, data for year 2017, https://ec.europa.eu/eurostat

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Table 1 (continued): Proportion of people according to region in national populations aged between 18 and 65

CZ		UK		ES		PT	
Prague	13%	*North East*	4%	*Noroeste*	9%	*Norte*	35%
Central Bohemia	12%	*North West*	11%	*Noreste*	9%	*Algarve*	4%
South Bohemia	6%	*Yorkshire and the Humber*	8%	*Comunidad De Madrid*	14%	*Centro*	22%
Plzeňský	5%	*East Midlands*	7%	*Centro*	12%	*Área Metropolitana de Lisboa*	27%
Karlovarský	3%	*West Midlands*	9%	*Este*	29%	*Alentejo*	7%
Ústecký	8%	*East of England*	9%	*Sur*	21%	*Região Autónoma dos Açores*	2%
Liberecký	4%	*Greater London*	14%	*Canarias*	5%	*Região Autónoma da Madeira*	3%
Královéhradecký	5%	*South East (excluding London)*	13%				
Pardubický	5%	*South West*	8%				
Vysočina	5%	*Wales*	5%				
South Moravia	11%	*Scotland*	9%				
Olomoucký	6%	*Northern Ireland*	3%				
Zlínský	5%						
Moravia-Silesia	12%						

Note: Quota for Latvian regions was not set.

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Table 2: Mean willingness to pay for attributes, mixed logit models, by environmental impacts (ENV) and physical activity (ACT) split-sample treatment, in PPS Euro

	CZ		LV		PT		ES		UK	
T: ENV										
meat	28.59	***	20.24	***	13.28	***	7.78	***	8.17	***
fish	52.76	***	39.96	***	21.14	***	17.73	***	8.00	***
fruit	33.02	***	17.60	***	20.45	***	21.39	***	5.48	***
pulses	10.95		9.31	*	11.90	*	-1.15		-0.26	
sugar	-1.78		-0.21		-2.14		-2.79	**	0.45	
health risk [%]	-13.97	***	-8.72	***	-12.27	***	-14.58	***	-3.53	***
CO_2 emission *[kg]*	-3.84	***	-1.85	***	-4.92	***	-2.28	***	-1.22	***
T: ACT										
meat	16.79	***	18.91	***	1.21		5.59	*	7.18	***
fish	21.34	***	34.54	***	11.29	**	9.58	**	3.54	**
fruit	16.07	***	24.51	***	13.32	**	14.89	**	4.54	***
pulses	15.03	***	21.40	***	1.90		14.34	***	-2.53	
sugar	-0.88		0.99		-0.78		-2.27		0.62	
health risk [%]	-11.02	***	-14.31	***	-18.51	***	-12.76	***	-6.52	***
activities [min]	0.30		1.41	***	1.54	**	-0.02		0.04	

*Note: *** 1% level, ** 5% level, and * 10% level. Standard errors adjusted for respondents clusters (951, 836, 818, 952, and 1,297 respondents in the ENV split-sample, and 850, 735, 628, 800, and 1,044 respondents in the ACT split-sample). Respondents who reported extremely large or small expenditures on food and activity are excluded. Respondents who reported length of physical activity larger than 3 median values for given country were also excluded from the ACT sample.*

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Table 3: Mean willingness to pay for attributes – augmented mixed logit model by meatless and fishless attributes, by environmental impacts (ENV) and physical activity (ACT) split-sample treatments, in PPS Euro

	CZ		LV		PT		ES		UK	
T: ENV										
meat	8.56	*	11.09	***	3.54		-0.55		2.30	*
meatless	-340.4	***	-293.8	***	-217.5	***	-198.5	***	-123.3	***
fish_less	-77.41		-20.06		-14.51		-10.10		-11.34	*
fish_more	28.12		37.55	***	23.72	***	4.39		3.85	
fishless	-205.07	**	-75.67	***	-96.07	**	-74.77	**	-22.31	***
fruit	32.29	***	17.08	***	18.82	***	19.79	***	5.44	***
pulses	7.10		7.80		14.66	**	0.48		-1.12	
sugar	-0.29		0.31		-2.15		-1.82		0.63	
health risk [%]	-12.77	***	-8.39	***	-12.85	***	-14.20	***	-3.17	***
CO_2 emission *[kg]*	-3.91	***	-1.90	***	-5.54	***	-2.76	***	-1.33	***
T: ACT										
meat	8.46	**	7.71	**	-8.10	*	-3.48		5.66	***
meatless	-401.7	***	-321.7	***	-154.3	***	-278.0		-38.94	**
fish_less	-11.32		-164.52	**	-17.49		-12.16		-0.75	
fish_more	13.78		26.44	**	-20.87		-6.79		-8.84	*
fishless	-82.32	**	-34.74		-494.3	**	-146.9		-58.21	*
fruit	15.74	***	19.49	***	21.31	***	19.29	***	5.43	***
pulses	8.39		16.04	***	4.35		8.85		-0.44	
sugar	0.11		1.45		-0.88		-1.87		0.79	*
health risk [%]	-12.70	***	-15.23	***	-29.11	***	-15.00	**	-6.93	***
activities [min]	0.75		1.09	*	2.15	***	0.02		0.00	

Note: **** 1% level, ** 5% level, and * 10% level. Standard errors adjusted for respondents clusters (951, 836, 818, 952, and 1,297 respondents in the ENV split-sample, and 850, 735, 628, 800, and 1,044 respondents in the ACT split-sample). Respondents who reported extremely large or small expenditures on food and activity are excluded. Respondents who reported length of physical activity larger than 3 median values for given country were also excluded from the ACT sample.*

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Table 4: Mean willingness to pay for attributes, two-way interactions with TA and AB information intervention treatments, mixed logit models with, by environmental impacts (ENV) and physical activity (ACT) the split-sample and countries, in PPS Euro

Czech Republic

	ENV split-sample						ACT split-sample					
	control		TA=affirm		TB=env		control		TA=affirm		TB=env	
meat	40.9	***	37.4	***	20.7	***	19.03	***	18.41	***	15.04	**
fish	69.0	***	52.7	***	52.5	***	31.25	**	10.37		30.17	**
fruit	40.8	**	47.4	***	20.0	*	15.88		12.06		19.77	**
pulses	22.9		16.3		5.2		21.17	**	10.51		19.11	**
sugar	-0.7		-3.2		-0.4		-3.59		-2.14		0.02	
health risk [%]	-17.0	***	-17.5	***	-11.2	***	-11.54	***	-8.48	***	-13.69	***
emission [kg]	-2.4		-4.1	**	-3.7	***						
activity [min]							-0.49		1.78	**	-1.35	

Latvia

	ENV split-sample						ACT split-sample					
	control		TA=affirm		TB=env		control		TA=affirm		TB=env	
meat	21.3	***	11.8	***	35.3	***	25.80	***	13.69	***	26.51	**
fish	42.7	***	13.8	*	92.1	***	74.26	***	28.90	***	48.69	*
fruit	15.6	**	12.3	*	23.6	**	33.97	**	10.86	*	49.59	**
pulses	7.5		13.6	**	3.9		27.66	**	13.36	**	38.35	**
sugar	-0.3		1.1		-3.1		4.49		1.48		-0.36	
health risk [%]	-9.1	***	-6.5	***	-13.2	***	-23.65	***	-15.07	***	-10.72	*
emission [kg]	-2.8	***	-0.7		-3.7	**						
activity [min]							1.50		1.53	**	1.07	

Portugal

	ENV split-sample						ACT split-sample					
	control		TA=affirm		TB=env		control		TA=affirm		TB=env	
meat	8.2	**	16.5	**	8.4	**	4.31		6.08		-1.17	
fish	10.7	*	13.8		24.0	***	17.39		15.99		9.43	*
fruit	10.4		23.8	*	15.5	**	17.30		10.39		16.53	**
pulses	-1.0		19.8	*	9.0		10.70		-11.27		10.89	
sugar	-1.1		-0.1		-4.3		-0.05		-2.76		1.58	
health risk [%]	-10.2	***	-16.5	***	-8.1	**	-25.64	*	-13.87		-20.71	***
emission [kg]	-3.0	***	-4.1	***	-5.4	***						
activity [min]							4.28	*	0.72		1.76	**

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Table 4 (continued)

Spain

	ENV split-sample						ACT split-sample					
	control		TA=affirm		TB=env		control		TA=affirm		TB=env	
meat	6.7	**	9.3	***	6.5	**	7.15		0.43		11.12	**
fish	26.7	***	27.3	***	8.2		12.45	*	9.53		9.63	
fruit	13.5	**	23.8	***	19.8	***	18.60	*	15.66	**	19.09	**
pulses	4.2		5.1		-6.6		18.28	*	9.72		13.53	
sugar	-1.4		-2.2		-3.5	*	-3.34		1.16		-5.35	**
health risk [%]	-18.9	***	-15.9	***	-13.9	***	-18.12	***	-10.67	***	-13.35	***
emission [kg]	-2.2	***	-2.7	***	-2.1	***						
activity [min]							-1.36		-0.02		-0.44	

United Kingdom

	ENV split-sample						ACT split-sample					
	control		TA=affirm		TB=env		control		TA=affirm		TB=env	
meat	7.6	***	8.6	***	7.8	***	7.43	***	8.02	***	6.09	***
fish	6.5	***	8.1	***	7.5	***	6.28	*	2.10		4.93	
fruit	3.8		4.6	*	6.0	***	0.88		6.41	**	3.12	
pulses	-4.0		-0.7		0.2		1.22		1.11		-7.15	**
sugar	0.2		0.2		0.8		0.64		1.31	*	-0.03	
health risk [%]	-3.0	***	-5.1	***	-2.2	***	-7.99	***	-7.61	***	-5.39	***
emission [kg]	-1.6	***	-1.6	***	-1.0	***						
activity [min]							0.15		-0.12		0.18	

*Note: *** 1% level, ** 5% level, * 10% level. Standard errors clustered around respondents, the same cleaning as in Appendix, Table 2.*

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