FULFILL

Fundamental decarbonisation
through sufficiency by lifestyle changes

Report on the first survey and identification of the sufficiency groups

FULFILL Deliverable D 3.1

Place: Karlsruhe

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Fundamental decarbonisation through sufficiency by lifestyle changes

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Authors:	Abigail Alexander-Haw, Elisabeth Dütschke, Marvin Helferich, Sabine Preuß, Joachim Schleich
Contributor(s):	Hannah Janßen, Josephine Tröger, all consortium partners who contributed national data for the carbon footprint
Internal reviewer(s):	Janis Brizga, Fiona Breucker

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Project Partners

No	Participant name	Short Name	Country code	Partners' logos
1	**Fraunhofer Institute for Systems and Innovation Research ISI**	FH ISI	DE	Fraunhofer
2	**Wuppertal Institut für Klima, Umwelt, Energie GGMBH**	WI	DE	Wuppertal Institut
3	**Accademia Europea di Bolzano**	EURAC	IT	eurac research
4	**Notre Europe - Institut Jacques Delors**	JDI	FR	NOTRE EUROPE Jacques Delors Institute
5	**Association négaWatt**	NW	FR	ASSOCIATION négaWatt
6	**Politecnico di Milano**	POLIMI	IT	POLITECNICO MILANO 1863
7	**International Network for Sustainable Energy-Europe**	INFORSE	DK	INFORSE-EUROPE International Network for Sustainable Energy
8	**Zala Briviba Biedriba SA**	ZB	LV	Zaļā brīvība

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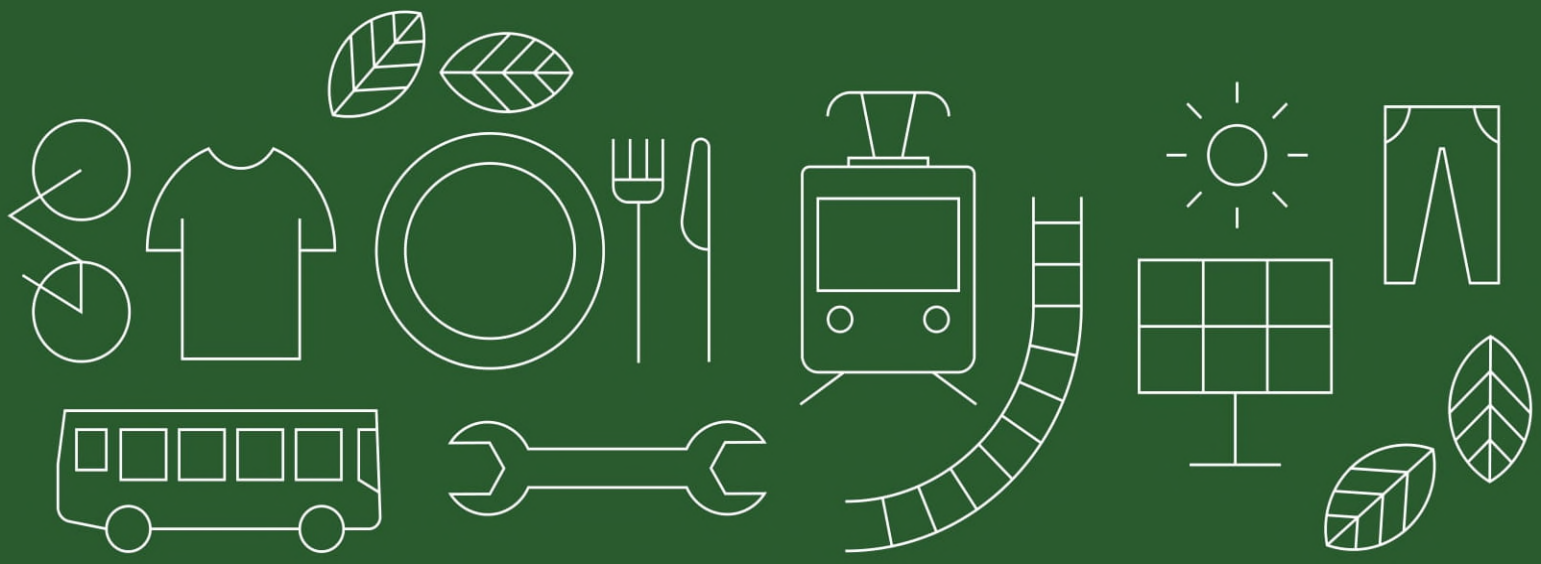

Content

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List of Abbreviations

CNG	Compressed natural gas
CF	Carbon footprint
GHG	Greenhouse gas
LPG	Liquefied petroleum gas
MFH	Multi-family house
PV	Photovoltaic
SFH	Single family house
SSH	Social sciences and humanities
WP	Work Package

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Abstract/Summary

As an overarching objective, WP3 aims to examine lifestyle change mechanisms and sufficiency lifestyles through social sciences and humanities (SSH) research methods on the micro (individual, household) level. It hence contributes to developing a better understanding of the potential scope and diffusion of sufficiency lifestyles.

In the task corresponding to this deliverable, WP3 relies on large sample demographically representative household surveys in five EU countries (Denmark, France, Germany, Italy, and Latvia) and in two major cities in India (Mumbai and Delhi). The aim is to identify the existing variety of lifestyles that are present in today's households with a focus on their level of sufficiency. This involves translating the concept of sufficiency lifestyles to the micro level for empirical research. In FULFILL, sufficiency is defined as a lifestyle that is low in CO_{2eq}-emissions and at the same time related with individual well-being. Therefore, a comprehensive carbon footprint calculator is developed to measure individual emissions from the following key activities: housing (heating and hot water use), electricity, transport and diet. Measuring CO_{2eq}-emissions from other areas is explored. This is combined with a measure of individual well-being. In addition, further questions cover socio-economic attributes, attitudes such as towards the environment or political preferences, sufficiency-oriented practices, some structural aspects (e.g., degree of urbanisation), social deprivation and on the gender-related division of work within the household. The current report presents in detail the descriptive findings. Unfortunately, due to an error in the questionnaire, the data on well-being is not usable for France.

The estimated level of average annual CO_{2eq}-emissions per person related to the key activities varies between 3.2 t (France) and 4.9 t (Denmark) across the European countries studied. The Indian footprint - calculated in a slightly different way due to necessary adaptations e.g. in terms of climate - is much lower with 1.5 t (Delhi) and 1.6 t (Mumbai). The share of the different activities among the four key activities considered also varies between countries: diet accounts for the largest share (between 41% in Germany and 59% in France and 63 % and 69 % in Delhi and Mumbai respectively) and electricity for the smallest in the European countries (between 6% in Germany and 3% in France).

For the lifestyle analysis, the sample of each country is divided into several groups based on the individual CO_{2eq}-emissions: the lowest 25% (first quartile), the middle 50 % (second and third quartiles) and the highest 25 % (fourth quartile). The bottom 25% are considered to potentially have a sufficient lifestyle and therefore their well-being was also analysed. This quarter of the sample is therefore further categorised. For Europe, we find that around 3 to 4% are in the lowest 25% of emitters in all four key activities and have above-median levels of well-being in their country ("Very sufficient" group 1). Between 7 and 8% have low emissions in at least one key activity and report above median levels of well-being ("Sufficient" group 2). Finally, 13 to 15% have low emissions and below median levels of well-being (" Low Carbon Footprint, Low Well-Being" group 3).

An analysis of differences in frequencies and means on further variables point out that these three groups from the first quartile share some similarities across the European countries: Women are more frequent than men in the group of *very sufficient* respondents (group 1); people in this group tend not to show signs of social deprivation and to support attributes of a sufficiency oriented lifestyle such as being opposed to overconsumption. Those who are *sufficient* (group 2) are also less likely to be deprived and tend to be comfortable on their current income; they support environmentally oriented policies and see themselves as eco-friendly consumers. Those with low emissions but also lower well-being (group 3) are also often women, tend to have a low income and exhibit several characteristics of deprivation. They are opposed to liberal oriented policies and often burdened with several care taking duties. The big group with average lifestyles in terms of CO_{2eq}-emission (group 4) is heterogeneous and men are more likely to be part of this group. Finally, the group with a high carbon footprint (group 5) are also often men, have a high income, live outside large cities, in a house, work full-time and, surprisingly, sometimes show signs of deprivation. They tend to prefer conservative policies and are less involved in care-taking duties at home.

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Regarding the Indian mega cities, we found large differences between Mumbai and Delhi. For instance, participants in Mumbai seem to walk a lot (almost daily) which is not the case in Delhi. Moreover, the number of technical and cooling devices appears to be lower on average in Mumbai than Delhi. In contrast, the reported governmental support in Delhi is very little and slightly higher in Mumbai. This - combined with the different climate situation in both cities - may be related to the fact that the deprivation in winter and summer times is higher in Delhi than in Mumbai, based on participants' responses. However, there are also many similarities between the cities for instance, the low number of owned cars and 2-wheelers.

Regarding the group development, the two cities in India also differ from each other: In Delhi, there are less (very) sufficient households than in Mumbai. Overall, the (very) sufficient groups (groups 1 and 2) in Mumbai and Delhi do not share any characteristics, while the average and high carbon footprint group (groups 4 and 5) as well as the low carbon footprint, low well-being group (group 3) share at least some degree of overlap when describing the groups' characteristics. Interestingly, the sufficiency-orientation in Mumbai and Delhi differ for the third and fifth group: While the low carbon footprint, low well-being group (group 3) in Mumbai is characterised by lower sufficiency-orientation (among other), the same group in Delhi reports a higher tendency toward sufficiency-orientation than other groups in Delhi. The same pattern is visible for the high carbon footprint groups (group 5): In Mumbai, this group has a higher sufficiency-orientation and tends to be environmentally friendly, while in Delhi, this fifth group shows lower sufficiency-orientations than other groups in Delhi.

In the next steps of the project, the survey will be repeated to examine the stability of lifestyles and to analyse in more detail the consequences of lifestyles, such as rebound effects. In addition, the second survey will explore the acceptability of policy instruments to promote highly sufficient lifestyles. Other tasks in further WPs include a more in-depth analysis of the data, including country differences.

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1. Introduction

The overarching aim of work package (WP) 3 is to translate the concept of sufficiency lifestyles to the micro level for empirical research. The WP applies a mixed method design with two longitudinal surveys (task 1 and 3) and an interview study (task 2) which are connected methodologically and conceptually. It is implemented in five European countries, including Denmark, France, Germany, Italy and Latvia, as well as India as an additional non-European country. As an outcome, we will gain insights on the current prevalence of sufficiency oriented lifestyles across citizens in five European and the Indian society. The emergence of these lifestyles will be analysed according to contextual and structural factors as well as across the lifespan which will lead to the identification of enablers and barriers. As outlined in previous deliverables (Pagliano & Erba, 2022; Tröger et al., 2022), within the scope of FULFILL, sufficiency is defined as creating the social, infrastructural, and regulatory conditions for changing individual and collective lifestyles in a way that reduces energy demand and greenhouse gas emissions to an extent that they are within planetary boundaries and simultaneously contributes to societal well-being.

The aim of the first task is to identify the existing variety of sufficiency lifestyles that are present in today's households in Europe and India. This task builds on the outcomes of WP2 as a conceptual framework. From an empirical point of view, in this task, a cross-sectional representative survey is designed and implemented in five European countries (Denmark, France, Germany, Italy, and Latvia) as well as in India. The scope of the questionnaire includes a carbon footprint calculator and measures of well-being as well as sufficiency practices to identify sufficiency-oriented lifestyles (Tröger et al., 2022). Further questions in the survey aim at capturing structural as well as individual-level factors to further describe lifestyles and start at identifying determinants. In addition to describing groups already showing a sufficient lifestyle today, the aim is to identify further groups in the population as control groups or contrast, namely,

- highly sufficient individuals
- individuals with a high level of sufficiency in certain domains of life (e.g. living space, transport)
- individuals with average carbon footprints
- individuals with very high carbon footprints

The outcomes of the survey will feed into in-depth interviews which are planned in task 3.2 and into the experimental survey planned for task 3.3 as well as into task 5.1 which elaborates on the potential pathways for upscaling sufficiency on a wider scale and the macro level perspective.

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2. Measuring sufficiency-oriented lifestyles

This chapter focuses on detailing our approach to operationalise sufficiency-oriented lifestyles. This leads to the need of simplifying the concept to main pillars to make it manageable, e.g., in surveys. Building on the definition of sufficiency referred to in the previous chapter, to operationalise the concept in the empirical work packages of the project two aspects are important:

- On the one hand, the environmental impact of the individual lifestyle is relevant. In this project we will focus on the climate impact indicated by estimations of CO_{2eq}-emissions for quantifications.
- On the other hand, well-being plays an important role as we are aiming for lifestyles that do not fall short on physical, psychological or social well-being.

2.1. Carbon footprint calculation method

The climate impact of lifestyles is measured by using carbon footprint estimates. In the following, we provide a detailed description of how we estimated the carbon footprint at the individual level. Our carbon footprint calculator estimates annual per-capita greenhouse gas emissions related to electricity consumption, thermal heating, transportation, diet and miscellaneous based on input data for 2021. The calculator expands on a carbon footprint calculator built for Germany (Schleich & Alsheimer, 2022). It is similar to existing online carbon footprint calculators for individuals such as those available from the UNFCCC[1], the WWF[2], and the German Federal Environmental Agency Umweltbundesamt[3], but more strongly focuses on sufficiency aspects.

[1] https://offset.climateneutralnow.org/footprintcalc

[2] https://footprint.wwf.org.uk/#/

[3] https://uba.co2-rechner.de/en_GB/

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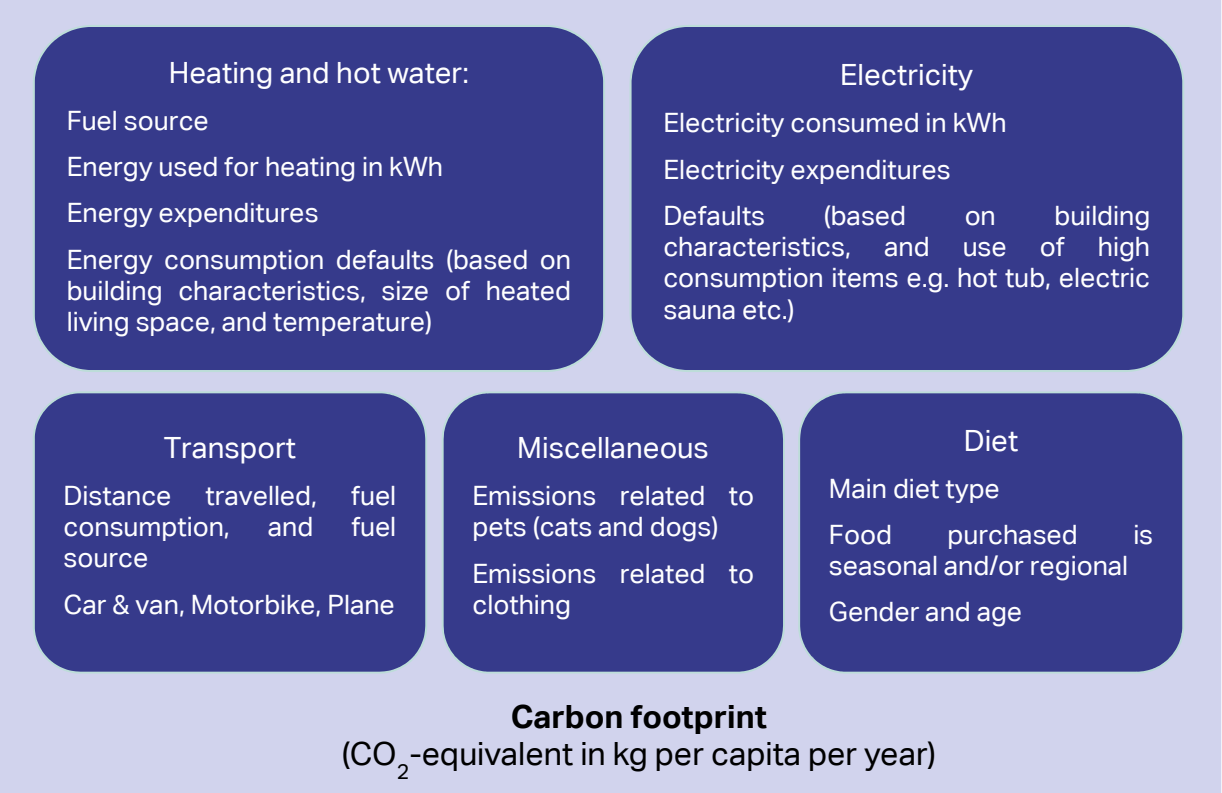
Figure 1 Carbon footprint activities and overview of relevant variables



We consider emissions from five activities, i.e., from space heating & hot water, electricity, transport, diet as well as selected fields of consumption ('miscellaneous'), as displayed in Figure 1. Thus, the calculator only measures a subset of GHG emissions as estimating individual carbon footprints is practically impossible and in any case beyond the scope of the project.

In line with common practice, a varying approach is taken on system definition. For electricity consumption, indirect emissions are considered from burning fossil fuels at the site of the power plant. For heating and transport, we take into account direct CO_{2eq}-emissions (i.e., from burning fossil fuel at the site or by the internal combustion engine vehicles) and indirect emissions when relevant (such as from electricity or for district heating). For diet, the footprint calculator takes into account greenhouse gas emissions associated with livestock, i.e., methane emissions. This is also the case for cats and dogs, where only emissions related to their food consumption are taken into account. For the miscellaneous consumption of clothes, we use cradle-to-grave estimates. Standard global warming factors are used to make CO_2 and methane emissions comparable, expressing emissions in terms of CO_{2eq}.

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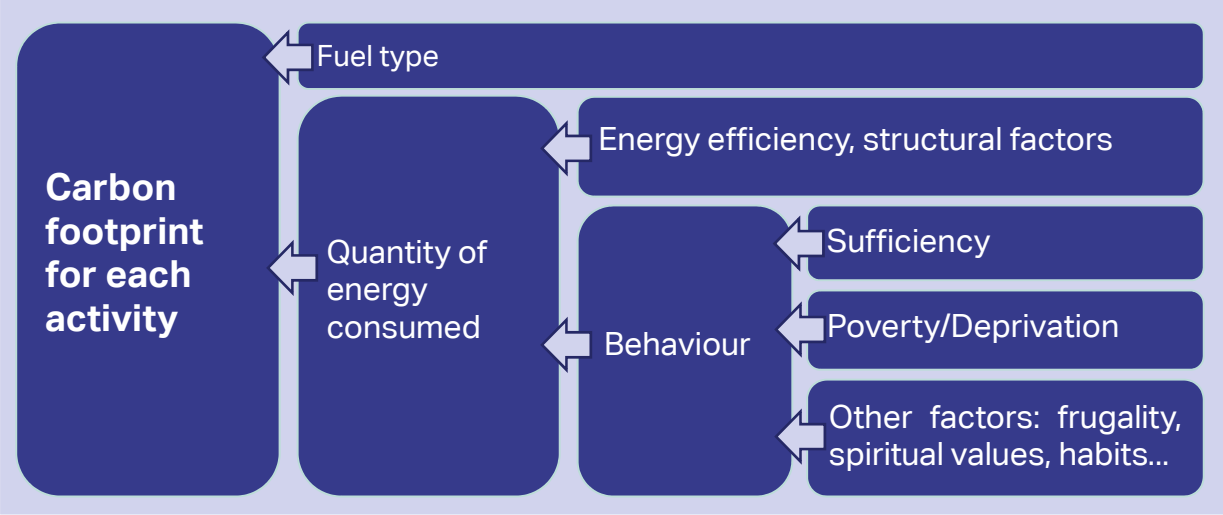
It is important to note that an individual's carbon footprint is influenced by a variety of factors. Some of these factors are directly within a person's sphere of influence, such as adopting sufficiency or frugal behaviours e.g., reducing meat consumption or lowering the room temperature in winter. Such behaviour may however be shaped by further factors, such as level of income or lack thereof, religious factors, cultural norms etc. Other factors may not be within an individual's sphere of influence depending on the structural conditions, for example, refurbishing one's dwelling or choosing which fuel source is used for heating is rarely possible for tenants, and living in a less carbon intensive dwelling may be too expensive. Figure 2 presents a simplified depiction of how both behaviour, energy efficiency and fuel type can influence the carbon footprint. These aspects will be further explored in WPs 4 and 5. Finally, a low level of emissions does not necessarily reflect a sufficient lifestyle. For example, heating a home to comparatively high indoor temperatures contradicts sufficiency even if it is achieved by renewable sources, e.g., electric heating using green electricity and therefore on low emission levels.

Figure 2 Carbon Footprint composition overview (simplification)



2.1.1. General Information

This section provides general information that is used for calculating the carbon footprint of survey participants in the various activities. The following sections will explain how the carbon footprint was calculated for heating and hot water, transport, electricity, diet and miscellaneous.

In order to know how much CO_{2eq} is generated from consuming various fuel types, we use GHG emission intensities of liquefied petroleum gas (LPG), compressed natural gas (CNG), biogas, diesel, petrol, liquefied natural gas (LNG), wood and biomass, biodiesel and bioethanol that were sourced from DEFRA (DEFRA, 2021). Country-specific emission intensities were used for electricity[4] and district heating[5].

2.1.2. Heating and hot water

Participants were requested to indicate their primary fuel type utilised for space heating in 2021 from the provided alternatives: natural gas, LPG, biogas, heating oil, electric heat pumps, electricity (excluding heat pumps), district heating, wood/biomass, solar thermal, or other. In cases where participants selected "other," they were given the opportunity to manually specify

[4] https://www.eea.europa.eu/ims/greenhouse-gas-emission-intensity-of-1

[5] https://ens.dk/en/our-services/statistics-data-key-figures-and-energy-maps/key-figures, https://www.fedene.fr/reseaux-de-chaleur-et-de-froid-les-chiffres-clefs-edition-2019-ont-ete-publies/, https://www.co2online.de/modernisieren-und-bauen/heizung/fernwaerme/, https://www.airu.it/teleriscaldamento-e-sistemi-energetici-integrati/, https://irees.de/2021/10/18/district-heating-and-cooling-trend-interactive-report/

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their space heating type. When necessary, we manually reassigned the type of heating fuel; for instance, "pellets" was recorded as "wood/biomass". In instances where participants did not know which type of heating fuel was used to heat their dwelling or if the information was missing, the most frequent in that country was used (natural gas in Germany[6] and Italy[7], biomass in Latvia[8], electricity in France[9] and district heating in Denmark[10]).

We estimated the energy consumption associated with heating purposes in 2021 in one of three ways, depending on the fuel source and information that participants were able to provide. An overview is visible in Figure 3.

Energy consumption related to heating was estimated for the participant's household using one of the following methods:

The first calculation method used the energy consumption for heating in 2021 provided by participants based on their bills or on estimates for natural gas (in kWh or m³)[11] or electricity (in kWh)[12].

The second calculation method was used if the energy consumption of natural gas or electricity was not known by participants, or if the main heating source was heating oil. Participants provided their heating expenditures (based on bills or estimates) in 2021. To estimate energy consumption, heating expenditures were divided by the average cost of electricity[13], heating oil[14], and natural gas[15] for household consumers in 2021 in the respective country.

[6] https://www.bmwk-energiewende.de/EWD/Redaktion/EN/Newsletter/2021/02/Meldung/direkt-answers-infographic.html

[7] https://www.istat.it/it/files/2022/06/REPORT-CONSUMI-ENERGETICI-FAMIGLIE-2021-DEF.pdf

[8] https://ec.europa.eu/energy/sites/default/files/documents/lv_ca_2020_en.pdf

[9] https://www.bva-group.com/wp-content/uploads/2018/03/PRESSE-REGIONALE-FONCIA-Observatoire-de-la-vie-quotidienne-Mars-2018-L%C3%A9nergie.pdf

[10] https://ens.dk/sites/ens.dk/files/Statistik/energistatistik2019_dk-webtilg.pdf

[11] If the consumption of natural gas was provided in m³, it was converted into kWh using a rate of 10kWh per m³ of gas.

[12] Only participants who heated using electricity and natural gas were asked their consumption as participants are more likely to know this information for these fuel sources.

[13] https://ec.europa.eu/eurostat/databrowser/view/NRG_PC_204_C__custom_3540637/default/table?lang=en

[14] https://www.bmwi.de/Redaktion/DE/Binaer/Energiedaten/energiedaten-gesamt-xls.xlsx?__blob=publicationFile&v=117

[15] https://ec.europa.eu/eurostat/databrowser/view/nrg_pc_202/default/table?lang=en

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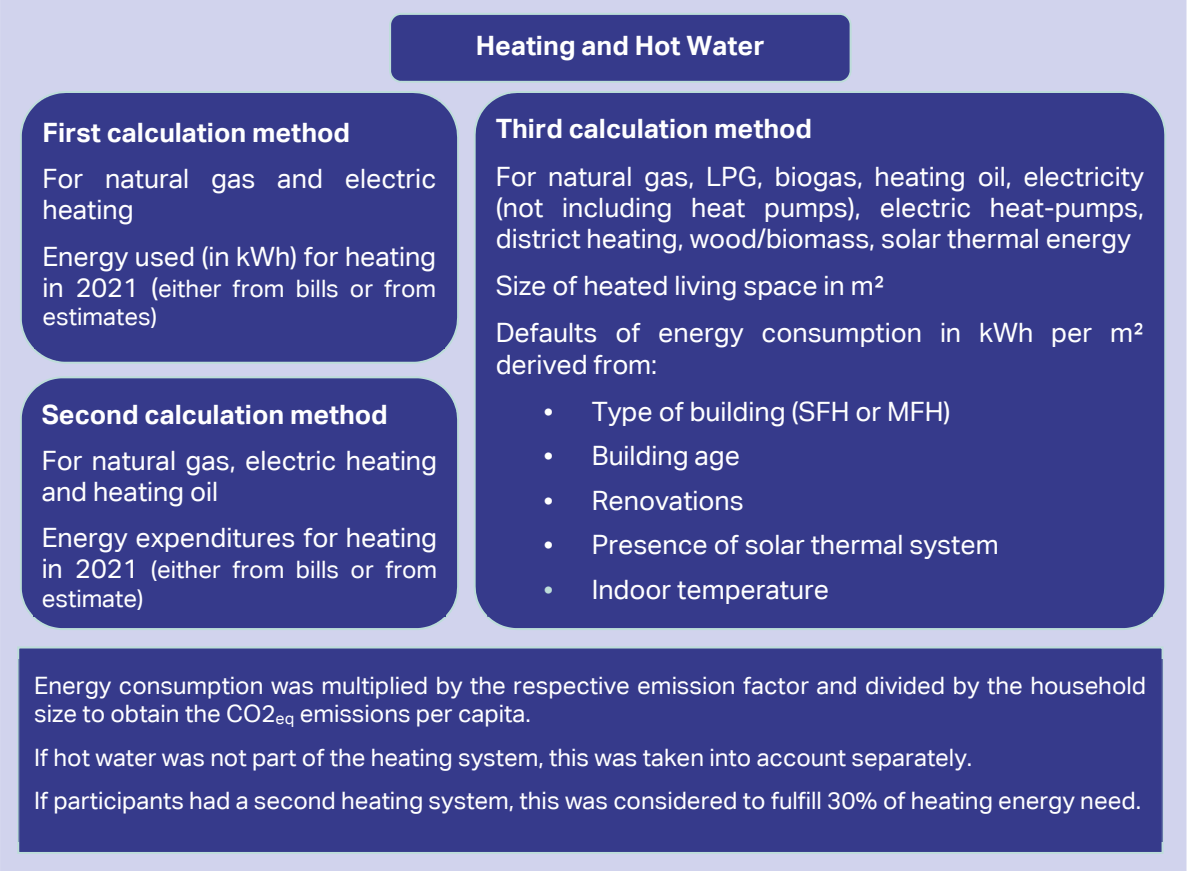
Figure 3 Heating and hot water CO_{2eq} calculation method



Finally, if neither billing-data nor estimates on energy consumption and heating expenditures were available or if a different fuel type was used, heating demand was estimated based on the size of the heated living space in m^2 and default values for final energy demand per m^2[16]. These default values vary by building type (single family house, terraced house, multi-family or apartment block), building age[17], types of retrofitting measures implemented (insulation of roof, insulation of exterior walls, insulation of ceiling in cellar, exchange of majority of windows)[18] and timing of retrofitting measures. Participants then stated whether they had a solar thermal heating system in addition to their main heating system. If so, their energy demand was reduced by 25% (IRENA, 2015). Furthermore, participants were asked to report the typical temperature at which they heated their main living room in 2021, and to state whether the temperature was read from a thermometer or whether it was estimated. Each degree increase (or decrease) compared to the assumed temperature in the default data (between 19°C and 21°C depending on the country) was considered to constitute an increase (or decrease) of energy consumption for heating of 6.5%[19]. Considering that the default energy consumption values were specific to

[16] Data was sourced from country reports available from https://episcope.eu/building-typology/country/. Since very little data was available for buildings in Latvia, default values for Poland were used instead.

[17] The age categories varied depend on the countries to reflect the different building norms and regulations. For example, the categories in Germany are: (built before 1918, 1919-1948, 1949-1978, 1979-1994, 1995-2001, 2002-2009, 2010-2015, and built after 2016.

[18] The following energy savings were used for renovations after 2001: 7% for the roof/attic, 19% for exterior walls, 10% for the basement ceilng, 5% for windows and 30% for the installation of a new heating system as per https://www.co2online.de/modernisieren-und-bauen/daemmung/fassadendaemmung/ and https://www.co2online.de/modernisieren-und-bauen/heizung/heizung-kaufen-modernisieren/#c94099. The savings attributed to renovations pre-1978 were assigned a savings factor of 25% of the respective saving estimates and pre-2000 a savings factor of 50%.

[19] https://www.co2online.de/energie-sparen/heizenergie-sparen/heizkosten-sparen/richtig-heizen-die-10-besten-tipps/#c27389; https://expertises.ademe.fr/professionnels/entreprises/performance-energetique-energies-renouvelables/lenergie-commerces/dossier/chauffage-magasin/tout-quil-faut-savoir-chauffage.

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particular energy sources (such as natural gas or electricity), an energy carrier factor was applied [20] when the energy source used was different from the assumed energy source in the default values. If defaults were used to calculate energy consumption for heating and hot water was not part of their heating system, then 500kWh were removed from their energy heating consumption.

Respondents had the possibility to state if they had a secondary heating system, and if so, which fuel source was used. It was assumed that the secondary heating system corresponded to 30% of their heating needs and their carbon footprint for heating was thus adjusted accordingly. If participants provided two sources of heating, the first one mentioned was considered to be the main heating source. Two different methods were used to estimate the energy consumption of the secondary and/or primary heating systems, depending on the calculation method for the main heating system:

- If the energy consumption of the main heating system was calculated using method 1 or 2 (i.e., using expenditures or kWh), then the energy consumption of the secondary heating source was calculated using the following formula:

$$kWh_{secondary\ system} = kWh_{primary\ system} * 0.3/0.7$$

- If defaults were used to calculate the energy of the main heating system, then the following adaptations were undergone:

$$kWh_{secondary\ system} = kWh_{primary\ system\ default} * 0.3$$
$$\text{and: } kWh_{primary\ system} = kWh_{primary\ system\ default} * 0.7$$

Heating-related CO_{2eq}-emissions were then estimated using the relevant emission factor(s) (cf. Section 2.1.1), if relevant adding the emissions from the primary and secondary heating systems, and divided by the number of household members, with no differentiation between adults and children.

Participants were further asked whether the generation of hot water for bathing and other purposes was included as part of their space heating system[21]. When this was not the case, CO_{2eq}-emissions linked to heating hot water were calculated using the energy source, the relevant emission factor, and the assumption that a person uses 500kWh of energy per year for hot water. When participants stated that they had a solar thermal system for hot water in addition to their main heating system, their energy demand and thus their heating-related CO_{2eq}-emissions for hot water was reduced by 60% (IRENA, 2015).

If respondents stated that they used no heating in 2021, then they were attributed zero emissions for heating.

2.1.3. Transport

For transport-related emissions, we distinguished between distances travelled by private cars, motorcycles, and airplanes[22]. This includes travelling as a passenger and driver, for trips to and from work. Business trips were excluded from the questionnaire - and thus the analysis - due to the scope of the project.

For *private car use* we asked participants to report (or estimate as precisely as possible) the total number of kilometres travelled in 2021. This value was then adjusted using the average rate of

[20] Energy carrier factors were calculated using estimates from https://www.heizspiegel.de/heizkosten-pruefen/heizspiegel/

[21] If participants did not know then it was assumed that hot water was heated as part of their heating system.

[22] Cruises were removed from the questionnaire as hardly any cruises operated in 2021 due to the pandemic.

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occupancy for each country[23]. If participants did not know the distances they travelled by car, we used defaults from national data on travel averages that take into consideration gender and age [24]. We further asked for fuel consumption and the fuel type of the car respondents used the most. We thereby distinguished between gasoline, diesel, natural gas, liquefied petroleum gas, bio-diesel/ethanol, electricity and gasoline/diesel for hybrid cars[25], and electricity[26]. For participants who failed to report the average fuel consumption of their vehicle, we used default values distinguishing between large cars (including SUVs), midsize/compact cars, and small/sub-compact cars, and fuel types[27]. Multiplying fuel consumption and distance travelled per capita yielded our estimate for the per-capita fuel consumption. Multiplying this figure by standard emission factors of fuels yielded per capita CO_{2eq}-emissions related to private car use.[28]

To calculate the CO_{2eq}-emissions related to *motorcycle* use we applied the same logic as for private car use. For fuel types, we distinguished between gasoline, diesel and electricity. For participants who failed to report fuel consumption, we used default values distinguishing between small motorbikes/scooters (up to 300 cm³), motorbikes between 301-600 cm³, motorbikes between 601-1000 cm³, and motorbikes over 1000 cm³, and fuel types[29]. If participants failed to report fuel consumption, we used defaults for petrol[30].

To calculate the CO_{2eq}-emissions related to *aviation*, we asked participants to report the number of flights they took in 2021 for private purposes (e.g. for vacation, but not business trips or trips with a sporting airplane). Participants were asked to distinguish between very short trips up to 500km (less than 1-hour flight time), short trips between more than 501 and 1500km (between 1 and 2 hours' flight time), medium trips between more than 1501km to 3000km (between 2 and 4 hours' flight time), long distance trips between more than 3001km to 10000km (between 4 and 12 hours' flight time), and very long distance trips over 10000km (over 12 hours' flight time). We asked participants to count flights with stop-overs as one flight and to count outbound and return flights as two separate flights. Various country-specific examples were provided in the questionnaire in order to help participants more accurately determine the distance travelled for each flight. We then calculated the aviation-related CO_{2eq}-emissions as the product of the number of flights per category and the corresponding emission factor[31]. We thereby took into account that when CO_{2eq}-emissions are emitted at higher layers of the atmosphere, they have a much greater impact on the climate there than when they are emitted close to the ground.

[23] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Passenger_mobility_statistics&oldid=551014#Passenger_car_occupancy, https://www.statistiques.developpement-durable.gouv.fr/sites/default/files/2022-07/datalab_essentiel_281_se_deplacer_en_voiture_juillet2022.pdf, https://stat.gov.lv/en/statistics-themes/business-activities/passenger-traffic/press-releases/1753-latvijas-iedzivotaju.

[24] https://www.mobilitaet-in-deutschland.de/archive/publikationen2017.html, www.statistiques.developpement-durable.gouv.fr/resultats-detailles-de-lenquete-mobilite-des-personnes-de-2019?rubrique=60&dossier=1345, https://www.cta.man.dtu.dk/-/media/centre/modelcenter/tu_2022/tu_danmark_2021.pdf?la=da&hash=56DB01F23EBA710684491D2736D9F72DC870EF19.

[25] We assume 60% of distance is travelled using diesel/gasoline based on Plötz et al. (2020).

[26] Fuel consumption values that were higher (or lower) than the highest (or lowest) values provided in spritmonitor.de were considered implausible and were attributed default values.

[27] In the survey, we provided country-specific examples of the most popular models in each class. Fuel consumption defaults were obtained using data taken from spritmonitor.de on the 6.07.2022. There may be a bias in that people who drive in a more economic way may be more likely to upload their data and thus the results might not be representative. However, it should be a sufficient approximation for the survey's purposes.

[28] https://www.co2online.de/klima-schuetzen/mobilitaet/auto-co2-ausstoss/.

[29] Values also obtained from spritmonitor.de.

[30] https://de.statista.com/statistik/daten/studie/468850/umfrage/kraftrad-bestand-in-deutschland-nach-kraftstoffarten/.

[31] https://www.atmosfair.de/de/.

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2.1.4. Electricity consumption

Participants were requested to provide information regarding their household electricity consumption for the year 2021, either based on bills or through estimation, measured in kilowatt-hours. In cases where participants were unaware of their electricity consumption, they were asked to report the amount paid for electricity during that period. Subsequently, electricity consumption was estimated by dividing the electricity expenditures by the national average electricity prices for households[32].

For participants who neither knew their electricity consumption nor their electricity bill we used default values distinguishing by household size (1, 2, 3, 4, 5 >6 persons), and building type (single family (SFH) or multi-family buildings (MFH))[33]. In some countries, no data on electricity consumption was available that was differentiated by building type and/or by household size. We therefore used estimates that were obtained using the percentage of individuals living in SFH (rather than in MFH)[34], and the proportional difference between electricity consumption between households in SFH and MFH in Germany[35]. In order to improve the accuracy of the electricity consumption data, we asked individuals whether they possessed and used items with very high electricity consumption in 2021 (air conditioner, swimming pool, electric sauna, water bed, hot tub, and aquarium). We then added the associated electricity consumption of the appliances[36] to the default electricity consumption.

In addition to household electricity consumption data, participants were asked to indicate if they generated electricity from rooftop photovoltaic (PV), or plug-in PV installations. In such cases, participants were requested to provide information (based on bills or estimates) regarding the electricity generated from these sources specifically in 2021[37]. Electricity generated from these sources was deducted from the total household electricity consumption.

To calculate CO_{2eq}-emissions pertaining to electricity consumption, we took into account whether households subscribed to a green electricity tariff (and if so, for how many months of the year). In this case, electricity-related CO_{2eq}-emissions were set to zero for the length of time

[32] https://ec.europa.eu/eurostat/databrowser/view/NRG_PC_204_C__custom_3540637/default/table?lang=en.

[33] https://www.stromspiegel.de/presse/begleitmaterial/, https://estimation-energie.selectra.info/resultats, https://www.autorita.energia.it/allegati/docs/dc/03/dc_fasciasociale.pdf#page=54, https://ny.sparenergi.dk/elforbrugsberegner, https://ny.sparenergi.dk/elforbrugsberegner.

[34] https://ec.europa.eu/eurostat/cache/digpub/housing/bloc-1a.html.

[35] Taken from https://www.stromspiegel.de/presse/begleitmaterial/.

[36] Estimated using the following sources and assumptions:
For a swimming pool: https://www.hellowatt.fr/suivi-consommation-energie/consommation-electrique/piscine, assuming a 40m² swimming pool, filtered 15h/day, heated 5 months/year with a heat pump;
For an electric sauna: https://www.energie.web.de/ratgeber/verbrauch/stromverbrauch-sauna/, assuming an output of 7kW and a usage of 2 hours/week;
For a water bed: https://www.energie.web.de/ratgeber/verbrauch/stromverbrauch-wasserbett/, assuming an output of 1,125kW and 8 hours use per day;
For a hot tub: https://stromrechner.com/stromverbrauch-whirlpool/, assuming that the circulation pump is on 24h/day, the tub heated for 1h/day with 15 minutes' massage/day;
For an aquarium: https://www.energie.web.de/ratgeber/verbrauch/stromverbrauch-aquarium/ assuming a 200 l aquarium heated to 25°C;
For air conditioning: https://www.energie.web.de/ratgeber/verbrauch/stromverbrauch-klimageraet/ assuming a power of 0,5kW, a running time of 4 hours a day in Germany, Denmark and Latvia, and 6 hours a day in France and Italy, and running 4 months a year in Germany, France, and Italy and 1 month a year in Denmark and Latvia

[37] If individuals did not know how much energy was produced by their PV system, we used defaults obtained from https://www.langfristszenarien.de/enertile-explorer-de/szenario-explorer/erneuerbare.php assuming an installed peak PV power of 5kWp and a central location for each country.
For plug-in PV systems we used the same method but with 0,5kWp (https://www.pv-magazine.de/2021/06/24/schlaglichter-auf-stecker-solar-anlagen/).

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that they had a green electricity tariff[38]. We calculated the per-capita electricity consumption by dividing the household electricity consumption by the number of household members.

Furthermore, if applicable, electricity used for charging electric cars at home, space heating, and water heating was deducted from the calculated household electricity consumption in order to accurately account for these specific uses.

We then calculated electricity-related CO_{2eq}-emissions per household by multiplying (net) electricity consumption by the national emission intensity for electricity (cf. section 2.1.1).

2.1.5. Diet

To calculate the diet-related CO_{2eq}-emissions, we asked participants to best characterise their typical diet distinguishing between meat-based (1970kg CO_{2eq}) balanced/mixed (1690kg CO_{2eq}), low-meat (1500kg CO_{2eq}), vegetarian (1310kg CO_{2eq}), pescatarian (1310kg CO_{2eq}) and vegan (950kg CO_{2eq}) diets. The associated greenhouse gas emission factors consist of the averages from various sources (ADEME, n.d.; Bruno et al., 2019; Corrado et al., 2019; Hallström et al., 2015; Meier & Christen, 2013; Pairotti et al., 2015; Rosi et al., 2017; Saxe et al., 2013; Umweltbundesamt, n.d.; Werner et al., 2014).
In the second step, the responses were adjusted according to the regionality and seasonality of the diet as reported by participants. Here we drew on the approach as performed by UBA[39] for Germany: If the participant reported that they always purchase regional food, the associated emission value was multiplied by 0.95, reflecting a presumed 5% reduction in emissions. Conversely, if the food choices were consistently non-regional, the value was multiplied by 1.05, indicating a presumed 5% increase in emissions. For the options "almost always" and "rarely" we would use values of 0.975 and 1.025, respectively.

Finally, the CO_{2eq}-emission level for diet was adjusted by gender and age. According to DGE e.v., 2015, men consume on average 27% more calories than women and people over 50 consume 10% more than people under 25. Thus, the CO_{2eq}-emissions associated with diet were multiplied by 0.86 for women and by 1.14 for men to reflect this difference and similarly adjusted for age.

2.1.6. Miscellaneous

In addition, to cover further lifestyle aspects, we decided to include CO_{2eq}-emissions related to pets, clothing consumption[40], and carbon compensation.

To this end, participants were asked to provide the number of clothes they purchased in 2021, distinguishing between small items of clothing (shirt, t-shirt, skirt), medium items of clothing (jumper, shoes, pair of jeans) and large items of clothing (dress, coat). Participants were specifically requested not to include very small items such as socks and underwear. Each item of clothing was associated a carbon footprint of 15, 20 and 25kg CO_{2eq} respectively (ADEME, 2018). However, some participants from Denmark stated that they had bought over 1000 items of clothing. We believe that the question was misunderstood and respondents answered in DKK rather than items of clothing. We cannot guarantee that this was not the case in the other countries in euros, thus the question was removed from subsequent analysis.

Regarding pets, only emissions related to pet food were considered. We assume that other factors such as taking the car to reach a destination to go for a walk or increased energy

[38] Whether green electricity tariffs actually lead to lower CO_2 emissions is contested. First, in terms of physical flows, unless the power plants that are producing electricity on the grid at the time electricity is used happens to be a renewable plant, electricity demand of a green tariff customer causes emissions. Second, total emissions of installations governed by the EU Emissions Trading System (EU ETS) are fixed. Hence, because of the so-called waterbed effect, any emission reductions by a fossil-fueled power plant will be offset by an increase in emissions of equivalent magnitude by other installations covered by the EU ETS (e.g. Perino et al. (2019)).

[39] https://www.umweltbundesamt.de/publikationen/der-uba-co2-rechner-fuer-privatpersonen

[40] GHG emissions related to clothing consumption cover lifecycle emissions.

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consumption due to the presence of a cat flap are already covered in the transport and heating sections.

To calculate pet-related emissions, we asked participants to provide the number of cats and dogs according to the following categories:

- Cats
- Small dogs (less than 10kg)
- Medium dogs (10-20kg)
- Large dogs (over 20kg)

The associated carbon emissions related to the pet's diet are 200kg CO_{2eq} per cat (Martens et al., 2019), 375kg CO_{2eq} per small dog, 631kg CO_{2eq} per medium dog and 1056kg CO_{2eq} per large dog (Yavor et al., 2020).

The above values assume the consumption of conventional pet food.

Dog owners were asked to provide the main diet of their dog, distinguishing between the following categories:

- Raw meat, organs and bones (aka. BARF for Bones And Raw Food)
- Conventional dog food (wet or dry)
- Insect-based
- Plant-based or vegetarian

The associated carbon emissions related to the dogs' diet were multiplied by the following adjustment factors compared to a conventional diet: an adjustment factor of 2 for a BARF diet (Annaheim et al., 2019), 0.75 for an insect-based diet (Oonincx & Boer, 2012) and 0.5 for a plant-based diet.
The carbon footprint for pets was divided by the household size assuming collective ownership of the pet.

Participants were also asked whether they had compensated carbon emissions, and for how many of their emissions. However, few people claimed to have compensated for carbon emissions and the numbers provided were inconclusive (e.g., possible confusion between tons and kg). We thus decided not to include this in the calculator as it was unclear whether the question was correctly answered.

To mitigate data input errors, we included plausibility checks for several items. Consequently, participants could only enter answers that lay in a reasonably pre-defined range. To this end, the number of working hours per week could range between 0 and 80, participants had to indicate that at least one adult (they themselves) lived in their home and could indicate that 0 to 12 children lived there, too. Further, values for apartment size were required to range between 1 m^2 and 3,000 m^2. We also added plausibility checks for the expenditures (50 - 5,000€) and consumption (500 - 50,000kWh) of electricity per year. In the Danish survey, we adapted the cost check to be 350 - 40,000DKK. The PV-generated electricity per year was allowed to range between 0 and 20,000kWh. The indoor temperature in participants' homes was allowed to range between 10 and 30°C. For distance travelled by car or motorbike in 2021 we allowed values between 0 and 200,000km only. Fuel consumption for gasoline, diesel, and LPG-fuelled cars had to lie between 3 l/100km and 32 l/100km. For CNG fuelled cars, that range was set to be 2 - 12kg/100km. For electric cars, the consumption could range between 9 and 50kWh/100km. Fuel consumption of motorbikes had to range between 1 and 15l/100km. The maximum number of flights per distance (very short, short, medium, long, very long) was allowed to be 500 each within the survey; during data analyses the maximum number of flights per person was restricted to 150. The number of weeks people spent on vacation away from home could range between 0 and 52. Participants who were away from their home for 13 weeks or more were removed from the analysis.

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2.2. Well-being

As outlined in D2.3, several definitions of well-being and quality of life exist. To achieve a measurable indicator of well-being, we implemented an adapted version of the quality of life scale from the World Health Organisation (WHO). The WHO defines the construct as follows: "Quality of life is defined as individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns." (World Health Organization, 1996, p. 5) Importantly, this definition does not aim to assess objective measures but the **individual's perception of quality of life**. It does not focus on medical diseases or diagnoses but instead on the effect and impact of diseases and symptoms and, ultimately, how they affect everyday life. Based on research with international health professionals and patients in 18 countries and 19 languages, the short version of the original WHO-Quality of life scale (WHOQOL-BREF) comprises 24 items measuring the following 24 facets and two additional items measuring the domain "overall quality of life and general health", as outlined in Table 1 (World Health Organization, 1996, p. 6):

Table 1 Domains and facets of the WHOQOL-BREF measurement and the implemented items in FULFILL

Domain	Facet	Items included in FULFILL survey
Overall quality of life and general health	*How would you rate your quality of life?*	Yes
	How satisfied are you with your health?	Yes
Physical health	1 Activities of daily living	No
	2 Dependence on medicinal substances & medical aids	Yes
	3 Energy and fatigue	No
	4 Transport	No
	5 Pain and discomfort	No
	6 Sleep and rest	No
	7 Work capacity	Yes (adjusted)
Psychological health	8 Bodily image and appearance	No
	9 Negative feelings	Yes
	10 Positive feelings	No
	11 Self-esteem	Yes
	12 Spirituality/religion/personal beliefs	Yes
	13 Thinking, learning, memory and concentration	No
Social relationships	14 Personal relationships	No
	15 Social support	Yes (adjusted)
	16 Sexual activity	No
Environment	17 Financial resources	No (see deprivation items)
	18 Freedom, physical safety and security	No
	19 Health and social care: accessibility and quality	No
	20 Home environment	Yes
	21 Opportunities for acquiring new information and skills	

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	22 Participation in and opportunities for recreation/leisure activities	No Yes
	23 Physical environment (pollution/noise/traffic/climate)	
	24 Transport	No Yes

The WHOQOL-BREF was created to arrive at a measure of quality of life that can be applied cross-culturally. The intention of its development was to have a holistic and systemic approach to health aspects and quality of life. Thus, the measure appears relevant and applicable for the sufficiency research in FULFILL. However, to avoid being overburdening survey participants, we adjusted the WHOQOL-BREF slightly to fit the project's objectives and implemented only 11 items (see Table 2- italicised items were included; for exact wording of the items see Annex 1). Considering the context and the research aim, we closely inspected the items and selected those items that appeared most relevant for answering the research question. At the same time, we evaluated that (i) the content is not covered by other items in the questionnaire and that (ii) we do not omit one of the WHO-categories. Thus, at least one item per category is included in the final questionnaire to complement the other items in the questionnaire (but avoiding redundant questions). Moreover, we framed all instructions in a way to relate to the year 2021. This ensured that the carbon footprint calculator referring to the emissions in 2021 could be combined with the well-being score. Due to the adjustments, we applied an analysis approach that differs slightly from the established approach from the WHO, for instance, we did not calculate domain scores due to the limited number of implemented questions. Since the resulting data are not fully comparable with the WHOQOL-BREF results and/or the results of the long version (WHOQOL-100), we did not perform the respective transformations. However, the data cleaning procedures as recommended by the WHO were applied. After reverse-coding the two negatively phrased items, we computed a mean score across all implemented items. The score is scaled in a positive direction (i.e. higher scores denote higher quality of life).

2.3. Identification of sufficiency lifestyles

In the previous sections, we have described how we measured the environmental impact of the individual lifestyle via the carbon footprint, and how we measured physical, psychological or social well-being via the well-being index.

We understand a sufficiency-oriented lifestyle to be characterised by having a low environmental impact - that is, carbon footprint - in all four activities (electricity, diet, heating and hot water, and transport), in addition to having a high score on the well-being index.

A detailed description of how individuals with a sufficiency-oriented lifestyle were identified can be found in section 2. Overall, we take a relative approach, i.e., we categorise people as low on emissions if the emissions attributed to them are lower than those from other members in the respective country. The same applies to well-being.

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3. Further variables under examination

The following section presents various other variables included in the survey. The aim of these variables was either to allow us to gain a deeper understanding of the drivers and barriers that encourage the adaptation of sufficiency lifestyles, such as socio-economic and psychological variables. Others allow us to verify the results by assessing whether respondents are afflicted by deprivation or by gender-inequality.

3.1. Socio-economic variables

After presenting participants with the questions relevant to the quota (age, gender, income, region), which were programmed and monitored by the market research institute, we started the questionnaire by asking the participants about their current employment/retirement status and the year in which they moved into their 2021 residence.

Given that several of the variables are gender dependant, we decided to exclude non-binary individuals from this deliverable as there is currently no data or method available that allows us to treat these cases in a non-biased manner.

Next, we asked those who moved into their 2021 residence in 2021 about the specific month of that year in which they moved in and those who worked about the number of hours per week they were working. These questions were followed by some more general questions about education, postal code and number of people in the household. The next section was all about household questions. We asked participants about their household income and whether they perceived it as comfortable or not, how they shared the household income among the household members, if they rented or owned their dwelling and how they shared the responsibilities for different household duties (e.g., cleaning, laundry, shopping, etc.). Then we asked about whether they themselves or another household member suffered from a chronic illness or disability, whether they had close relatives abroad whom they visited on a regular basis and whether they had a second home in the same or another country.

3.2. Attitudinal variables

Towards the end of the survey, we asked participants about their political orientation by presenting five different policies and asking how strongly they identified with each of them. These policies reflected national, social, liberal, environmental and conservative orientations.

Furthermore, we asked participants about their environmental identity. This concept is commonly used as a specific form of self-identity referring to pro-environmental actions. A self-identity is understood as a label to describe oneself in order to differentiate oneself from others but also to conform with the norms of a specific social group (Whitmarsh & O'Neill, 2010). We used 3 of the 4 items from the scale developed by Whitmarsh & O'Neill (2010) to measure environmental identity.

3.3. Practice oriented measures of sufficiency

Furthermore, for the different activities under study, additional questions were asked providing a further indication on the lifestyle and in how far it is in line with a sufficiency lifestyle in the sense of reducing carbon emissions. For housing this included a question on whether people preferred a smaller or bigger place of living compared to the current one. Hot water use was taken up by the frequency of taking hot baths and showers. People were also asked how often they walk, cycle or take public transport in addition to car and plane use, which was part of the carbon footprint calculator. For electricity, the questionnaire encompassed that people were asked to indicate what type and how many electricity-intensive appliances they had in their household in 2021 (e.g., electric sauna, air conditioner) as well as a variety of digital devices (e.g. smartphone, gaming consoles).

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On a more general level, six items built on a scale measuring sufficiency orientation developed by Loy et al. (2021) were included. The items of this scale referred to the preference to own a few things only or a perception of affluent consumption in shops. This was complemented by two items asking whether people considered renting or sharing.

3.4. Structural aspects

Especially with regard to transport structural conditions can play an important role in limiting transport options. Therefore, the questionnaire also asked respondents to indicate whether or not they were able to reach a variety of places such as health care, shops or sports facilities within 15 minutes of cycling or walking.

3.5. Social deprivation

For transport, electricity/heating, and diet the survey included items eliciting the extent to which participants felt socially deprived in these domains in 2021, i.e., to what extent they could not afford (for financial reasons) goods, services and activities considered common. We also added several items capturing social deprivation at an aggregate level. More specifically, the items on social deprivation in transport pertain to the frequency participants were unable to participate in cultural events or in sports activities, visit a doctor or keep an appointment with the administration because they did not have the transportation they needed. We also asked how often they worried about inconveniencing their peers because they needed help with transportation and how often they thought that someone did not invite them to an event because of problems with transportation (Murphy et al., 2021).

The items capturing social deprivation related to energy/heating asked about participants' ability to pay their home energy bill, their fear of being disconnected from energy services and their ability to keep their home at temperatures that they felt were unsafe or unhealthy during summer and winter months. These items were adapted from the US Residential Energy Consumption Survey (EIA, 2005).

The items on social deprivation related to diet asked how often participants were unable to afford eating balanced meals and how often they were worried food would run out before they got money to buy more. Both items are based on the Food Insecurity Experience Scale of the UN Food and Agricultural Organization[41]. In addition, we asked participants how often they were unable to eat as much meat (not for vegetarians), dairy products (not for vegans), high quality food (e.g., special fruit or vegetables), and locally grown or organic products because they were too expensive.

Finally, we elicited social deprivation at an aggregate level through a set of items inquiring the extent to which participants had to lower expenses for basic necessities, were unable to afford unexpected expenses, spending a week's vacation away from home, and whether they received any financial support from the government. These items were adapted from BMAS[42].

3.6. Gender dimension

To be able to document the impact on the gender dimension and the gendered distribution of paid and unpaid work as well as access to resources on the household level, we asked people within a household with more than one member how cleaning, shopping, laundry, organisation of social life, paying bills and decision making around contracts and investment was shared as well as the access to financial resources. It is important to note that this neglects aspects related to the androcentric organisation of today's society outside the home, e.g. in working life or the transport system.

[41] https://www.fao.org/in-action/voices-of-the-hungry/fies/en/

[42] https://www.armuts-und-reichtumsbericht.de/SharedDocs/Downloads/Berichte/sechster-armuts-reichtumsbericht.pdf?__blob=publicationFile&v=2

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4. Survey implementation

The citizen surveys in WP3 are designed as demographically representative national online surveys in Denmark, France, Germany, Italy, and Latvia. The intended sample size was 1500 participants in Latvia and 2000 participants in each of the other countries. The lower sample size in Latvia was due to its smaller population and challenges to finding a subcontractor for participant recruitment. The surveys were fielded one after the other across summer 2022 with Germany starting in mid-August and finally Denmark and Latvia where the fieldwork ended in early October. France and Italy were implemented in between.

4.1.1. Procedure

The questionnaire was implemented via the EFS software. Prior to fielding the survey, extensive pre-tests were carried out in all countries. The responses obtained in the pre-tests allowed to test the length of the questionnaire and participants' understanding of the different tasks and questions. Necessary adjustments were made before the final questionnaire was translated from English into national languages and back translated (for quality control). The survey was then administered in Denmark, France, Germany, Italy, and Latvia through existing household panels of a professional market research institute via subcontracting. Representative samples were drawn in each country by quota sampling, taking into account the distribution of the target population by gender, age, income and region.

The survey contained two quality control questions. In the first question, respondents were asked to provide the result of a simple mathematical problem (the sum of 2 and 4). For the second attention check, respondents were asked to check a particular answer option among all options available in a matrix question. Respondents who failed both control questions were excluded from the survey. 4 respondents in France, 2 in Germany, 3 in Latvia, 4 in Italy and 2 in Denmark were excluded from the survey for this reason. Furthermore, due to a technical bug in the survey administration, a few participants answered the survey twice. To ensure data quality and since we could not determine which of the two answer sets per participant were "correct", we decided to exclude all datasets from participants who answered twice. This concerned 14 datasets in Denmark, 24 in France, 10 in Germany, 18 in Latvia, and 22 in Italy.

Based on the results from the pre-tests, we gathered that average participation in our survey lasted around 20 minutes, with a standard deviation of about 10 minutes. As another measure to ensure data quality, we implemented a filter in the online survey to screen out participants who took less than 4.5 minutes (mean - 1.5 standard deviations) to complete the survey.

4.1.2. Survey design overview

The survey started with an introduction informing participants about survey procedures, anonymity, privacy and data protection, as well as their right to withdraw at any time.

The introduction was followed by screening questions to ensure that quota requirements were met and that only qualified participants (i.e., being 18 years or older and not living in a dorm or similar) participated in the survey.

We implemented nationally representative quotas for the following variables (see Table 6 in the next section for the categories):

- Age (4 categories)
- Gender (male, female)
- Region (NUTS 1)
- Household net income per year (4-5 categories)

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Participants who did not fulfil the quota requirements received a message informing them that they were not eligible to participate and were automatically directed back to the survey institute's website.

The survey had five parts:

- General questions: socio-economic items and standard items eliciting citizens' values and attitudes, socio-cultural characteristics (incl. gender) and socio-political opinions
- Carbon footprint calculator: questions relating to living conditions and electricity, heating, transport, diet and miscellaneous
- Health and well-being
- Deprivation of transport, heating/energy, diet, and at the aggregate level
- Attitudinal variables: environmental identity, political orientation

The full questionnaire is included in Annex 1. It was developed in English and then translated into national languages by a professional translation agency. This translation was checked by the respective partners from the countries.

4.1.3. Data preparation

The plausibility checks aimed to reduce the number of outliers. As expected, some outliers are still present and will be highlighted in the following analysis.

Respondents were asked if they were over 18 and if they lived in a hostel or similar. Minors and individuals in hostels were thanked for their participation but told that they did not fulfil the requirements of the survey.

The carbon footprint was only calculated for individuals who did not move in 2021 and who spent 12 weeks or less away from home because they were on holiday. This resulted in removing around 200 respondents in each country. We thus obtained samples of 1803 participants in Germany (from 2016), 1889 in Denmark (from 2169), 1857 in France (from 2146), 1382 in Latvia (from 1556) and 1936 in Italy (from 2153). More details describing the reduced samples can be found in Table 6. In summary, people who were more likely to have moved in 2021 are young women studying or working as well as tenants.

Individuals who provided a larger heated space than living space were also excluded from the analysis, as visible in Table 2.

Table 2 Number and percentage of respondents who provided a larger heated space than living space

Denmark	France	Germany	Italy	Latvia
38 (2%)	21 (1%)	0 (0%)	35 (2%)	13 (1%)

We thus obtained a sample size of 1851 in Denmark, 1836 in France, 1803 in Germany, 1901 in Italy, and 1369 in Latvia.

When participants provided a response manually which was offered in some questions. These were manually recoded to the corresponding category where appropriate.

For the carbon footprint calculator, missing values were replaced with national defaults. If possible, these were estimated using socio-demographic and other relevant variables. For example, the default electricity consumption was estimated using household size and type of building, and defaults for distance travelled by car were estimated using the national average distance travelled by age and gender. When respondents answered "I don't know", their response was treated the same way as missing values.

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Table 3 Data source electricity

	kWh	expenditures	default
Denmark	32,6%	52,2%	15,2%
France	17,4%	82,2%	0,4%
Germany	39,3%	60,1%	0,6%
Italy	13,0%	86,7%	0,4%
Latvia	37,3%	62,4%	0,3%

Table 3 shows which form of data was used to calculate the carbon footprint associated with the consumption of electricity. Either respondents provided the values in kWh or in expenditures, or we used defaults. In less than 1% of cases, electricity consumption was calculated using defaults in France, Germany, Italy and Latvia. In Denmark, this was the case for 15% of respondents.

On average, estimates using expenditures or kWh to calculate electricity related CO_{2eq}-emissions are 44% higher than if we were to use defaults. This difference could be attributed to a self-selection bias where respondents who have a higher electricity consumption are more likely to be aware of and actively monitor their electricity consumption. This is the case for respondents who own their own dwellings or own several high electricity consumption appliances. On the other hand, respondents who live in a shared or state-owned flat and tend to have a lower electricity consumption are less likely to know and be able to provide their electricity consumption.

Table 4 Data source for heating

	kWh	expenditures	default
Denmark	7,6%	16,4%	76,0%
France	6,6%	69,8%	23,5%
Germany	11,4%	56,1%	32,6%
Italy	6,3%	64,1%	29,6%
Latvia	4,0%	12,9%	83,1%

As demonstrated in Table 4, defaults were used to calculate the carbon footprint for heating in a minority of cases in France, Germany, and Italy (24% to 33%) and in the majority of cases in Denmark (76%) and Latvia (83%). This is because the dominant heating source in Denmark is district heating and biomass in Latvia, both of which are estimated using defaults in our model.

On average, estimates using expenditures or kWh to calculate space heating and hot water CO_{2eq}-emissions are 19% higher than if we were to use defaults.

Table 5 Data source for distance travelled by car

	km provided	default
Denmark	99,9%	0,1%
France	99,6%	0,4%
Germany	99,9%	0,1%
Italy	99,7%	0,3%
Latvia	99,8%	0,2%

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Table 5 shows that at least 99% of respondents in each country provided the distance that they travelled by car in 2021.

4.1.4. Sample description

Representativeness

The samples from all countries are representative in terms of gender, age, income, and region of living as the recruitment of participants included quota on these variables. The following table gives an overview in how far the actual sample aligns with statistics on the population level.

Table 6 Sample description and comparison to national statistics

Country	Variable	Category	Share in population	Share in the sample (N)	Share among people who did not move during 2021 and who spent 12 weeks or less away from home because they were on holiday (n)
Denmark (N=2169, n=1889)	Gender	Male	49.75%	49.10% (1065)	50.66% (957)
		Female	50.25%	50.48% (1095)	48.91% (924)
	Age	18-30	20.35%	19.27% (418)	15.03% (284)
		31-45	24.05%	22.78% (494)	22.71% (429)
		46-60	24.15%	25.63% (556)	27.10% (512)
		> 60	31.25%	32.32% (701)	35.15% (664)
	Income	< 191,100 DKK	25.00%	25.22% (547)	24.09% (455)
		191,100 - 308,900 DKK	25.00%	24.80% (538)	24.88% (470)
		308,900 DKK - 530,200 DKK	25.00%	25.03% (543)	25.52% (482)
		> 530,200 DKK	25.00´%	24.04% (541)	25.52% (482)
	Region	Hovedstaden	31.80%	30.94% (671)	31.18% (589)
		Midtjylland	22.85%	22.36% (485)	22.02% (416)
		Nordjylland	10.05%	10.60% (230)	10.22% (193)
		Sjaelland	14.35%	14.52% (315)	15.09% (285)
		Syddanmark	20.90%	21.58% (468)	21.49% (406)
	Urbanisation	Cities	37.2%	40.57% (880)	39.22% (726)
		Towns or suburbs	30.6%	30.98% (672)	31.33% (580)
		Rural areas	32.2%	27.11% (588)	28.20% (522)
		Unknown	0%	1.34% (29)	1.24% (23)
France (N=2146, n=1857)	Gender	Male	48.40%	46.13% (990)	47.44% (881)
		Female	51.60%	53.49% (1148)	52.23% (970)
	Age	18-30	19.00%	19.20% (412)	15.40% (286)
		31-45	23.45%	22.69% (487)	22.40% (416)
		46-60	24.65%	24.28% (521)	25.79% (479)
		> 60	32.90%	33.78% (725)	36.35% (675)
	Income	< 19,200€	25.00%	24.74%	23.59% (438)

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Country	Variable	Category	Share in population	Share in the sample (N)	Share among people who did not move during 2021 and who spent 12 weeks or less away from home because they were on holiday (n)
		19,200 - 31,200€	27.00%	27.17% (583)	26.55% (493)
		31,200 - 43,200€	23.00%	23.90% (513)	24.50% (455)
		43,200 - 60,000€	16.00%	16.03% (344)	16.80% (312)
		> 60,000€	9.00%	8.15% (175)	8.56% (159)
	Region	Auvergne-Rhône-Alpes	12.40%	12.72% (273)	12.33% (229)
		Bourgogne-Franche-Comté	4.25%	4.33% (93)	4.25% (79)
		Bretagne	5.20%	4.99% (107)	5.44% (101)
		Centre - Val de Loire	3.90%	3.73% (80)	3.45% (64)
		Corse	0.55%	0.37% (8)	0.38% (7)
		Grand Est	8.45%	8.34% (179)	8.56% (159)
		Hauts-de France	9.10%	9.23% (198)	9.26% (172)
		Île de France	18.90%	18.78% (403)	18.90% (351)
		Normandie	5.05%	4.99% (107)	5.17% (96)
		Nouvelle Aquitaine	9.25%	9.46% (203)	9.26% (172)
		Occitanie	9.20%	9.46% (203)	9.42% (175)
		Pays de la Loire	5.90%	6.06% (130)	5.87% (109)
		Provence-Alpes-Côte d'Azur	7.80%	7.55% (162)	7.70% (143)
	Urbanisation	Cities	37.2%	46.41% (996)	46.19% (848)
		Towns or suburbs	28.5%	16.63% (357)	16.67% (306)
		Rural areas	34.3%	30.19% (648)	30.56% (561)
		Unknown	0%	6.76% (145)	6.59% (121)
Germany (N=2016, n=1803)	Gender	Male	49.30%	48.56% (979)	49.69% (896)
		Female	50.70%	51.24% (1014)	50.19% (905)
	Age	18-30	17.90%	18.95% (382)	15.59% (281)
		31-45	23.60%	23.21% (468)	22.96% (414)
		46-60	25.00%	24.90% (502)	25.85% (466)
		> 60	33.50%	32.94% (664)	35.61% (642)
	Income	< 15,600€	13.30%	13.34% (269)	13.31% (240)
		15,600 - 31,200€	29.70%	29.96% (604)	30.89% (557)
		31,200 - 43,200€	17.80%	17.86% (360)	17.03% (307)
		43,200 - 60,000€	16.80%	16.57% (334)	16.08% (290)
		> 60,000€	22.20%	22.27% (449)	22.68% (409)
	Region	Baden-Württemberg	13.35%	13.00% (262)	13.09% (236)
		Bayern	15.85%	15.82% (319)	15.97% (288)
		Berlin	4.40%	4.56% (92)	4.38% (79)
		Brandenburg	3.05%	3.13% (63)	3.16% (57)

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Country	Variable	Category	Share in population	Share in the sample (N)	Share among people who did not move during 2021 and who spent 12 weeks or less away from home because they were on holiday (n)
		Bremen	0.80%	0.69% (14)	0.67% (12)
		Hamburg	2.25%	2.18% (44)	2.11% (38)
		Hessen	7.55%	7.64% (154)	7.27% (131)
		Mecklenburg-Vorpommern	1.95%	1.84% (37)	1.83% (33)
		Niedersachsen	9.65%	10.12% (204)	10.37% (187)
		Nordrhein-Westfalen	21.55%	21.48% (433)	21.58% (389)
		Rheinland-Pfalz	4.95%	4.91% (99)	5.21% (94)
		Saarland	1.20%	1.24% (25)	1.33% (24)
		Sachsen	4.85%	4.86% (98)	4.66% (84)
		Sachsen-Anhalt	2.60%	2.53% (51)	2.55% (46)
		Schleswig-Holstein	3.50%	3.42% (69)	3.27% (59)
		Thüringen	2.55%	2.58% (52)	2.55% (46)
	Urbanisation[43]	Cities	38.7%	39.05% (792)	39.38% (710)
		Towns or suburbs	41.3%	33.28% (675)	34.44% (621)
		Rural areas	20.1%	17.41% (353)	18.49% (328)
		Unknown	0%	10.26% (208)	7.99% (144)
Italy (N=2153, n=1936)	Gender	Male	48.70%	45.42% (978)	45.51% (881)
		Female	51.30%	54.25% (1168)	54.29% (1051)
	Age	18-30	15.90%	16.49% (355)	15.08% (292)
		31-45	22.55%	23.08% (498)	22.93% (444)
		46-60	27.40%	28.29% (609)	29.08% (563)
		> 60	34.25%	32.14% (691)	32.90% (637)
	Income	< 16,000€	20.00%	21.83% (470)	21.44% (415)
		16,000 - 23,999€	20.00%	21.18% (456)	21.85% (423)
		24,000 - 33,999€	20.00%	22.06% (475)	22.37% (433)
		34,000 - 51,000€	20.00%	20.81% (448)	20.76% (402)
		> 51,000€	20.00%	14.12% (304)	13.58% (263)
	Region	Abruzzo	2.15%	2.04% (44)	2.01% (39)
		Basilicata	0.90%	0.88% (19)	0.93% (18)
		Calabria	3.15%	3.58% (77)	3.25% (63)
		Campania	9.60%	9.52% (205)	9.76% (189)
		Emilia-Romagna	7.50%	6.18% (133)	5.94% (115)
		Friuli-Venezia Giulia	2.00%	2.14% (46)	2.27% (44)

[43] Using urbanisation classification as per https://ec.europa.eu/eurostat/web/degree-of-urbanisation/background, and national statistics from: https://ec.europa.eu/eurostat/databrowser/view/ILC_LVHO01__custom_5023702/default/table?lang=en

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Country	Variable	Category	Share in population	Share in the sample (N)	Share among people who did not move during 2021 and who spent 12 weeks or less away from home because they were on holiday (n)
		Lazio	9.65%	10.13% (218)	10.12% (196)
		Liguria	2.55%	3.02% (65)	3.25% (63)
		Lombardia	16.80%	18.21% (392)	17.98% (348)
		Marche	2.55%	3.20% (69)	3.31% (64)
		Molise	0.50%	0.60% (13)	0.67% (13)
		Piemonte	7.20%	6.04% (130)	5.94% (115)
		Puglia	6.65%	7.43% (160)	7.49% (145)
		Sardegna	2.70%	3.07% (66)	3.05% (59)
		Sicilia	8.15%	7.85% (169)	8.01% (155)
		Toscana	6.20%	5.71% (123)	5.68% (110)
		Trentino - Alto Adige/Südtirol	1.80%	1.58% (34)	1.65% (32)
		Umbria	1.45%	1.25% (27)	1.29% (25)
		Valle D'Aosta	0.20%	0.09% (2)	0.10% (2)
		Veneto	8.20%	7.48% (161)	7.28% (141
	Urbanisation	Cities	36.3%	36.32% (782)	36.72% (698)
		Towns or suburbs	45.7%	37.20% (801)	37.35% (710)
		Rural areas	18.0%	8.08% (174)	7.89% (150)
		Unknown	0%	18.39% (396)	18.04% (343)
Latvia (N=1556, n=1382)	Gender	Male	46.10%	44.15% (687)	43.78% (605)
		Female	53.90%	55.85% (869)	56.22% (777)
	Age	18-30	20.50%	20.63% (321)	17.37% (240)
		31-45	23.45%	24.49% (381)	23.73% (328)
		46-60	23.45%	25.13% (391)	26.27% (363)
		> 60	32.25%	29.76% (463)	32.63% (451)
	Income	< 6.000€	20.00%	20.95% (326)	21.13% (292)
		6.000 - 8.999€	20.00%	17.42% (271)	18.45% (255)
		9.000 - 14.999€	20.00%	20.05% (312)	20.19% (279)
		15.000 - 21.000€	20.00%	20.24% (315)	19.68% (272)
		> 21.000€	20.00%	21.34% (332)	20.55% (284)
	Region	Kurzeme	12.45%	13.37% (208)	13.82% (191)
		Latgale	13.50%	14.33% (223)	14.47% (200)
		Pieriga	20.00%	18.38% (286)	18.67% (258)
		Riga	32.45%	32.58% (507)	30.75% (425)
		Vidzeme	9.55%	10.15% (158)	10.71% (148)
		Zemgale	12.00%	11.18% (174)	11.58% (160)
	Urbanisation	Cities	43.2%	39.46% (614)	38.35% (525)
		Towns or suburbs	22.0%	16.19% (252)	16.44% (225)

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Country	Variable	Category	Share in population	Share in the sample (N)	Share among people who did not move during 2021 and who spent 12 weeks or less away from home because they were on holiday (n)
		Rural areas	34.8%	34.00% (529)	35.42% (485)
		Unknown	0%	10.35% (161)	9.79% (134)

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5. Descriptive analysis

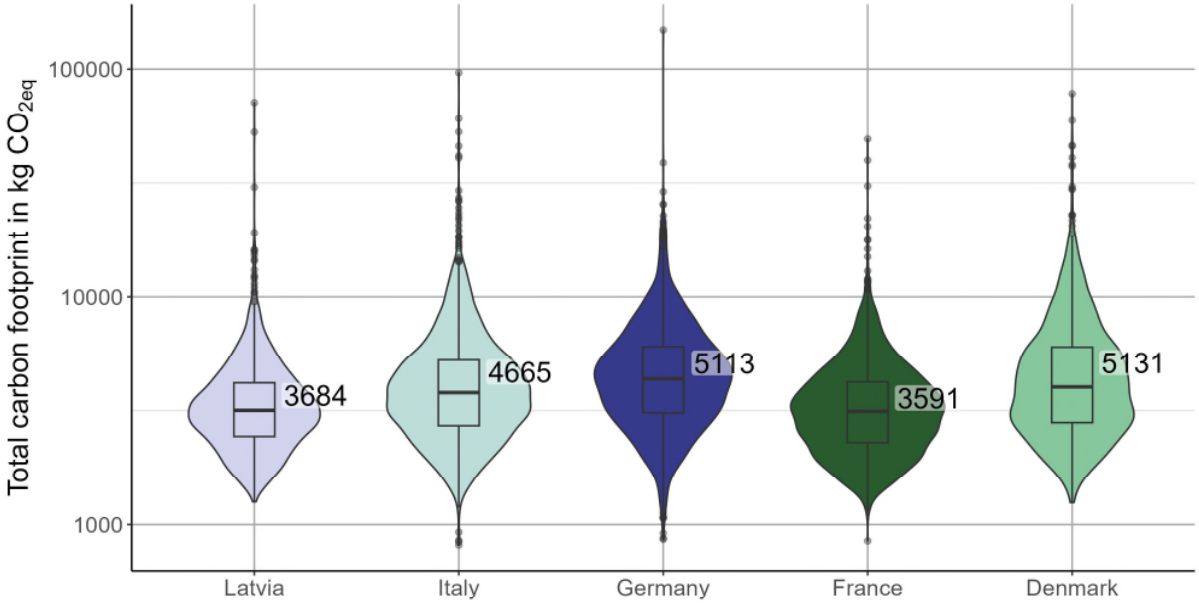
The following section will present various aggregated summary statistics of the identified sufficiency lifestyle variables.

5.1. Carbon footprint

Figure 4 to Figure 11 present the calculated total and the carbon footprints for heating and hot water, electricity, transport, diet, and pets in kg CO_{2eq}-emissions. The carbon footprint for aviation is displayed separately as the participant's decision to fly may have been constrained by COVID-19 regulations in 2021. In order to facilitate the reading of the graphs, the scales were transformed logarithmically for all carbon footprint graphs with the exception of diet.

The first four figures depict the total carbon footprint of respondents. The total carbon footprint is displayed with and without pets. Indeed, most carbon footprint calculators only include the activities of heating, electricity, diet, and transport.

Figure 4 Total carbon footprint of respondents in 2021 without aviation and with pets



LV: n=1354, IT: n=1894, DE: n=1797, FR: n=1827, and DK: n=1828;
Mean written on graph.
Violin plots are a variation of kernel density plots.

Figure 4 consists of violin plots of the total carbon footprint of respondents by country. Taking into account the remaining activities (electricity, heating, motorised transport, diet and pets), the calculated carbon footprint is highest in Denmark and Germany, and lowest in Latvia and France. The causes of these differences can be gleaned from the following graphs.

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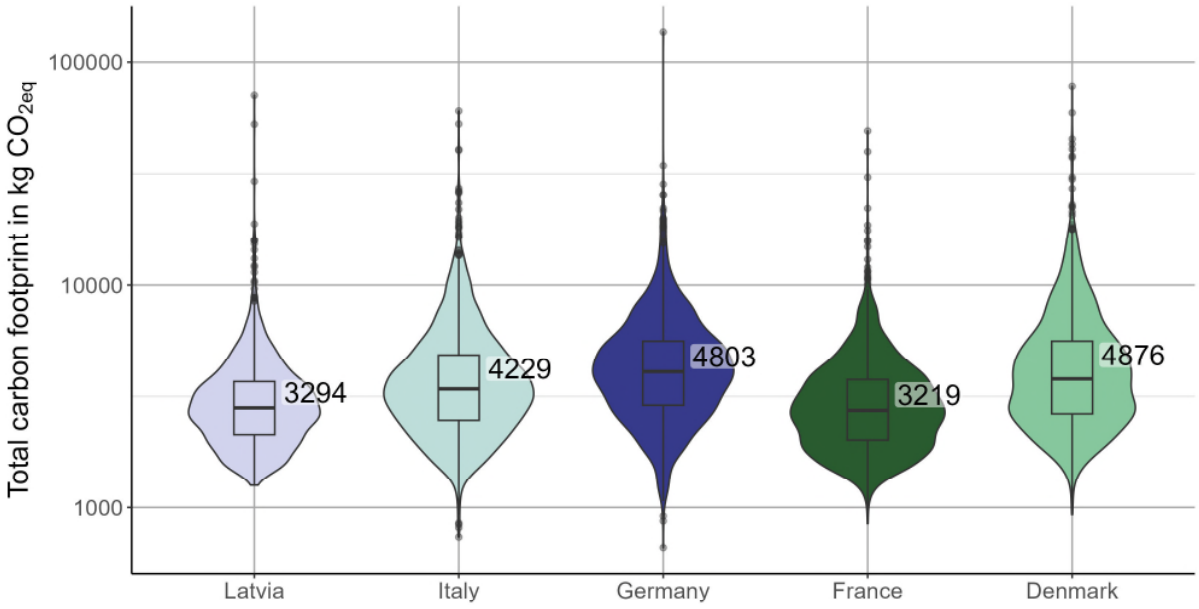
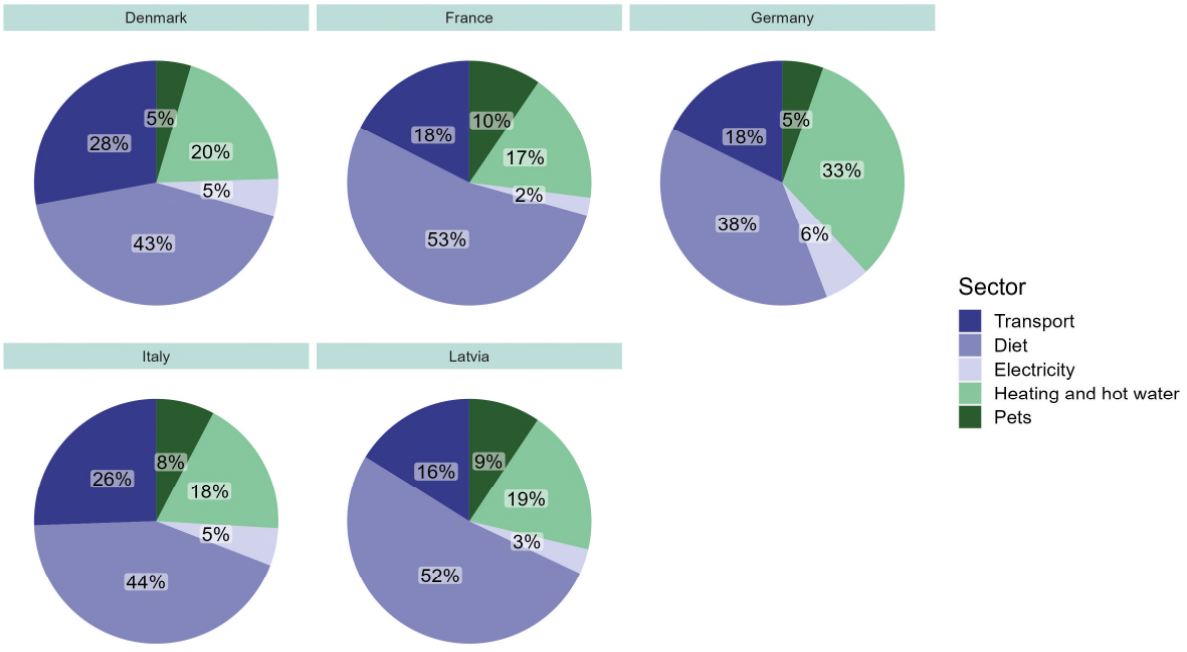
Figure 5 Total carbon footprint of respondents in 2021 without aviation and without pets



LV: n=1354, IT: n=1894, DE: n=1797, FR: n=1827, and DK: n=1828;
Mean written on graph.
Violin plots are a variation of kernel density plots.

Since most carbon footprint calculators do not include pets, Figure 5 displays violin plots of the total carbon footprint without pets. The total carbon footprint is several hundred kilograms lower than in the previous figure with pets and the general trend and differences between countries remains similar.

Figure 6 Pie charts of total carbon footprint of respondents without aviation and with pets in 2021



DK: n=1828, FR: n=1827, DE: n=1797, IT: n=1894, and LV: n=1354

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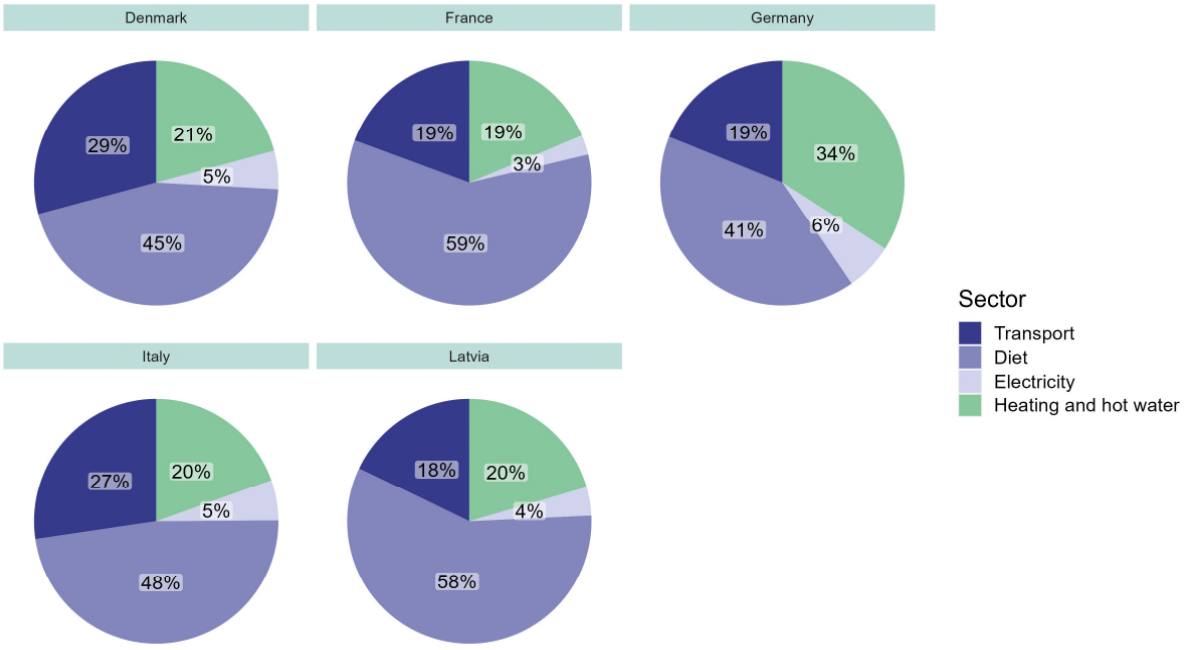
Figure 6 depicts the average contribution of each activity to the total carbon footprint in each country. In all countries, diet is the largest part of the carbon footprint, however, its share varies from 38% in Germany to 53% in France. The carbon footprint for electricity is relatively low in all countries (between 2% and 6% of total carbon footprint)[44]. This is in part due to the use of "green tariffs" and PV panels, but also the relatively low emission factor of electricity. Pets account for between 5% and 10% of the aggregated total carbon footprint, which indicates that it is relevant to include pets in the carbon calculator.

Figure 7 Pie charts of the total carbon footprint of respondents without aviation and without pets in 2021



DK: n=1828, FR: n=1827, DE: n=1797, IT: n=1894, and LV: n=1354

Figure 7 presents the contribution of the four traditional carbon footprint activities to the total carbon footprint without pets.

[44] As mentioned in Section 2.1, electricity used for heating and e-vehicles is included in the respective activitiess and not within the electricity carbon footprint.

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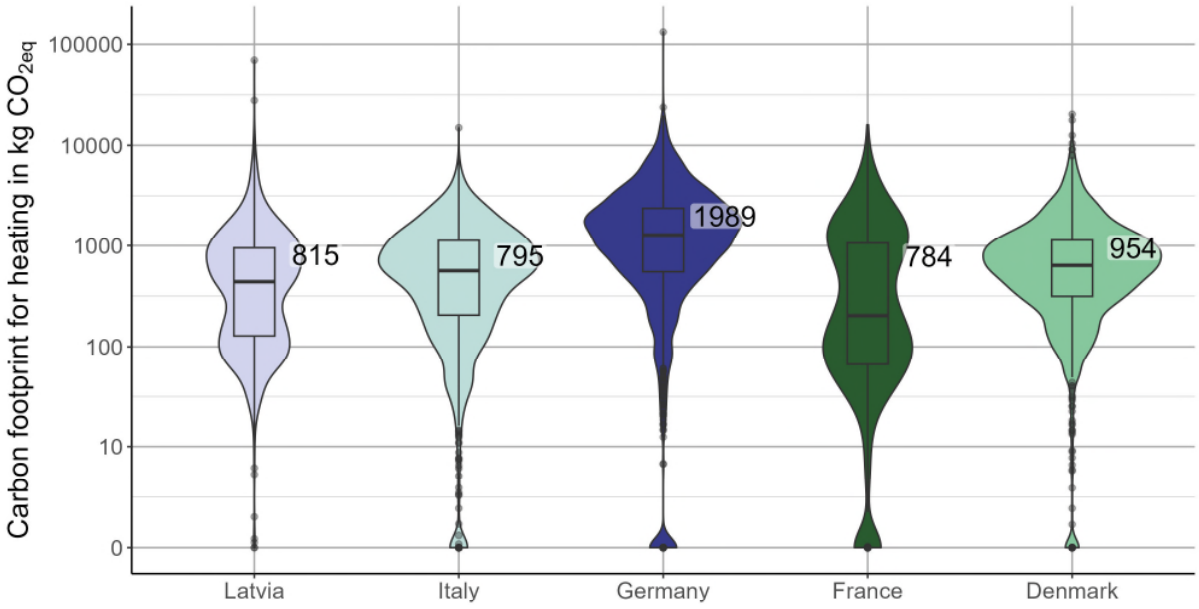
Figure 8 Carbon footprint for space heating and hot water in 2021



LV: n=1354, IT: n=1898, DE: n=1799, FR: n=1833 and DK: n=1837
Mean written on graph.
Violin plots are a variation of kernel density plots.

According to Figure 8, Germany has the highest carbon footprint for space heating and hot water by far with an average of 1989kg CO_{2eq}-emissions per respondent, possibly due to the widespread use of natural gas for heating purposes. The other four countries have a similar average carbon footprint for heating between 784kg and 954kg CO_{2eq}-emissions. This is possibly due to the frequent use of less carbon intensive fuel sources (district heating in Denmark, electricity (mostly from nuclear) in France and biomass in Latvia) and also lower energy for heating requirements (Italy). The violin plot for France indicates the presence of two clusters, one around 100kg CO_{2eq}-emissions which typically refer to respondents who heat with electricity, and the second over 1000kg CO_{2eq}-emissions which is typically associated with the use of natural gas and heating oil[45].

[45] Adding hot water results in a maximum increase of 145kg CO_{2eq}-emissions.

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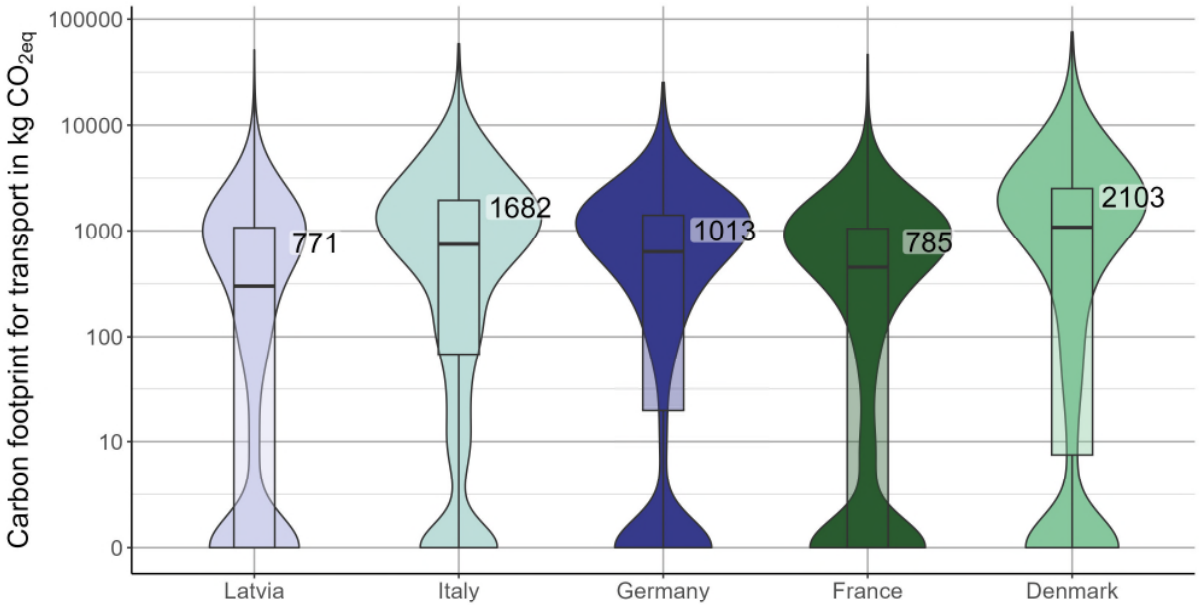
Figure 9 Carbon footprint for transport without aviation in 2021



LV: n=1369, IT: n=1901, DE: n=1803, FR: n=1836, and DK: n=1851
Mean written on graph.
Violin plots are a variation of kernel density plots.

Figure 9 depicts the carbon footprint associated with motorised transport in 2021, i.e. cars, vans and motorbikes. Denmark has the highest average carbon footprint with 2103kg CO_{2eq}-emissions, followed by Italy with 1682kg CO_{2eq}-emissions and Germany with an average of 1013kg CO_{2eq}-emissions per respondent. France and Latvia have similarly low carbon footprints for motorised transport with 785kg and 771kg CO_{2eq}-emissions, respectively. The differences may, to a large extent, reflect varying country-level restrictions, regulations and recommendations resulting from the COVID-19 pandemic.

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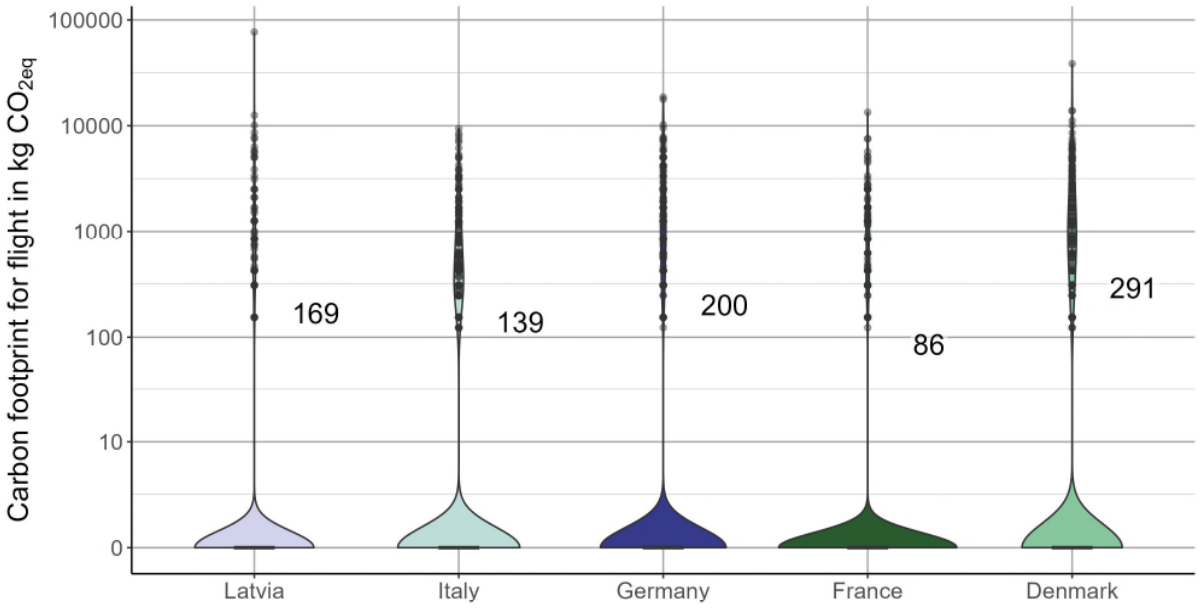
Figure 10 Carbon footprint for aviation in 2021



LV: n=1369, IT: n=1891, DE: n=1800, FR: n=1831, and DK: n=1847
Mean written on graph.
Violin plots are a variation of kernel density plots.

The ability and willingness to fly was strongly impacted by the COVID-19 pandemic. As demonstrated by Figure 10, only a relatively small share of respondents flew in 2021 resulting in carbon footprints for flying that most likely do not reflect the respondents' regular aviation patterns (cf. Table 7). Therefore, the carbon footprint of aviation was not included in the total carbon footprint. Flying more than 150 times a year was considered implausible, and thus recoded as missing.

Table 7 Respondents who flew in 2021 (Q. T10)

	Denmark	France	Germany	Italy	Latvia
Respondents who flew in 2021	316 (16.7%)	121 (6.5%)	188 (10.4%)	290 (15.0%)	87 (6.3%)
Respondents with over 150 flights (removed from analysis)	4 (0.2%)	5 (0.3%)	3 (0.2%)	10 (0.5%)	0 (0.0%)
Number of respondents who flew (valid responses)	312 (16.5%)	116 (6.2%)	185 (10.3%)	280 (14.5%)	87 (6.3%)

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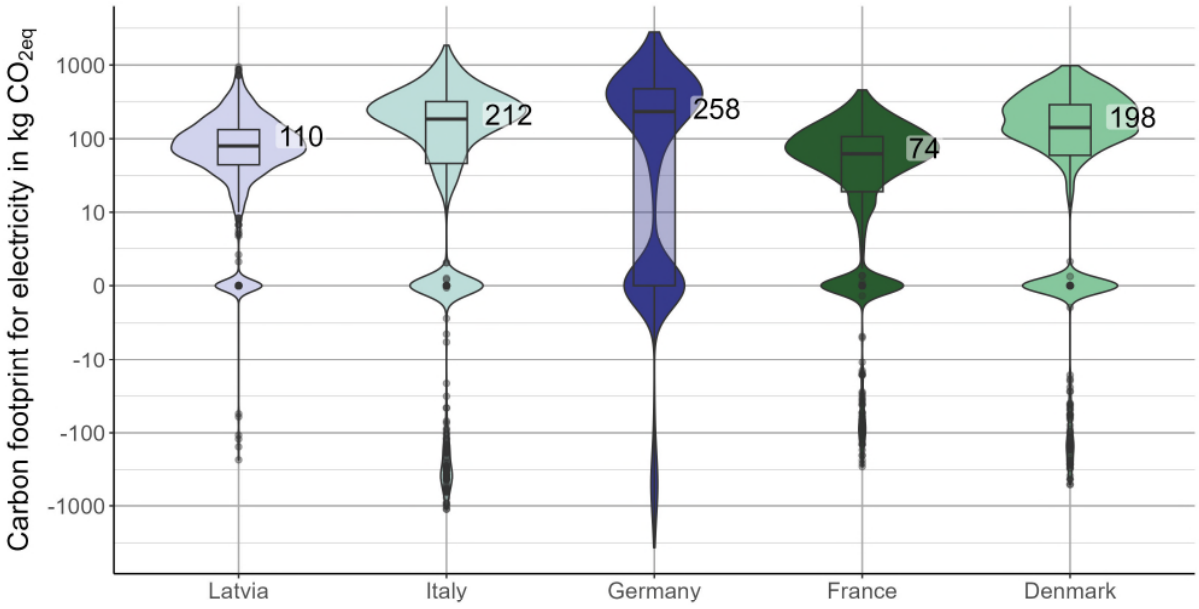
Figure 11 Carbon footprint for electricity consumption in 2021



LV: n=1369, IT: n=1901, DE: n=1803, FR: n=1836 and DK: n=1851
Mean written on graph.
Violin plots are a variation of kernel density plots.

Figure 11 shows that the highest average carbon footprint for electricity is in Germany with 258kg CO_{2eq}-emissions, followed by Italy with 212kg, and Denmark with an average of 198kg CO_{2eq}-emissions per respondent. Latvia has the second lowest carbon footprint for electricity with 110kg CO_{2eq}-emissions and France has the lowest with 74kg CO_{2eq}-emissions on average per respondent.

In addition to the actual consumption of electricity, the average carbon footprint for electricity consumption varies according to the carbon intensity of the electricity production in each country (cf. Table 8), the proliferation of green tariffs and the number, size and effectiveness of PV panels. The use of PV panels can result in negative emissions, e.g. for households where electricity generation from PV panels exceeds electricity consumption.

Table 8 Emission factor for electricity for each country in 2021

Germany	0.311	kg/kWh
Latvia	0.1065	kg/kWh
Denmark	0.109	kg/kWh
Italy	0.2134	kg/kWh
France	0.0511	kg/kWh

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Figure 12 Net electricity consumption per person (without PV) in 2021

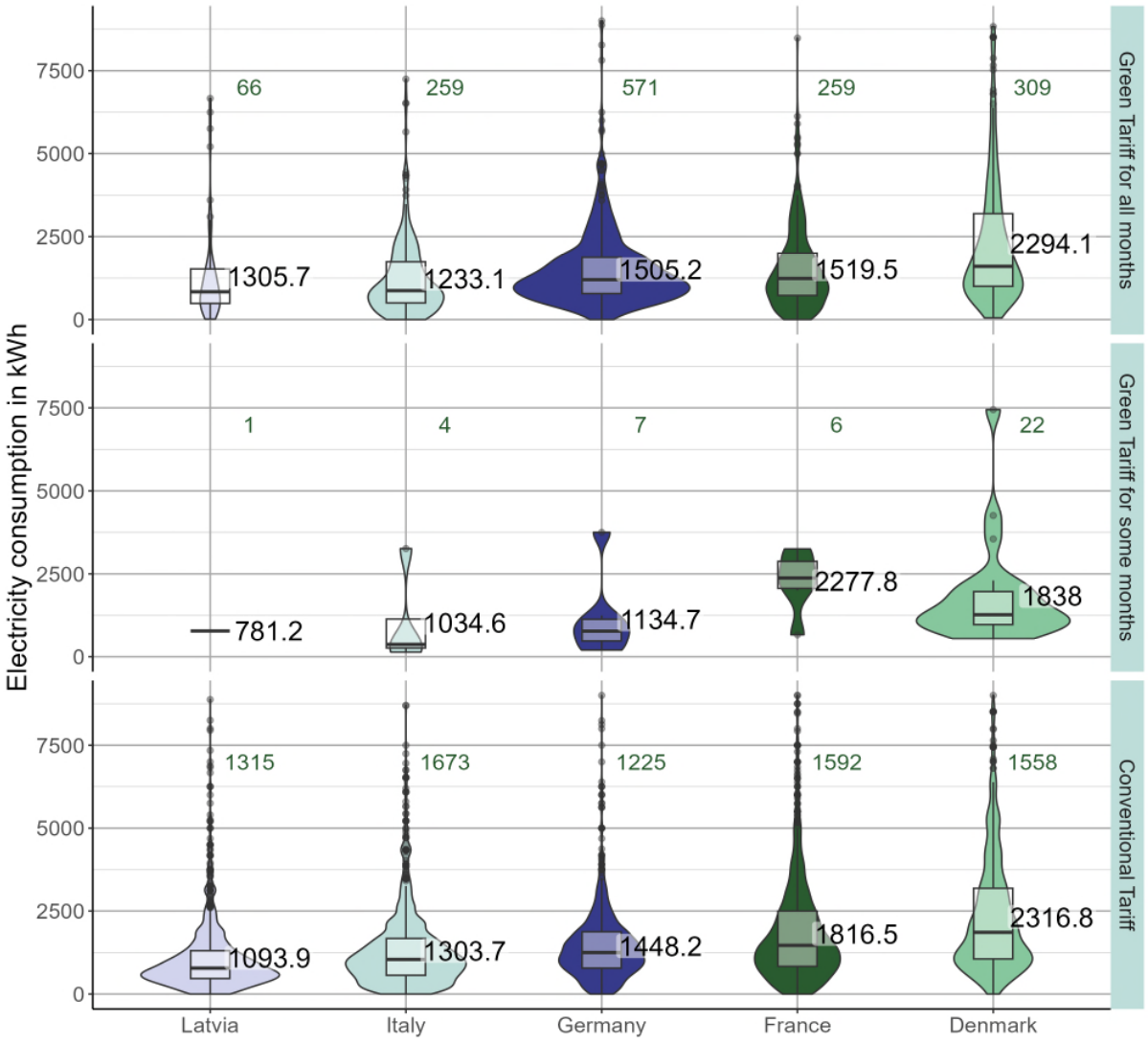

Figure 12 depicts the electricity consumption in kWh, differentiating between whether or not individuals have a green tariff. The impact of PV panels is also excluded from the graphs. The figure shows that individuals with a green tariff consume more electricity on average in Germany and Latvia, but less in Italy, France and Denmark. In any case, average differences are relatively small (less than 300kWh).

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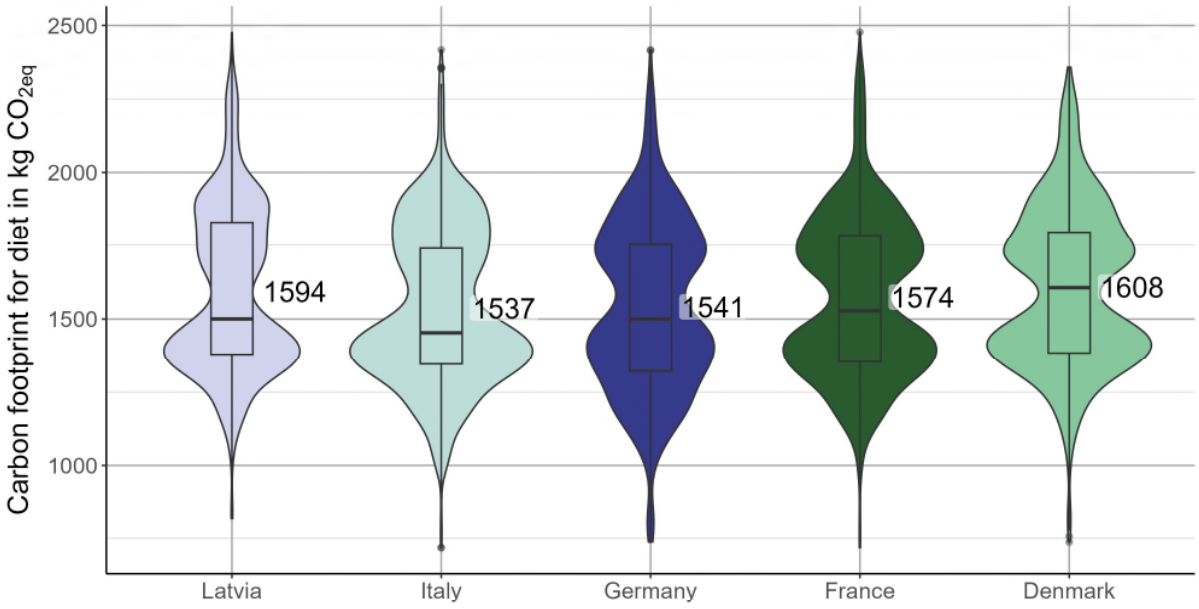
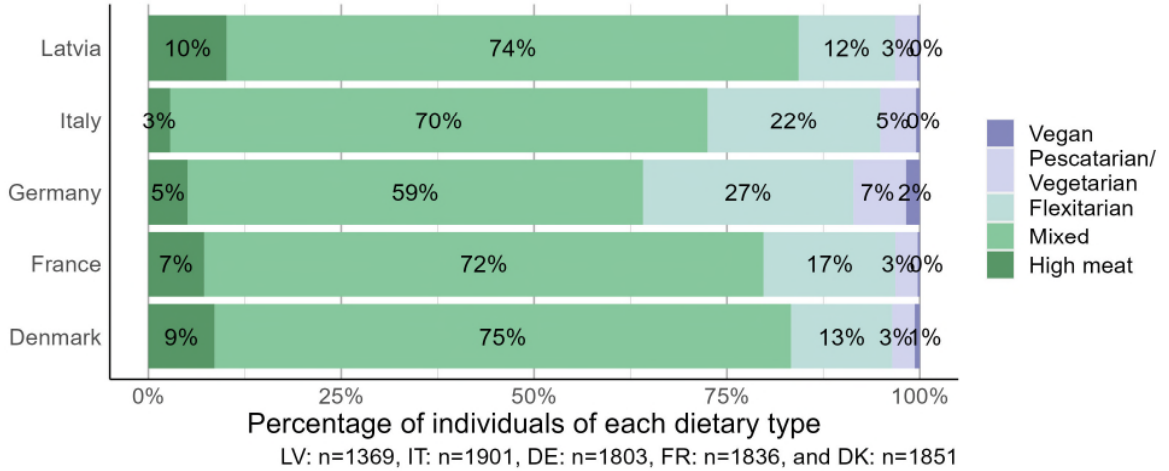
Figure 13 Carbon footprint for diet in 2021



LV: n=1369, IT: n=1891, DE: n=1800, FR: n=1831, and DK: n=1847
Mean written on graph.
Violin plots are a variation of kernel density plots.

Figure 13 depicts the carbon footprint of respondents associated with diet. The distribution spreads from below 750kg to close to 2500kg CO_{2eq}-emissions per respondent. The average footprint per country is between 1537kg CO_{2eq}-emissions in Italy and 1608kg in Denmark. The violin curves are caused by the impact of biological sex as men tend to consume more calories than women, which results in higher CO_{2eq}-emissions on average.

Figure 14 Distribution of main dietary types by country



LV: n=1369, IT: n=1901, DE: n=1803, FR: n=1836, and DK: n=1851

Figure 14 displays the main dietary type that individuals have per country. Vegans and pescatarians/vegetarians are most prevalent in the sample in Germany with 2% and 7% of respondents following these diet types respectively.

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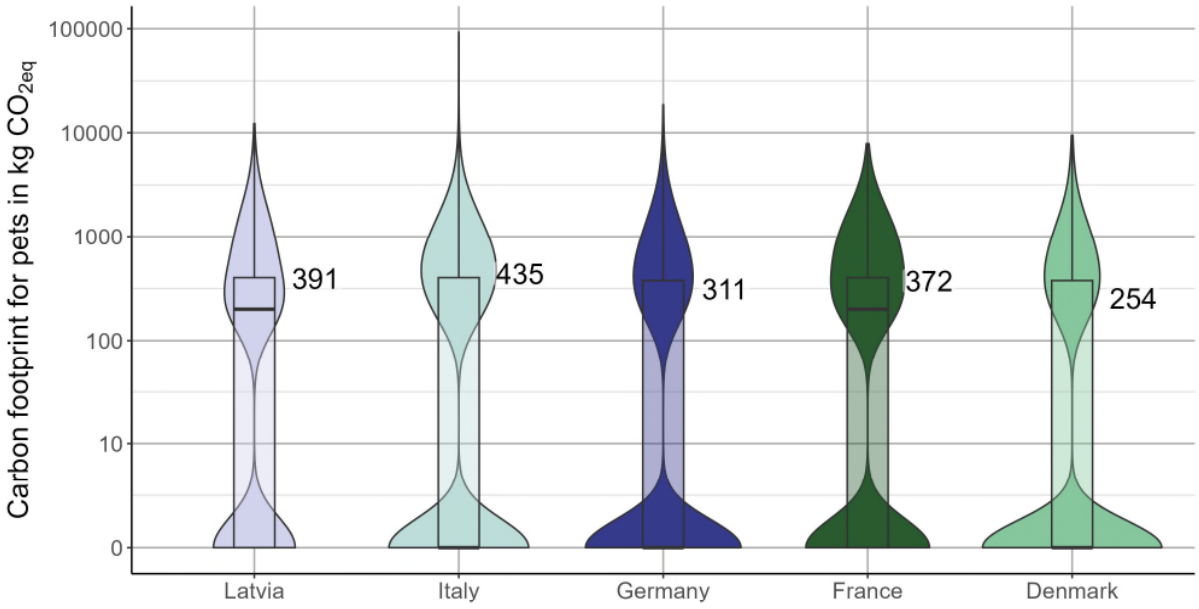
Figure 15 Carbon footprint for pets (cats and dogs) in 2021 per respondent



LV: n=1369, IT: n=1901, DE: n=1803, FR: n=1836, and DK: n=1851
Mean written on graph.
Violin plots are a variation of kernel density plots.

Figure 15 indicates that respondents from Denmark have the lowest carbon footprint associated with cats and dogs with 254kg CO_{2eq}-emissions on average per respondent. The average carbon footprint for pets is highest in Italy with 435kg CO_{2eq}-emissions. Despite the fact that many respondents did not have any of the pets included, the carbon footprint for pets is on average higher than the carbon footprint associated with electricity. This indicates the high relevance of pets concerning their carbon footprint.

Table 9 Ownership of pets per country (Q. M1)

	Denmark	France	Germany	Italy	Latvia
No pets	1149 (57%)	843 (31%)	1046 (58%)	942 (42%)	574 (35%)
Cat(s)	325 (16%)	716 (27%)	434 (24%)	566 (25%)	585 (36%)
Dog(s)	400 (20%)	780 (29%)	353 (20%)	573 (26%)	371 (23%)
Other small pets like fish, hamster, guinea pigs	128 (6%)	235 (9%)	144 (8%)	140 (6%)	96 (6%)
Other large pets e.g. horse	17 (1%)	114 (4%)	32 (2%)	4 (0%)	9 (1%)

According to Table 9, most respondents from Denmark and Germany do not have any pets (57% and 58%), as do almost half of the respondents from Italy (42%). 69% of respondents have pets in France, 65% in Latvia, 58% in Italy and 42% in Germany. In all countries, of the animals listed, cats are most frequently owned by respondents (16% to 36%), followed by dogs (20% to 29%).

5.2. Health and well-being

In the following two sections, we focus mainly on the well-being score based on the items described in Section 2.2. First, we explain the preparatory steps including a factor analysis. Then, we describe the country-specific average well-being score across participants, and afterwards, we show results on the relation of well-being with the carbon footprint results.

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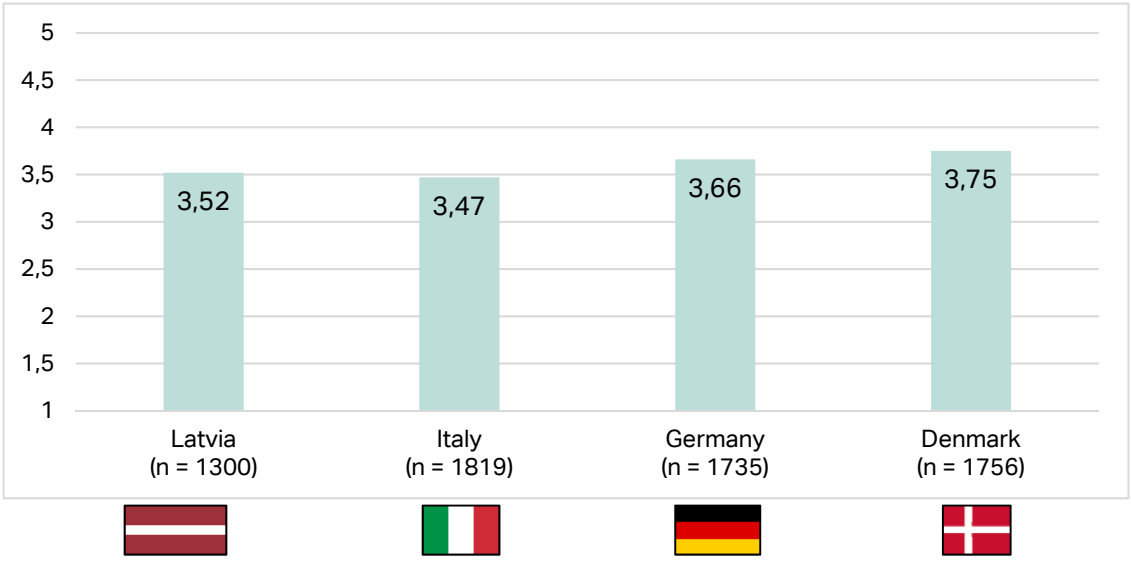
In France, a programming error occurred in the questionnaire section for well-being: The response scale contained the option "disagree completely" on both extremes of the scale and did not include the option "agree completely". Thus, the results regarding well-being for France cannot be interpreted.

In all other countries, a factor analysis suggested to extract two factors. However, the eigenvalue of the second factor in all countries was only slightly above the threshold of 1 (ranging from $Eigenvalue_{Factor2}$ = 1.00 in Denmark and $Eigenvalue_{Factor2}$ = 1.19 in Latvia). In addition, only one to four items loaded on the second factor and only one of them had a higher loading on the second than on the first factor. Content-wise the second factor focused on physical health. Since the well-being score is supposed to include physical health, this result is not surprising and it appears reasonable to continue the data analysis with one common well-being score in all samples.

5.3. Well-being scores and their relationship with carbon footprints

For the well-being score, we excluded participants (n =245) who did not answer one or more items on the well-being scale. Additionally, to conduct all analyses with the same sample, we excluded participants with an extreme carbon footprint[46] as well as participants who identified as non-binary/queer (for gender analyses). Regarding well-being, Figure 16 shows the average ratings of well-being and Table 5 displays the standard deviation and the reliability for each country. The results do not differ largely between the countries. Cronbach's alpha is above 0.80 in all countries, demonstrating good reliability; thus, the items were appropriate to measure the construct of quality of life. This supports our choice of a carefully developed and validated measure with 11 items based on the initial WHOQOL scale. We computed an average score of all items measuring the quality of life (i.e., summing the responses across items and dividing this sum by the number of items). These average well-being scores range between 3.47 (in Italy) and 3.75 (in Denmark) with low standard deviations smaller than 1 (see Figure 16 and Table 10 for standard deviations). In all countries, the mean scores of well-being are only slightly left skewed (ranging between skewness = -.61 in Germany and skewness = -.44 in Latvia; (Bulmer, 1979)); thus, in the surveyed European countries, slightly more participants report higher well-being than participants reporting lower well-being.

Figure 16 Average scores of well-being across countries.



[46] We consider an extreme carbon footprint to be above 30,000kg CO_{2eq} emissions for heating and hot water, and above 20,000kg CO_{2eq} emissions for transport.

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On the left-hand side of Table 10, the correlations between well-being and the carbon footprint calculations (total without flying and for each activity) are presented. Regarding correlations between well-being and the carbon footprint, the average carbon footprint does not correlate with well-being in two of four countries and the correlations in Italy and Latvia are very small. Thus, respondents' well-being perceptions and their carbon footprints do not appear to be largely linearly related. Looking closer into the different areas and activities of the carbon footprint, we find positive, negative as well as no correlations (see Table 10).

Well-being correlates positively with the carbon footprint for transport – across all countries. Hence, respondents in all countries report higher levels of well-being simultaneously with higher emissions for transport (e.g. due to higher mileage or more emission-intensive car use). The transport carbon footprint does not include aviation due to the reference year of 2021 and the related COVID-19 restrictions that were in force. For electricity, we find a negative relationship with well-being, with an exception for Latvia. This mirrors either higher levels of well-being in relation to green electricity use or lower electricity demand in Latvia.

The correlations between well-being and the carbon footprint for diet differs between countries. It is not significantly correlated in Denmark, Germany and Latvia, but significantly and positively correlated in Italy. This means that for respondents in Italy, higher well-being is associated with a more carbon-intensive diet (i.e., eating meat and/or buying non-regional and non-seasonal products).

In addition, having pets and the related carbon footprint only correlate with well-being in Denmark. Respondents in Denmark experience more well-being when the carbon footprint of their pets is low (e.g., feeding them less or no meat) and/or when they do not have a (large) pet.

The emissions caused by heating and hot water are not correlated with the well-being of the respondents from Germany and Italy, but correlate positively in Denmark and Latvia. This shows that a higher carbon footprint in heating and hot water is related with more well-being. This is not surprising given the low temperatures in winter in Denmark and Latvia. It is noteworthy that all found correlations are small (all r < .13); thus, the relationship between well-being and the carbon footprints in the different activities requires further examination to understand what other factors are related with the two variables.

Table 10 Descriptive statistics of well-being and bivariate correlations between the well-being score and the carbon footprint calculations (overall and per activity), across countries

Country	Well-being M (SD)	Reliability (Cronbach's alpha)	CF total (without aviation)	CF Heating	CF Electricity	CF Transport without aviation	CF Diet	CF Pets
DK (n=1756)	3.74 (0.70)	.88	.02	**.06***	**-.08*****	**.08****	.04	**-.07****
DE (n=1735)	3.66 (0.65)	.85	.02	-.02	**-.13*****	**.10*****	.01	.01
IT (n=1819)	3.47 (0.63)	.84	**.06***	.04	**-.08*****	**.07****	**.06****	.01
LV (n=1300)	3.52 (0.55)	.80	**.11*****	**.06***	.02	**.11*****	-.01	-.02

*Note: CF = carbon footprint; *** p < 0.001; ** p < 0.01; * p < 0.05*
transport carbon footprints and overall carbon footprints do not include the carbon footprint of aviation.

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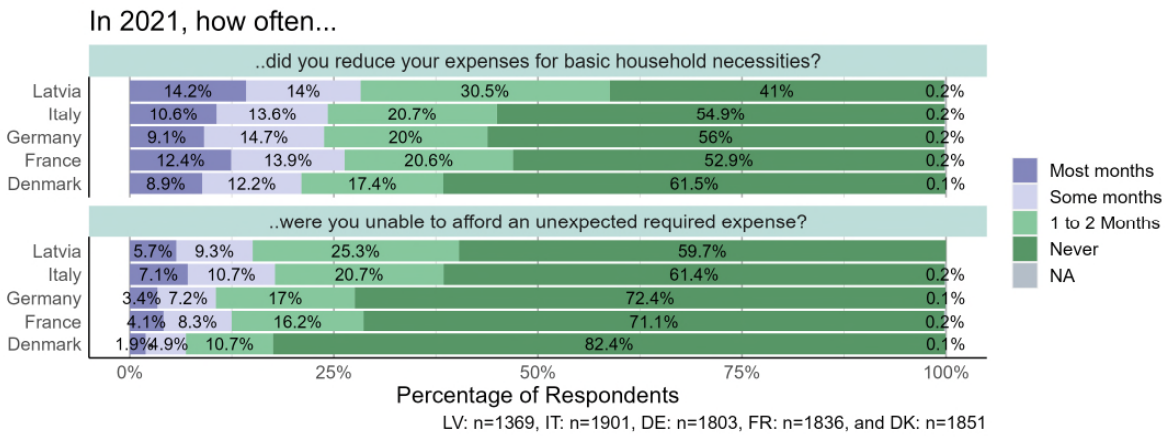
5.4. Deprivation

Figure 17 to Figure 21show to what extent respondents can be considered deprived, in general, and specifically in the transport and diet activities.

Figure 17 General deprivation (Q. DA_1 and DA_2)



According to Figure 17, the majority of respondents in France, Germany, Italy and Denmark did not reduce their expenses for household necessities at all in 2021, whereas 59% did in Latvia. Between 18% (Denmark) and 40% (Latvia) of respondents were at least once unable to afford an unexpected required expense in 2021.

Figure 18 General deprivation continued (Q. DA_3, DA_4 and DA_5)

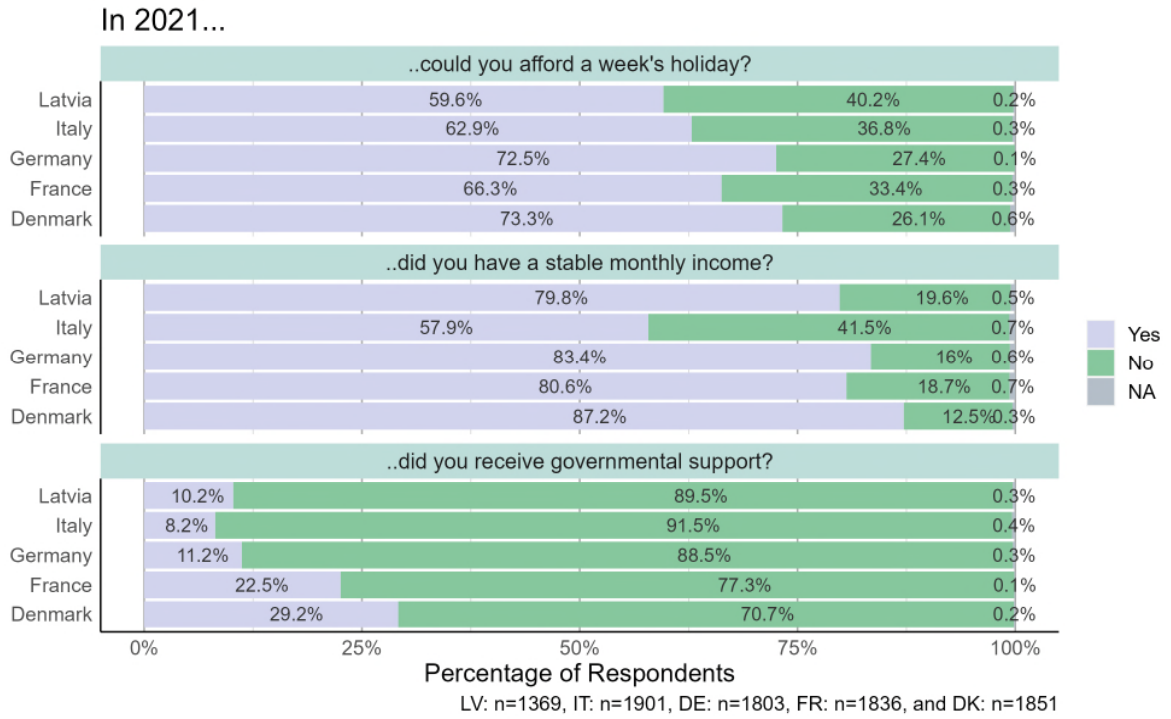


Figure 18 shows that between around 40% (Latvia) and 27% (Germany and Denmark) of respondents were not able to afford to go on a week's holiday. Income was stable for 87% of respondents from Denmark but only for 58% of respondents from Italy. The share of respondents receiving governmental support varied from 8% in Italy to 29% in Denmark.

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Figure 19 Diet deprivation (Q. DN_1, DN_2 and DN_6)

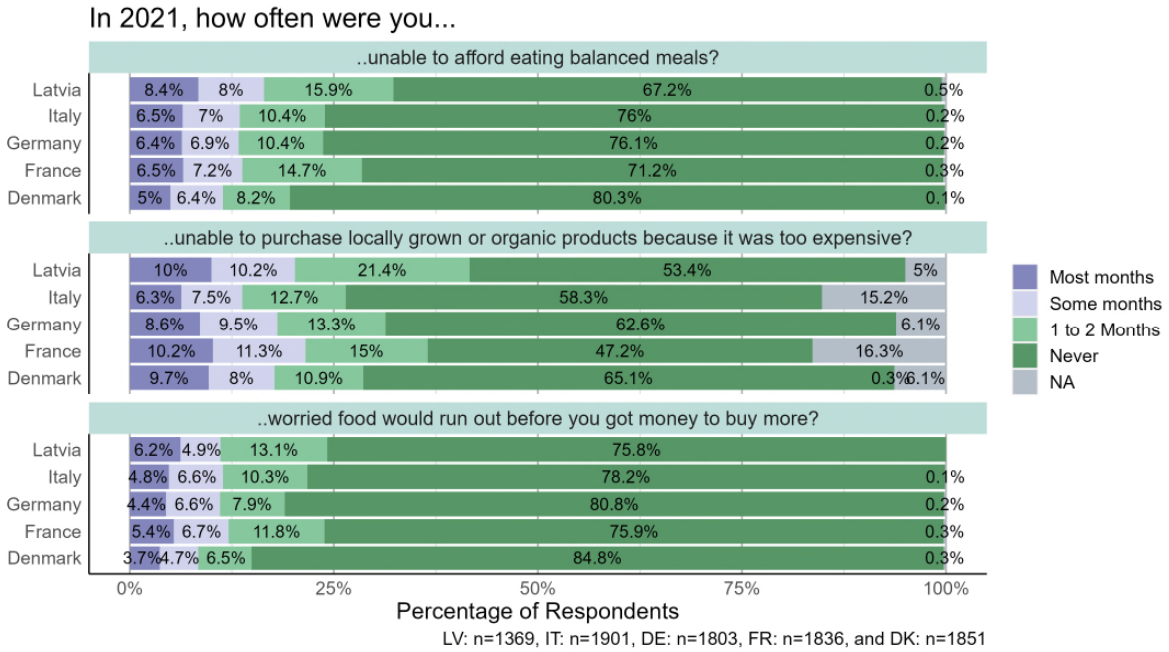
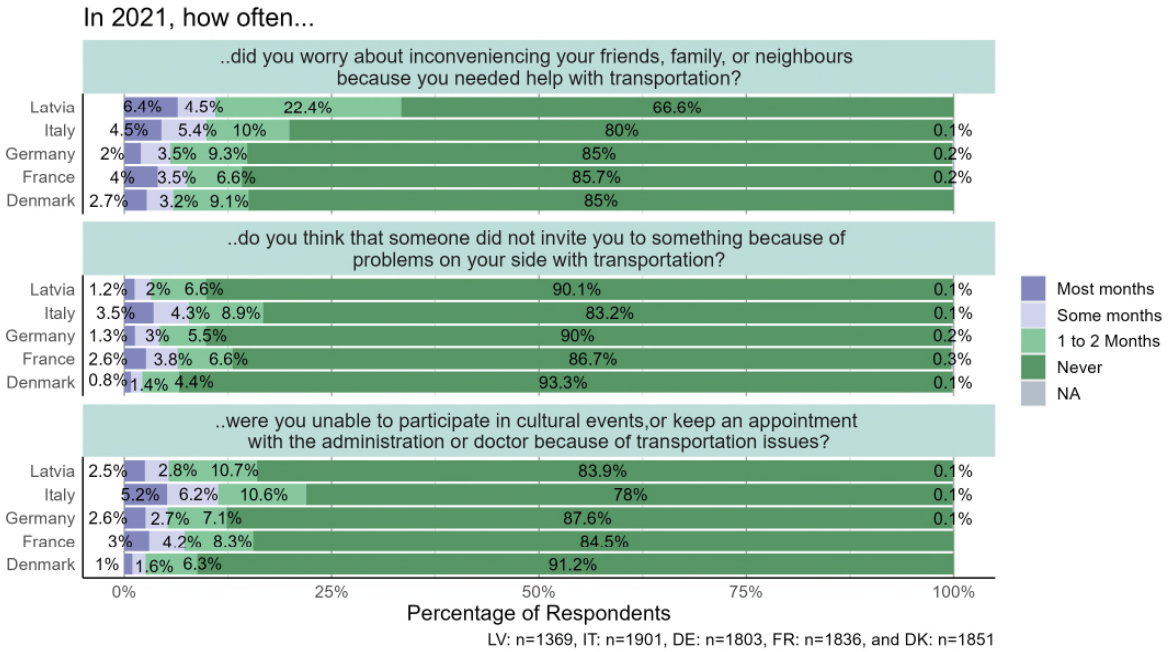


Figure 19 indicates that only 67% of respondents in Latvia were always able to afford balanced meals. Between 5% (Denmark) and 8% (Latvia) were unable to afford a balanced meal almost every month. Between 27% (Italy) and 42% of respondents (Latvia) were, at some point, unable to purchase locally grown or organic produce due to cost[47]. Between 24% (France and Latvia) and 15% (Denmark) of respondents were at some point in 2021 worried about food running out before getting money to buy more.

Figure 20 Transport deprivation (Q. DT_1, DT_2 and DT_3)



[47] Respondents who always purchased seasonal or regional products were not asked this question, which explains the high share of missings for this question.

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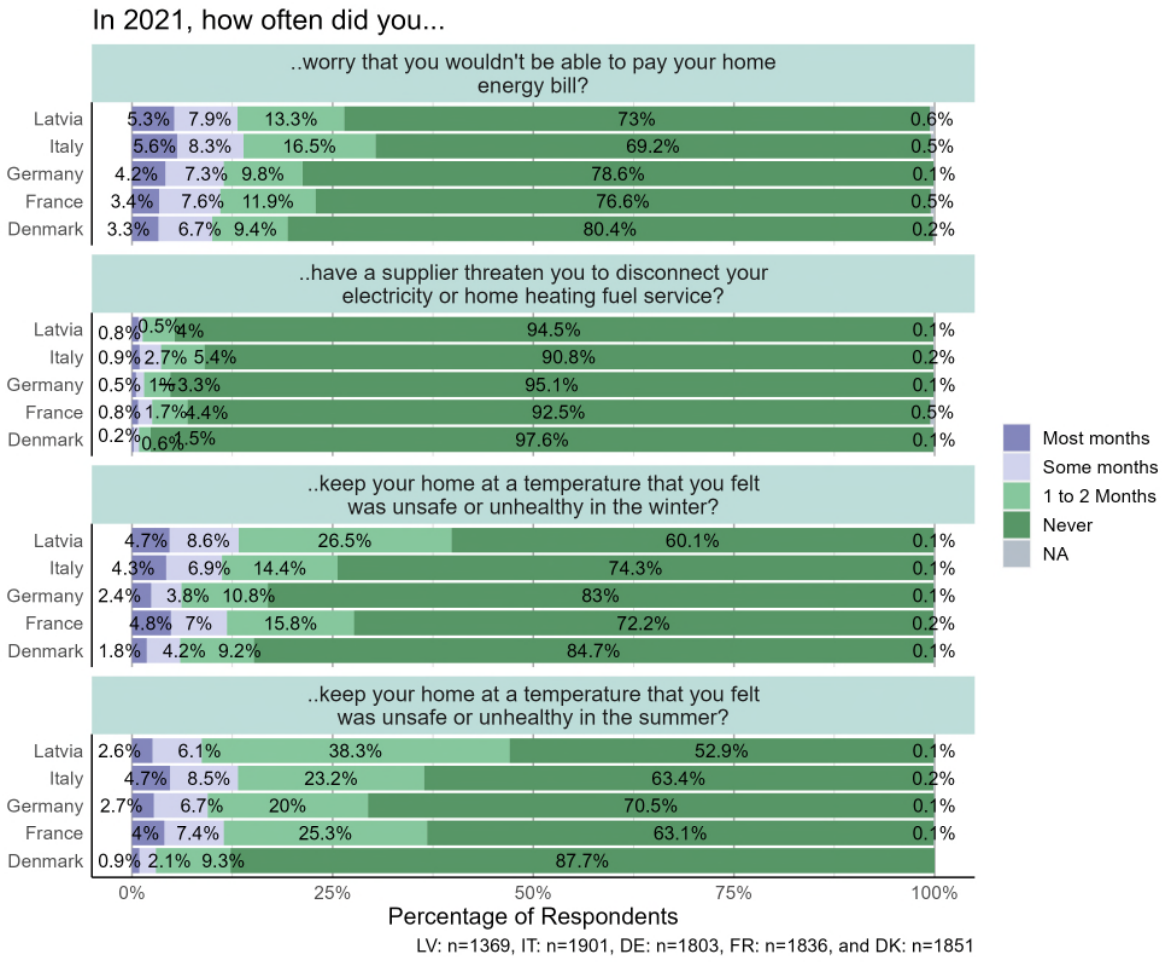
Figure 20 illustrates that between 15% (Denmark, France, Germany) and 33% (Latvia) of respondents worried at some point during 2021 that they would inconvenience friends, family or neighbours because they needed help with transportation. Between 7% (Denmark) and 17% (Italy) of respondents think that they weren't invited due to problems on their end with transportation. Finally, between 9% (Denmark) and 22% (Italy) of respondents state that they were at some point in 2021 unable to participate in cultural events or keep important meetings due to transportation issues. The COVID-19 pandemic may have impacted the desire and necessity to travel. Isolation and movement restriction measures may have reduced the possibility and desire to travel, for example since various cultural events were cancelled. On the other hand, individuals may have had more difficulties travelling if they were unable or unwilling to use public transport.

Figure 21 Deprivation electricity and heating (Q. DE_1, DE_2, DE_3 and DE_4)



According to Figure 21, between 20% (Denmark) and 31% (Italy) of respondents worried at least once that they could not pay their home energy bill in 2021. Between 2% (Denmark) and 9% (Italy) were threatened by their electricity or heating fuel service to be cut off during 2021. Compared to respondents from the other countries, respondents from Latvia most frequently feel that their home was kept at unsafe temperatures at least once in the winter months (40%) and in the summer months (47%) in 2021.

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Figure 22 Deprivation variables correlation matrix

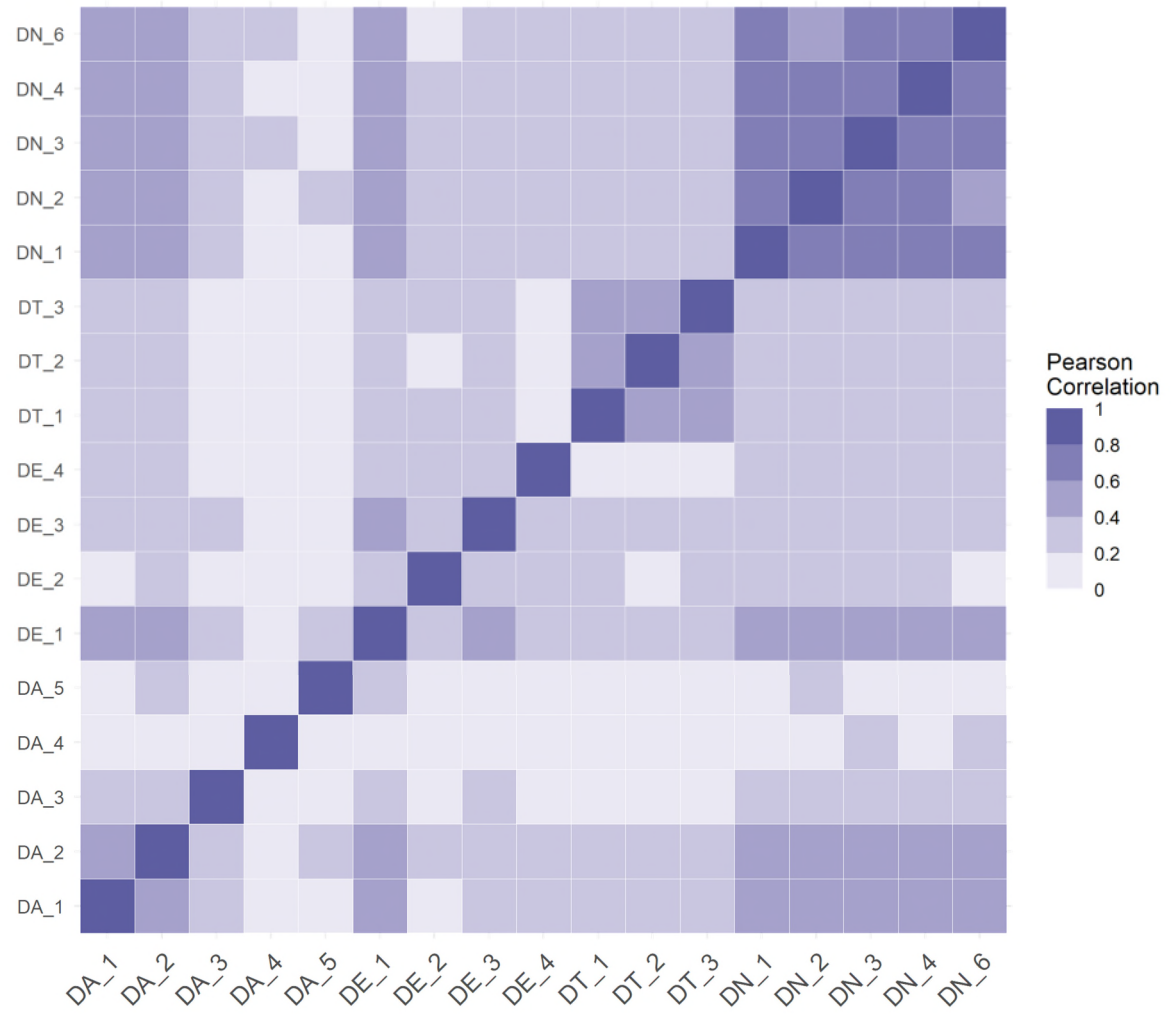

Figure 22 depicts the correlations between all deprivation-related questions[48]. As expected, all correlations are positive with varying strengths. The matrix indicates that:

1. Diet deprivation items (DN_1 to DN_6) are strongly correlated with one another.

2. Transport deprivation items (DT_1 to DT_3) are also quite highly correlated with correlations of at least 0.4.

3. All diet deprivation items are correlated with general deprivation responses relating to expenditure reduction for basic household items (DA_1) and difficulties to afford unexpected expenses (DA_2).

4. The five diet deprivation items also have high correlations of at least 0.4 with DE_1, i.e. worrying about being able to pay energy bills.

In addition, unsafe temperatures in summer and winter (DE_3 and DE_4) are significantly correlated in each country with a correlation coefficient between 0.32 (Denmark) and 0.55 in Italy.

[48] For interpretation purposes, all variables were coded so that the highest value corresponds to the response considered to represent deprivation.

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5.5. Attitudinal variables

Figure 23 Environmental orientation (Q. EID_1, EID _2 and EID _3)

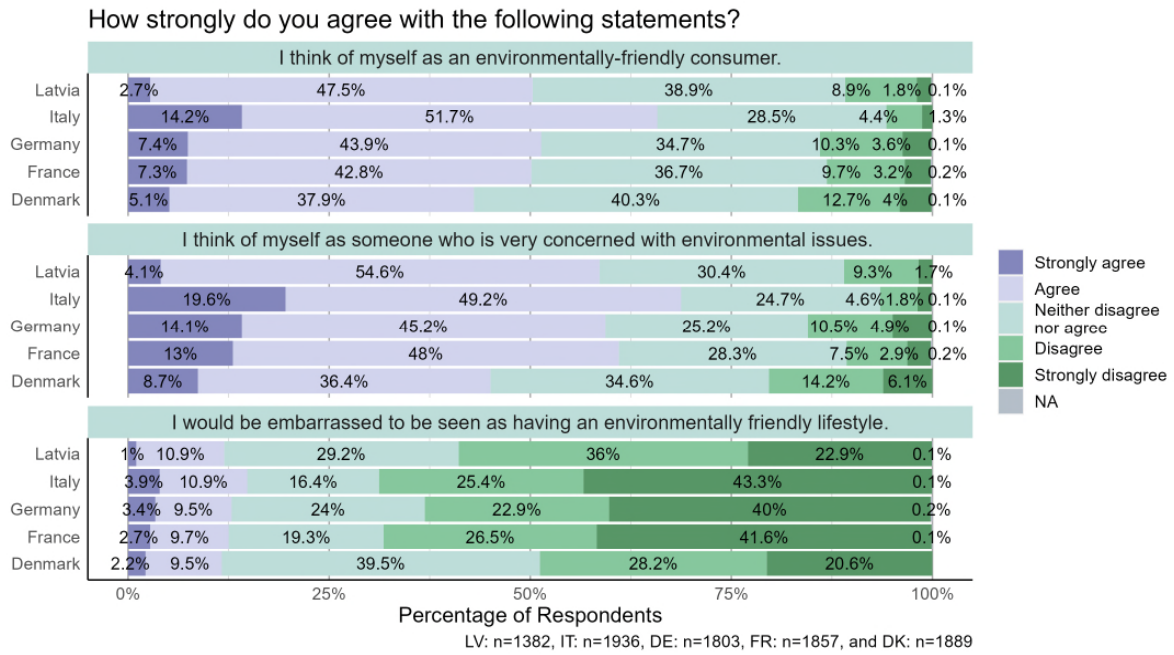

Figure 23 shows that in all countries except Denmark, at least half of respondents consider themselves to be environmentally-friendly consumers. Similarly, between around 60% and 70% of respondents in France, Italy, Germany and Latvia agree or strongly agree that they are concerned with environmental issues. In Denmark, this is the case for 45% of respondents. In all countries, between 12% and 14% of respondents would be embarrassed to be seen as having an environmentally friendly lifestyle, with between 49% (Denmark) and 69% (Italy) who would not be embarrassed.

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Figure 24 Political orientation (Q. PO_1, PO _2, PO_3, PO _4 and PO _5)

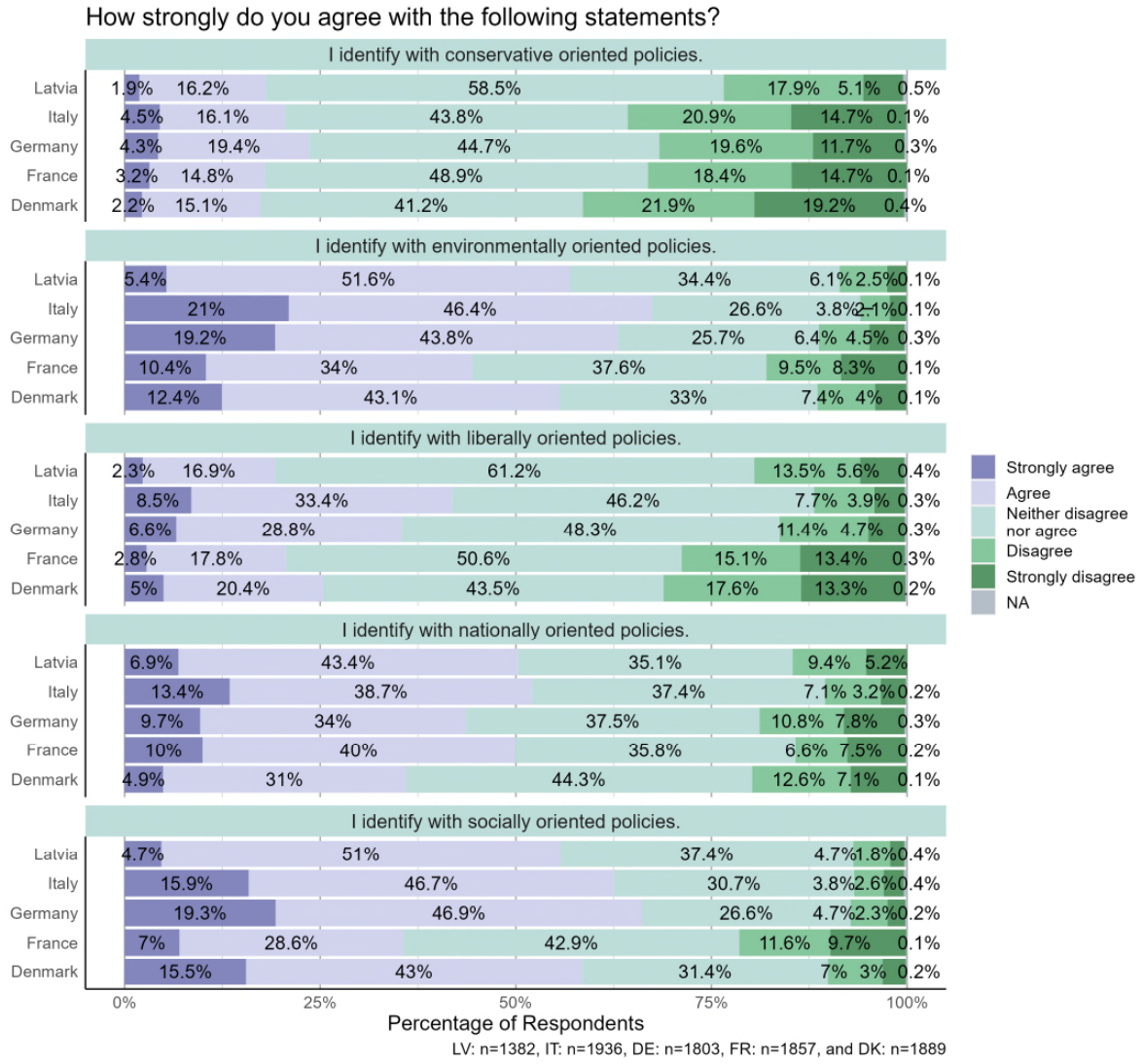

Figure 24 shows that a share of respondents from all countries identified with conservative, environmentally, liberally, nationally, and socially oriented policies. Except for respondents from France, the majority of respondents identify with environmentally and with socially oriented policies.

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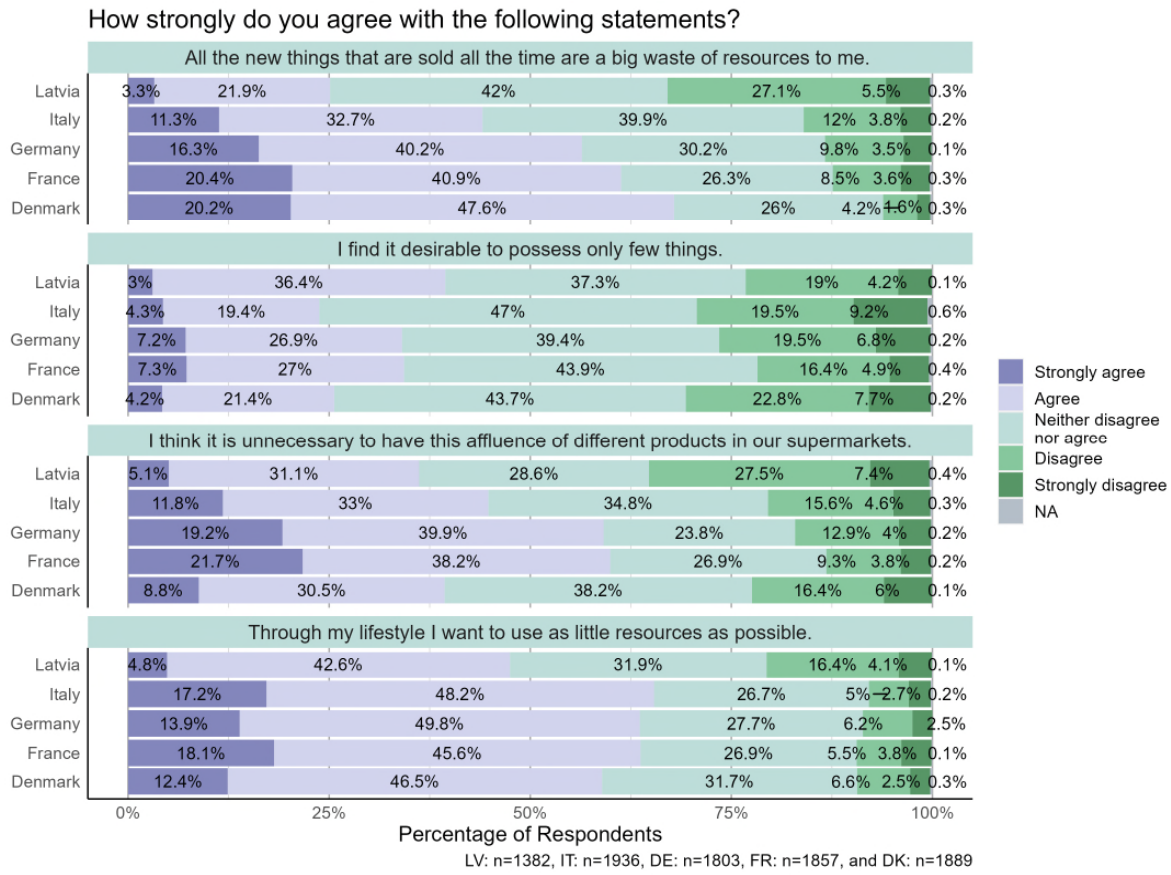
5.6. Sufficiency variables

Figure 25 Sufficiency orientation (Q. SO1_1, Q. SO1_2, Q. SO1_4 and SO1 _5)



According to Figure 25, between 25% (Latvia) and 68% (Denmark) of respondents agree or strongly agree that all the new things that are sold are a huge waste of resources. Around 25% of respondents from Italy and Denmark find it desirable to possess few things. This is the case for 34% of respondents from Germany and France and 40% of respondents from Latvia. Around 60% of respondents from France and Germany think that the affluence of products in supermarkets is unnecessary, whereas only between 36% and 39% think this in Latvia and Denmark, respectively. Less than half of respondents from Latvia want to use as few resources as possible.

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Figure 26 Sufficiency orientation borrowing (Q. SO2_1 and SO2 _2)

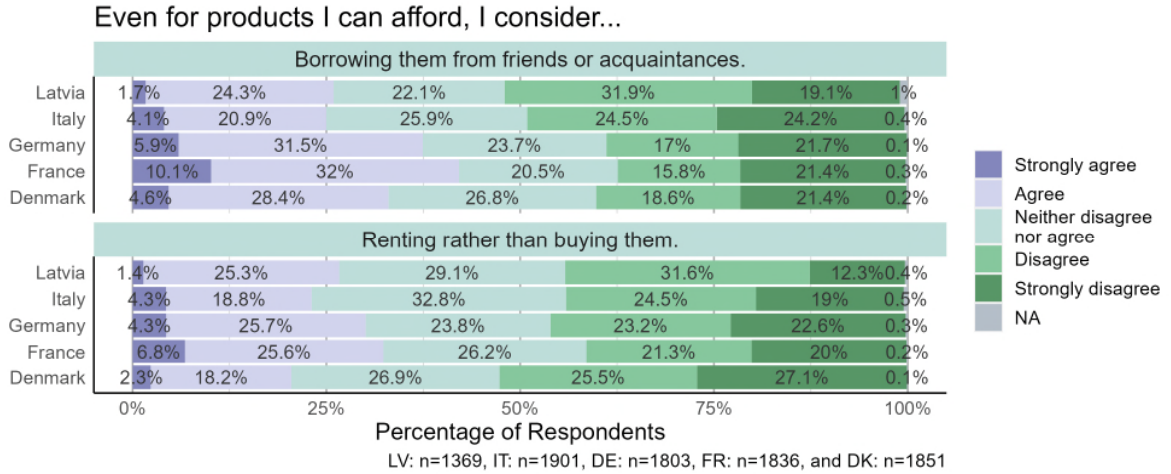

Figure 26 indicates that between 26% (Latvia and Italy) and 42% (France) of respondents would consider borrowing rather than buying items that they can afford. Between 20% (Denmark) and 32% (France) would consider renting rather than buying such items.

Table 11 Ownership of electronic devices (Q. LS1)

Number of appliances	Denmark	France	Germany	Italy	Latvia
0	0 .4%	0.8%	0.6%	1.1%	1.9%
1	3.6%	4.9%	3.9%	3.2%	6.6%
2	9.6%	18.1%	13.5%	13.8%	16.1%
3	20.9%	24.6%	16.3%	19.0%	22.4%
4	24.0%	20.1%	18.6%	20.3%	19.9%
5	18.7%	13.7%	15.3%	16.0%	16.3%
6	11.8%	8.2%	12.6%	11.8%	10.5%
7	7.8%	5.0%	9.5%	7.9%	4.4%
8	2.4%	2.4%	5.0%	3.3%	1.6%
9	0.7%	1.5%	2.7%	2.4%	0.2%
10	0.1%	0.2%	1.5%	0.7%	0.1%
11	0.0%	0.5%	0.2%	0.3%	0.0%
12	0.0%	0.1%	0.3%	0.1%	0.0%
Mean	4.27	3.88	4.57	4.35	3.76
SD	1.69	1.88	2.15	2.00	1.74

Respondents were asked which of the twelve following electronic items they owned for personal use: smartphone, tablet, laptop/desktop PC, e-book-reader, wearable device, virtual reality goggles, smart home system, smart TV, gaming console, connected exercise machine, wireless accessories and projector. Table 11 displays how many respondents own at least one item in each device category. On average, respondents from Germany own devices from the most categories with items from 4.57 categories per person. In Latvia, respondents own the least with devices for 3.76 categories on average.

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Table 12 Ownership of electronic appliances (Q. E7)

	Denmark	France	Germany	Italy	Latvia
Tumble dryer	44.8%	22.3%	38.4%	18.5%	8.6%
Electric sauna	0.5%	7.0%	3.2%	0.3%	0.6%
Hot tub	2.3%	7.5%	1.7%	2.5%	1.5%
Swimming pool	1.3%	10.8%	2.1%	1.3%	0.4%
Air conditioner	3.2%	13.4%	8.4%	40.4%	5.5%
Aquarium	3.0%	8.9%	4.7%	3.6%	3.4%
Water bed	0.2%	6.7%	2.8%	0.0%	0.0%
None of the above	44.6%	23.4%	38.7%	33.4%	80.1%

Table 12 depicts whether or not respondents own at least one of various electricity intensive appliances. Tumble dryers are most common in the samples from France, Germany and Denmark (22% to 45%), followed by Italy (19%) and finally Latvia with 9%.

The ownership of at least one electric sauna, hot tub, swimming pool, aquarium, and waterbed is most often the case for respondents from France (7%, 7.5%, 11%, 9%, and 17% respectively) whilst being hardly present in the other countries (less than 5%). Air conditioning is most frequently present in Italy (40% of respondents), followed by France (13%), Germany (8%), Latvia (5%) and Denmark (3%).

5.7. Structural aspects

Figure 27 Walking accessibility of services (Q. SP7a_1 to SP7a_7)

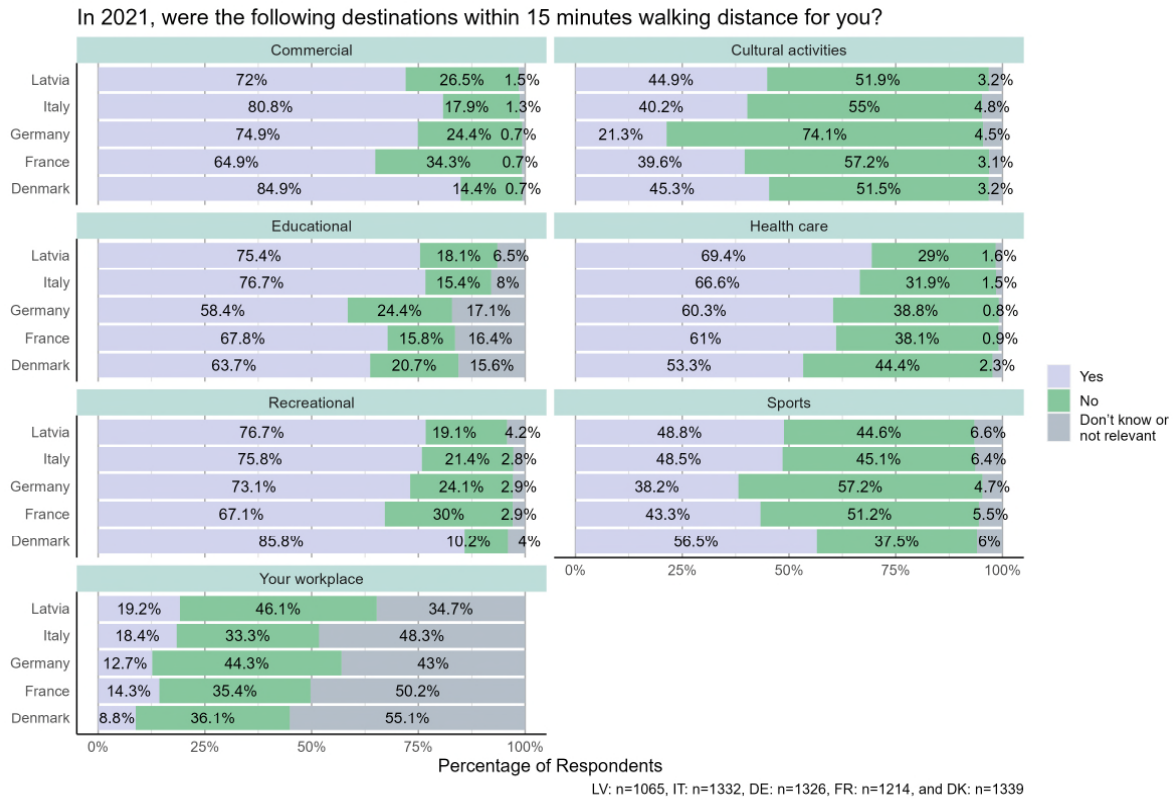

Figure 27 depicts whether various facilities are within 15 minutes walking distance. The question was asked to individuals who walked at least once a month. For over half of respondents in all

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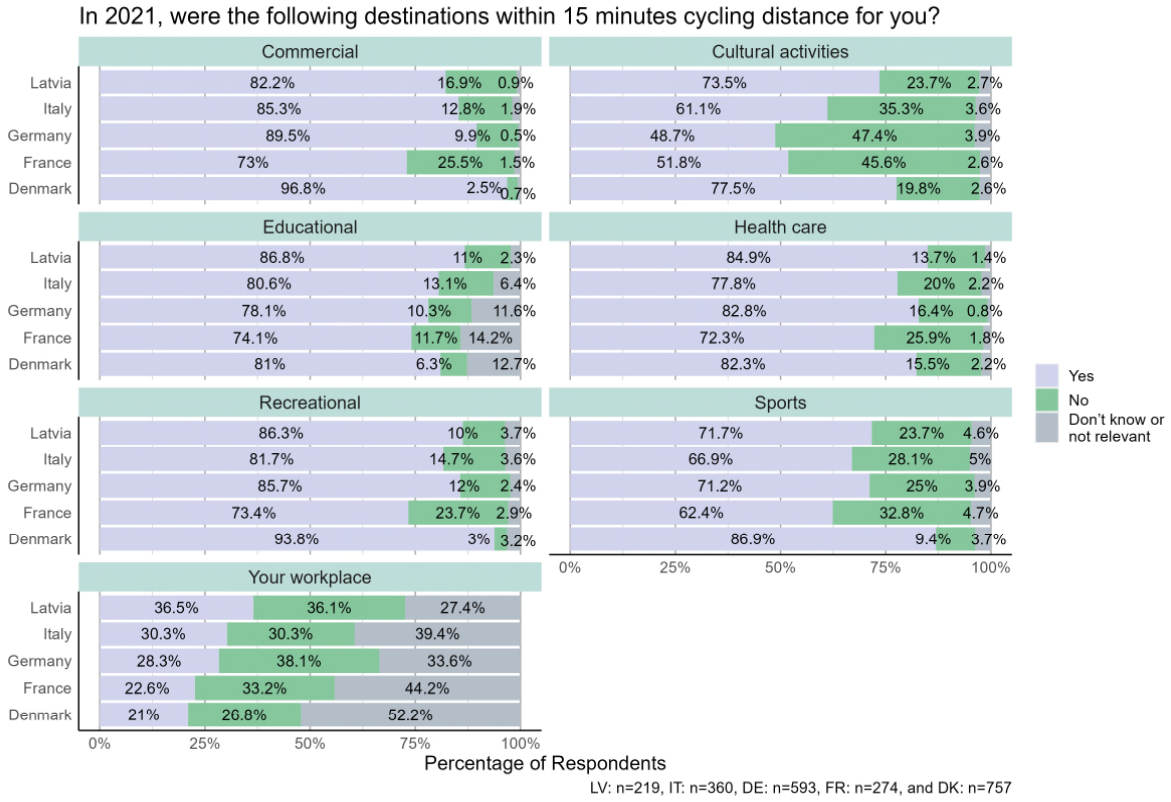
countries, commercial, educational and recreational and healthcare facilities are within 15 minutes walking distance. Only between 9% (Denmark) and 19% (Latvia) of respondents live within 15 minutes walking distance of their workplace.

Figure 28 Cycling accessibility of services (Q. SP7b_1 to SP7b _7)



Similarly to the previous figure, Figure 28 depicts whether the facilities are within 15 minutes cycling distance of respondents who cycle at least once a month. Sports, recreational, educational, healthcare and commercial facilities are within 15 minutes cycling distance for at least 60% of cyclist respondents in all countries. Between 21% (Denmark) and 36.5% (Latvia) of respondents live within 15 minutes walking distance of their workplace.

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5.8. Socio-economic variables

Figure 29 Age of respondents (Q. SD2)

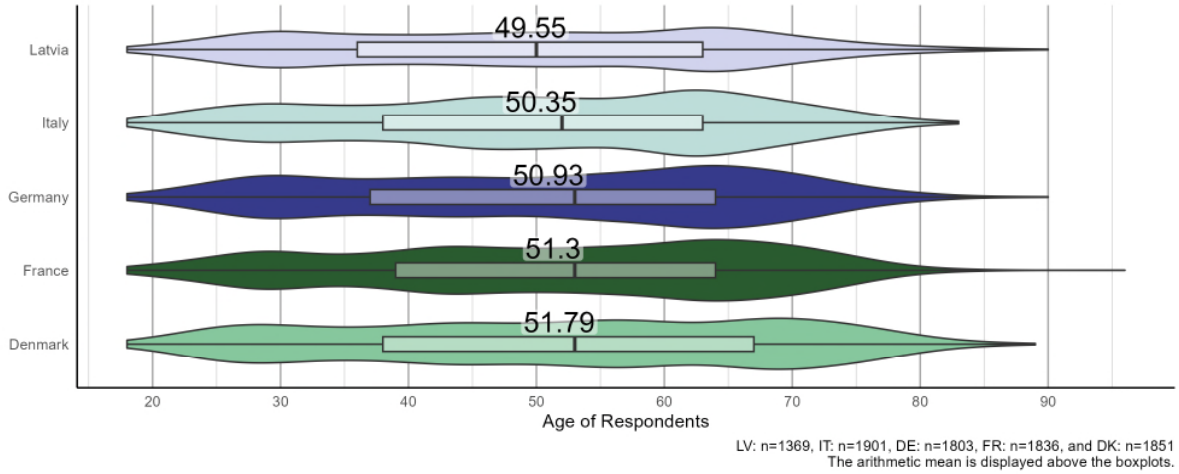

Figure 29 depicts the age distribution of participants and shows that there is a similar distribution between all five countries.

Figure 30 Gender of respondents (Q. SD1)

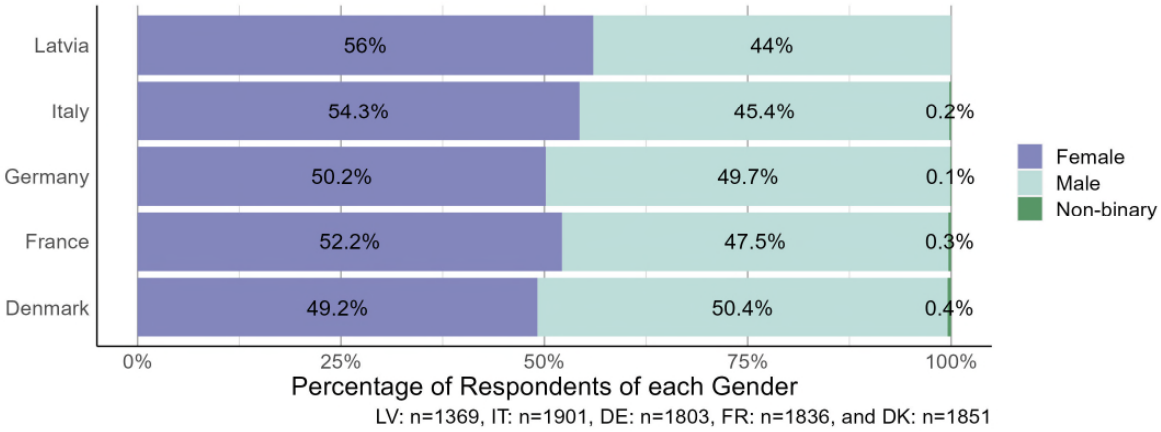

Figure 30 shows that in all countries except Denmark, there are more female than male participants. Non-binary respondents are present in all countries except Latvia.

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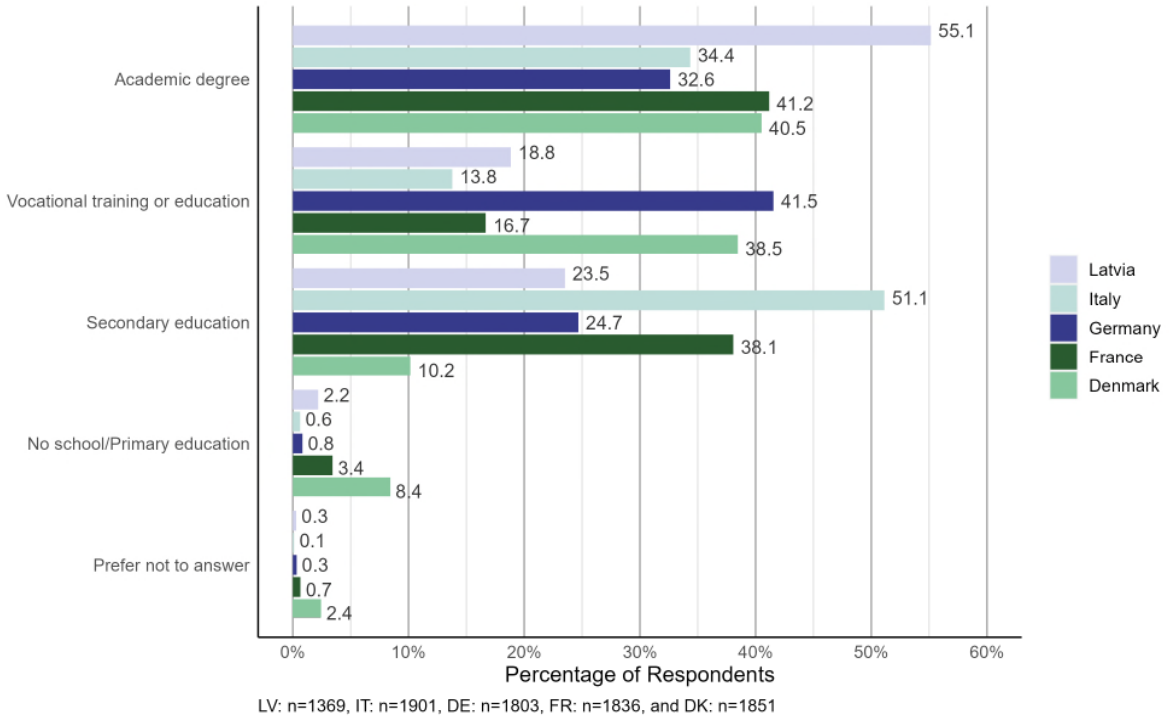
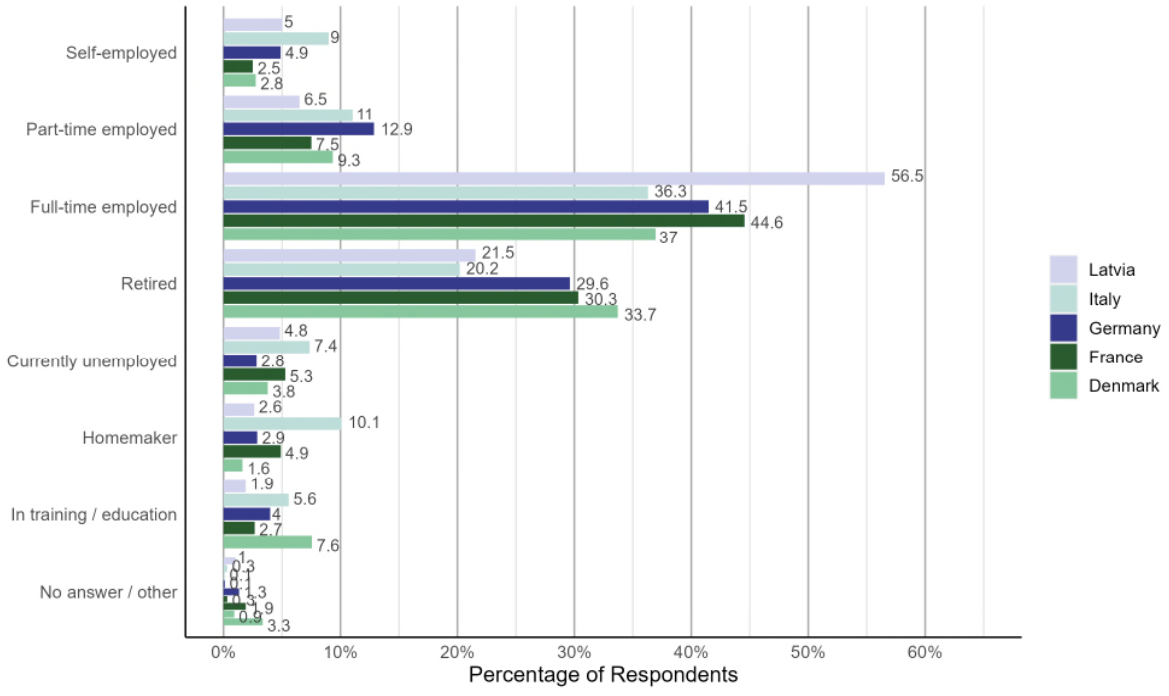
Figure 31 Highest education level of respondents (Q. SD4)



LV: n=1369, IT: n=1901, DE: n=1803, FR: n=1836, and DK: n=1851

Figure 31 depicts the highest education level of respondents. The majority of respondents from Latvia have an academic degree, and the majority from Italy have a secondary education. In Denmark, most respondents have an academic degree (40%) or vocational training (39%).

Figure 32 Current occupational status of respondents



LV: n=1369, IT: n=1901, DE: n=1803, FR: n=1836, and DK: n=1851

Figure 32 indicates that respondents are mainly full-time employed or retired in all countries.

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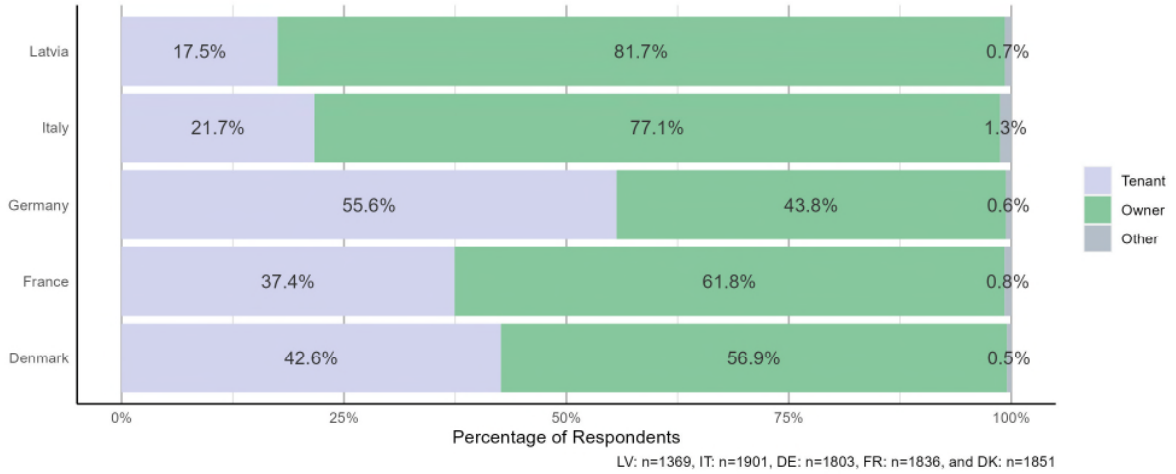
Figure 33 Percentage of tenants and owners (Q. SD12)



According to Figure 33, most respondents are owners in Latvia (82%), Italy (77%), France (62%) and Denmark (57%). In Germany, most respondents are tenants (56%).

Figure 34 Household size (Q. SD9)

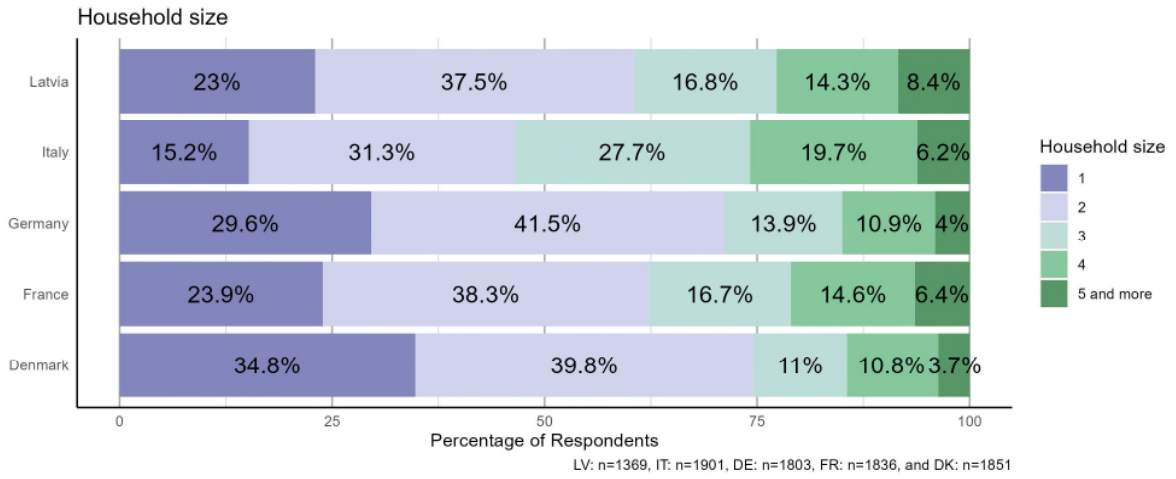


Figure 34 depicts the number of individuals of all ages living in the respondent's household. Between 15% (Italy) and 35% (Denmark) of respondents live alone. Only in Italy do more respondents live in households with three or more residents than in households with two or less (54%).

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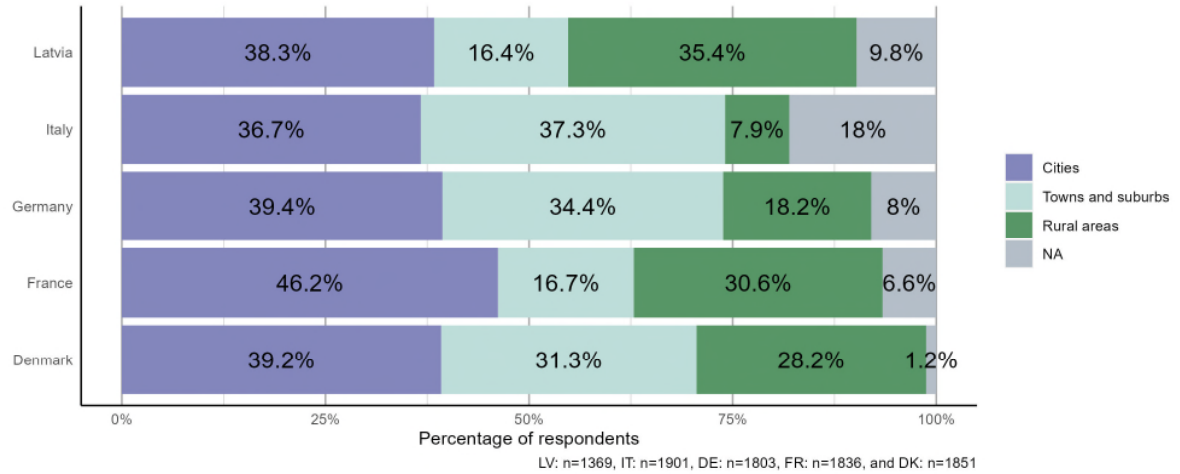
Figure 35 Percentage of rural, suburban and urban respondents[49]



According to

Figure 35, between 37% (Italy) and 46% (France) of respondents live in densely populated urban areas such as cities. Between 16% and 17% (Latvia and France) and 37% (Italy) live in suburbs or in towns. Italy has the lowest share of respondents from rural areas (8%)[50]. For up to 18% (Italy) of respondents, it was not possible to determine the level of urbanisation. This was either because they did not provide a complete postcode, or because their postcode was not included in the Eurostat datasets used to deduce the degree of urbanisation. This could be the case for recently changed postcodes.

5.9. Gender

The following tables and figures depict the division of various tasks between household members. Only households with more than one adult were included in the graphs. Separate graphs for males and females were produced to visualise gender-related differences.

Table 13 Household composition (Q. SD9)

	Denmark	France	Germany	Italy	Latvia
Single adult, no children	34,8%	12,7%	29,6%	15,2%	23,0%
2 adults, no children	36,3%	17,3%	40,0%	29,5%	34,6%
1 adult, at least 1 child	6,3%	16,3%	2,3%	2,7%	4,7%
At least 2 adults, at least 1 child	18,4%	48,4%	18,5%	24,4%	27,5%
3 or more adults, no children	4,2%	5,3%	9,6%	28,2%	10,2%

Table 13 describes the composition of households. Between 15% (Italy) and 35% (Denmark) of respondents live alone with no children. Households composed of three or more adults and no children are most common in Italy (28%), followed by Germany and Latvia (10%), and finally France (5%) and Denmark (4%).

[49] Information deduced from respondent's postcode (https://data.europa.eu/data/datasets/postcodes-and-nuts-nomenclature-of-territorial-units-for-statistics?locale=de and https://ec.europa.eu/eurostat/de/web/gisco/geodata/reference-data/population-distribution-demography/degurba)

[50] For more information, cf. https://ec.europa.eu/eurostat/web/degree-of-urbanisation/background

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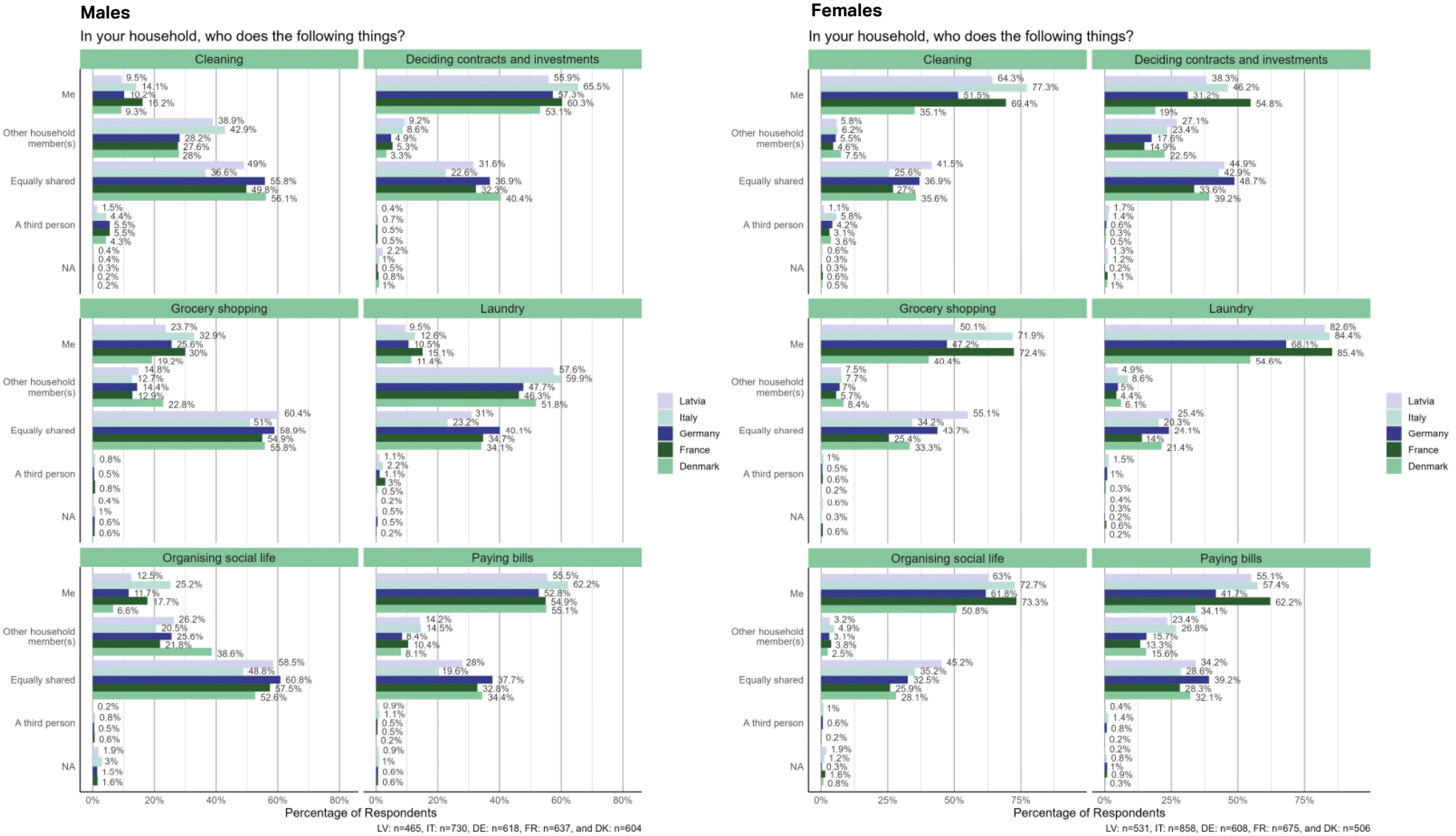
Figure 36 Distribution of household tasks for respondents who did not live alone (Q. SD14_1 to SD14_6)



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According to Figure 36, between 9% (Denmark) and 16% (France) of men who live in households with another adult are solely responsible for cleaning. In comparison, this is the case for between 35% (Denmark) and 77% (Italy) of women. In our sample, men living with another adult are a lot less often solely responsible for laundry, grocery shopping, and organising social life than women living in a household with another adult in all countries.

Figure 37 Organisation of the income for males (Q. SD15)

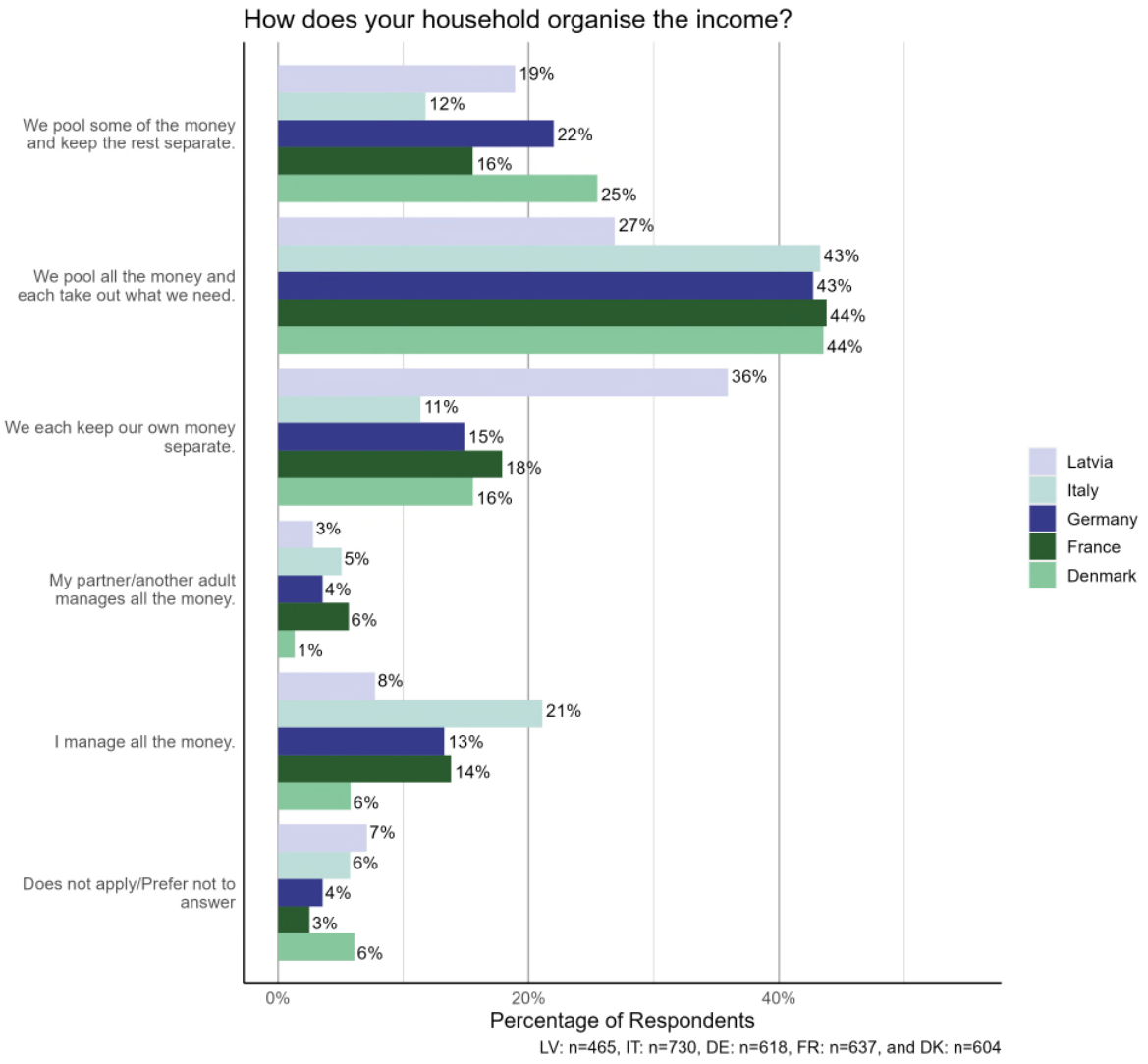

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Figure 38 Organisation of the income for females (Q. SD15)

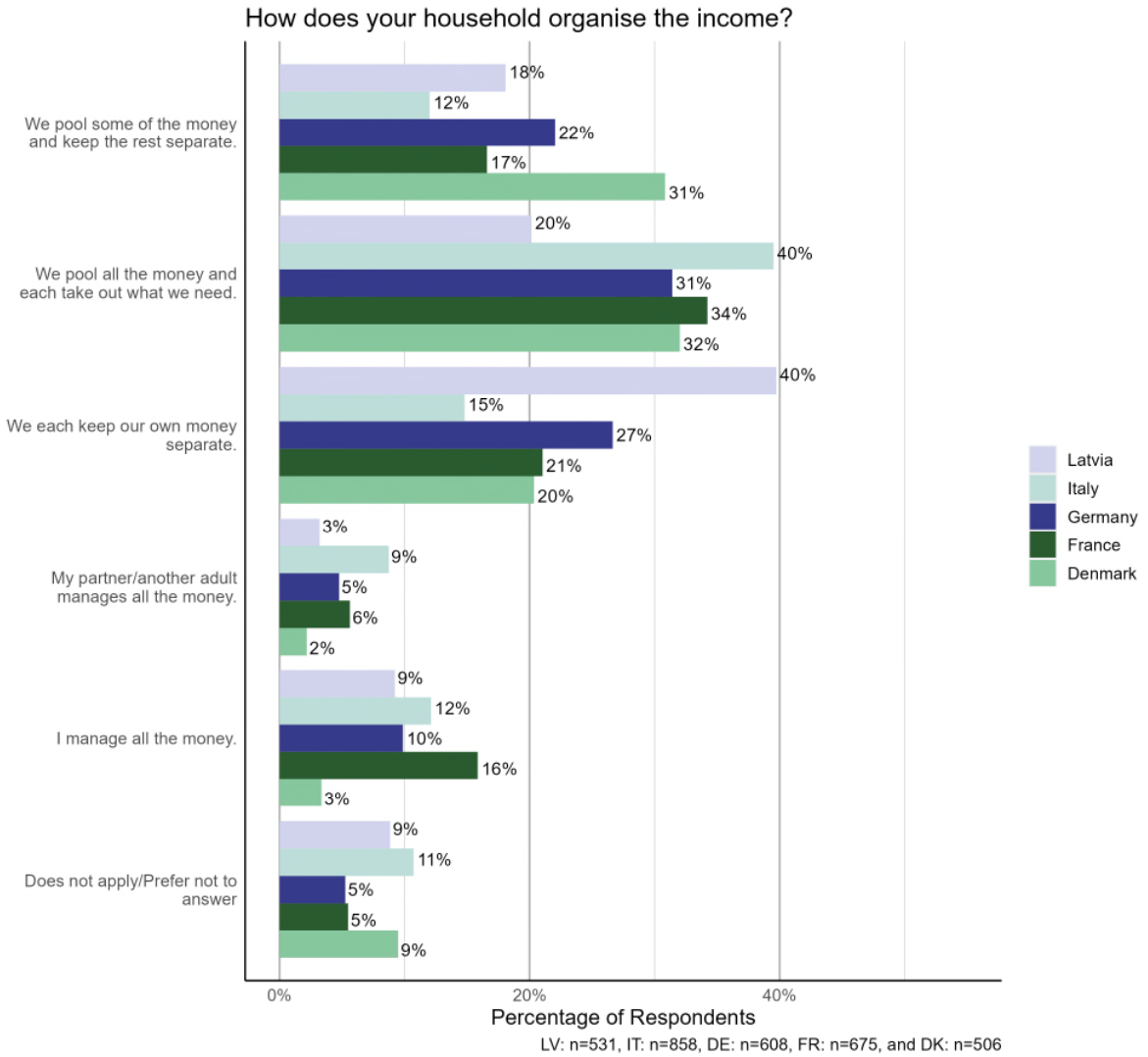

Figure 37 and Figure 38 depict how the household organises the income for men and for women who live with another adult. Respondents from Latvia are most likely to keep their money separate (36% of men and 40% of women).

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6. Identification of sufficiency-oriented lifestyles

This section uses the quantitatively estimated carbon footprint and well-being index described in Sections 2.1 and 2.2 to identify sufficiency-oriented lifestyles in each country.

This involves the assessment of four different broad groups:

- Highly sufficient individuals
- Individuals with a high level of sufficiency in certain domains of life

and for comparison:

- Individuals with average carbon footprints
- Individuals with very high carbon footprints

Section 6.1 provides an overview of the methodology and describes the groups in Denmark, Germany, Italy, and Latvia using socio-economic factors and quality of life. Section 6.3 describes the methodology and the groups in France where the categories had to be applied in a different way as the well-being measure was not available.

6.1. Lifestyle groups in Denmark, Germany, Italy, and Latvia

6.1.1. Methodology

As discussed in Section 2, we operationalised a sufficiency-oriented lifestyle as a lifestyle with a low-carbon footprint in all four activities (electricity, diet, heating and hot water, and transport) and a high score on the well-being index. Since we were mainly interested in individuals with sufficient behaviour, our focus was on individuals with a lower carbon footprint. Individuals with average and high carbon footprints were divided into groups and used as comparison groups.

We did not include CO_{2eq}-emissions related to aviation in the transport carbon footprint due to the probable bias caused by the COVID-19 pandemic (cf. Section 2.1).

Due to an error in the survey, we were not able to calculate the well-being index for respondents from France. This section thus focuses on Denmark, Germany, Italy, and Latvia.

Our methodology for identifying the groups is summarised in Figure 39. For each country:

1. we used the following two criteria to categorise respondents: carbon footprint and well-being
2. we distinguished quartiles of carbon footprint for total carbon footprint and individual activities (heating, electricity, transport, diet)
3. we distinguished above and below median-well-being.

Based on the previous steps, we create the following five groups:

Group I - Very Sufficient: above median well-being and carbon footprint in the lowest quartile for all activities.

Group II - Sufficient: above median well-being, total carbon footprint in lowest quartile & above second quartile footprint for at least one activity.

Group III - Low Carbon Footprint, Low Well-Being: below the second quartile of the total carbon footprint and below the median well-being.

Group IV - Average Carbon Footprint: total carbon footprint between second and third quartile.

Group V - High Carbon Footprint: total carbon footprint in the fourth quartile.

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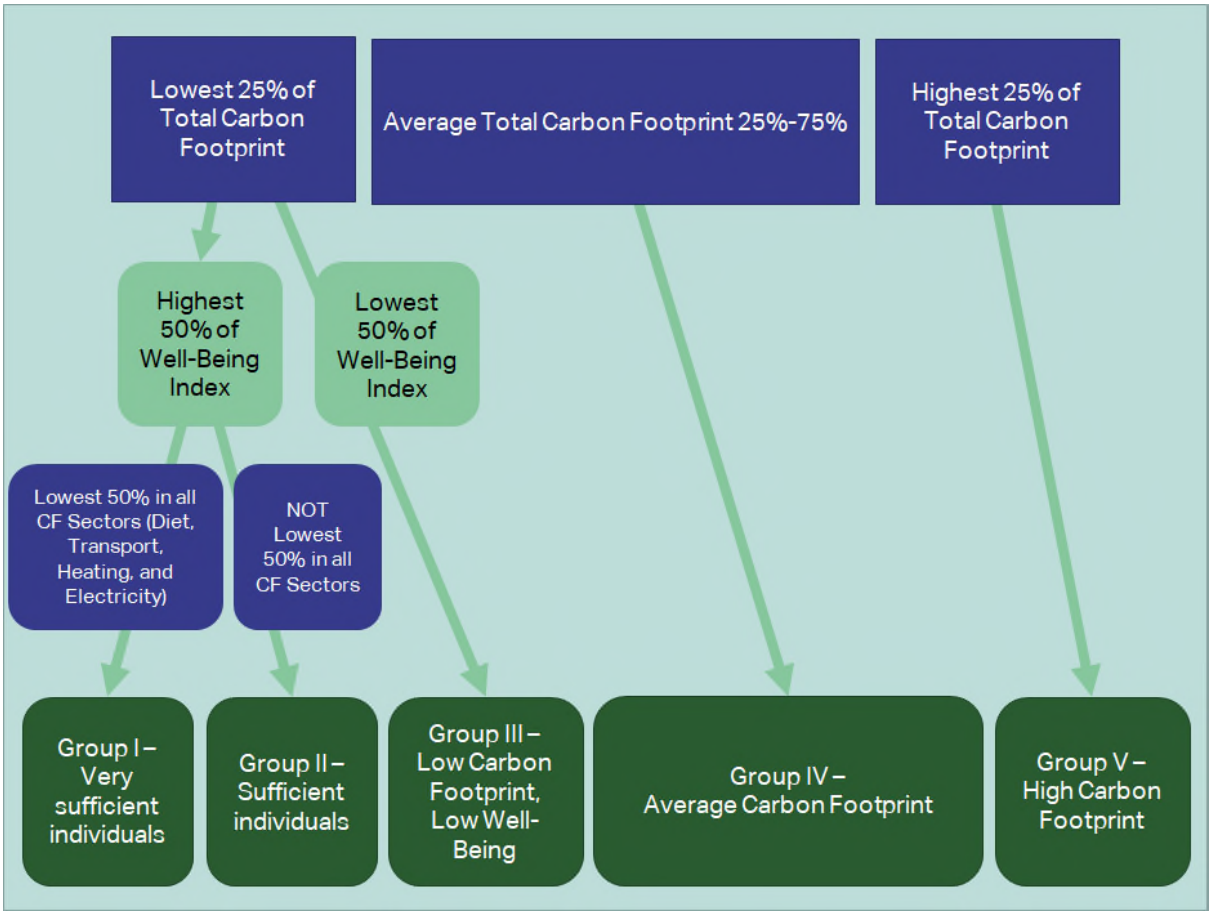
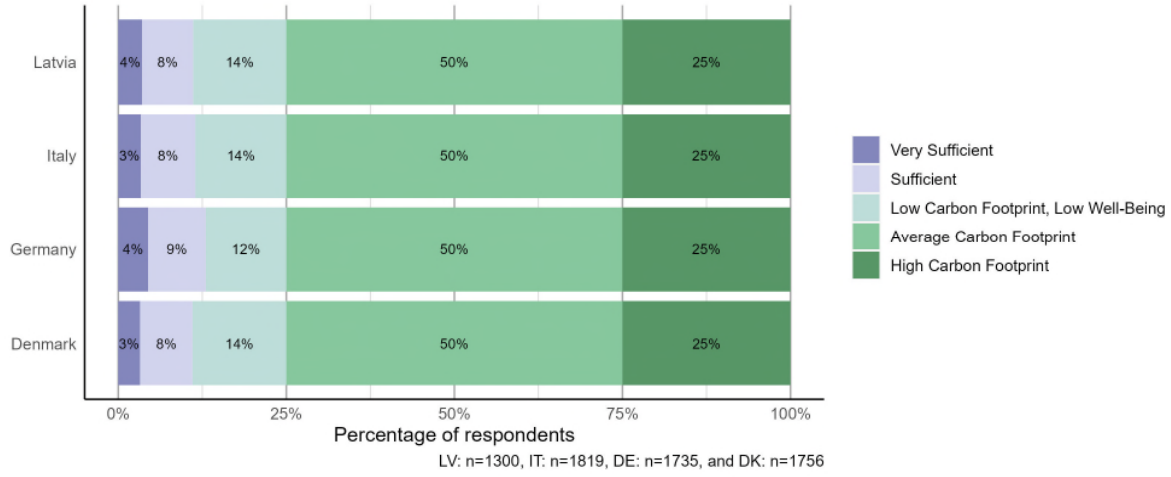
32 extreme outliers[51] and individuals who did not provide responses to at least one question on the well-being index (n=245) were removed.

Figure 39 Group identification operationalisation for each country



6.1.2. Respondents' distribution between the groups in Denmark, Germany, Italy, and Latvia

Figure 40 Distribution of participants between groups in all in Denmark, Germany, Italy, and Latvia



[51] Heating and hot water carbon footprint>30000kg CO_{2eq}-emissions and transport carbon footprint >20000kg CO_{2eq}-emissions, n=32

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Figure 40 depicts the distribution of survey participants in the groups by country. As expected, 50% of individuals in each country are in *Group III - Average Carbon Footprint,* and a quarter are in *Group V - High Carbon Footprint*. The distribution of respondents in the low carbon footprint groups (*Groups I* to *III*) is similar between countries, with between 3% and 4% of respondents in *Group I - Very Sufficient*, 7% to 8% in *Group II - Sufficient*, and 13% to 15% in *Group III - Low Carbon Footprint, Low Well-Being*.

Figure 41 Distribution of participants between groups: zoom on the lowest 25% in terms of carbon footprint

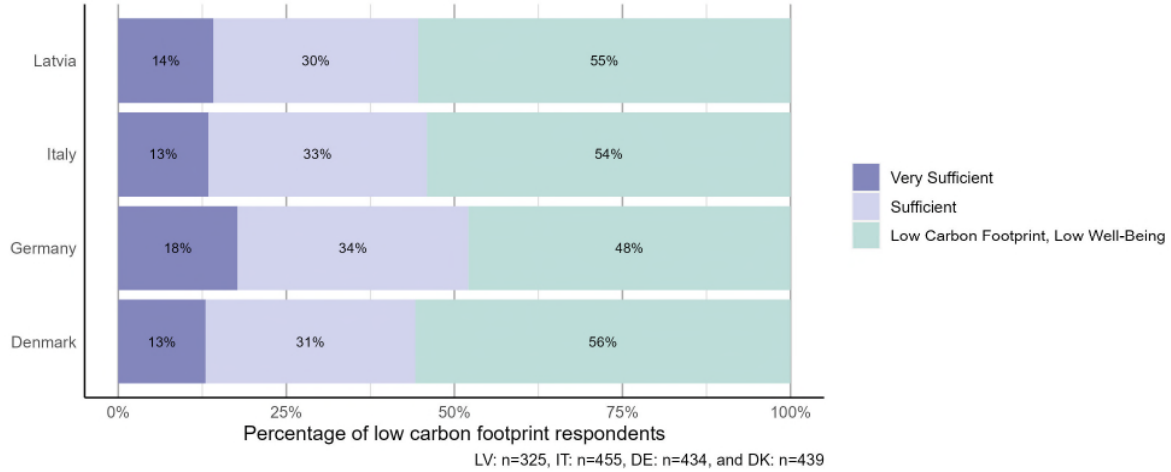

Figure 41 depicts the distribution of participants in the lowest total carbon footprint quartile. Between 14% and 18% of respondents with a total carbon footprint in the lowest quartile are in Group I - Very Sufficient, between 30% and 34% are in Group II - Sufficient, and between 48% and 56% are in Group III - Low Carbon Footprint, Low Well-Being.

6.1.3. Description of the lifestyle groups

The following section describes the five groups by country. Chi-square tests of independence with a Bernoulli correction and Welch t-tests were used to ascertain whether the groups have significant common characteristics. We tested whether the groups were significantly more or less likely to be characterised by socio-economic factors (age, gender, income, education, area of living, political/cultural orientation), quality of life (including security/money, comfort), and along the gender dimension (care economy, effort sharing). Please note that age and gender were used to calculate the CO_{2eq}-emissions for diet and for the default for the distance travelled by car. Therefore, it is expected that females (and older respondents) will have lower diet-related emissions than males (and younger respondents) in general. All significant effects are described in the following statements ($p<0.05$). Figure 42 summarises the groups for all countries.

Group I - Very Sufficient

Denmark: Individuals in this group are more likely to be female and younger than average. They are more likely to be students and are less likely to have a vocational training. They also try to possess fewer items. It is more likely that someone else in the household deals with bills and contracts.

Germany: Individuals in this group are more likely to be female, younger than the average, live in a flat, and in a city. They tend to be employed part-time and do not have to reduce expenditure for household basics. They have no difficulty living on their current income. They tend to support socially and environmentally oriented policies, and to not support nationally oriented policies. These individuals tend to be interested in environmental issues and would not be embarrassed to be seen as having an environmentally friendly lifestyle. They have a strong sufficiency-

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orientation as they try to limit their resource use, possess fewer items and prefer to borrow items from friends and acquaintances rather than buy them new. These individuals are more likely to share equally the responsibility for dealing with contracts and investments, and less likely to deal with these on their own.

Italy: These individuals are more likely to be female, younger than the average, to have children and to be a homemaker. They are also more likely to do the cleaning, and washing by themselves.

Latvia: Individuals in this group are significantly more likely to be female. They try to limit their resource use and prefer to borrow rather than buy new items. They are more likely to do the cleaning themselves. It is less likely that another household member does the washing for these individuals.

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Group II - Sufficient

Denmark: In this group, individuals are more likely to be younger than the average, have an academic degree and less likely to have vocational training. They tend to live in a flat and in a city. They are more likely to be in training or education. They tend to be able to afford a week's holiday as well as balanced meals and to have no difficulty living on their current income. They tend to support environmental policies. It is more likely that dealing with bills and household finances is shared equally between household members.

Germany: Individuals in this group tend to be younger than the average, are more likely to live in a flat and in a city, and are generally comfortable on their current income, and tend to be able to afford a week's holiday. They are less likely to worry about being able to pay their energy bill. They are less likely to support conservative policies. They tend to consider themselves to be eco-friendly consumers. It is less likely that people in this group pay household bills themselves.

Italy: Individuals in this group are more likely to be female, and younger than the average. They are generally comfortable on their current income, tend to be able to afford a week's holiday and to afford unexpected expenses. It is less likely that respondents in this group pay bills and deal with household finances on their own, instead it is more likely that another household member does it. It is also less likely that individuals in this groups deal with contracts and investments on their own, but it is more likely that another household member does it or that it is equally shared between them and another household member.

Latvia: These individuals tend to be female, and to support liberal policies. They tend to consider themselves to be eco-friendly consumers and to consider new things to be a waste of resources. They are less likely to deal with contracts and investments on their own.

Group III - Low Carbon Footprint, Low Well-Being

Denmark: These individuals are more likely to be female, younger than average, and belong to the lowest income group. They are more likely to have a primary or secondary education. They are more likely to live in a flat and in a city and not in rural areas. They are more likely to be in training, in education or unemployed and less likely to be employed full-time. They are more likely to have an unstable income that is difficult to live on and tend to receive governmental support. They are more likely to have had to reduce expenditure for household basics, to not be able to afford an unexpected expense or a week's holiday, and to be unable to afford balanced meals, as well as being unable to eat as much meat, dairy seasonal, and regional products as they would like. They tend to consider that they live in unsafe temperature in the winter and summer months. They also tend to feel that they need more living space. They are less likely to support conservative and liberal policies. These individuals are more likely to clean the house, to do the grocery shopping, do the washing, to take care of social life, to pay bills and deal with household finances, with contracts and with investments alone. It is less likely that another household member does the washing and organises social life. It is also less likely that cleaning, shopping, organising social life and dealing with bills, contracts, household finances and investments are equally shared between household members.

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Germany: Individuals in this group are more likely to be female and belong to the lowest income group. They are more likely to live in a flat and in a city. They are less likely to be full-time employed. They are more likely to have an unstable income that is difficult to live on and tend to receive governmental support. They are more likely to have had to reduce expenditure for household basics, to not be able to afford an unexpected expense or a week's holiday, and to be unable to afford balanced meals. They are more likely to consider that they live in unsafe temperature in the winter months. They also tend to feel that they need more living space. They are more likely to borrow items, even if they could afford new ones. They are more likely to clean the house, to do the shopping, and to take care of social life on their own. It is more likely that they or a third unpaid non-household member does the washing, and sharing the shopping with another household member is less likely in this group.

Italy: The individuals in this group are more likely to be female, younger than the average, and to belong to the lowest income group. They are less likely to be full-time employed and more likely to be unemployed or a homemaker. They are more likely to have an unstable income that is difficult to live on and tend to receive governmental support. They are more likely to have had to reduce expenditure for household basics, to not be able to afford an unexpected expense or a week's holiday, and to be unable to afford balanced meals. They tend to consider that they live in unsafe temperature in the winter and summer months. They also tend to feel that they need more living space. They tend to not support liberally and environmentally oriented policies. They are less likely to consider themselves to be eco-friendly consumers and to be interested in environmental issues. These individuals are more likely to do the cleaning and the washing on their own. It is more likely that someone else in the household deals with bills, investments and contracts.

Latvia: In this group, individuals are more likely to be female and to belong to the lowest income group. They are less likely to have an academic degree or a secondary education. They are less likely to be full-time employed. They have difficulties living on their current income. They are more likely to have had to reduce expenditure for household basics, to not be able to afford an unexpected expense or a week's holiday, and to be unable to afford balanced meals. They tend to consider that they live in unsafe temperature in the winter months. They are less likely to support liberal policies. These individuals are more likely to clean the house, to do the shopping, do the washing, and to take care of social life on their own. It is less likely that they equally share cleaning with another household member and less likely that another household member does the washing. It is more likely that another household member deals with contracts and investments.

Group IV - Average Carbon Footprint

Denmark: These individuals are most likely male, older than the average, and without children. Their highest education level tends to be vocational training and not secondary education. They are more likely to be retired. They tend to be able to afford a week's holiday, unexpected expenses and balanced meals. They can also afford as much meat, seasonal and local products as they desire. They are less likely to have difficulty living on their current income, but tend to consider that they require more living space.

Germany: In this group, respondents are more likely to be male. They also tend to be able to afford as many dairy products as they would like. They also are more likely to consider that they require more living space. They are more likely to support social policies.

Italy: Individuals in this group are more likely to be male, to be retired, and to be able to afford an unexpected expense.

Latvia: Individuals in this group are more likely to live in a flat and to state that they require more living space. They are less likely to have another household member deal with contracts and investments. It is less likely that another household member does the washing, but more likely that another household member deals with bills and household finances and with contracts and investments.

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Group V - High Carbon Footprint

Denmark: These individuals are more likely to be male, in the highest income group, to have children and to live in a house. They are more likely to live in rural areas and not in cities. They are less likely to be in training, in education, or retired. They are more likely to be employed full-time and do not tend to receive governmental support. They are less likely to support social or environmental policies, and more likely to support conservative policies. They are less likely to be interested in environmental issues and more likely to be embarrassed to be seen as environmentally friendly. Individuals in this group are less likely to do the cleaning by themselves, and more likely to share cleaning with another household member. They are also less likely to be solely responsible for organising social life.

Germany: These individuals are more likely to be male and in the highest income group. They tend to live in a house in rural or suburban areas, or in a small town (but not in a city). They are more likely to be employed full-time, to not receive governmental support, and to be able to afford as many dairy, seasonal and local products as they like. They tend not to require more living space. Regarding their political views, they are less likely to support social and environmental policies, but more likely to support conservative policies. They tend to neither try to limit their resource use, nor possess fewer items. They are less likely to consider new things to be a waste of resources, and to not think that there are too many items in supermarket, and are less likely to borrow items that they can afford.

Italy: In this group, individuals are more likely to be male, to live in a house, and to not live in a city. They are more likely to be employed full-time. They are more likely to be conservative. They tend to not consider themselves to be eco-friendly consumers, but do tend to rent items, even if they could buy them new. It is more likely that another household member does the cleaning. These individuals are more likely to deal with bills, household finances, with contracts, and investments on their own and it is less likely that another household member does.

Latvia: Individuals in this group are more likely to be male, in the highest income group and to live in a house. They are more likely to have an academic degree and to be employed full-time. They tend to not be able to afford a week's holiday and can afford as many meat, dairy, seasonal and local products as they like. They tend to live in conditions that they consider safe in the winter and have no difficulty living on their current income. They are less likely to rent items. Individuals in this group are less likely to clean, to do the washing, and to organise social life, alone, by themselves. It is more likely that someone else in the household does the washing.

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Figure 42 Summary of group characteristics for Denmark, Germany, Italy, and Latvia

Group I - Very sufficient	Individuals in this group are predominantly **female**, **younger** than average, **not deprived** and tend to exhibit **a sufficiency-oriented lifestyle**.
These individuals tend to **not be deprived**, to be **younger** than average, and **comfortable on their current income**. They tend to support **environmentally oriented policies** and consider themselves to be **eco-friendly consumers.**	**Group II - Sufficient**
Group III - Low Carbon Footprint, Low Well-Being	In this group, individuals are predominantly **female**, tend to have a **low income** and to **not be employed full-time**. They exhibit many characteristics of **deprivation**, including **not having a stable income** and **not being able to afford balanced meals**. They tend to have **unsafe conditions in the winter** months and feel they **require more living space**. They tend **not to support liberal** oriented policies. They are also more likely to clean, to do the shopping, the washing, and to take care of social life on their own.
Individuals in this group are not particularly homogenous. They are more likely to be **male**.	**Group IV - Average Carbon Footprint**
Group V - High Carbon Footprint	These individuals are more likely to be **male**, have a **high income**, live in a **house**, and **not live in large cities**. They tend to be **employed full-time**. They tend to prefer **conservative policies** and do **not exhibit a sufficiency-oriented lifestyle**. It is more likely that someone else in the household does the cleaning, the washing, and takes care of social life.

Figure 42 summarises the main common characteristics of the groups in Denmark, Germany, Italy, and Latvia.

6.2. Carbon footprint groups in France

6.2.1. Methodology

Since the responses from France could not be classified using the well-being index, a classification was used by distinguishing quartiles of carbon footprint for total carbon footprint and individual activities (heating, electricity, transport, diet).

We then created the following four groups:

- **Group A - Low carbon footprint in all activities:** carbon footprint in the lowest quartile for all activities.
- **Group B - Low carbon footprint:** total carbon footprint in lowest quartile & above second quartile footprint for at least one activity.
- **Group IV - Average Carbon Footprint:** total carbon footprint between second and third quartile.

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Group V - High Carbon Footprint: total carbon footprint in the fourth quartile.

6.2.2. Respondent's distribution between the groups in France

Figure 43 Distribution of participants between groups in France

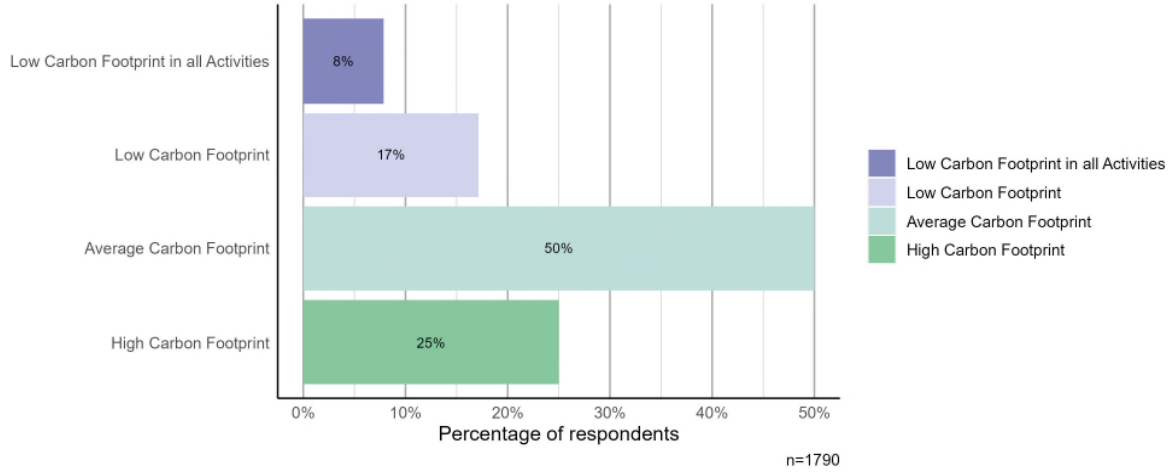

Figure 43 depicts the distribution of survey participants in the groups in France. As expected, 50% of individuals are in *Group III - Average Carbon Footprint,* and a quarter are in *Group V - High Carbon Footprint*. Regarding the two low carbon footprint groups, 8% are in *Group A - Low Carbon Footprint in all Activities* and 17% are in *Group B - Low Carbon Footprint*.

6.2.3. Description of the groups

The following section describes the five groups. Chi-square tests of independence with a Bernoulli correction and Welch t-tests are used to ascertain whether the groups have significant common characteristics. The following statements refer to significant effects ($p<0.05$). Detailed information about the groups can be found in the Annex 1.

Group A - Low Carbon Footprint in all Activities: Individuals in this group are most likely female, younger than average, and in the lowest income group. They tend to live in cities and not in rural areas. They are more likely to be a homemaker and to not be retired. They are less likely to have had to reduce expenditure for household basics and to be able to afford the desired amount of meat, dairy, seasonal and local products. They are less likely to support nationally oriented policies. They are more likely to try to possess less items. Individuals in this group are more likely to do the washing on their own, and less likely to have other household members do it. They are more likely to organise social life on their own. Individuals in this group are more likely to pay a non-household member to do the shopping.

Group B - Low Carbon Footprint: These individuals are more likely female, to not have children, and to be in the lower income groups. They are more likely retired and not employed full-time. They did not have to reduce expenditure for household basics. Individuals in this group are more likely to do the washing on their own. They are less likely to equally share paying bills and dealing with household finances with other household members.

Group IV - Average Carbon Footprint: Individuals in this group are more likely to be male.

Group V - High Carbon Footprint: The individuals in this group are more likely to be male, to be in the highest income group, and to be older than the national average. They tend to live in houses rather than flats, and to live in small towns, suburban, or rural areas rather than in cities. They are less likely to be unemployed and to be a homemaker. They are more likely to be employed full-time. They tend to not receive governmental support and can afford their desired amount of meat, seasonal and local products. They do not tend to require more living space.

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They are less likely to try to limit their resource use, to possess less items and to rent items. Individuals in this group are less likely to clean, to do the washing, and to organise social life on their own alone. It is more likely that someone else in the household does the shopping and washing. It is more likely that household members pool all the money and each take out what they need.

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7. Sufficiency-oriented lifestyles outside Europe: India

7.1. India as a comparison

In order to consider sufficiency-oriented lifestyles not only in Europe but also in the Global South, we conducted a similar survey in India as a country representing the Global South. More specifically, we adjusted the survey to fit the context (e.g., including cooling) and, due to the large size and diversity within India, we focused data collection on two Mega Cities (>10Mio inhabitants), namely Mumbai and Delhi. These cities were selected based on their location: Delhi is located in the North of India (without a coastal line). As it is a state-city and the capital of India, it does not suffer largely from high poverty rates. In contrast, Mumbai is located on the Arabian Sea in the West of India with a very humid and hot climate and a medium poverty rate. Due to their large size, inhabitants of both cities vary in their lifestyle and socio-demographic variables. In the following, we describe the applied methodology and afterwards, present the results of the survey in Mumbai and Delhi, separately.

7.2. Methodology

Survey data was collected in July and August 2023. After pretesting and several exchanges with the market research institute, we adjusted the survey in length and improved the description for some questions to avoid receiving ambiguous answers. A researcher from India was involved as a consultant in the preparation of the survey to support on the country- and culture-specific adaptation. As the data was collected in 2023, we asked respondents about the year 2022 because we believe it would yield more accurate and relevant information compared to inquiring about 2021, i.e. the year two years prior.

7.2.1. Methodological adjustments compared to Europe

Due to the different cultural context and in exchange with Indian researchers and the supporting market research institute, we decided to change the methodology for data collection from an online survey to face-to-face interviews. The reasons for this are the following:

- Members of online survey panels in India are predominately male (at least 60%), highly educated and young (between 18 and 35 years old). In general, only between 5% and 18% are above 35 years old. With face-to-face interviews, we intended to obtain a higher representativeness in our sample.
- Most people having a device for completing an online survey do not check their emails on a regular basis and are thus very difficult to recruit for participation in online surveys.
- For the longitudinal approach, the overlap between the first and the second waves can potentially be enlarged with face-to-face interviews because this results in a personal, already established contact between the market research institute and the participant and thus may lead to a higher motivation for participation.

Moreover, we made the following adjustments compared to the questionnaire applied in Europe:

- To consider the cultural background and context, we included additional socioeconomic variables to more adequately reflect the Indian situation. In addition to household income, we asked for monthly consumer expenditure and used this value for quotas. Further new socioeconomic variables included whether the household was male- or female-headed or equally shared. With regard to the general questions, we added a question on people's religiousness and omitted the question on their political orientation as the European political orientations do not fit the Indian system.
- Regarding the survey parts for the carbon footprint calculator, we added questions on cooling and reduced the number of questions for heating and hot water. In the survey

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part on transport, we added a question on the use of rickshaws. Additionally, no questions on 15-minute-accessibility by foot or bike were asked and thus, the Indian context does not include the section on structural variables. A reason for this is the focus on cities in India which leaves less space for structural differences compared to an entire country.

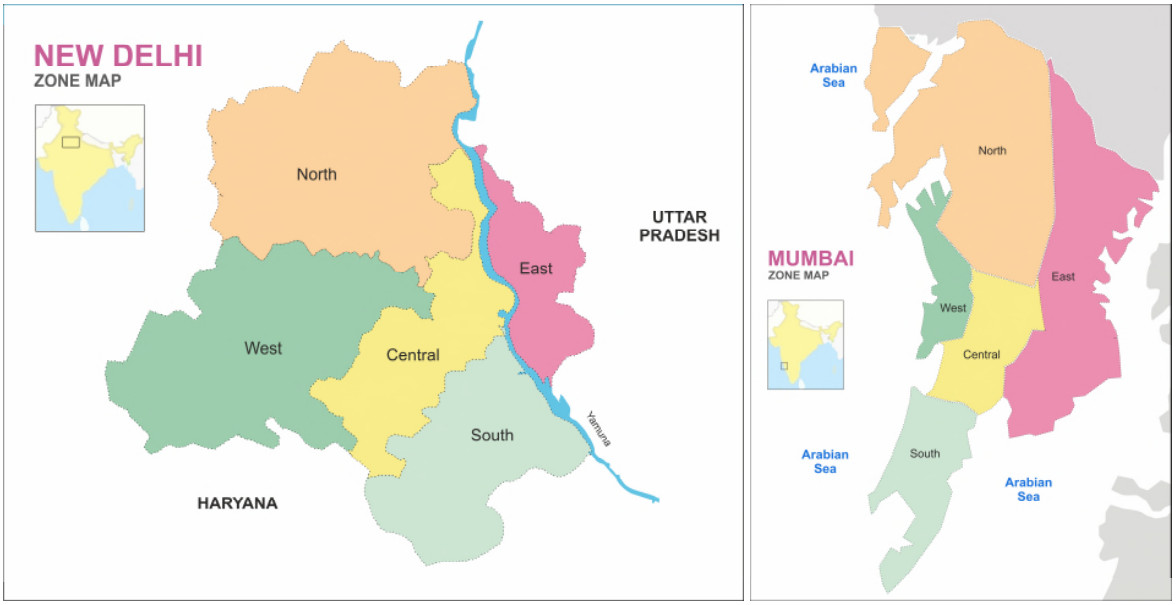
- In the survey part on diet, we included questions on the consumption of rice as this presents also a high source of emissions and a larger part of the Indian diet (compared to Europe).

The questionnaire is included in Annex 2.

7.2.2. Recruitment of participants and interviewer characteristics

Instead of recruiting participants all over India, we restricted the recruiting process for our face-to-face interviews to the two largest cities in India, Delhi and Mumbai, as outlined above. We aimed to get representative samples from these cities, with 500 participants per city. Thus, we set quotas on age, gender, and household expenditure (see details below). To ensure geographical variability, the market research institute divided the two cities into five regions each (North, South, East, West, and Centre) and aimed to recruit 20% of the sample from each of these regions. For an overview of the zones, see Figure 44.

Figure 44 Zones used as quotas to ensure geographical distribution across cities



To recruit the participants, the market research institute's approach was two-fold: Firstly, interviewers started to ring at the doors and asked for spontaneous interviews. For this approach, two rules were applied for recruiting: After a successful interview, two homes were skipped; additionally, the right-hand-rule[52] was applied to guide the interviewer through a neighbourhood (except in South Delhi and West Mumbai because of their infrastructural complexity). Secondly, to achieve the quota and a representative sample, some interviewees from the market research institute's panel were called and an interview appointment was determined.

To ensure a standardised process of the interview, all interviewers received a briefing before the first interview and were accompanied by another experienced interviewer for the first day or at least for the first interview. The survey was available in English and Hindi, however, all

[52] A household was randomly selected as a starting point. After the first household was contacted, interviewers turned right until the required number of interviews were completed.

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interviewers were able to speak both languages to translate and explain in case of problems in understanding the question.

Table 14 Demographic characteristics of interviewers by city (Q. QI6, QI7, QI9, v_473, v_474)

City	Number of interviewers	Gender		Age	# of interviews conducted prior to this survey	Years at a market research company
		Male	Female			
Delhi	28	10	18	M = 28.7, SD = 2.9	M = 442, SD = 60	M = 3.09, SD = 0.9
Mumbai	30	26	4	M = 27.3, SD = 2.5	M = 403, SD = 131	M = 3.08, SD = 0.9

Table 14 displays demographic characteristics of the interviewers in Delhi and in Mumbai. In Delhi, the interviews were conducted by a total of 28 interviewers, 18 of whom were female and 10 male. They were 28.7 years old on average and had worked at the market research company for about 3 years. On average, they had conducted 442 interviews in their professional lives. The interviews in Mumbai were conducted by a total of 30 interviewers, 26 of whom were male and 4 female. They were on average 27.3 years old and had worked at the company for about 3 years. The Mumbai interviewers had conducted an average of 403 interviews in their professional lives.

7.2.3. Applied Exclusion Criteria

Since the survey was performed face-to-face, we were not able to include any items serving as attention checks as in the European surveys. Instead, we closely monitored the fieldwork and the collected data to ensure high data quality and conducted weekly meetings with the market research institute besides regular email updates regarding the quota. Our initial sample size consisted of 1095 participants. We excluded respondents who provided unrealistic data, such as, consuming over 8kg of rice per week, driving 200000km by car per year or being on holidays for more than 12 weeks/year (n=12) as well as participants who moved in the reference year for the carbon footprint (n=352; 225 in Delhi, 127 in Mumbai). The data associated with 364 participants was excluded from the data set prior to all analyses. Thus, our complete sample in India comprises of 731 participants (323 in Delhi and 408 in Mumbai).

7.2.4. Carbon footprint calculation method for the Indian context

To consider the cultural background and context, we applied various adjustments to the carbon footprint calculator. Cooling was considered instead of heating and diet was calculated differently. Due to a different structure of the transport sector, the calculations for this sector were extended. We also asked several questions related to cooking, but the data was not of sufficient quality and thus is not included in this deliverable. On top of that, electricity was not analysed in detail, due to bad data quality. To limit the length of the questionnaire, the category miscellaneous, which was applied in Europe was skipped in India.

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Figure 45 Carbon footprint activities and overview of relevant variables adapted to the Indian context

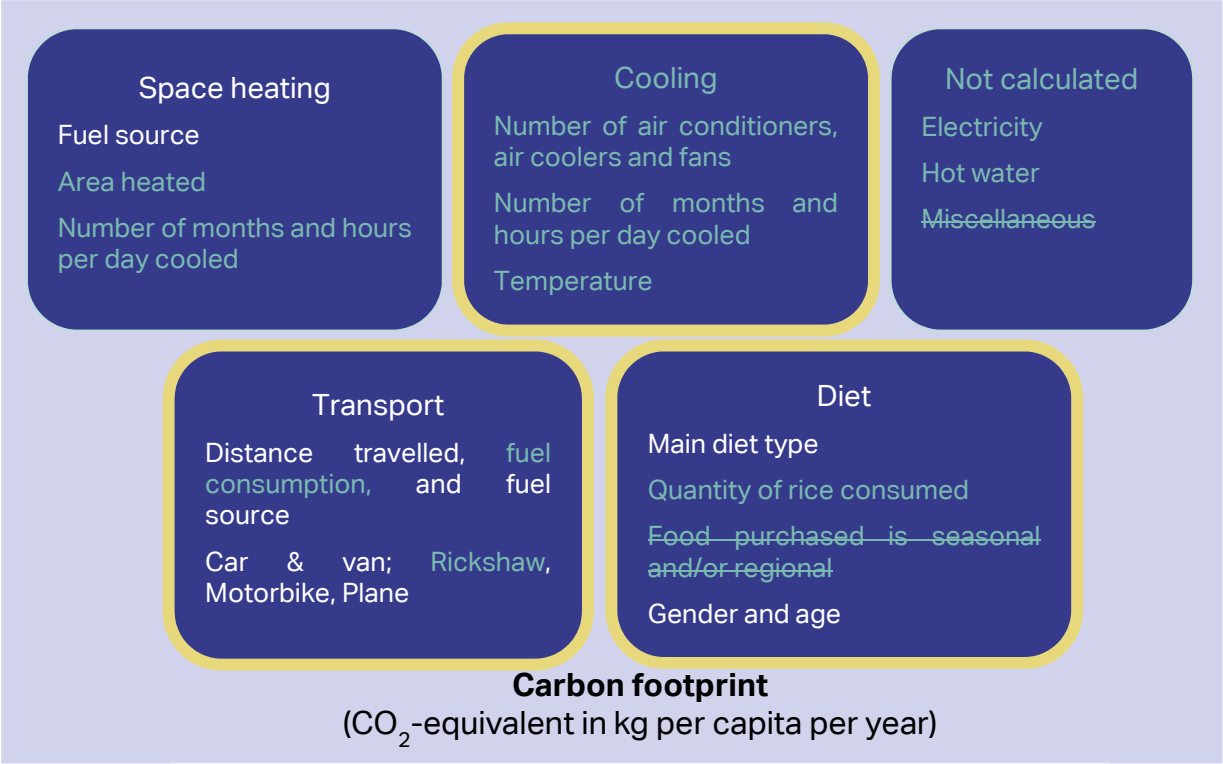

Figure 45 summarises the adapted carbon footprint calculator with adjustments written in turquoise. In the total carbon footprint, the sectors with a yellow frame are included. The adjustments are outlined in the following sections.

General information

To calculate the CO_{2eq}-emissions, we used region-specific emission intensities for electricity, i.e. 0,472kg CO_{2eq} /kWh in Delhi and 0,739kg CO_{2eq} /kWh in Maharashtra and thus Mumbai[53]. For the remaining energy sources, we used the same emission intensities as for Europe.

Respondents were asked to report the dimensions of their living space, as well as the specific areas they cooled and heated in 2022, either in square meters (m²) or square feet (sqft). In cases where respondents provided measurements in sqft, these were converted to square meters for consistency. When respondents provided incompatible values that were most likely due to confusion between sqft and m², we recoded the values to the most probable unit.

Space heating

For the space heating carbon footprint, we had to reconstruct the variable to suit the Indian context. We first asked whether or not respondents used heating in 2022. If not, the respondent received a heating-related carbon footprint of 0kg CO_{2eq}. Otherwise, the participants were asked to state how their dwelling was primarily heated by choosing between different kinds of electric heaters (heat convector, with a fan, with halogen or oil-based), gas heaters, heating stoves or fireplaces, cooking stove with firewood or a heating system with water heated by the sun (solar thermal energy). Participants were also asked what area of their dwelling was heated (in square feet or in square meters). We assumed that 0.1kWh of electricity or gas or 0.1kg of

[53] https://app.electricitymaps.com/map

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wood was necessary to heat 1m² per hour[54]. To obtain the heating carbon footprint, we thus multiplied 0.1 by the relevant emission factor. Respondents provided the number of months and the average number of hours per day during which they heated their dwelling. We used this information to calculate the number of hours during which heating was used, assuming 30 days per month. Finally, we divided this value by the household size.
In cases where information about the heated area was missing, we approximated this value by calculating the product of the total living area and the average heated percentage (37%) derived from the responses of participants who reported using heating.

Hot water
The question on hot water heating offered different options compared to the European surveys. In India, participants were asked to state how they heated hot water between the following options: electric geysers, LPG-based water heaters, LPG/PNG stoves, firewood, kerosene stoves, electric coal stoves and solar water heaters, and how much hot water they use on average per day.
Only 44% of respondents provided how much hot water they consumed. We built various OLS models to attempt to estimate the hot water consumption for the remaining respondents using the household size, expenditure and city, however, these variables accounted for less than 20% of the variance in hot water consumption. In addition, the average carbon footprint associated with hot water for the respondents who provided the relevant data was relatively low (38kg CO_{2eq} in Mumbai, and 27kg CO_{2eq} in Delhi). We therefore decided not to include hot water in the analysis of the total carbon footprint. However, we included a short descriptive analysis in Section7.5.2, which should be interpreted with caution.

Electricity
Contrarily to the EU survey, we first asked whether or not respondents had an electricity connection in 2022, whether they received a subsidy[55], their yearly electricity consumption (in kWh) and their yearly electricity costs (in INR). If a respondent did not have an electricity connection in 2022, the respondent received an electricity-related carbon footprint of 0kg CO_{2eq}. If they had, they got a similar set of questions compared to the European surveys.
In order to determine how to convert electricity costs into electricity consumption, we estimated a simple OLS model to obtain the marginal change in kWh for each additional INR of electricity cost. With an adj-R^2 of 0.86, the model accounted for 86% of the variation. If the respondent provided data in electricity costs, we estimated the electricity consumption by multiplying the electricity costs by 0.153, as this corresponds to the estimated marginal effect in the OLS model.
As with Europe, we subtracted the electricity consumption generated by heating, electric cars charged at home, PV. For India, we also subtracted electricity consumption related to cooling. If respondents failed to provide the electricity generation of the PV system, we used the average amount of electricity generated provided by the respondents with PV who provided their electricity generation. We then used the electricity consumption and the regional electricity emission factor to estimate the electricity CF.
We did not need defaults as all respondents with an electricity connection provided electricity consumption (in kWh) or electricity costs (in INR).

[54] Based on the following sources:
For electricity: https://www.sylvane.com/heater-buying-guide.html#:~:text=As%20a%20rule%20of%20thumb,floor%20area%20in%20a%20room.&text=This%20means%20that%20a%201%2C500,covers%20a%20much%20larger%20area.;https://timesofindia.indiatimes.com/gadgets-news/things-you-should-consider-before-buying-a-room-heater/articleshow/88476207.cms; https://learnmetrics.com/what-size-space-heater-do-i-need-wattage-to-sq-ft/#:~:text=Electric%20Heater%20Size%20(Wattage)%3A,%2C%20that%27s%20two%201500W%20heaters);
For gas: https://www.choice.com.au/home-and-living/heating/gas-heaters/buying-guides/gas-heaters
For firewood: https://rvaindia.com/RVA-Fireplaces-India-Catalog.pdf; Pal et al. (2014)

[55] In Delhi, households who consume less than 200kWh electricity per month can receive a subsidy that covers 100% of their electricity consumption, and up to 50% for those who consume between 201 and 400kWh per month (https://www.livemint.com/news/india/delhi-govt-says-subsidy-on-electricity-to-continue-till-march-31-next-year-11680224539720.html).

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However, the following inconsistencies in the data put into question its quality and validity:

1. 52 (7%) of respondents reported having no electricity connection but owning electricity-using appliances
2. In Delhi in particular, no respondent stated not paying for their electricity, although it is estimated that, due to subsidies, around 50 % of households would not pay anything for electricity[56]
3. For 155 respondents (21%) the calculated electricity CF was higher than the estimated cooling CF

We therefore decided that the quality of the data for electricity was not high enough to accurately estimate the electricity carbon footprint and thus were not able to estimate the carbon footprint in a reliable way (but see section 7.5.1 for a short outline)

Cooling

To account for the different climatic conditions, we not only asked for heating-related consumption patterns, but also for those related to cooling. We asked participants how many room air conditioners (AC), air coolers or fans they used. We then proceeded to ask to which temperature participants cooled their main living room when they were at home and for how many months and hours per day they cooled their dwelling. We also asked if their main room AC was an inverter or fixed-speed.

We calculated the carbon footprint related to cooling by first estimating the energy consumption respondents used to cool their dwelling per hour. This was performed by adding the estimated energy consumption produced by AC, air coolers and electric fans. In each case, we multiplied the number of units of the particular technology with the estimated average hourly consumption. This amounts to 1.5kWh for each regular AC unit (Abhyankar et al., 2017), 1.05kWh for inverter AC units (Kumar, 2020), 0.25kWh for air coolers (Kumar, 2020) and 0.06kWh for each fan (Kumar, 2020). We then adjusted this sum by taking into account the temperature of the main living space. For air conditioning units, a decrease in temperature by 1°C from the default temperature of 25°C is associated with an increase in electricity consumption by 20%, and vice versa (Wang et al., 2023). We thus adjusted the energy consumption due to AC units accordingly. For air coolers, we were not able to find any scientific sources estimating the impact of the temperature setting on their energy consumption. For fans, the set speed is not expected to impact the actual room temperature. We thus did not adjust the energy consumption derived by these two technologies. Finally, we applied the regional electricity emission intensity factors to the total energy consumption for to calculate the cooling CF.

Motorised transport

The transportation section also saw some changes compared to the European surveys. Indian participants were asked for rickshaws and for the average occupancy if they used cars (in Europe we used default car occupancy rates). If this was missing, we used the mean value derived from the other respondents. For rickshaws, we assumed that the rickshaw ran on CNG with a fuel consumption of 3.88kg/100km (Reynolds et al., 2011).

For Europe, if the individual did not provide the distance travelled by car or motorbike, we used national transport data that provided the average distance travelled in the specific country for males and females and by age category. For India, we were not able to find corresponding representative travel data. When respondents did not provide the distance travelled for a specific form of transport, we therefore used the complete data to estimate the average distance travelled, distinguishing by gender and city. This was the case for 53% of respondents who travelled by rickshaw, however, this did not occur for car drivers.

[56] https://economictimes.indiatimes.com/news/india/from-oct-1-delhiites-to-get-electricity-subsidy-if-opted-kejriwal/articleshow/91346379.cms?from=mdr

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Aviation
The aviation CF was calculated in the same manner in Europe and India, with country level flight examples.

Diet
The diet section saw some minor changes compared to the European surveys. The Indian participants received some slightly more detailed questions on how often they ate dairy and rice, and got no questions on how often they bought regional or seasonal products.

We estimate the diet-related CF for the following dietary choices depending on the respondents dairy, fish, eggs and meat consumption as described in Table 15.

Table 15 Carbon footprint of diet-related CF depending on dairy, fish, eggs and meat consumption patterns

Diet	kg CO_{2eq} /Year
Vegan (no dairy, no fish, no eggs, no meat)	392
Vegetarian without dairy (no dairy, no meat)	589
Vegetarian/pescitarian low dairy (dairy 1-3 times per month or less, fish and/or eggs, no meat)	662
Vegetarian/pescitarian medium dairy (dairy 1-3 times per week, fish and/or eggs, no meat)	771,5
Vegetarian/pescitarian high dairy (dairy (almost) everyday, fish and/or eggs, no meat)	881
Meat-based low dairy (dairy 1-3 times per month or less, with meat)	852,25
Meat-based medium dairy (dairy 1-3 times per week, with meat)	961,75
Meat-based high dairy (dairy (almost) everyday, with meat)	1130

Values adapted from Athare et al., 2020; Green et al., 2018; Pathak et al., 2010.

We then adapted this value depending on the rice consumption of the individual. Participants were asked to provide their weekly rice consumption. They had the option to respond in kg per household, in kg per person or in number of meals with rice that the participant consumed per week. For respondents who provided their rice consumption in kg per household, we estimated the respondent's individual rice consumption, assuming a child consumes 42%, and a teen 75% of an adult's consumption[57]. For respondents who provided their rice consumption in meals per week, we assumed that for each meal, the respondent consumed 88g of rice per meal (Pathak et al., 2010). Respondents who did not provide their rice consumption were attributed a yearly rice consumption of 47kg (Pathak et al., 2010).
We then adapted the diet-related CF assuming a carbon intensity of 1.4kg CO_{2eq}/kg of rice (Alam et al., 2016; Kashyap & Agarwal, 2021; Pathak et al., 2010).
As in the EU diet carbon footprint calculator, we finally adjusted the diet-related CF depending on the gender and age of the respondent.

Miscellaneous
In order to accommodate the extended duration of interviews compared to online surveys, we made the decision to remove items pertaining to miscellaneous carbon footprint factors,

[57] On average a child under 5 years old consumes 1000cal/day, a child aged between 6 and 17 years consumes 1800cal/day, and an adult consumes 2400cal/day (Faizan and Rouster 2022). To obtain the respondents rice consumption, we divided the household rice consumption by the result of the following formula: number of children under 5*0.42+ number of children between 6 and 17 years*0.75+number of adults.

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specifically those associated with clothing and pets. Consequently, these aspects have been excluded from our assessment of the carbon footprint.

Total carbon footprint
The total carbon footprint was estimated by combining the carbon footprints related to cooling, transport not including aviation, and diet. The carbon footprint related to space heating was not included as only 33% (n=240) of respondents had space heating and the associated CF was very low. Indeed, only 4% (n=30) of respondents had a space heating CF larger than 150kg $CO_{2eq.}$ Since we did not include aviation CF in the European total CF, we also did not include it here.

7.2.5. Well-being for the Indian context

For well-being, we used the exact same items in India as in the European context since the WHO-QL-BREF (which presents the basis for our items) has been validated in an international context to ensure to be applicable across countries and for country comparison. Thus, there have been no modifications and the implemented items are displayed in Section 7.4.2.

7.3. Sample description and representativeness

To get representative samples from both Delhi and Mumbai, we implemented quotas on the participants' gender, age, household expenditure and zone of living. For the gender quotas, we got population-level data from the National Family Health Survey (International Institute for Population Sciences [IIPS] & ICF, 2019, 2020). For age, we used data from the 2011 census which was the most recent data available (for Mumbai: PopulationU, 2023; for Delhi: StatisticsTimes, 2020). The third quota was set on monthly consumer expenditure per person in the household. For this variable, we also got population-level data from the 2011 census (Census India, 2023), but extrapolated these with yearly inflation rates since then (Statista, 2023). As detailed above, the market research institute established five zones in each city to ensure regional variability of our participants and aimed at recruiting 20% of the sample from each zone. The original samples from both Delhi and Mumbai were representative of the populations of the respective cities in terms of gender, age, monthly consumer expenditure and city zone. Due to the application of the exclusion criteria outlined in Section 7.2.3, the final samples are not necessarily representative in all four categories anymore. (see Table 16).

Table 16 Sample description and representativeness

City	Variable	Category	Share in population	Share in original sample (N)	Share in final sample (N)
Delhi ($N_{original}$ = 549, N_{final} = 323)	Gender	Male	54%	53.92% (296)	54.8% (177)
		Female	46%	46.68% (253)	45.2% (146)
		Non-binary	0%	0%	0%
	Age	18-29	33%	32.42% (178)	31.3% (101)
		30-44	37%	36.61% (201)	38.4% (124)
		45-59	20%	20.04% (110)	19.2% (62)
		>= 60	11%	10.93% (60)	11.1% (36)
	Monthly consumer expenditure per person in household	<= 2300 INR	13%	13.11% (72)	12.7% (41)
		2300 - 3100 INR	18%	18.03% (99)	14.6% (47)
		3100 - 4400 INR	24%	24.04% (132)	23.5% (76)
		4400 - 7600 INR	26%	25.68% (141)	27.2% (88)
		> 7600 INR	19%	19.13% (105)	22.0% (71)
	Zone	North	20%	20.04% (110)	28.2% (91)

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City	Variable	Category	Share in population	Share in original sample (N)	Share in final sample (N)
		East	20%	20.04% (110)	5.0% (16)
		South	20%	19.85% (109)	18.9% (61)
		West	20%	20.04% (110)	26.6% (86)
		Center	20%	20.04% (110)	21.4% (69)
Mumbai ($N_{original}$ = 532, N_{final} = 408)	Gender	Male	52%	51.32% (273)	52.2% (213)
		Female	48%	48.50% (258)	47.8% (195)
		Non-binary	0%	0.19% (1)	0%
	Age	18-29	31%	31.01% (165)	28.2% (115)
		30-44	35%	34.21% (182)	34.8% (142)
		45-59	22%	22.18% (118)	23.5% (96)
		>= 60	12%	12.59% (67)	13.5% (55)
	Monthly consumer expenditure per person in household	<= 2300 INR	14%	14.29% (76)	15.0% (61)
		2300 - 3100 INR	19%	18.61% (99)	17.9% (73)
		3100 - 4400 INR	25%	24.44% (130)	24.5% (100)
		4400 - 7600 INR	27%	27.26% (145)	26.0% (106)
		> 7600 INR	15%	15.41% (82)	16.7% (68)
	Zone	North	20%	19.74% (105)	23.0% (94)
		East	20%	20.30% (108)	20.1% (82)
		South	20%	20.30% (108)	21.1% (86)
		West	20%	20.49% (109)	20.1% (82)
		Centre	20%	19.17% (102)	15.7% (64)

7.4. Descriptive analyses

The following section presents various aggregated summary statistics of the identified sufficiency lifestyle variables.

Figure 46 to Figure 54 present the calculated total and the carbon footprints for heating, transport, diet, and cooling in kg CO_{2eq}-emissions in India. As with Europe, we display the carbon footprint related to aviation separately. In order to facilitate the reading of the graphs, the scales were transformed logarithmically for all carbon footprint graphs with the exception of diet.

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7.4.1. Carbon footprint

Figure 46 Total carbon footprint of respondents in India in 2022 with heating

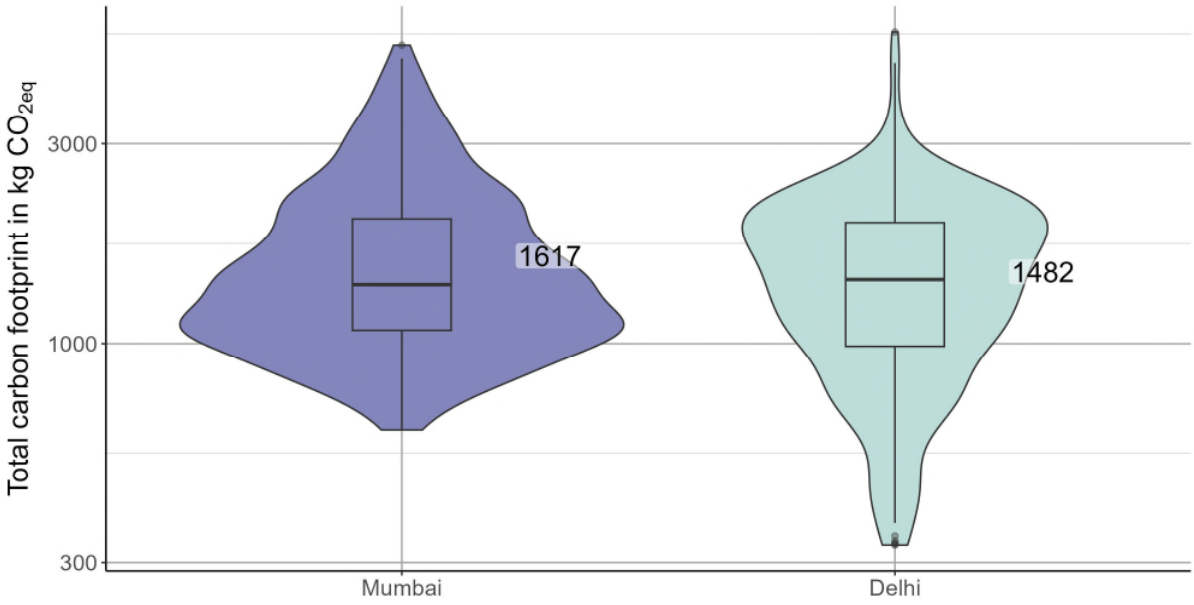

Figure 46 consists of violin plots of the total carbon footprint of respondents by city. Taking into account cooling, heating, motorised transport, and diet, the calculated carbon footprint is higher in Mumbai, but Delhi has a larger spread. The causes of these differences can be gleaned from the following graphs.

Figure 47 Total carbon footprint of respondents in India in 2022 without heating

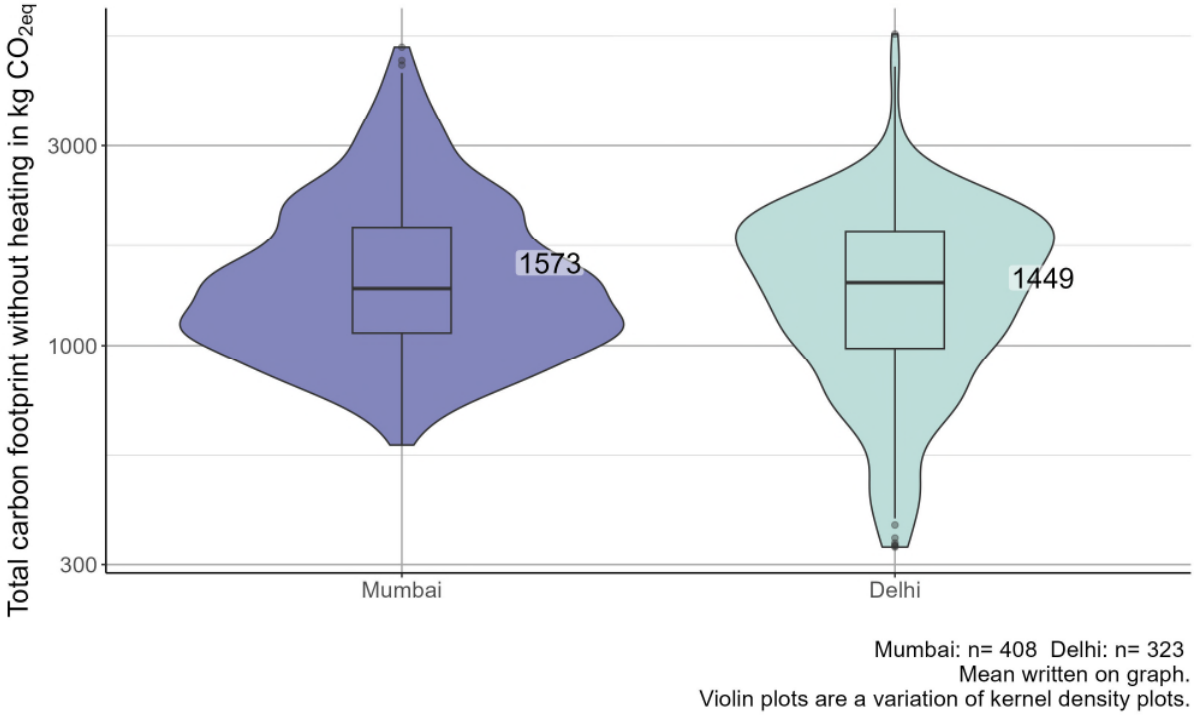

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Figure 47 displays the total carbon footprint without heating, as this is the basis of the sufficiency group identification that takes place in Section 7.6. The average total carbon footprint is around fifty kilograms lower than in the previous figure with heating and the general trend and differences between the cities remain similar.

Figure 48 Pie charts of the total carbon footprint of respondents in India in 2022 with heating

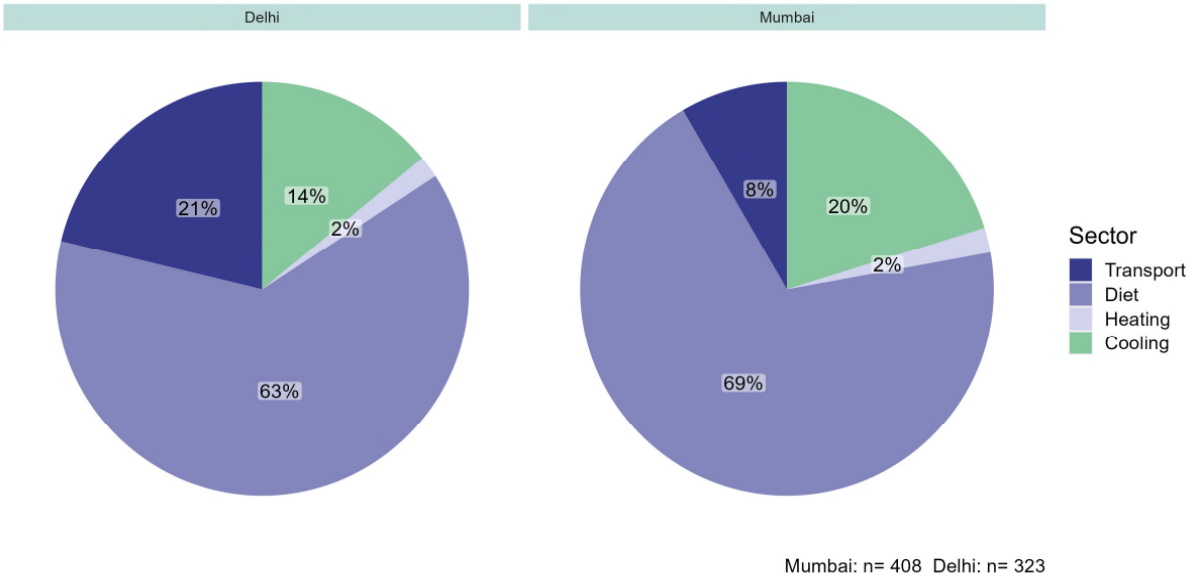

Figure 48 depicts the average contribution of each activity to the total carbon footprint in each city. In both cities, diet presents the largest part of the carbon footprint, with a share of between 63% and 69%. The second largest sector is cooling in Mumbai which amounts to 20% of the total carbon footprint (14% in Delhi). In Delhi, the second largest sector is transport at 21% of the total carbon footprint, whereas transport only consists of 8% of the total carbon footprint in Mumbai. The carbon footprint for heating is, as expected, low in both cities (2% of the total carbon footprint).

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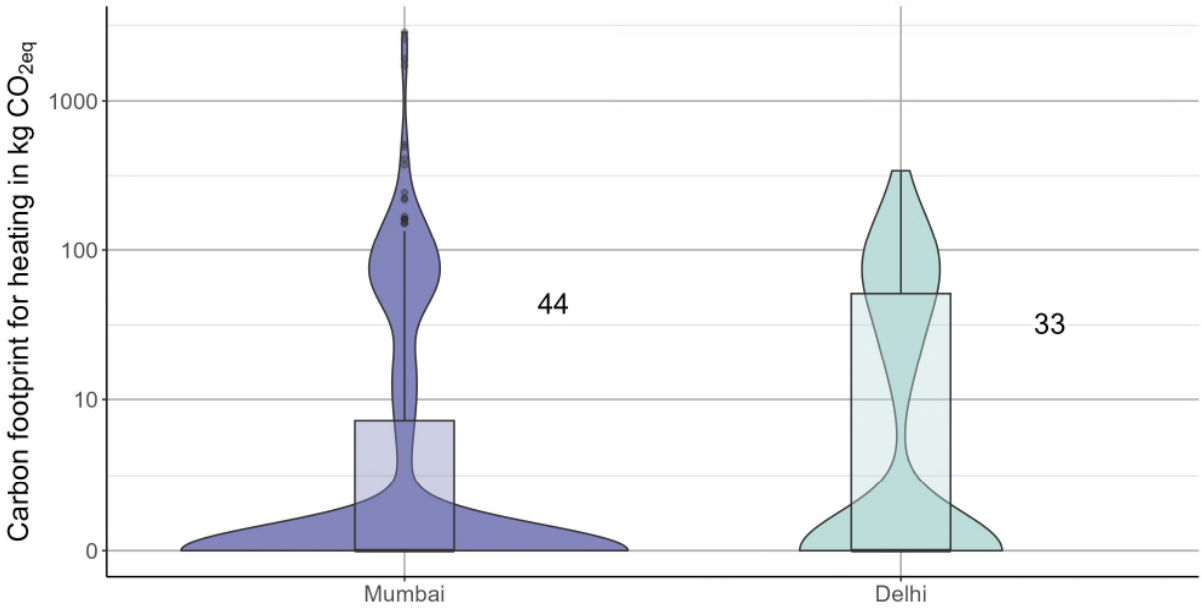
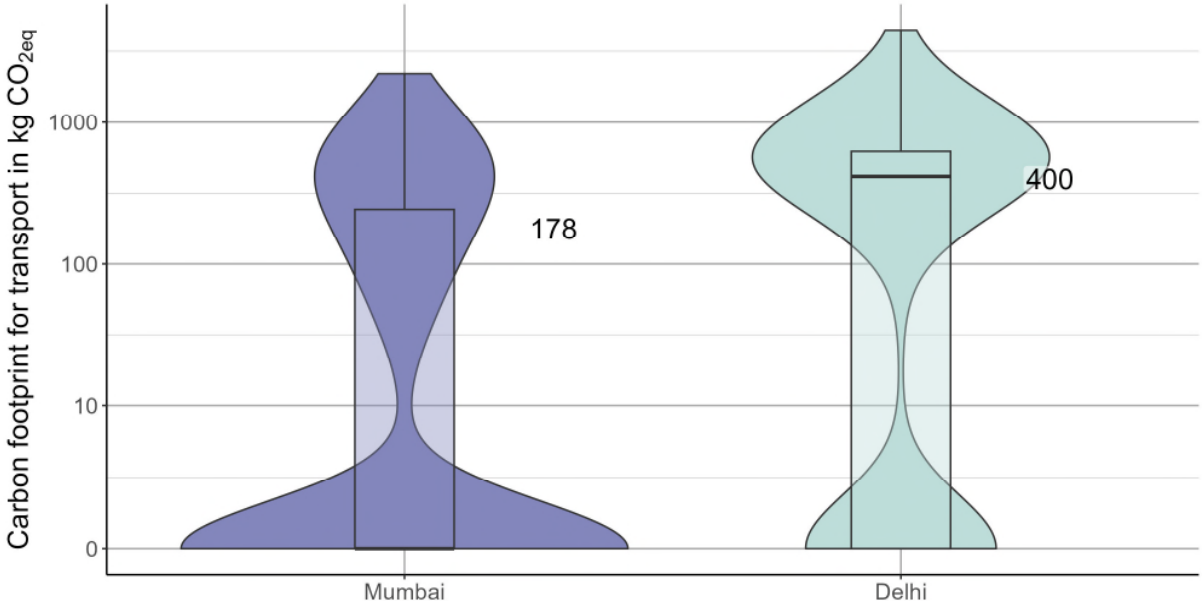
Figure 49 Carbon footprint for space heating in India in 2022



Mumbai: n= 408 Delhi: n= 323
Mean written on graph.
Violin plots are a variation of kernel density plots.

According to Figure 49, the carbon footprint for space heating is low in both cities with an average of 44kg CO_{2eq}-emissions in Mumbai and 33kg CO_{2eq}-emissions in Delhi.

Figure 50 Carbon footprint for transport without aviation in India in 2022



Mumbai: n= 408 Delhi: n= 323
Mean written on graph.
Violin plots are a variation of kernel density plots.

Figure 50 depicts the carbon footprint associated with motorised transport in 2022, i.e. cars, vans, rickshaws and motorbikes. Delhi has the highest average carbon footprint with 400kg CO_{2eq}-emissions, whereas the average in Mumbai is 178kg CO_{2eq}-emissions per respondent.

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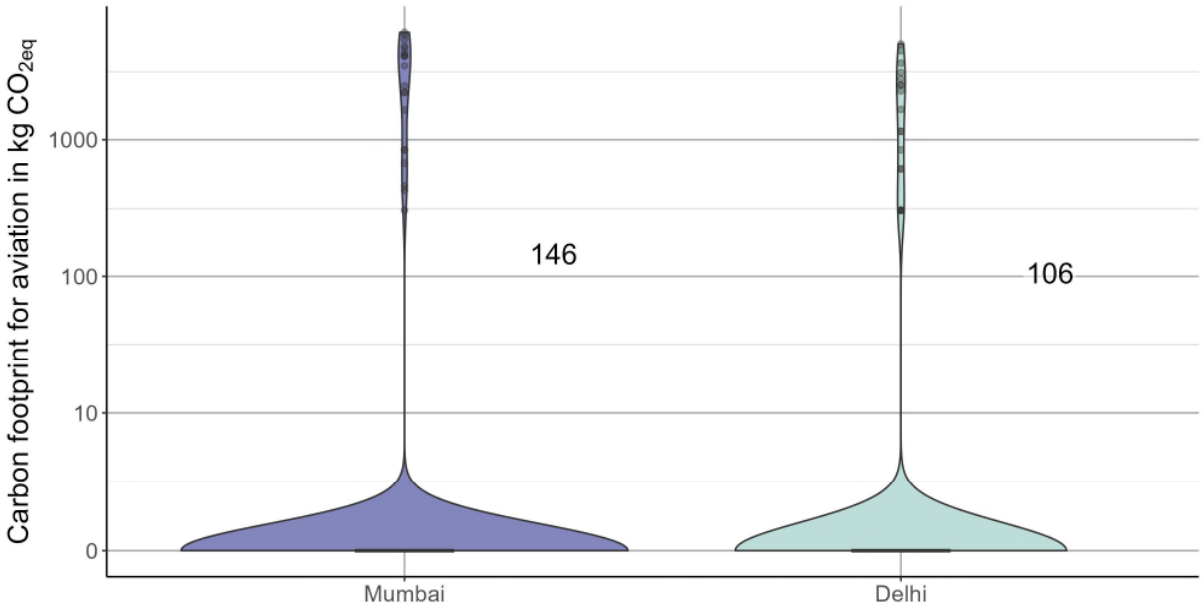
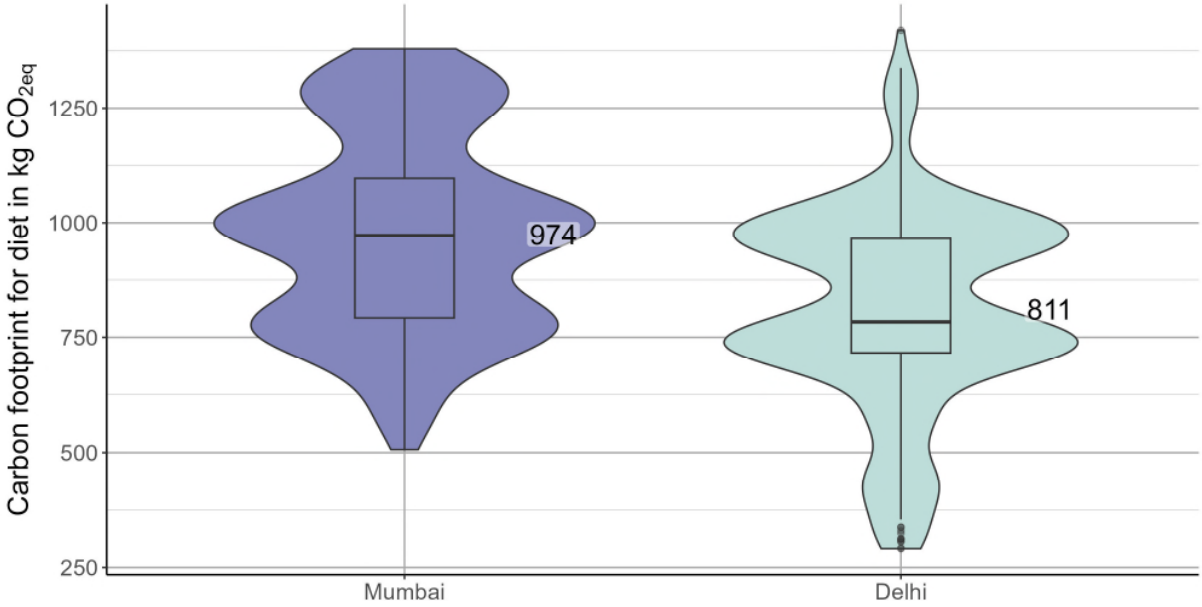
Figure 51 Carbon footprint for aviation in India in 2022



Mumbai: n= 408 Delhi: n= 323
Mean written on graph.
Violin plots are a variation of kernel density plots.

As demonstrated by Figure 51, only a relatively small share of respondents flew in 2022. The ability and willingness to fly may have been also impacted by the COVID-19 pandemic.

Figure 52 Carbon footprint for diet in India in 2022



Mumbai: n= 408 Delhi: n= 323
Mean written on graph.
Violin plots are a variation of kernel density plots.

Figure 52 depicts the carbon footprint of respondents associated with diet. The distribution spreads from around 500kg in Mumbai and close to 290kg CO_{2eq}-emissions in Delhi, to around 1400kg CO_{2eq}-emissions per respondent.

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Figure 53 Distribution of main dietary types in India

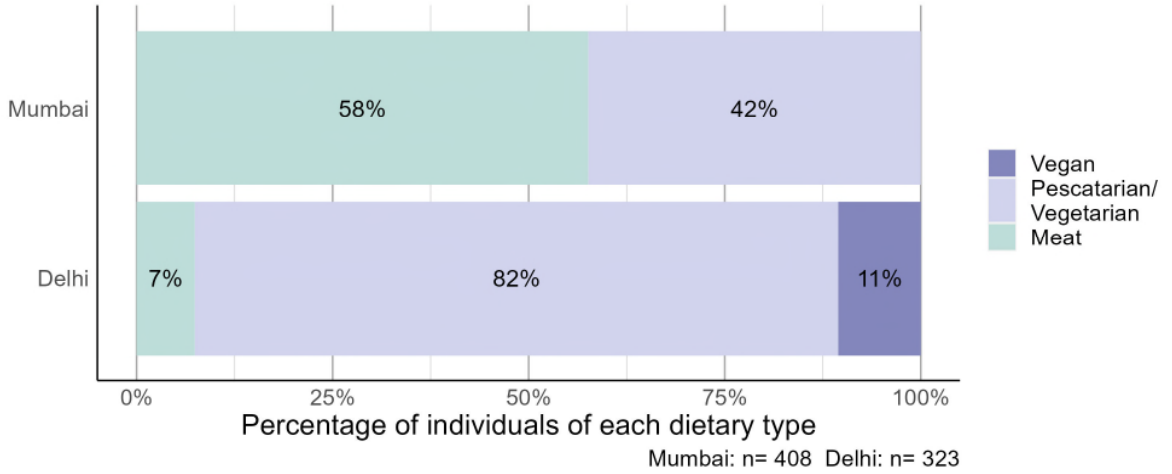

Figure 53 displays the main dietary type that individuals have per city. There are no vegans in Mumbai and 11% of the respondents are vegan in Delhi. In addition, few respondents consume meat in Delhi (7%), whereas 58% consume meat in Mumbai.

Figure 54 Carbon footprint for cooling in India in 2022

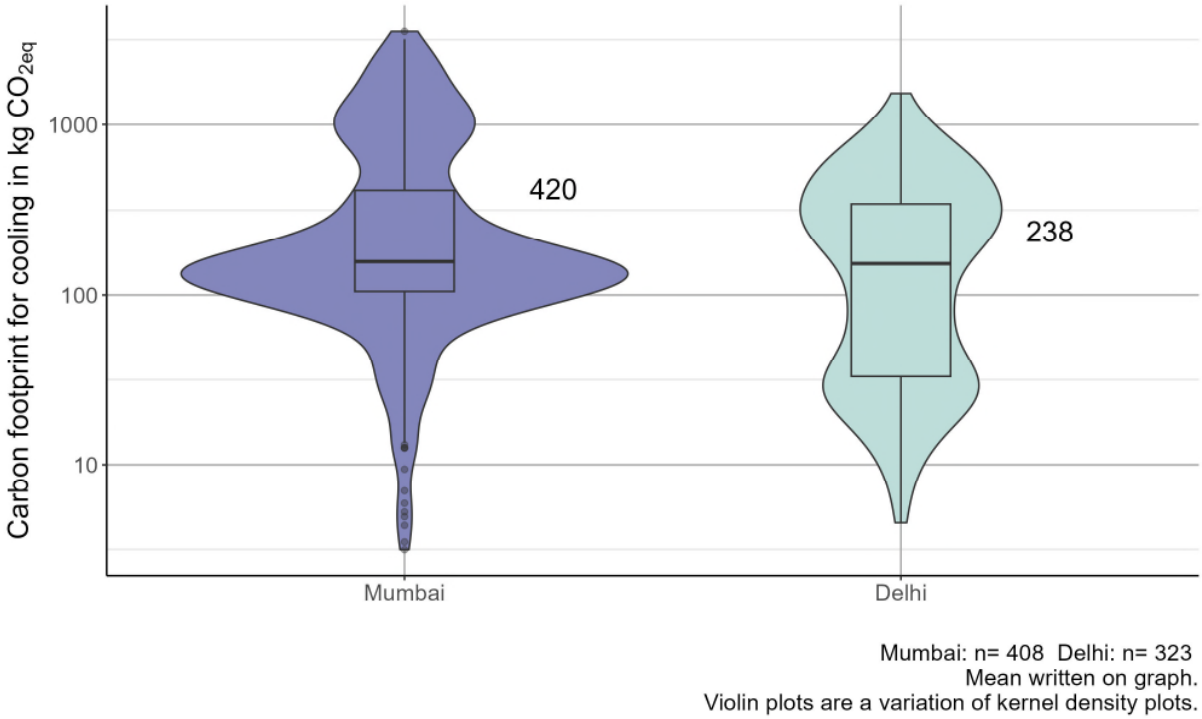

Figure 54 shows that the highest average carbon footprint for cooling is in Mumbai with an average of 420kg CO_{2eq}-emissions and a median of 157kg CO_{2eq}-emissions per respondent. In Delhi, the mean is 238kg CO_{2eq}-emissions and the median 149kg CO_{2eq}-emissions per respondent. The highest bulge in the violin shape is due to the presence of air conditioners.

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7.4.2. Health and well-being

In the following, we describe the analyses for well-being in India. As in Europe, we computed a well-being index, i.e., the sum of the 11 items related to well-being divided by the number of items, separately for Mumbai and Delhi. As preparatory analyses, we conducted reliability and factor analyses. The reliability analyses show acceptable to good reliability for both cities (Mumbai Cronbach's alpha = .76 and Delhi Cronbach's alpha = .85). The results of the factor analysis in Delhi resemble the pattern in Europe: although three factors have eigenvalues above 1, the scree plot suggests a one-factor solution which appeared reasonable due to the fact that the eigenvalue of the second and third factor were only slightly above 1 ($Eigenvalue_{Factor1}$ = 4.87, $Eigenvalue_{Factor2}$ = 1.43, $Eigenvalue_{Factor3}$ = 1.08). In addition, except one item (i.e., the item regarding medical treatment), all items have loadings above .30 on the first factor, supporting the one-factor solution.

In Mumbai, the factor analysis presents a different picture which is also mirrored in the lower reliability of .76: the analysis of Eigenvalues suggests a four-factor solution, while the scree plot suggested a three-factor solution ($Eigenvalue_{Factor1}$ = 3.87, $Eigenvalue_{Factor2}$ = 2.08, Eigenvalue Factor3 = 1.15, $Eigenvalue_{Factor4}$ = 1.01). Based on the Eigenvalues and the loadings of the items, a two-factor solution appears to fit best: items loading on Factor 1 do not load on any other factor (above .30). However, items loading on Factor 2 also load on Factor 4, three of these four items load higher on Factors 2 than Factor 4, suggesting to merge Factor 2 and 4. Factor 3 contains only one item, the one asking about medical treatment - consequently, this factor should not be interpreted separately. Nonetheless, it is worth to note that the medical treatment in both Indian cities seems to play a slightly different role compared to the other well-being items. Consequently, a two-factor solution appears for Mumbai - with one factor measuring well-being in general (including health) and one factor focusing more on mental well-being (overall quality of life, meaningfulness of life, opportunity for pursuing leisure activities, frequency of negative feelings such as depression - recoded). Despite these results for Mumbai, for comparability reasons, we continue the further analyses with one well-being index (as a one-factor solution) since the content of Factor 2 is still related to well-being but we will come back to this finding in the discussion and comparison section.

For the well-being score in India, we excluded participants who did not answer one or more items of the well-being scale (n=17 in Mumbai, n=7 in Delhi). Table 17 displays the average ratings of well-being, the standard deviation and the reliability, separately for each mega city. In Mumbai (n=391), the average well-being score is 3.44 with a standard deviation of 0.42 indicating rather little variability. The average scores in Mumbai range from 2.09 to 4.73 with a potential range from 1 to 5. Thus, the average scores are mostly above the scale's midpoint. In Delhi (n=316), the average score for well-being is 3.47 with a standard deviation of 0.58 presenting a similar pattern as in Mumbai. The scores range in Delhi from 1.82 to 4.73 with a potential range from 1 to 5; thus, in Delhi, there is slightly more variability in the perceived well-being of participants (than in Mumbai).

Table 17 Descriptive statistics of well-being and bivariate correlations between the well-being score and the carbon footprint calculations (overall and per activity across countries

	M (SD)	Reliability (Cronbach's alpha)	CF total	CF transport	CF cooling	CF diet
Mumbai (n=391)	3.44 (0.42)	.76	.33***	.18***	.31***	.02
Delhi (n=316)	3.47 (0.58)	.85	.65***	.48***	.48***	.47***

*Note: CF carbon footprint; *** p>.001; transport carbon footprints do not include the carbon footprint of aviation; total carbon footprint presents the sum of the other three displayed carbon footprints.*

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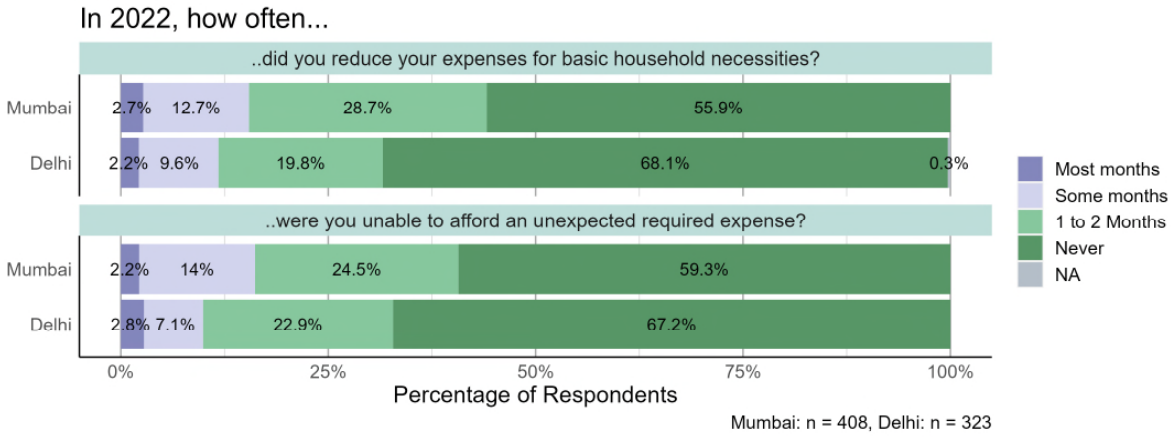
Regarding the correlations between respondents' carbon footprints and their well-being index, we found the following results (see Table 17): in both Indian cities, the correlations with the total carbon footprint and well-being are the highest (compared to the sector carbon footprints). Nonetheless, the correlations in Delhi are higher than in Mumbai - regardless of the sector of the carbon footprint. The total carbon footprint in Delhi correlates highly with respondents' well-being. While in Mumbai, the carbon footprint for diet does not correlate with respondent's well-being, in Delhi, the correlation between the carbon footprint and diet can be considered medium to high. In both Indian cities, the correlations between well-being and the carbon footprint are positive, demonstrating that a higher well-being is associated when participants have a higher carbon footprint.

7.4.3. Deprivation and household characteristics

Figure 55 to Figure 85 show to what extent respondents in India can be considered deprived as well as various household characteristics, in general and specifically in the transport and diet activities as well as regarding their energy supply.

Figure 55 General deprivation (Q. DA_1 and DA_2)



According to Figure 55, the majority of respondents in both cities did not reduce their expenses for basic household necessities, nor were they unable to afford an unexpected required expense. In Mumbai, 41% of respondents needed to do so in at least one or two months, while this applies to a third of respondents from Delhi.

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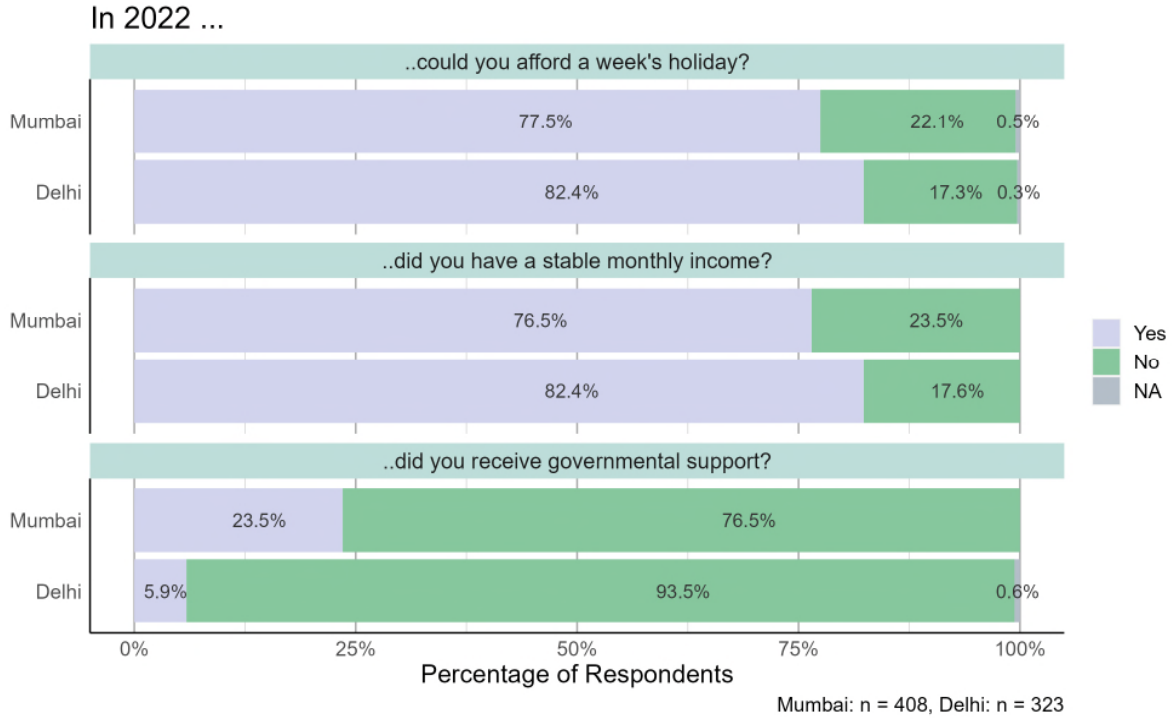
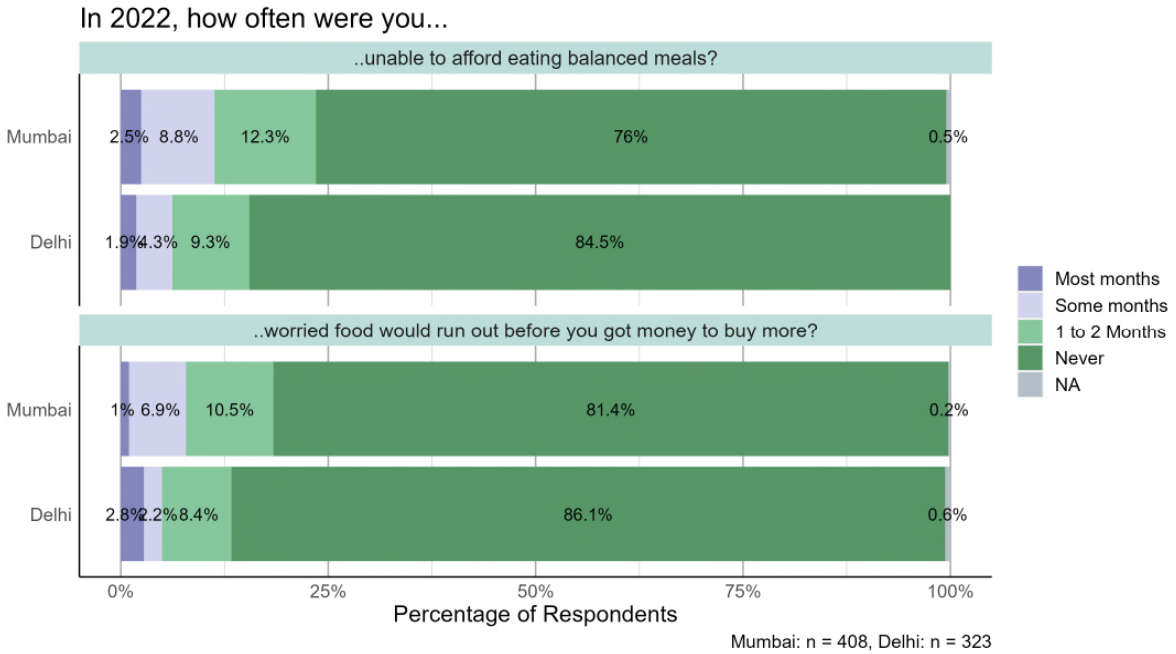
Figure 56 General deprivation continued (Q. DA_3, DA_4 and DA_5)



According to Figure 56, approximately 22% of respondents in Mumbai and 17% of respondents in Delhi were not able to afford a week's holiday in 2022. 23.5% of respondents from Mumbai and 17.6% of respondents from Delhi did not have stable incomes, but only 6% of respondents in Delhi received governmental support, while the same was true for almost 24% of respondents in Mumbai.

Figure 57 Diet deprivation (Q. DN_1 and DN_2)



According to Figure 57, 24% of Mumbai respondents and 16% of Delhi respondents were at least once unable to afford eating balanced meals during 2022. 19% of Mumbai respondents

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and 14% of Delhi respondents were at least once worried that their food would run out before they got money to buy more.

Figure 58 Transport deprivation (Q. DT_1, DT_2 and DT_3)

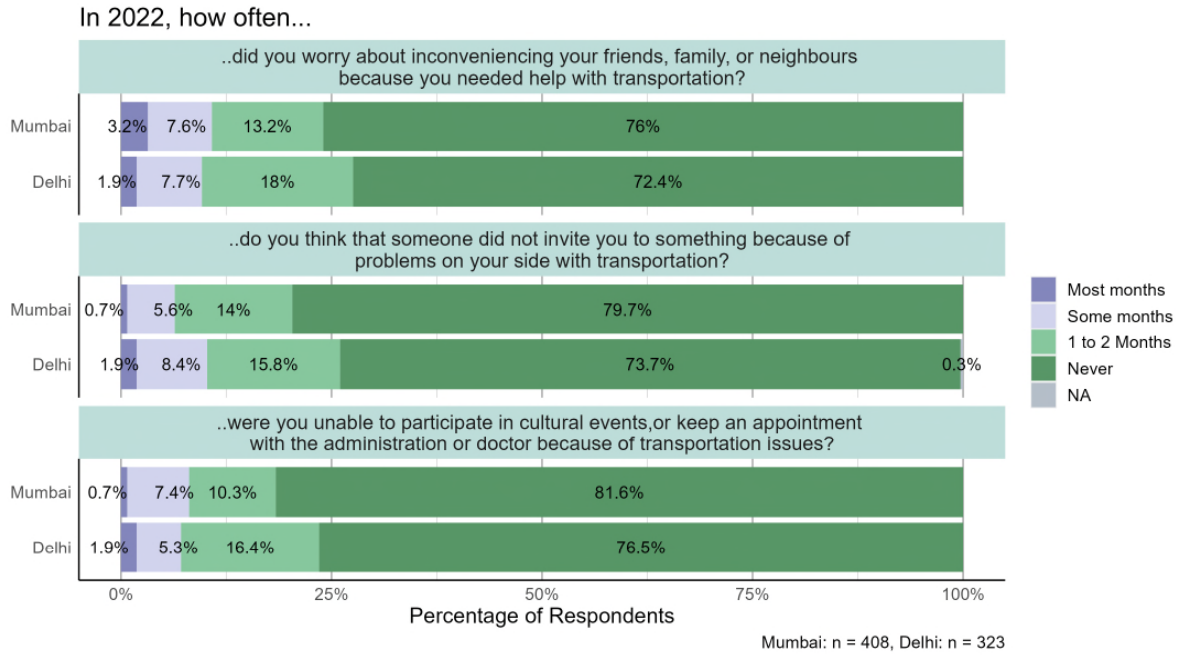

Figure 58 indicates that 24% of respondents from Mumbai and almost 28% of respondents from Delhi were at least once during 2022 worried about inconveniencing family or friends because they needed help with transportation. 20% of Mumbai respondents and 26% of Delhi respondents also think that they were not invited to something at least once because of transportation problems on their side. Lastly, 23.5% of respondents from Delhi and 18% of respondents from Mumbai indicated that they were at least once unable to participate in events or similar because of transportation issues.

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Figure 59 Number of cars per household (Q. v_611)

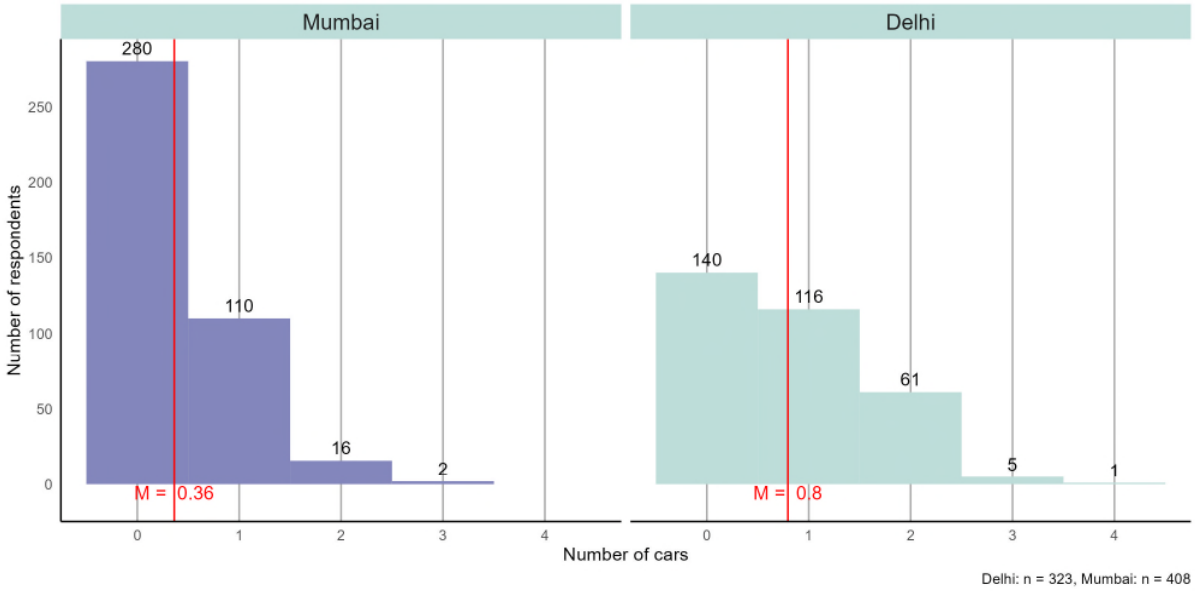

Figure 59 depicts the number of cars per household by city, with the red line representing the mean number of cars in each city. It shows that in both cities, most households do not own a car. In Delhi, the households own an average of 0.8 cars, while in Mumbai, they own an average of 0.36 cars. In Delhi, 19% of all households (n=61) own two cars, in Mumbai this percentage is lower with 4% (n=16). In both cities, only single households own more than two cars. Overall, the number of cars is very low in these two mega cities in India.

Figure 60 Number of two-wheelers per household (Q. v_615)

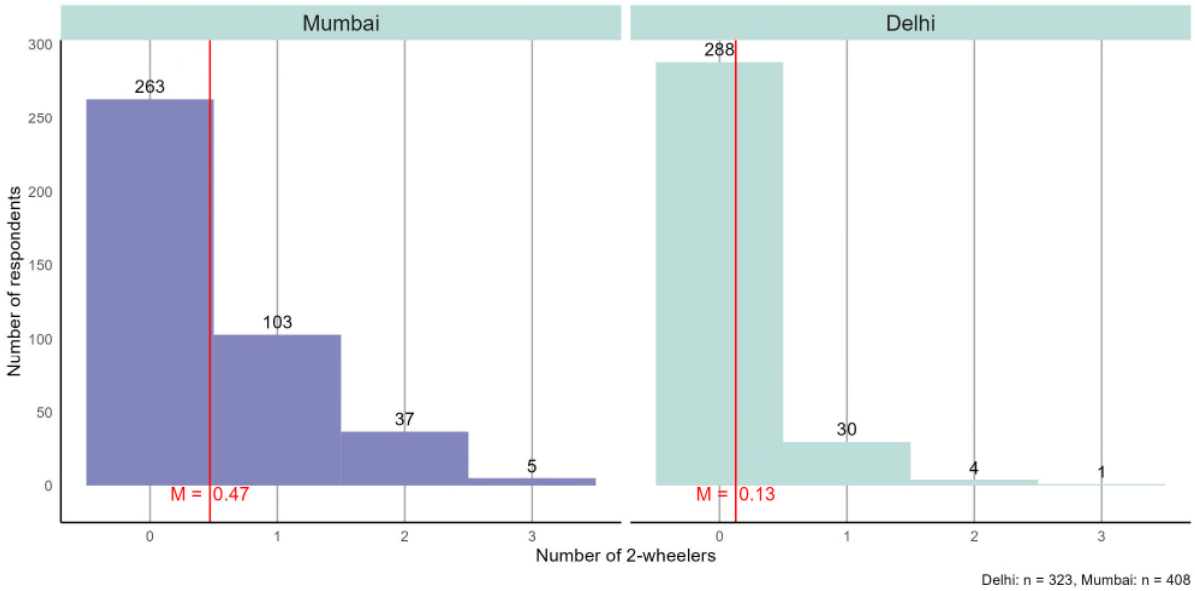

Figure 60 depicts the number of two-wheelers per household. Again, most of the households in both cities do not own two-wheelers. In Delhi, the average household owns 0.13 two-wheelers, while this number amounts to 0.47 in Mumbai. This fits to the number of cars the households in both cities own: the average number of cars in Delhi is higher than in Mumbai; however, for two-wheelers the pattern is the opposite, thus, more households in Mumbai own one (or more) two-wheelers compared to Delhi. However, the number of motorised individual transport is low in both cities.

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Figure 61 Use of different transportation modes. (Q. SP5_1 to SP5_4)

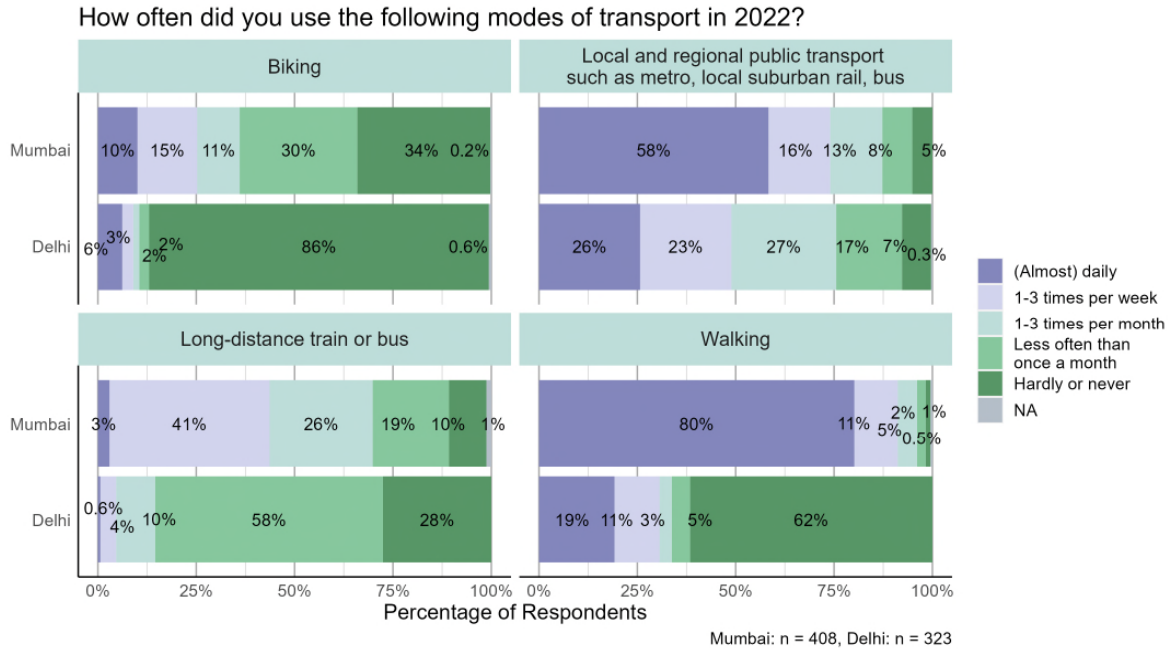

Figure 61 shows the frequency with which respondents use different modes of transportation. It is evident that the vast majority of Delhi respondents hardly ever use a bike or walk. Using these modes of transport seems to be more common in Mumbai, where 80% of respondents walk (almost) daily. Using public transport also seems to be more common in Mumbai, with 58% using local and regional public transport (almost) daily and 44% using long-distance public transport at least one to three times per week.

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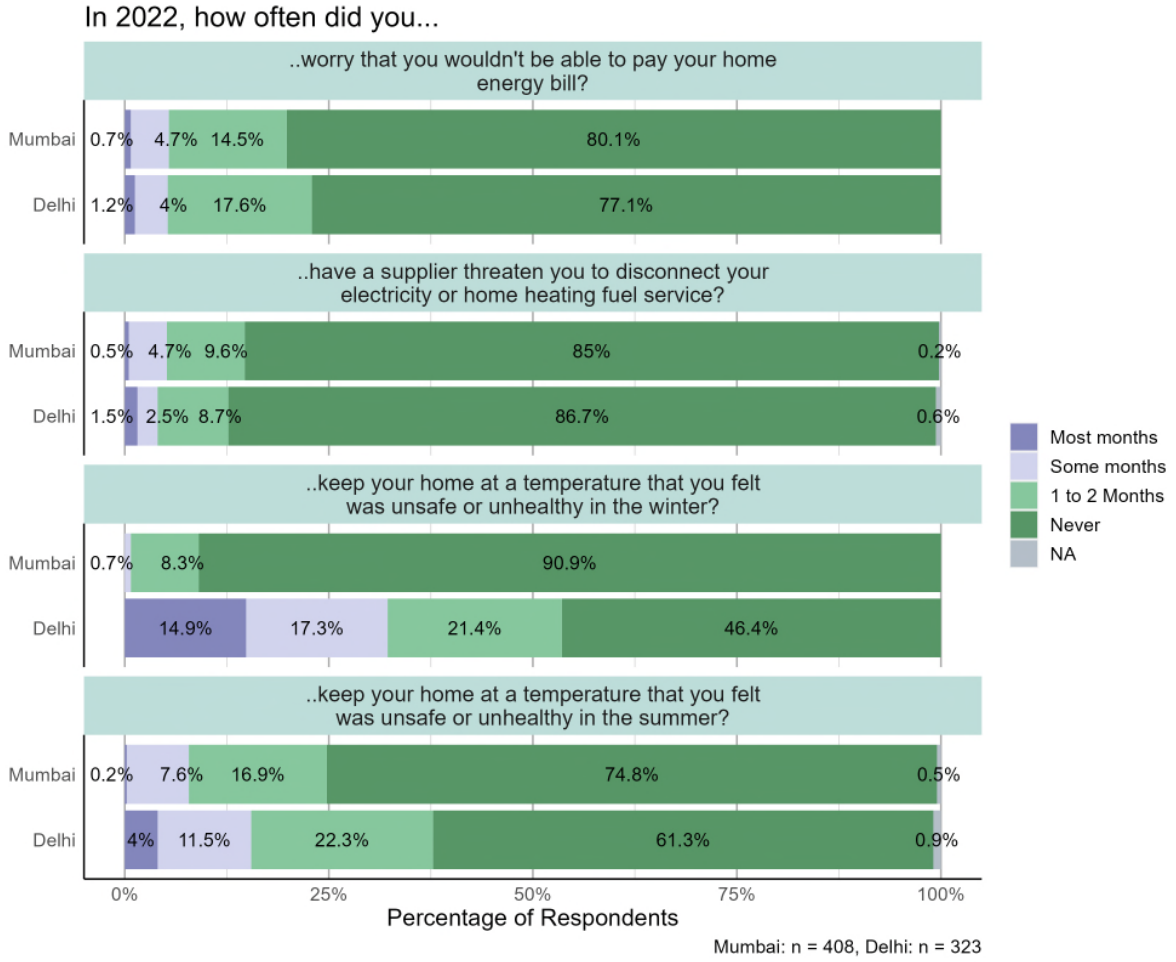
Figure 62 Deprivation electricity and heating (Q. DE_1, DE_2, DE_3 and DE_4)



As displayed in Figure 62, 20% of respondents in Mumbai and 23% of respondents in Delhi were at least once during 2022 worried that they could not pay their energy bill. Roughly 15% of respondents from both cities were also threatened with being disconnected from their electricity or home heating fuel service. 9% of respondents in Mumbai and the majority (54%) of Delhi respondents needed to keep their home at an unsafe temperature during winter, and during summer this was necessary for 25% of Mumbai respondents and 39% of Delhi respondents.

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Figure 63 Deprivation variables correlation matrix

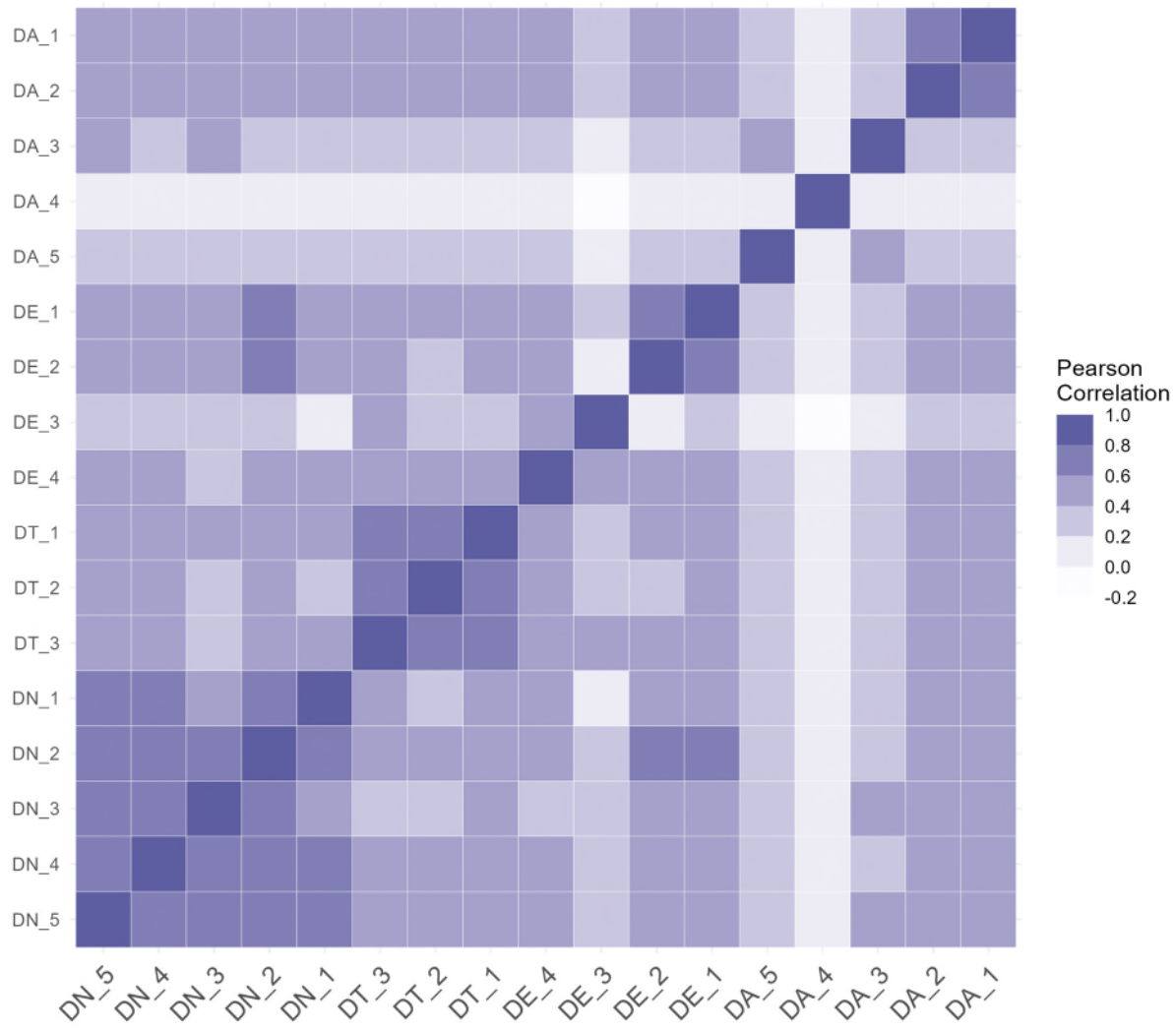

Figure 63 depicts the correlations between all deprivation-related questions. Items starting with "DA" refer to general deprivation, starting with "DE" to deprivation of energy services, "DT" to deprivation of transport services, and "DN" to deprivation of nutrition[58]. The exact item wordings can be found in Annex 2. As expected, most correlations are positive with varying strengths. However, all correlations with DA_4 are negative or close to zero. One explanation for this could be the fact that DA_4 asking whether respondents receive governmental support has little variation (e.g., in Delhi 94% stated to receive no governmental support, see Figure 56). Hence, the zero correlations with DA_4 are not surprising and the negative correlation shows that respondents who reported to be deprived do not receive governmental support. Overall, the matrix indicates that deprivation items within one sector (i.e., general, electricity, transport, and diet) have high intercorrelations with each other.

[58] One should note that some questions related to diet (e.g., DN_3 to DN_5; see questionnaire in Annex 2) were only presented to a subgroup of the sample depending on their previous answers. However, we included them in the correlation matrix because only pairwise correlations were calculated. Thus, the sample sizes vary between the cells of Figure 6

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7.4.4. Attitudinal variables

Figure 64 Environmental orientation (Q. EID_1, EID_2 and EID_3)

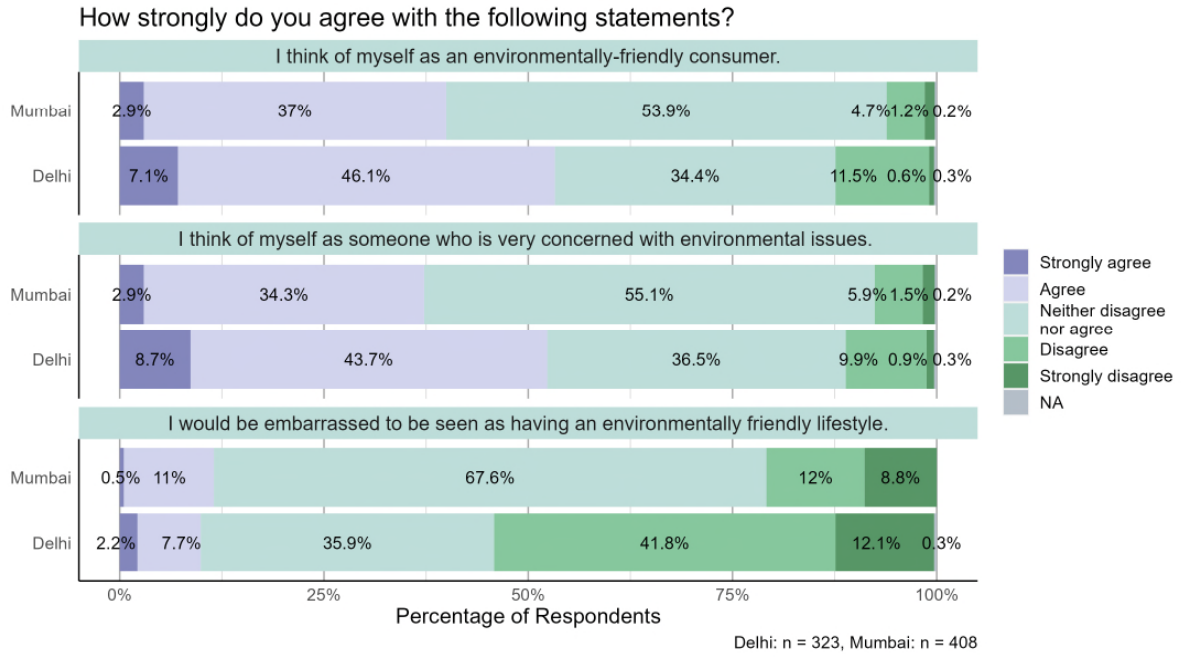

Figure 64 shows that in Mumbai (40%), less than half of the respondents consider themselves to be environmentally-friendly consumers, while the same is true for more than half of the respondents from Delhi (53%). Similarly, about the same percentage of respondents in both cities consider themselves to be concerned with environmental issues. Moreover, only 11% of Mumbai respondents and 10% of respondents from Delhi would be embarrassed to be seen as having an environmentally friendly lifestyle. Interestingly, and contrary to the European results, more than half of the respondents from Mumbai and about a third of respondents from Delhi neither disagree nor agree to any of these three statements.

Figure 65 Religiousness (Q. v_694)

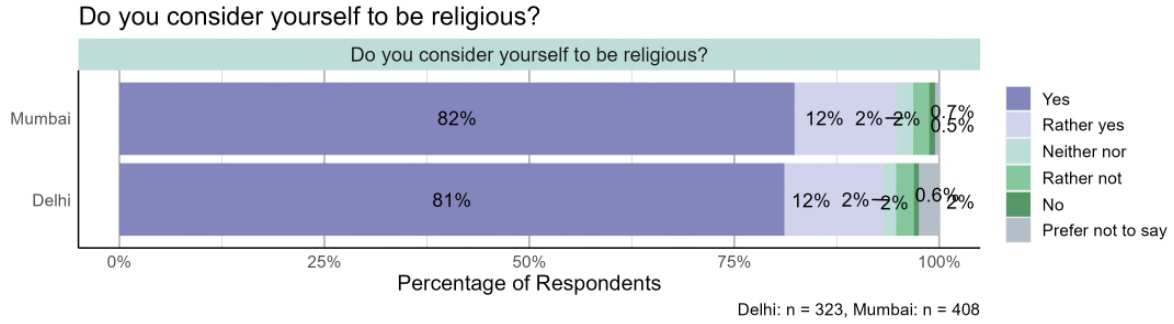

Figure 65 shows that religiousness is similarly high in both cities, with around 95% of Mumbai respondents and 93% of respondents from Delhi indicating that they are religious or rather religious.

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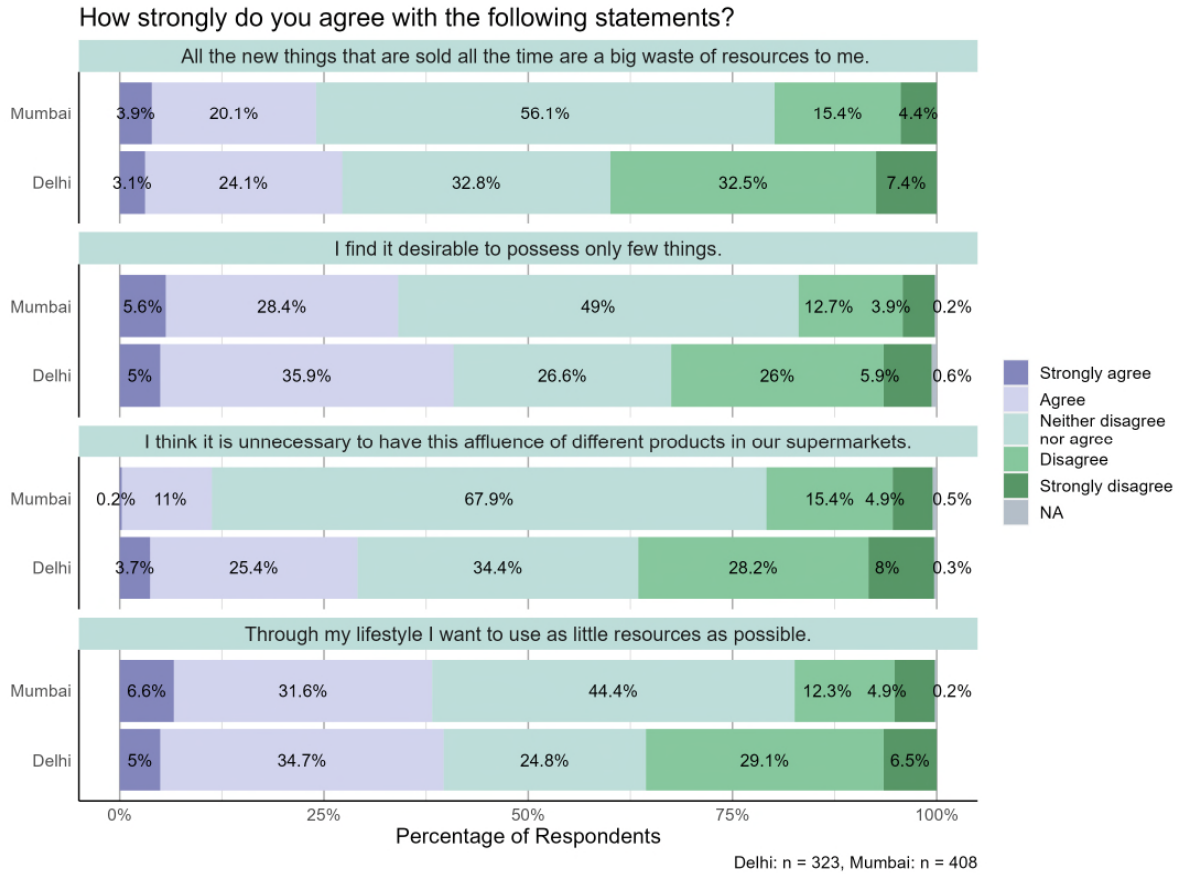
7.4.5. Sufficiency variables

Figure 66 Sufficiency orientation (Q. SO1_1, SO1_2, SO1_4, SO1_5)



According to Figure 66, 24% to 27% of participants from both cities agree or strongly agree that all the new things that are sold are a big waste of resources. Similarly, 34% of participants from Mumbai and 41% of participants from Delhi agree or strongly agree that they find it desirable to possess only a few things. However, there is a difference in the share of participants agreeing with the unnecessity to have such an affluence of products in supermarkets. This is true for 11% of Mumbai participants and for 29% of participants from Delhi. Finally, 37% of participants from Mumbai and 40% from Delhi agree or strongly agree that they want to use as little resources as possible through their lifestyle. Interestingly and similar to the questions on environmental values, large shares of participants from both cities indicate that they neither agree nor agree to any of these statements.

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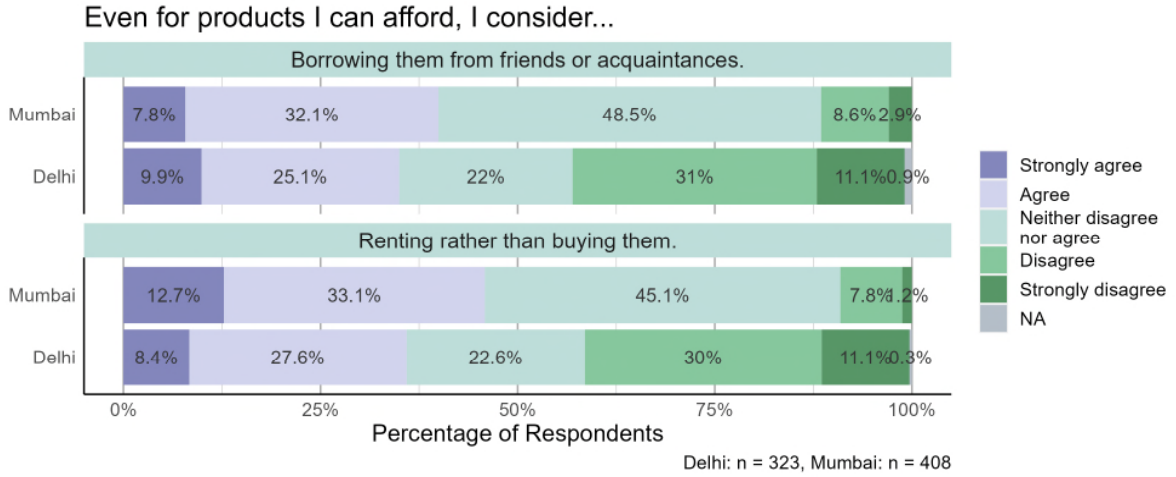
Figure 67 Sufficiency orientation borrowing (Q. SO2_1 and SO2_2)



According to Figure 67, it is evident that 40% to 45% of participants from Mumbai consider borrowing or renting products even if they could financially afford them, while the same is true for 35% of participants from Delhi in both cases.

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Table 18 Ownership of electronic devices (Q. LS1)

Number of appliances	Delhi	Mumbai
0	0%	1.7%
1	1.2%	12.5%
2	7.4%	23.0%
3	30.0%	19.4%
4	28.5%	14.2%
5	15.8%	12.2%
6	8.4%	7.6%
7	3.4%	4.7%
8	2.5%	2.5%
9	2.8%	0.7%
10	0%	1.0%
11	0%	0.5%
12	0%	0%
Mean	4.18	3.54
SD	1.60	2.08

Respondents were asked which of the following twelve electronic devices they own for personal use: smartphone, tablet, laptop/desktop PC, e-book-reader, wearable device, virtual reality goggles, smart home system, smart TV, gaming console, connected exercise machine, wireless accessories and projector. Table 18 displays the share of respondents in each city owning none to all twelve of these devices. On average, respondents from Delhi own 4.18 devices and respondents from Mumbai 3.54.

Table 19 Share of respondents owning cooling devices (Q. C1_1 to C1_3)

	Delhi	Mumbai
Room air conditioner	81.1%	49.3%
Air cooler/desert cooler	23.5%	19.6%
Fan	99.7%	98.8%

Table 19 shows that almost all respondents from both cities own fans to cool their dwellings. A fifth to a fourth of respondents from both cities own air or desert coolers. 81% of respondents from Delhi and 49% of respondents from Mumbai own room air conditioners.

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7.4.6. Socio-economic variables

Figure 68 Age of respondents (Q. QI7)

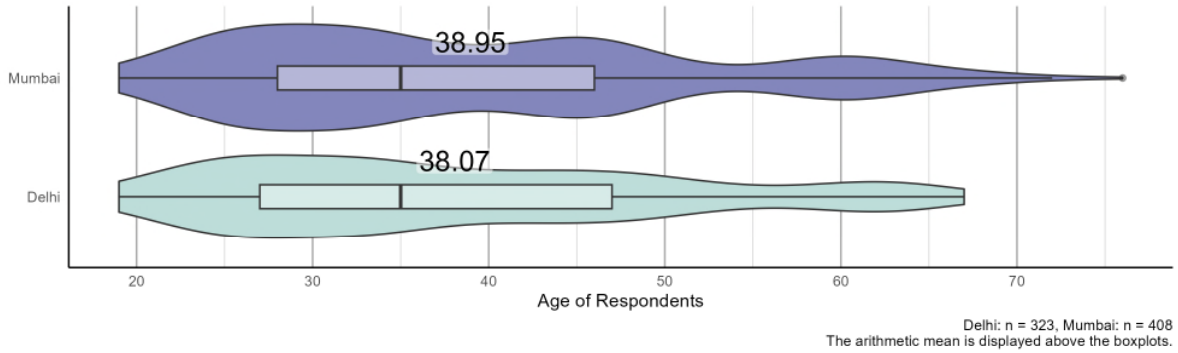


Figure 68 shows the age distribution of participants. The distributions are similar, with Mumbai participants being slightly older on average. The Mumbai sample includes participants up to a higher age than the Delhi sample.

Figure 69 Gender of respondents (Q. QI6)

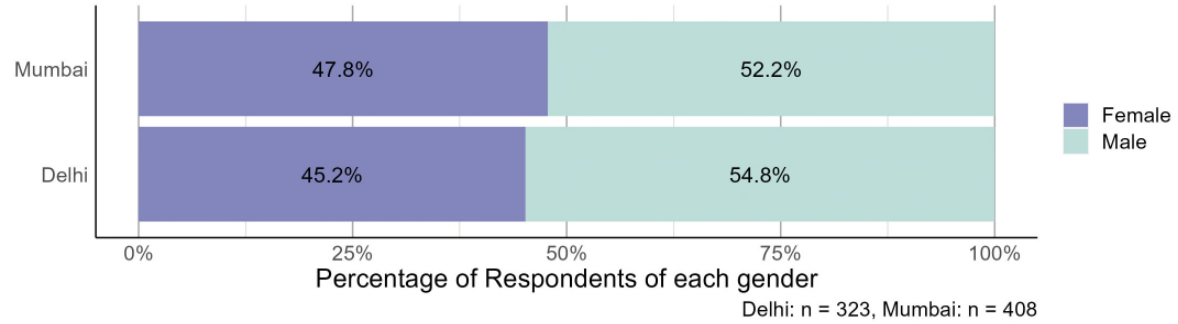
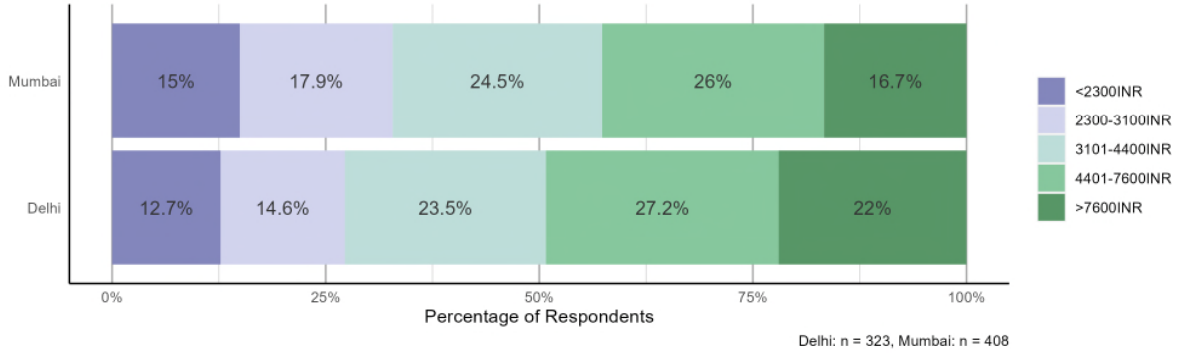


Figure 69 shows the gender distribution of participants from both cities. It can be seen that the share of women in the sample is higher in Mumbai than in Delhi.

Figure 70 Monthly consumer expenditure per person in the household (Q. F6)



According to Figure 70, the distribution of monthly consumer expenditure per person in the household is different across both cities. There are more participants from Delhi with a higher consumer expenditure.

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Figure 71 Income comfortability (Q. SD11)

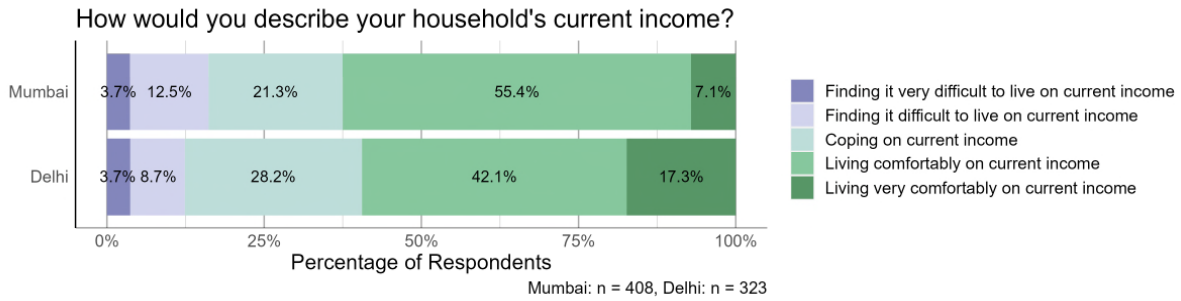

Figure 71 shows that the majority of respondents from both cities live (very) comfortably on their current income. However, 16% of Mumbai respondents and 12% of respondents from Delhi find it (very) difficult to live on their current income.

Figure 72 Income comfortability by income group (Q. SD11)

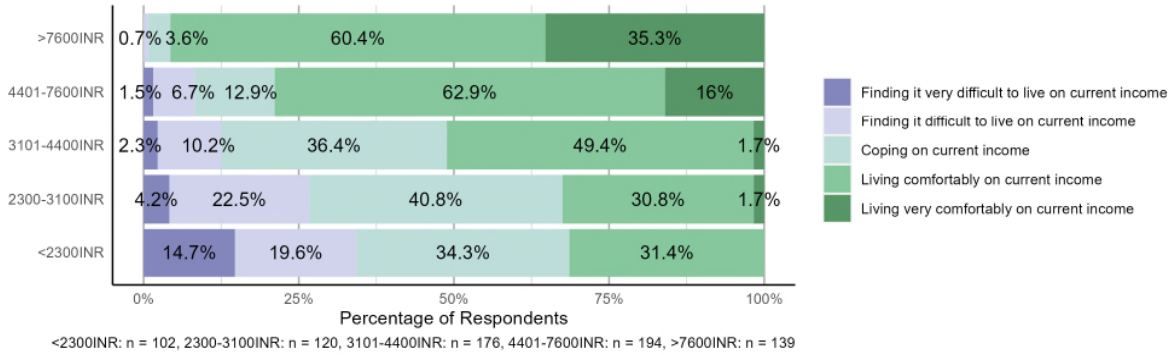

Figure 72 shows that income comfortability declines with decreasing consumer expenditure per person in the household, with only 31% of participants in the lowest expenditure group indicating that they live comfortably on their current income.

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Figure 73 Highest education level of respondents (Q. F7)

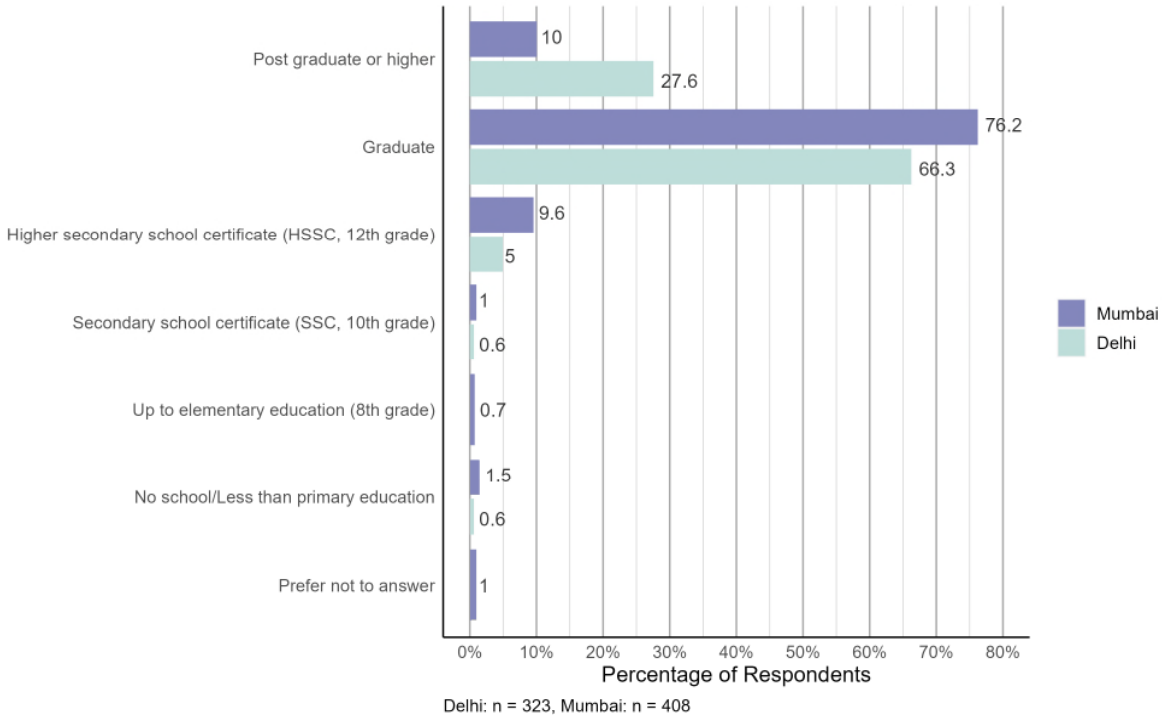

Figure 73 depicts the respondents' highest education level. The majority of respondents from both cities have academic degrees, with three quarters from Mumbai with graduate degrees and 10% with post graduate degrees or higher. In Delhi, these shares amount to two thirds with graduate degrees and almost 28% with post graduate degrees or higher.

Figure 74 Current occupational status of respondents (Q. F9 and SD5)

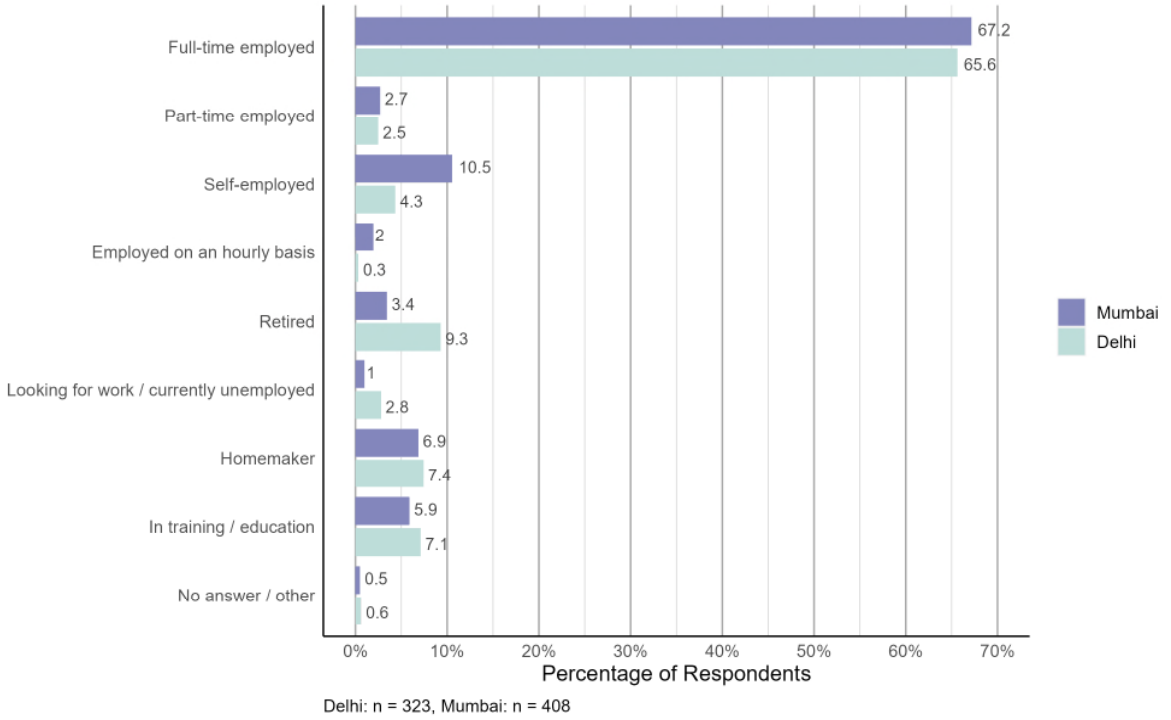

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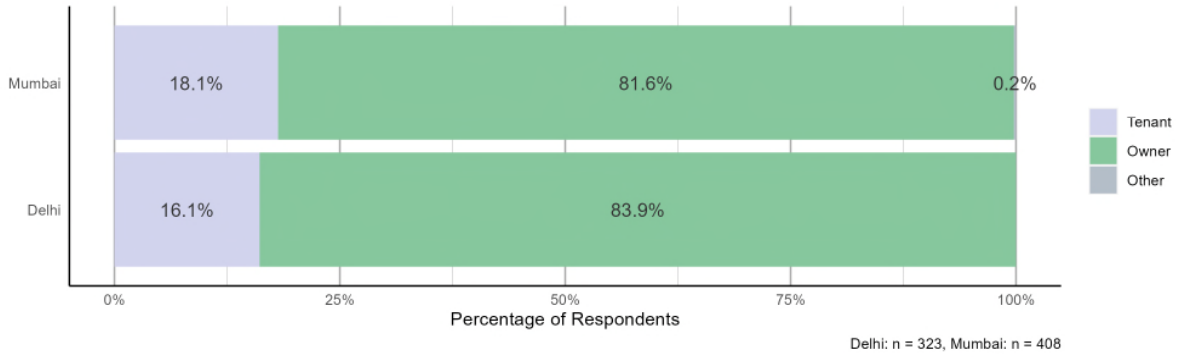
Figure 74 shows that most participants from both cities are employed full-time. Furthermore, it shows that the share of self-employed participants is higher in Mumbai. The other occupational statuses appear approximately equally frequent in both cities.

Figure 75 Percentage of tenants and owners (Q. SD12)



According to Figure 75, most respondents from Delhi and Mumbai own their dwellings.

Figure 76 Household size (Q. SD9)

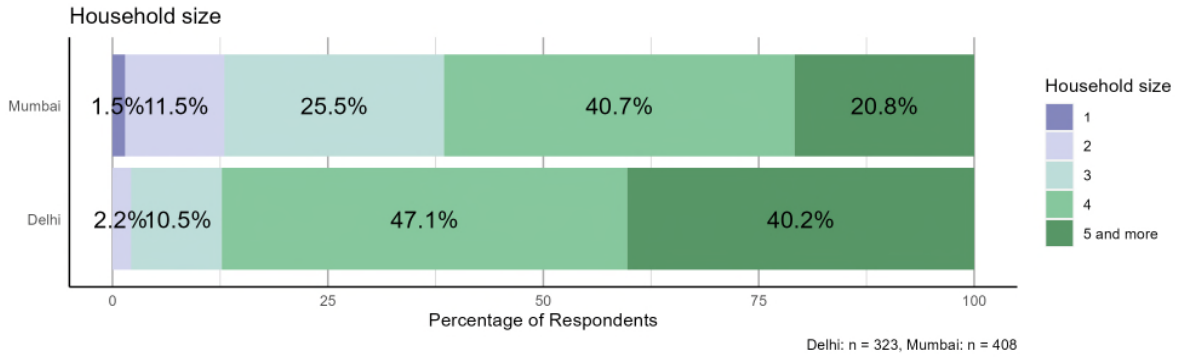


Figure 76 depicts the number of individuals of all ages living in the respondent's household. It can be seen that 1.5% of participants in Mumbai live alone, while none of the Delhi respondents live alone. In Delhi, 40% of the respondents live in households with 5 or more people, while this applies to only 21% of the households from Mumbai. The largest share of households from both cities consist of 4 people.

Figure 77 ercentage of respondents from each city by housing type (Q. GQ1)

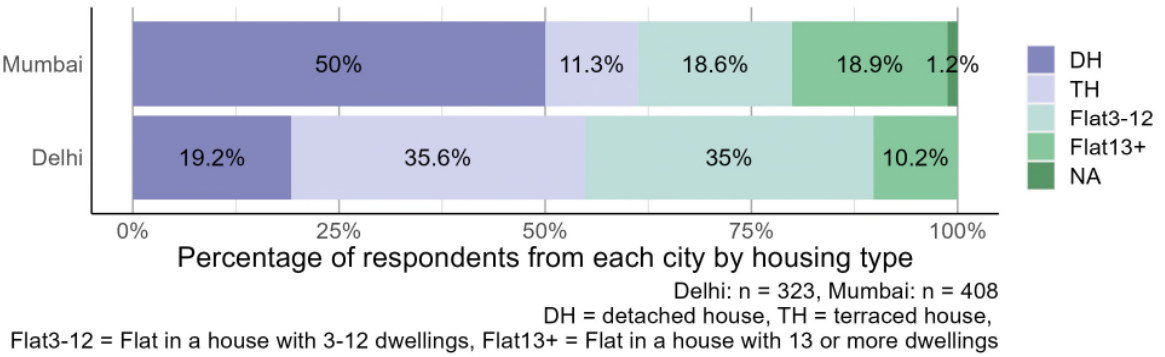


Figure 77 depicts the percentage of respondents from each city by housing type. It shows that half of the Mumbai respondents live in detached houses with 1-2 dwellings, while only 19% of the Delhi respondents do. The majority of respondents from Delhi live in terraced or multi-family

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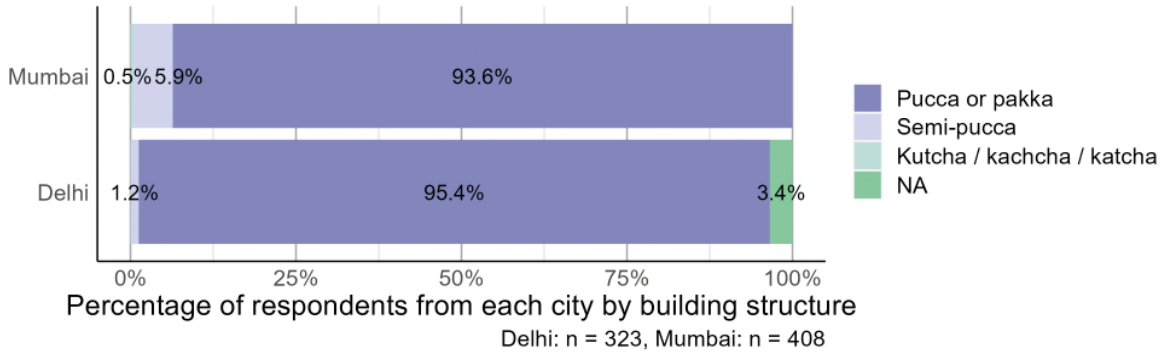
houses. Buildings with more than 13 dwellings are more common for Mumbai than Delhi respondents.

Figure 78 Percentage of respondents from each city by building structure (Q. GQ2)



According to Figure 78, the vast majority of respondents from both cities live in Pucca or Pakka building structures. Pucca or Pakka is defined as a building with a permanent structure, e.g. walls and roof made from metal, concrete, or brick. In contrast, semi-pucca are semi-permanent buildings, for instance, either wall or roof is made of permanent material (and the other of temporary material) and a kutcha, kachcha or katcha is a fully temporary, non-permanent structure (e.g., walls can be made of grass, bamboo, plastic).

Figure 79 Number of weeks spent away from home due to holiday in 2022 (Q. SP8)

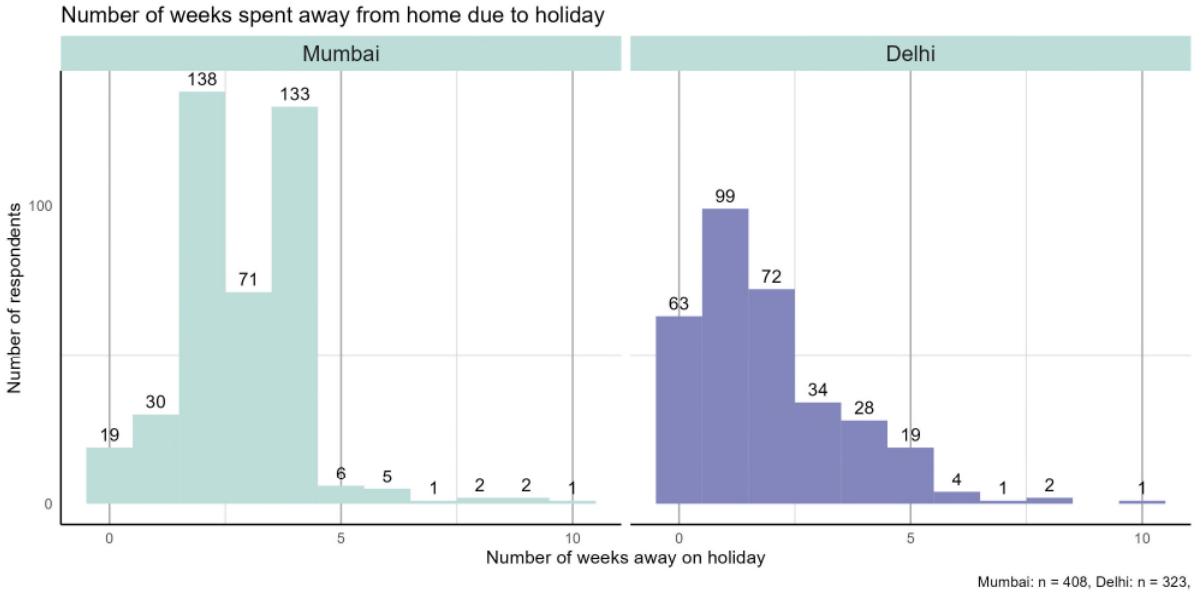


Figure 79 shows that more respondents from Delhi (63) than Mumbai (19) did not spend time away from home during a holiday in 2022. If they spent time away from home, most of the respondents from both Delhi and Mumbai did so for less than five weeks. Anything more than that was very rare.

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Figure 80 Perception of living space (Q. SP1)

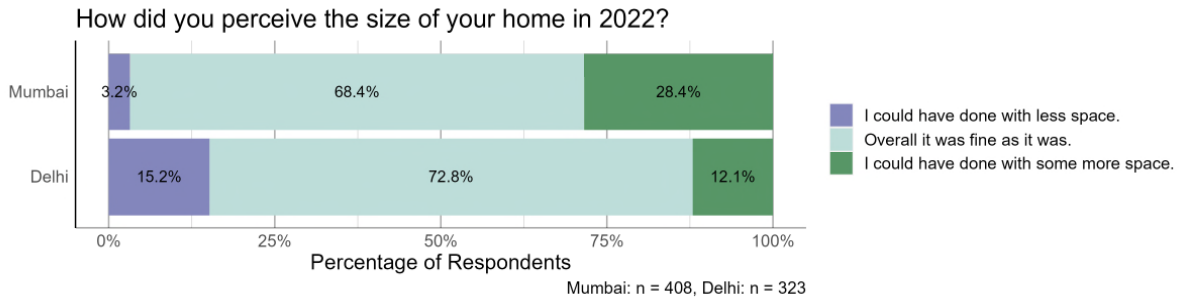

Figure 80 shows that 28.4% of respondents from Mumbai and 12% of respondents from Delhi would have wished for a larger living space in 2022. 3% of respondents from Mumbai and 15% from Delhi indicated that they could have done with less space.

Figure 81 Dietary types (Q. D1_1 to D1_4)

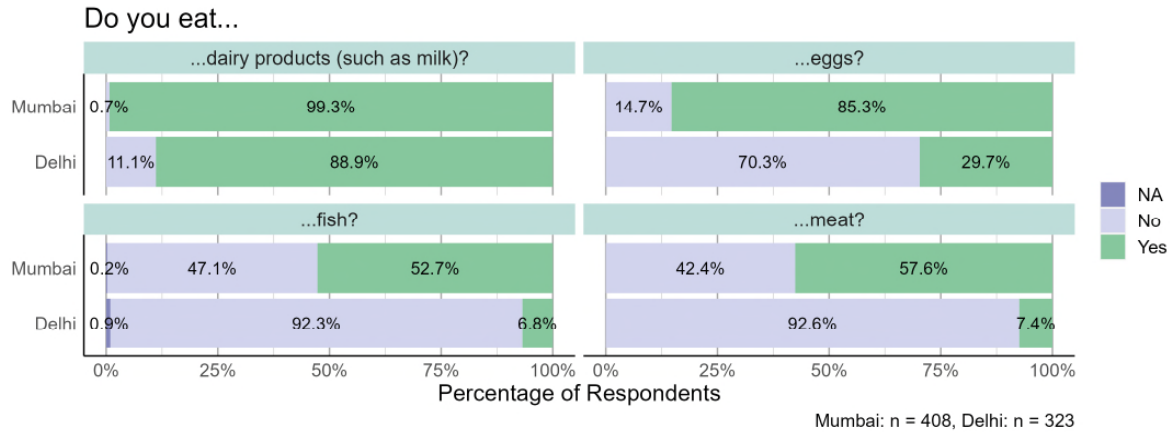

Figure 81 shows that almost all respondents from Mumbai and most respondents from Delhi eat dairy products. However, only a small share of respondents from Delhi eat eggs (29.7%), fish (6.8%) and meat (7.4%). In Mumbai, the majority of respondents eat these foods.

7.4.7. Gender

Table 20 Household composition (Q. SD9)

	Delhi	Mumbai
Single adult, no children	0%	1.5%
2 adults, no children	2.2%	11.3%
1 adult, at least 1 child	0%	0.7%
At least 2 adults, at least 1 child	74.3%	62.3%
3 or more adults, no children	23.5%	24.3%

Table 20 describes the composition of households. 1.5% of respondents in Mumbai live alone, while none of the Delhi respondents do. In both cities, most respondents live in households with two adults and at least one child.

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The following tables and figures depict the division of various tasks between household members. Only household with more than one adult were included in the graphs. Partly, separate graphs for males and females were produced so as to visualise gender-related differences.

Figure 82 Head of household (Q. SD13)

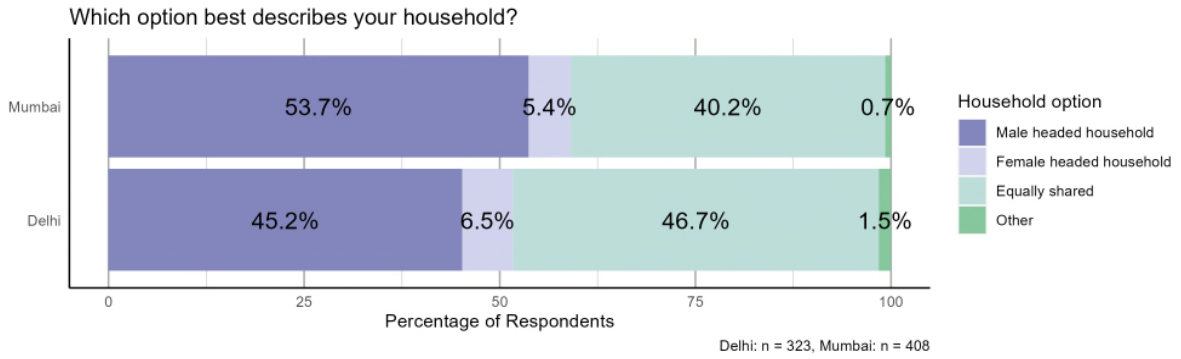

Figure 82 shows that in Mumbai, most respondents' households are male headed, while most households of respondents in Delhi are equally shared. Only between 5.4% and 6.5% of households in both cities are female headed.

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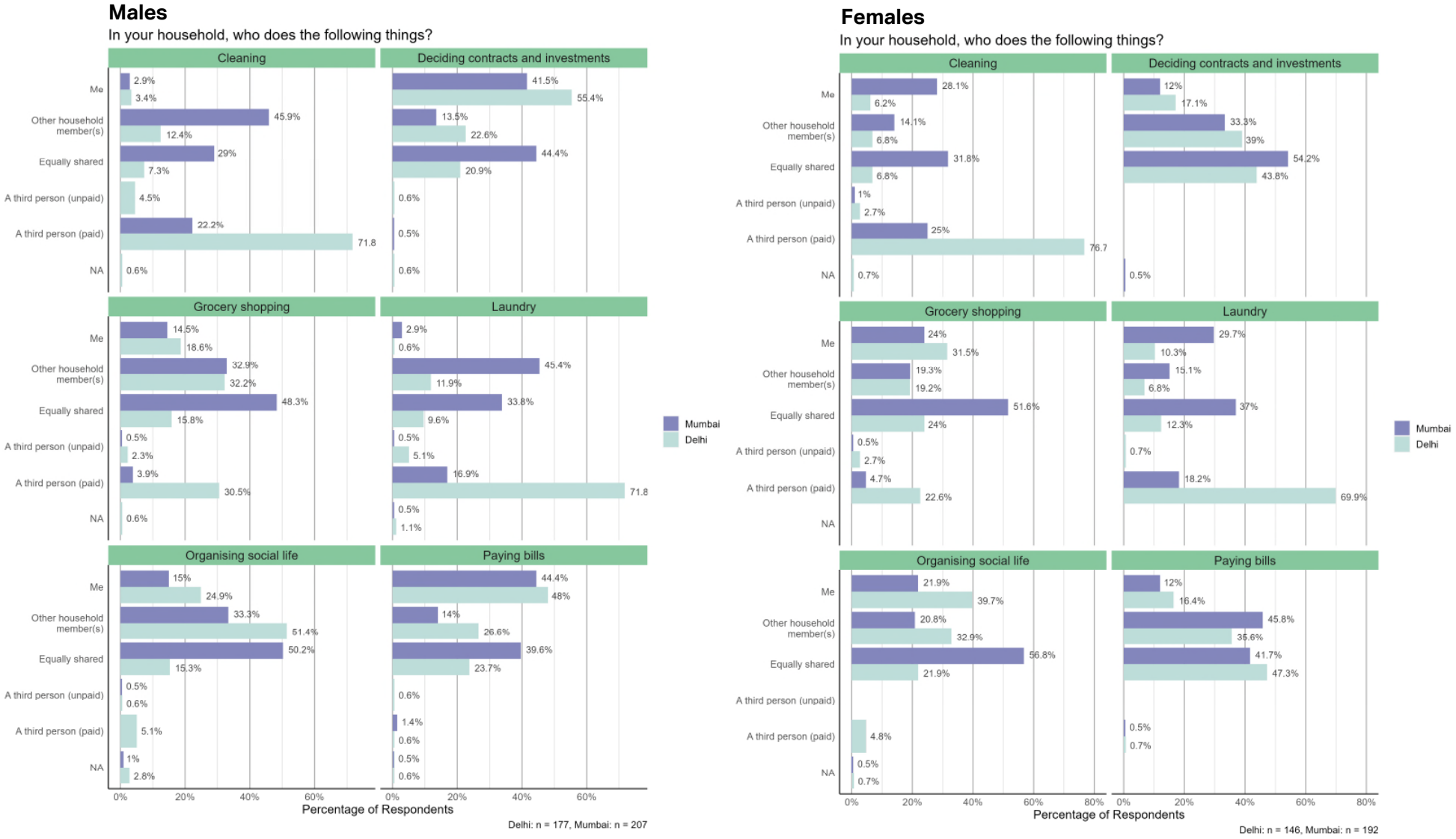
Figure 83 Distribution of household tasks for respondents who did not live alone (Q. SD14_1 to SD14_6)



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According to Figure 83, less than 4% of men who live with at least one other adult in both cities are solely responsible for cleaning and laundry. On the flip side, more than 40% of men not living alone in both cities are solely responsible for paying the bills and deciding on contracts and investment. However, almost 30% of women not living alone in Mumbai are solely responsible for cleaning and laundry. In Delhi, this share amounts to approximately 6%. It is evident that both cleaning and laundry are often done by a paid third person, especially in Delhi. Contrarily, paying the bills, organising social life and deciding on contracts and investments is almost never done by third persons.

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Figure 84 Organisation of income for males who did not live alone (Q. SD15)

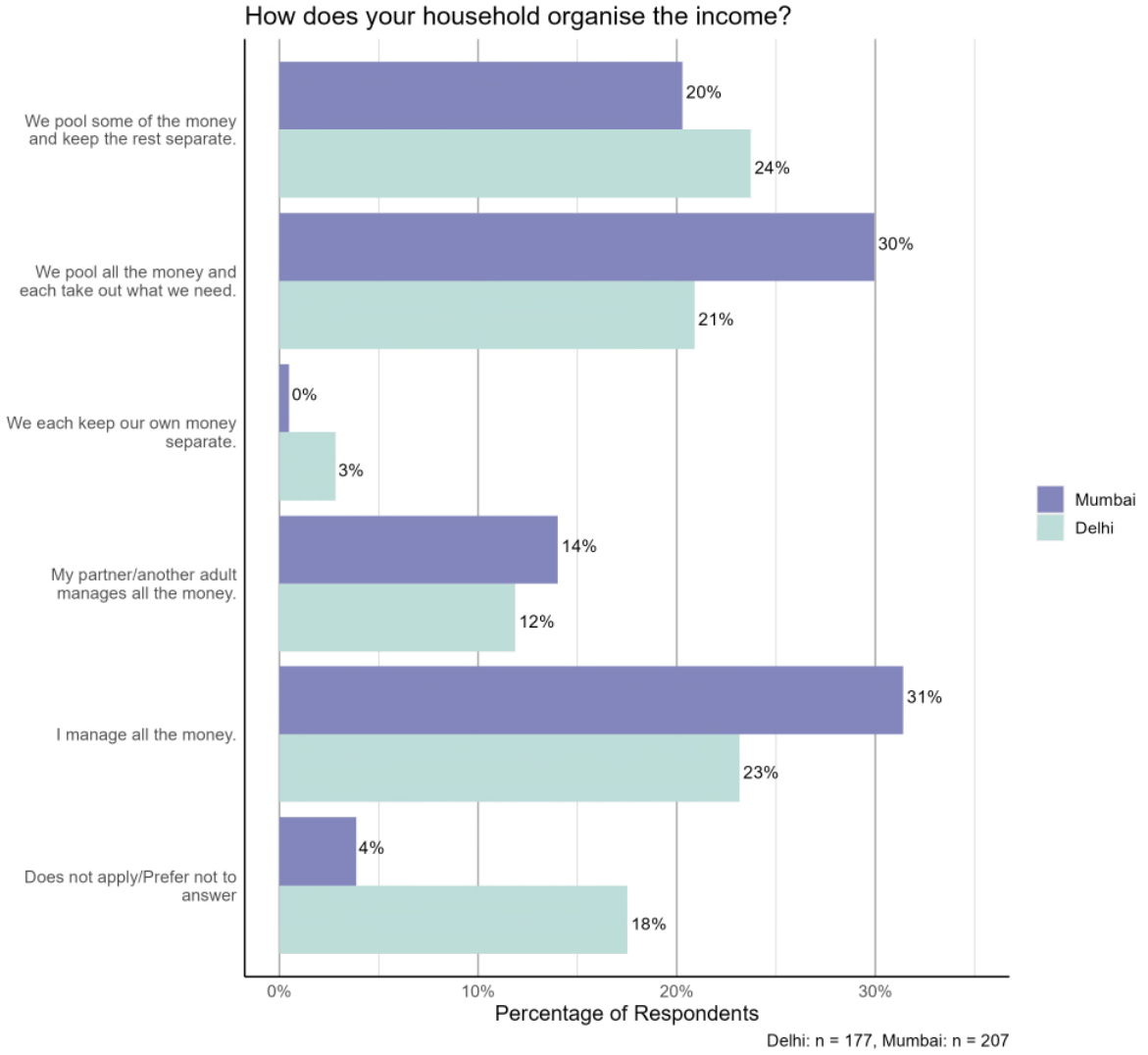

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Figure 85 Organisation of income for females who did not live alone (Q. SD15)

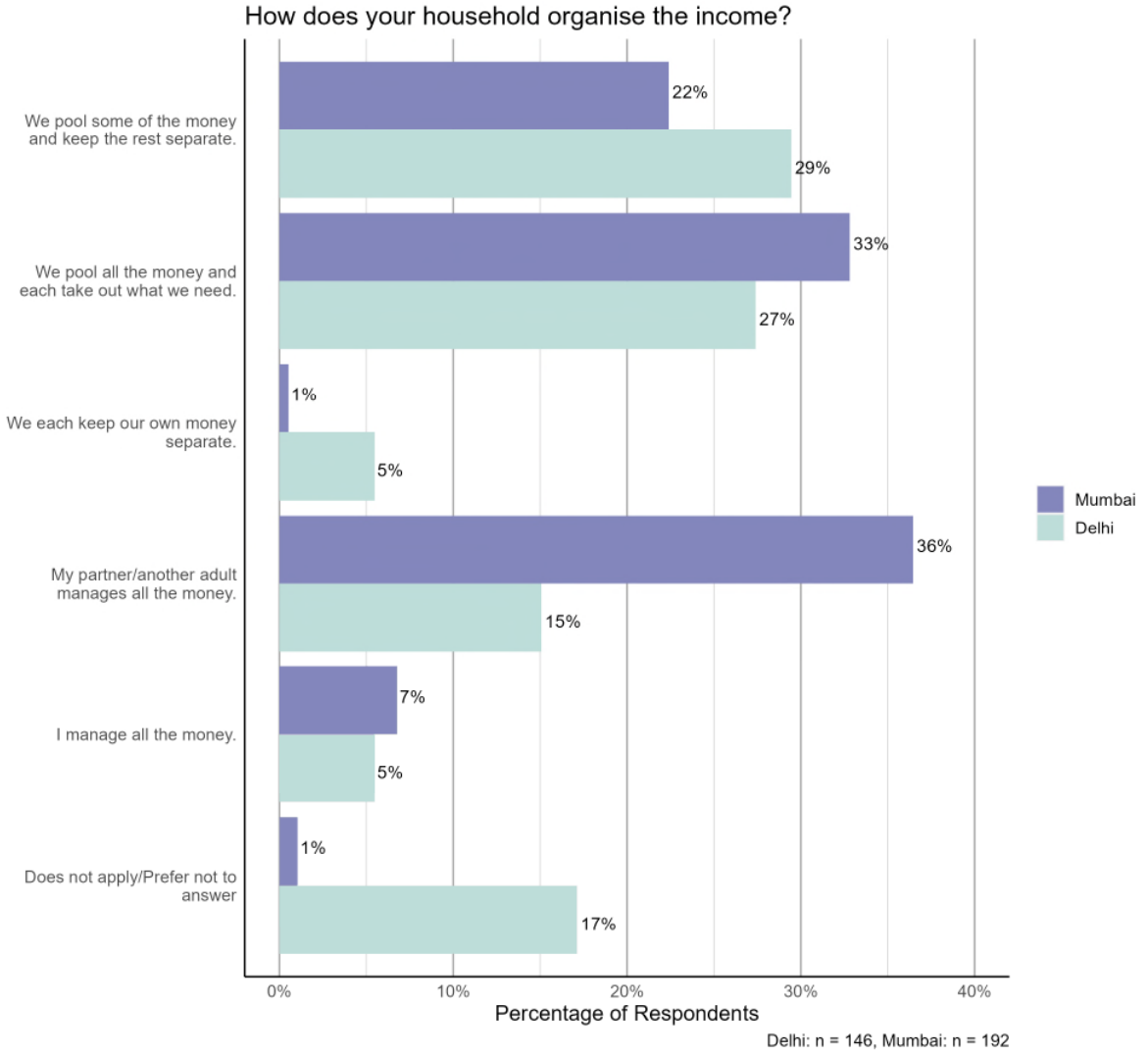

Figure 84 and Figure 85 depict how the households organise the income for men and for women who live with another adult. Keeping the money separate is very rare for both men and women in both cities. Most of the time, the household income is managed by the male in the household, especially in Mumbai. Oftentimes, the money is also pooled, but while in Delhi both men and women tend to pool the money and keep some of the rest separate, in Mumbai both men and women tend to pool all the money and each take out what they need. It also appears as if both men and women from Delhi do not like to talk about this type of money-related issues, as almost 18% of them did not answer to the question about the distribution of their income.

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7.5. Descriptive analysis of further sectors outside the carbon footprint

In the following section, we outline results that need to be interpreted with caution due to data quality reasons. Thus, no estimations for the carbon footprint from electricity and hot water were included in any analyses, including the total carbon footprint.

7.5.1. Electricity consumption in India

Figure 86 Total electricity consumption in India by data source

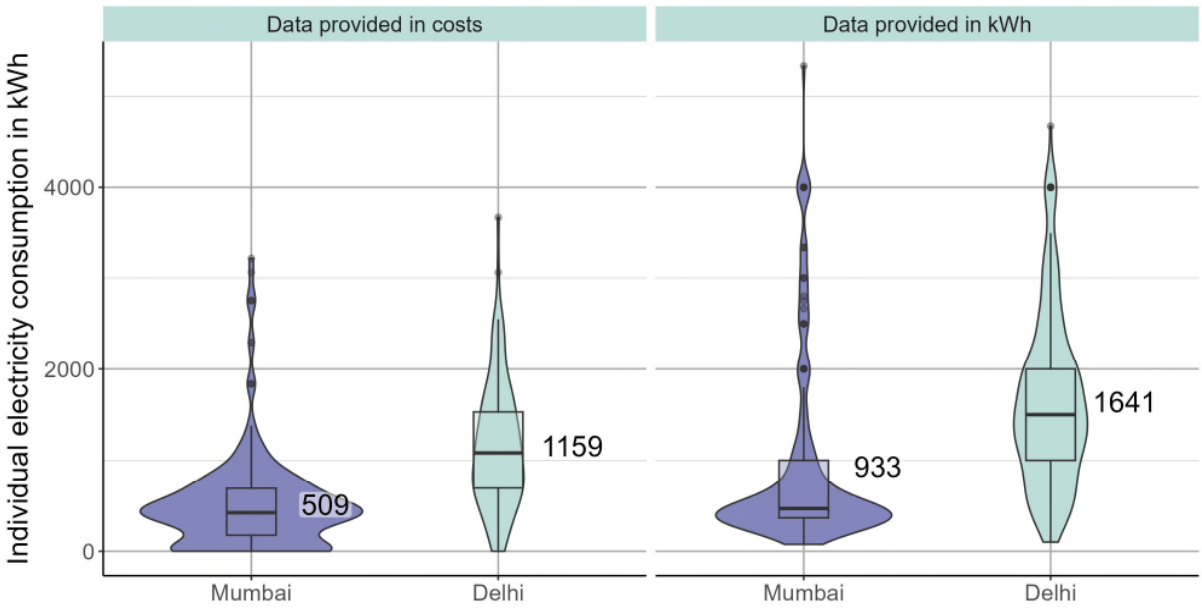

Figure 86 displays the total electricity consumption of respondents in India distinguishing between whether the data to calculate the individual electricity consumption is provided in costs or in kWh. Respondents from Delhi appear to have a higher electricity consumption than those in Mumbai. In addition, the electricity consumption of respondents who provided the data in costs appears to be lower than those who provide the data in kWh. This may be due to a bias that respondents who consume more electricity are more likely to be aware of their level of electricity consumption.

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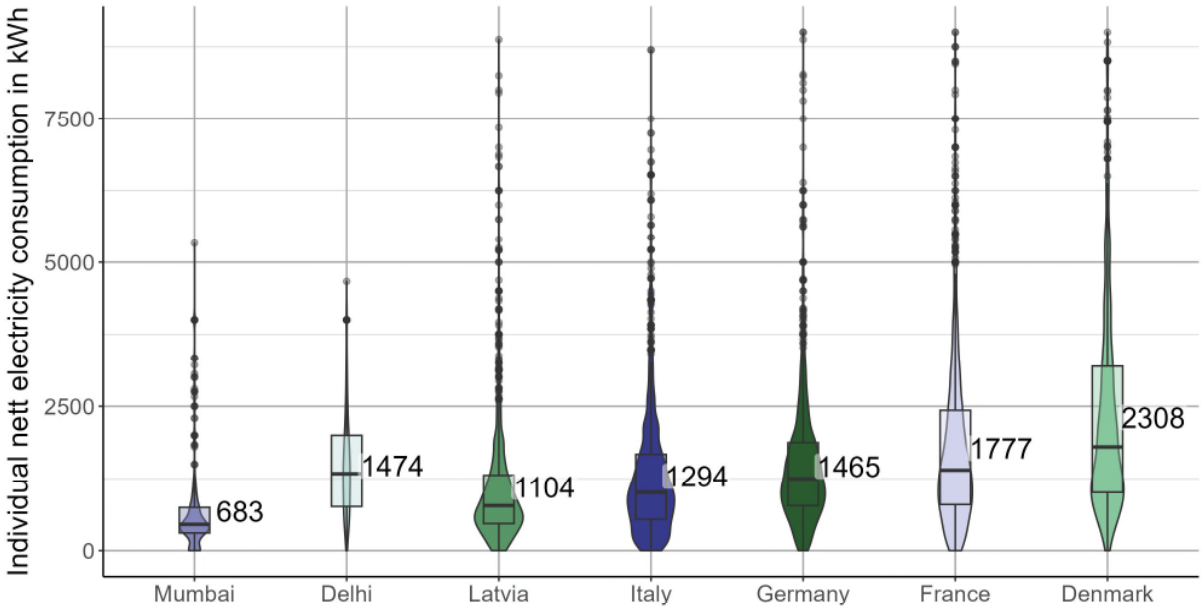
Figure 87 Electricity consumption comparison between Indian and EU countries



Mumbai: n= 408 Delhi: n= 323 LV: n=1367, IT: n=1929, DE: n=1797, FR: n=1848, and DK: n=1867
Mean written on graph.
Violin plots are a variation of kernel density plots.

Figure 87 displays the net electricity consumption of respondents from all EU countries, Mumbai and Delhi. The figure does not deduct any electricity generated by PV, nor take into account whether the respondent has a green tariff. For the European countries, electricity consumption related to space and water heating and transport has been deducted. For the Indian respondents, we have kept the raw data as removing estimated electricity consumption related to heating and cooling resulted in negative values.

We see that the European countries have a larger spread in their electricity consumption, with electricity consumption frequently exceeding 5000kWh, which is rare in Mumbai and inexistent in Delhi. Interestingly, the mean electricity consumption appears to be higher in Delhi than in Latvia, Italy and Germany. This is likely due to the high electricity consumption for cooling. It is important to stress that due to the low data quality in electricity consumption in Indie, these results must be interpreted with care.

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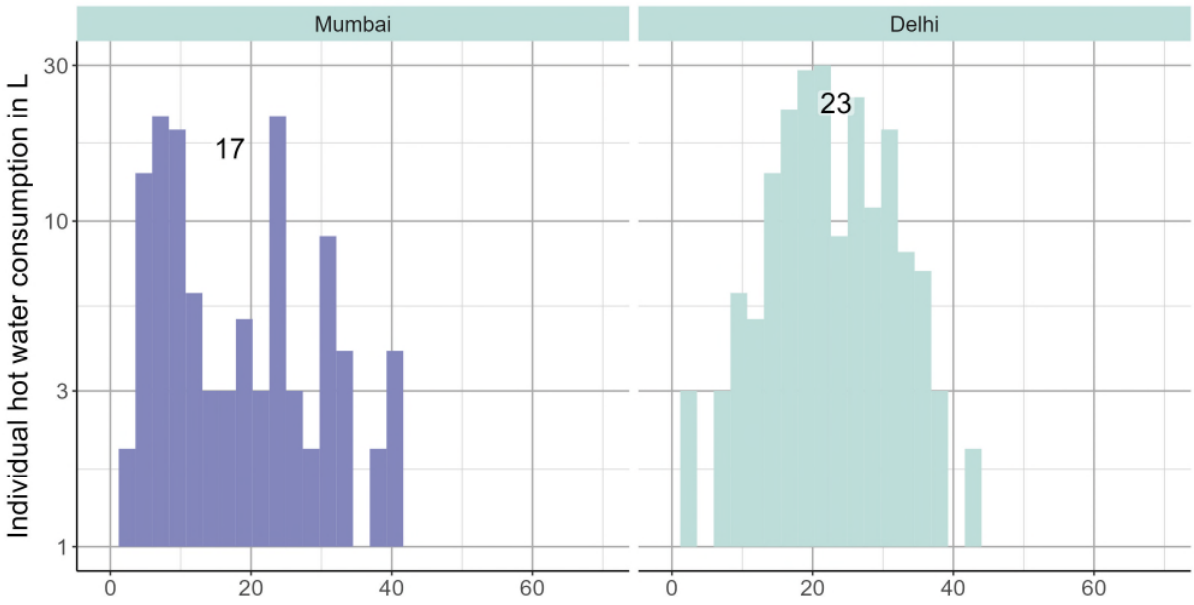
7.5.2. Hot water consumption in India

Figure 88 Individual hot water consumption in India



Mumbai: n= 123 Delhi: n= 199
285 respondents from Mumbai and 124 respondents from Delhi did not provide their hot water consumption.
Mean written on graph.

Figure 88 displays the quantity of hot water in India. Respondents from Mumbai appear to have a lower average hot water consumption than respondents in Delhi. However, over two thirds of respondents in Mumbai and around one third of respondents in Delhi did not provide their hot water consumption. These results can therefore not be considered reliable.

7.6. Identification of sufficiency-oriented lifestyle groups

7.6.1. Methodology

We employed the same general method in India as described in Section 2 for Europe to quantitatively estimate the carbon footprint (Section 2.1) and well-being index (Sections 2.2) to identify sufficiency-oriented lifestyles in India. The major difference is that the total carbon footprint is operationalised as the sum of the diet, motorised transport and cooling carbon footprints (cf. Section 7.2.4).

Our methodology for identifying the groups is very similar to Europe and summarised in Figure 89. For each city:

1. we used the following two criteria to categorise respondents: carbon footprint and well-being
2. we distinguished quartiles of carbon footprint for total carbon footprint and individual activities (transport, diet, and cooling)
3. we distinguished above and below median-well-being

Based on the previous steps, we create the following five groups:

Group I - Very Sufficient: above median well-being and carbon footprint below or equal to median for all activities[59]

[59] For India, we include respondents whose CF is equal to or below (rather than just below) the median value for each sector as the median of transport CF is equal to 0kg CO_{2eq} in Mumbai.

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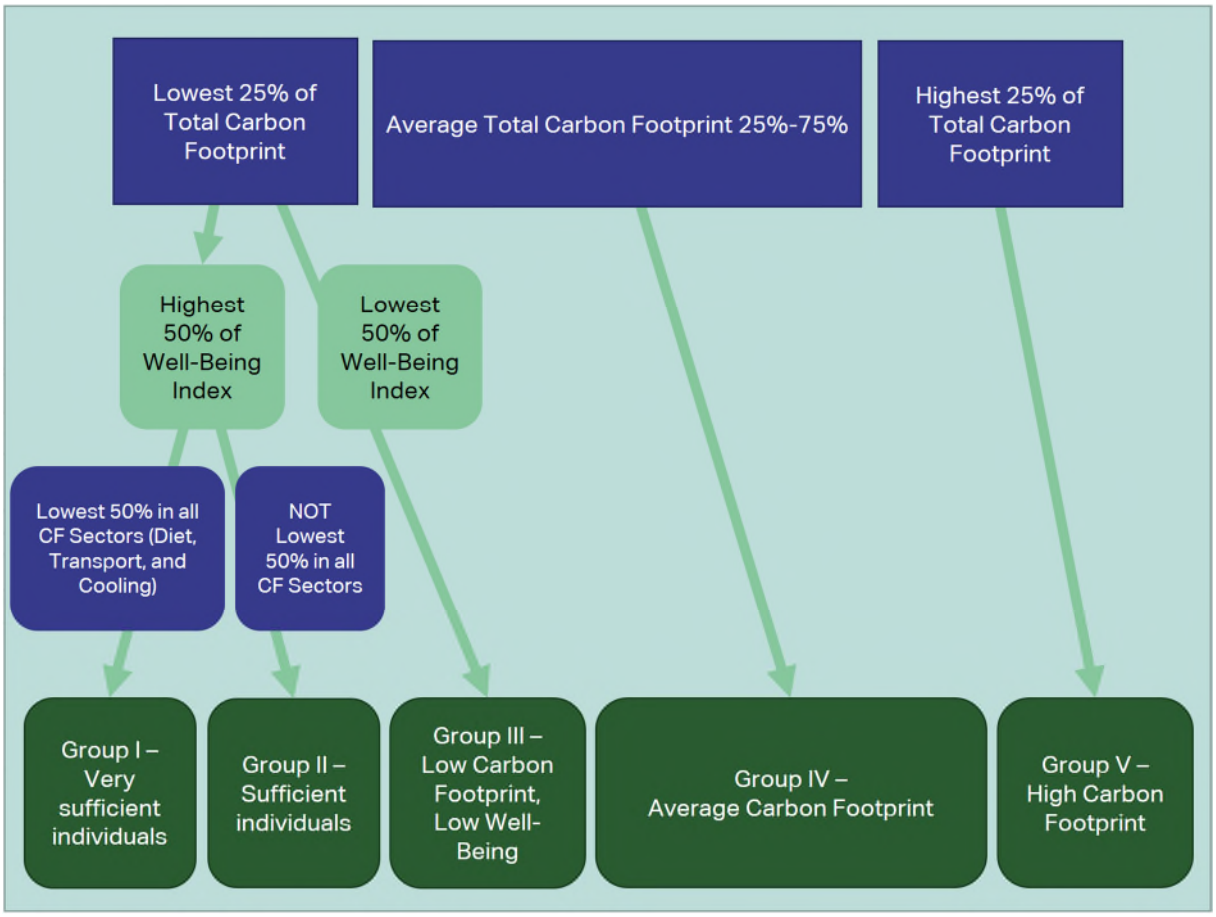
Group II - Sufficient: above median well-being, total carbon footprint in lowest quartile and above second quartile footprint for at least one other carbon footprint (i.e., transport, cooling, diet)

Group III - Low Carbon Footprint, Low Well-Being: below the median total carbon footprint and below the median well-being

Group IV - Average Carbon Footprint: total carbon footprint between second and third quartile

Group V - High Carbon Footprint: total carbon footprint in the fourth quartile

Figure 89 Group identification operationalisation for each city in India



As for the European countries, individuals who did not provide responses to at least one question on the well-being index (n=24) were removed from the analysis.

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7.6.2. Respondents' distribution between the groups

Figure 90 Distribution of participants between groups in Mumbai and Delhi

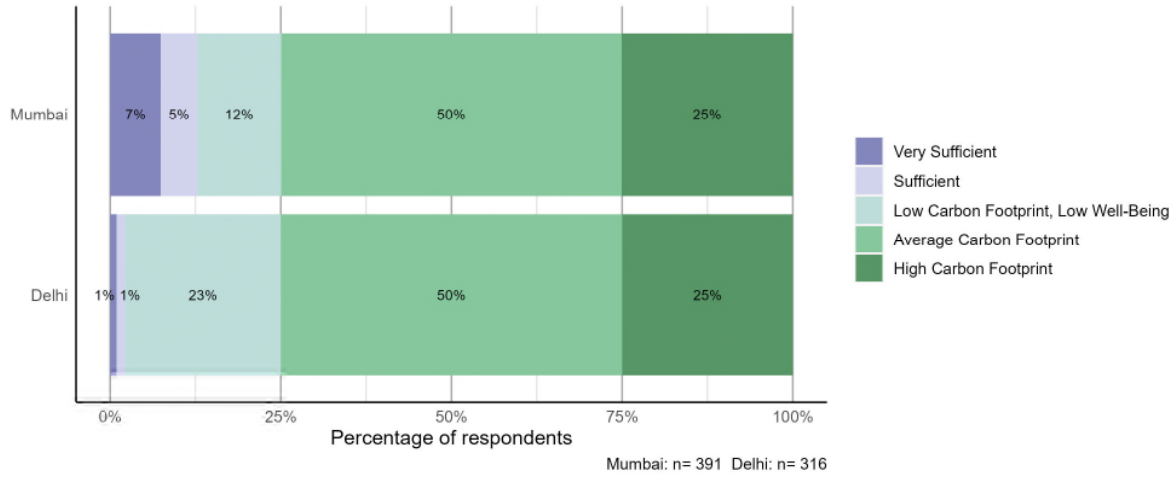

Figure 90 displays the distribution of survey participants in the groups by city. As expected, 50% of individuals in each country are in *Group III - Average Carbon Footprint,* and a quarter are in *Group V - High Carbon Footprint*. The distribution of respondents in the low carbon footprint groups (*Groups I* to *III*) varies between the Indian cities, with 1% or 7% of respondents in *Group I - Very Sufficient*, 1% or 5% in *Group II - Sufficient*, and 12 %or 23% in *Group III - Low Carbon Footprint, Low Well-Being*.

Figure 91 Distribution of participants between groups in Mumbai and Delhi: Zoom on the lowest 25%

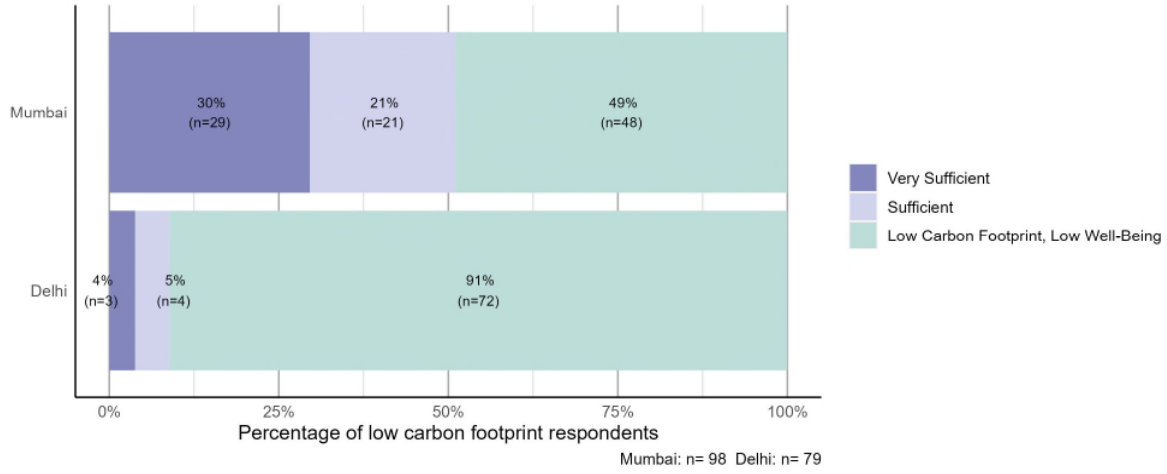

Figure 91 depicts the distribution of participants in the lowest total carbon footprint quartile. Only 4% of the respondents from Delhi are in Group I - Very Sufficient, whereas in Mumbai, the percentage is 30%. Similarly, 5% of respondents from Delhi and 21% of respondents from Mumbai are in Group II - Sufficient. Finally, 91% of respondents from Delhi and 49% from Mumbai are in Group III - Low Carbon Footprint, Low Well-Being. One explanation for this result may be the fact that the correlation between the total carbon footprint and the well-being index is high in Delhi (and higher than in Mumbai) leading to a large proportion of the sample in the low carbon footprint and low well-being group.

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7.6.3. Description of the lifestyle groups

The following section describes the five groups by city. Chi-square tests of independence with a Bernoulli correction and Welch t-tests were used to ascertain whether the groups have significant common characteristics. We tested whether the groups were significantly more or less likely to be characterised by socio-economic factors (age, gender, income, education, attitudes), quality of life (including security/money, comfort), and along the gender dimension (care economy, effort sharing). Please note that age and gender were used to calculate the CO_{2eq}-emissions for diet and for the default for the distance travelled by rickshaw. Therefore, it is expected that females (and older respondents) have lower diet-related emissions than males (and younger respondents) in general. All significant effects are described in the following statements ($p<0.05$). Figure 92 summarises the groups for both cities.

The analysis of the lifestyle groups at the city-level has resulted in a low sample size, especially in Group I - Very Sufficient and Group II - Sufficient, making statistical significance harder to achieve. We thus also present the results of both groups combined in Figure 38.

Group I - Very Sufficient

Mumbai: Individuals in this group are more likely to be female and more likely to pay someone else to organise social life. They are less likely to equally share decisions surrounding contracts and making investments.

Delhi: In this group, it is more likely that other household members do the laundry.

Group II - Sufficient

Mumbai: In this group, individuals are more likely to be female, and to be in the second lowest expenditure group.

Delhi: Individuals in this group tend to be older than the average. They tend to consider themselves to be environmentally friendly consumers and tend to be very concerned with environmental issues. Respondents in this group are more likely to consider new things to be a waste of resources. These respondents are more likely to share cleaning the house equally.

Group I and Group II - Very Sufficient and Sufficient combined

Mumbai: individuals in this combined group are more likely to be female than male.

Delhi: Individuals in this combined group are more likely to live in a flat rather than a house. They tend to be very concerned with environmental issues. Respondents in this group are more likely to consider new things to be a waste of resources.

Group III - Low Carbon Footprint, Low Well-Being

Mumbai: Individuals in this group are more likely to be female and older than the average. They are less likely to be in the higher expenditure group, tend to have an instable income, and are more likely to struggle on their current income. They are less likely to have an academic degree. Individuals in this group are more likely to be a housemaker, and less likely to work full-time. Their dwelling is more likely to be a flat than a house, and more likely to be semi-pucca or kutcha than a pucca. They are more likely to rent than own their dwelling. Respondents in this group are more likely to be less religious than the average. In this group, respondents are more likely to have had to reduce expenditure for basic household necessities, and less likely to have been able to afford a week's holiday. Respondents are more likely to have worried about affording their electricity bill. They are more likely to feel that the temperature in their home in winter and in summer was unsafe. Respondents in this group are more likely to have been unable to afford balanced meals, to worry food may run out, and to consume less dairy products than desired.

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They are less likely to be able to participate in events or attend appointments due to transportation issues. These respondents are more likely to desire more living space. Respondents in this group do not tend to try to use as little resources as possible (e.g. water, energy, wood) and do not tend to try to possess few things. These respondents are more likely to clean the house themselves and less likely to pay someone else. They are more likely to do the laundry themselves. It is more likely that another household member pays the bills and keeps financial records and less likely that this is equally shared. They are less likely to equally share decisions surrounding contracts and making investments and it is more likely that another household member does this. In this group, it is more likely that another adult in the household manages all the money and gives the respondent their share.

Delhi: These individuals are more likely to be female and older than the average. They tend to be in the lowest expenditure category and have an unstable income, upon which they have difficulties to live. Individuals in this group are more likely to be homemaker, retired or work part-time and less likely to work full-time. It is less likely that the respondent's household is equally shared between males and females. Their dwelling is more likely to be a flat than a house, and less likely to be a pucca. They are more likely to rent than own their dwelling. In this group, respondents are more likely to have had to reduce expenditure for basic household necessities, and less likely to afford an unexpected expense and to have been able to afford a week's holiday. Respondents are more likely to be worried about affording their electricity bill. They are more likely to feel that the temperature in winter and in summer is unsafe. Respondents in this group are more likely to have been unable to afford balanced meals, to worry food may run out, and to consume less dairy products than desired. They are less likely to be able to participate in events or attend appointments due to transportation issues. These respondents are more likely to require more living space. They are less likely to consider themselves to be environmentally friendly consumers and are less likely to be concerned with environmental issues. Respondents in this group do, however, tend to try to use as little resources as possible (e.g. water, energy, wood), tend to try to possess few things, and are more likely to consider new things to be a waste of resources. They are more likely to borrow items. They are more likely to do the laundry themselves and less likely to pay someone else to. In this group, it is more likely that another adult in the household manages all the money and gives the respondent their share.

Group IV - Average Carbon Footprint

Mumbai: These individuals are more likely male and to live in a house rather than a flat. They are more likely to work full-time. In this group, respondents are less likely to have had to reduce expenditure for basic household necessities and more likely to have been able to afford a week's holiday. Respondents are less likely to be worried about affording their electricity bill. They are less likely to feel that the temperature in summer is unsafe. Respondents in this group are less likely to have been unable to afford balanced meals. Respondents in this group are less likely to think of themselves as an environmentally friendly consumer, and less likely to be concerned with environmental issues. Respondents in this group do not tend to try to use as little resources as possible (e.g. water, energy, wood) and do not tend to try to possess few things. They are less likely to borrow items from friends or acquaintances. They are less likely to rent rather than buy products. For these respondents, it is more likely that another household member cleans the house, and less likely to pay someone else. Respondents in this group are more likely to pay the bills and to keep financial records themselves and it is less likely that another household member does it.

Delhi: In this group, the individuals are less likely to be in the lowest expenditure category, and more likely to be in the medium expenditure category. In this group, respondents are less likely to have had to reduce expenditure on basic household necessities. They were more likely to be able to consume as much dairy as they desired. Respondents in this group tend to not have difficulties living on their current income.

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Group V - High Carbon Footprint

Mumbai: These individuals tend to be male, and to be in the highest expenditure group. They tend to have a stable income and they are more likely to live very comfortably on their current income. Respondents are less likely to have worried about affording their electricity bill. They tend to not have transportation issues preventing them from participating in events or attending appointments. Respondents in this group are more likely to think of themselves to be an environmentally friendly consumer, and more likely to be concerned with environmental issues. They are however more likely to be embarrassed to be seen as having an environmentally friendly lifestyle. Respondents in this group tend to try to use as little resources as possible (e.g. water, energy, wood) and tend to try to possess few things. Additionally, this group is more inclined towards product rental as opposed to buying new products. For these respondents, it is more likely that another household member cleans the house or that someone else is paid. Respondents are more likely to pay a non-household member to do the shopping. They are less likely to do the laundry themselves and more likely to pay a third person.

Delhi: These individuals are more likely to be male and to be in the two highest expenditure categories with a stable income. They are more likely to live very comfortably on their current income. They are more likely to live in a house than a flat and less likely to rent than own their dwelling. In this group, respondents are less likely to have had to reduce expenditure for basic household necessities and tended to be able to afford unexpected expenses as well as a week's holiday. Respondents are less likely to have worried about affording their electricity bill. The temperature of their dwelling tend to feel safe in both winter and summer. They are less likely to worry that food would run out. They tend to not have transportation issues preventing them from participating in events or attending appointments. They are less likely to borrow or rent rather than buy products. Respondents are more likely to pay a non-household member to do the shopping. Respondents in this group are less likely to share the laundry equally and more likely to pay a third person.

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Figure 92 Summary of group characteristics for Mumbai and Delhi

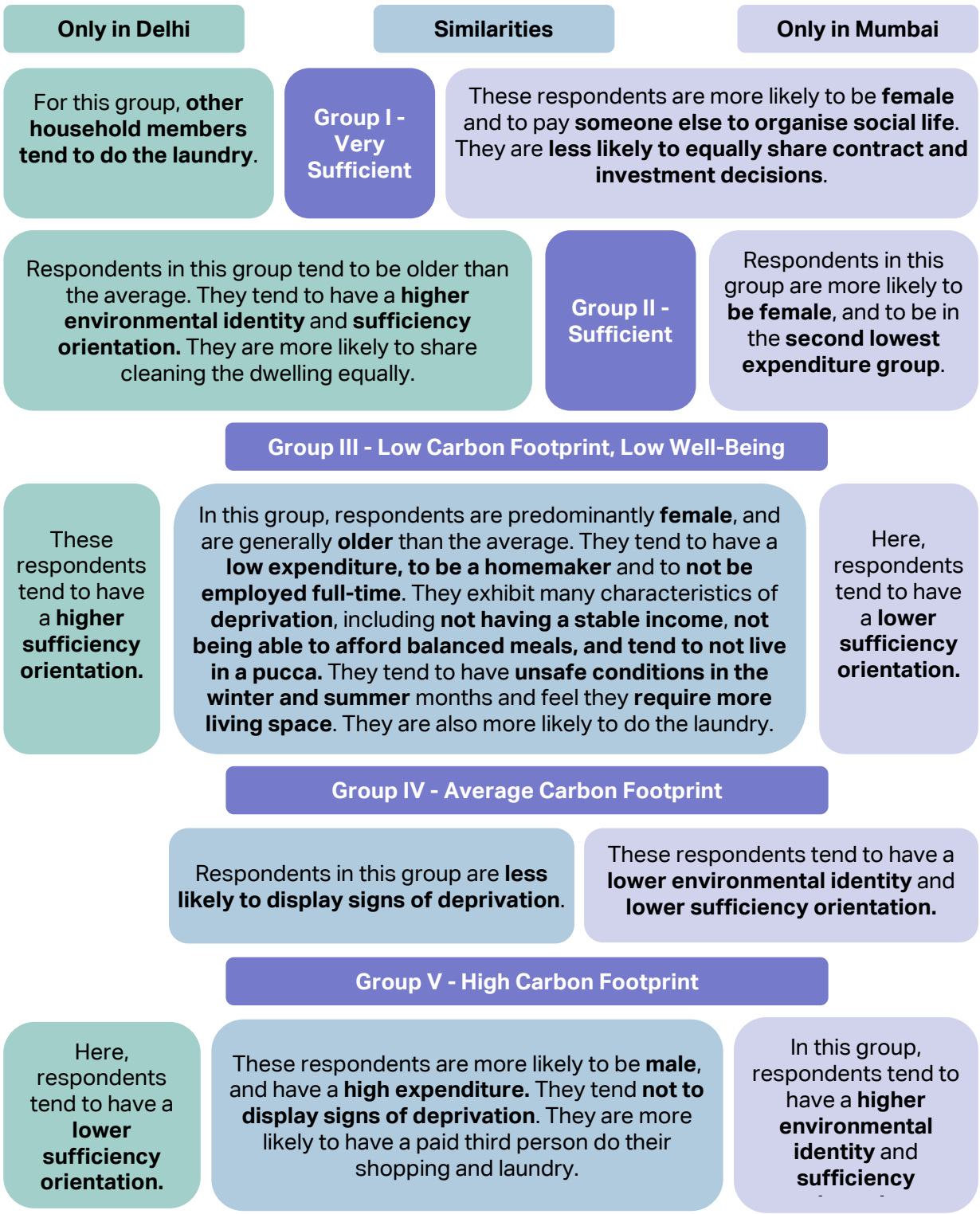

Figure 92 summarises the groups for both cities, with characteristics that are only present in Delhi in green, those only visible in Mumbai in lilac, and with common characteristics in blue.

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8. Summary and discussion

8.1. Discussion of results for countries in Europe

As an overarching objective, this task from WP3 aims to quantitatively examine lifestyle change mechanisms and sufficiency lifestyles through social sciences and humanities (SSH) research methods on the micro level (i.e., within individuals and households). The current report describes our approach to identify the prevalence of sufficiency-oriented lifestyles across Europe and India as well as the variation in lifestyles with regard to CO_{2eq}-emissions. The empirical work relies demographically representative on large-sample household surveys in five EU countries (Denmark, France, Germany, Italy, Latvia) and India (Mumbai and Delhi). The chapters of the deliverable provide details about the structure and items in the questionnaire, and especially the carbon footprint calculator that was developed for the purpose of the study. In FULFILL, sufficiency is defined as a lifestyle that has low CO_{2eq}-emissions and high individual well-being. Therefore, the carbon footprint calculator was combined with a measure of individual well-being. Further questions in the survey covered socio-economic attributes, attitudes such as towards the environment or political preferences, sufficiency-oriented practices, structural aspects, social deprivation and the gender-related division of work within the household. Unfortunately, due to an error in the questionnaire, the data on well-being is not usable for France. However, this will be assessed and included in the second survey in Task 3.3.

The carbon footprint calculator is designed to estimate individual emissions from the following key activities: housing (heating and hot water use), electricity, transport and food. In order to implement the calculator, we had to make a number of assumptions, which led to some limitations in the interpretation of the data. For example, we assumed that using a green electricity tariff would result in zero emissions and that using PV panels would result in negative emissions. For electricity and heating, some participants did not report their fuel and electricity consumption, so we had to use defaults, which resulted in lower estimated emissions on average than for those who provided more detailed data. Thus, this results in a bias in our estimations. For food, we had to estimate broadly the impact of eating seasonal and local (rather than conventional) food. While it is generally accepted that eating regional and seasonal vegetables and fruit reduces emissions, this is not necessarily the case for meat and dairy products. In addition, the survey was demographically representative in each country in terms of region, age and gender, which may not be the case for other aspects such as the percentage of people with a PV panel. Thus, generalising to the overall population of the countries under study needs to be done with care.

It is noteworthy to consider that travel emissions are likely strongly influenced by measures to mitigate the COVID-19 pandemic such that holiday travel and aviation were on lower levels than usual. Indeed, many of the results in this deliverable are likely to have been impacted by the COVID-19 pandemic. The possibility to fly was strongly affected; the number of flights in the EU was 64% lower in 2021 than in 2019[60], and thus flights were not included in the carbon footprint calculator, even though flights constitute a large proportion of people's carbon footprint in usual years. The pandemic also may have impacted motorised travel. Individuals may have travelled less due to isolation and movement restriction measures, but may have travelled more by motorised vehicle as they preferred to travel by car than by public transport. Finally, the restrictions possibly also affected well-being.

Furthermore, this first round of surveys also includes several learnings. This refers to some of the items, such as misinterpretations for example regarding the frequency of buying clothes, which led to inputs by respondents that were not possible to interpret in a useful way.

We find that the average levels of CO_{2eq}-emissions per person in 2021 varies in the European countries under study by a great extent between 4.9 t (Denmark) and 3.2 t (France) - excluding aviation. Diet contributes on average the highest share while electricity is the lowest.

[60] https://ec.europa.eu/eurostat/databrowser/view/AVIA_PAOC__custom_5119436/default/table?lang=en

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For the analysis of lifestyles, the sample is divided into groups based on the individual CO_{2eq}-emissions, i.e. the highest 25 % (group 5), the middle 50 % (group 4) and the lowest 25% (groups 1 to 3). The lowest 25% are considered as potentially having a sufficient lifestyle and thus well-being was analysed in addition. We find that between 3% and 4% are low on emissions in all activities ("very sufficient" group 1) and have an above median-level of well-being. Between 7% and 8% are low on emissions in at least one activity and high on well-being ("sufficient" group 2). Finally, between 13% and 15% can be described as deprived with below median-levels of well-being (group 3). An analysis of differences in frequencies and means on further variables investigated points out that these groups share some similarities across countries. The differences will be further investigated in WP5.

A descriptive analysis identifies some interesting patterns e.g. with regard to gender differences, participation in care work duties or political preferences between the groups. It has to be noted, that the results are purely bivariate correlations and can by no means be interpreted as causal. Some commonalities are identified across the three groups that constitute the lowest 25% in terms of CO_{2eq}-emissions. The first group, characterized by very sufficient respondents, has more women than men. Members of this group are unlikely to display signs of social deprivation and tend to endorse a sufficiency-oriented lifestyle, which includes opposing overconsumption. Group 2, consisting of those who are sufficient but not in all activities, also features a higher proportion of women. They generally enjoy relative comfort with their current income, support environmentally friendly policies, and consider themselves eco-friendly consumers. Group 3, which has low emissions but lower well-being, predominantly comprises women, people with low incomes and several deprivation-related attributes. They oppose liberal policies and often shoulder multiple caregiving responsibilities. Group 4, the largest group, maintains average CO2eq emissions and is diverse, with a higher representation of men. Group 5, associated with a high carbon footprint, is composed of more men than women, individuals in this group tend to have high incomes, live outside major cities, often in houses, and work full-time. Surprisingly, some members display signs of deprivation. They tend to favor conservative policies and are less involved in domestic caregiving duties.

8.2. Discussion of Indian survey results

Data collection in India proved to be challenging and caused a significant delay in concluding this deliverable. The final carbon footprint for the two Indian mega cities is based on a total of three sectors, i.e. transport, cooling and diet. The resulting average carbon footprint is 1.5 t (Delhi) and 1.6 t (Mumbai).

Despite, large efforts to implement high-quality fieldwork, it proved to be challenging to acheive a high quality data-set. This concerns the sample composition which is not fully representative of the population of the cities as due to data quality issues some data sets had to be excluded and as overall more highly educated people are more frequently part of the sample than of the population. Furthermore, in spite of close contact and training, the data quality was not sufficient to estimate the carbon footprint for electricity, and hot water.

We decided to not combine the results for Mumbai and Delhi and treated them similar to two different countries in Europe, because of their geographical distance and climatic variations. Analysing the Indian cities separately appeared valuable given the large differences between Mumbai and Delhi. For instance, participants in Mumbai seem to walk a lot (almost daily) which is not the case in Delhi. Moreover, the number of technical and cooling devices appears to be lower on average in Mumbai than Delhi. In contrast, the reported governmental support in Delhi is very little and slightly higher in Mumbai. This - combined with the different climate situation in both cities - may be related to the fact that the deprivation in winter and summer times is higher in Delhi than in Mumbai, based on participants' responses. However, there are also many similarities between the cities for instance, the low number of owned cars and 2-wheelers.

Regarding the well-being score, the distribution for respondents from Mumbai presents almost a two-peaked shape while in Delhi the well-being score is quite equally distributed. This may be one reason explaining the different levels of correlation between the total carbon footprint and

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well-being which is high in Delhi and medium to high in Mumbai. Moreover, in Mumbai, the well-being score seems to comprise several factors (incl. a health and well-being factor and a second one focusing more on mental balance and well-being), while the well-being index for respondents from Delhi resembles the pattern of the one-factor solution in Europe.

Regarding group development, the two cities in India also differ from each other: In Delhi, there are less (very) sufficient households than in Mumbai (group 1 and 2). Overall, the groups (very) sufficient groups in Mumbai and Delhi do not share any characteristic, while the average (group 4) and high carbon footprint group (group 5) as well as the low carbon footprint, low well-being group (group 3) share at least some degree of overlap when describing the groups' characteristics. Interestingly, the sufficiency-orientation in Mumbai and Delhi differs for the third and fifth group: While the low carbon footprint, low well-being group in Mumbai is characterized by lower sufficiency-orientation (among other), the same group in Delhi reports a higher tendency toward sufficiency-orientation than other groups in Delhi. The same pattern is visible for the high carbon footprint groups: In Mumbai, this group has a higher sufficiency-orientation and tends to be environmentally friendly, while in Delhi, this fifth group shows lower sufficiency-orientations than other groups in Delhi.

8.3. Discussion of Indian survey results in comparison to Europe

In the following, we outline some differences between the countries examined in Europe (Germany, France, Italy, Latvia and Denmark) and the two mega cities in India (Mumbai and Delhi). First of all, the calculated total carbon footprint in the European countries is higher than in India. Given the known economic differences, this is not surprising.

Figure 93 Total carbon footprint of respondents in India in 2022 and Europe in 2021

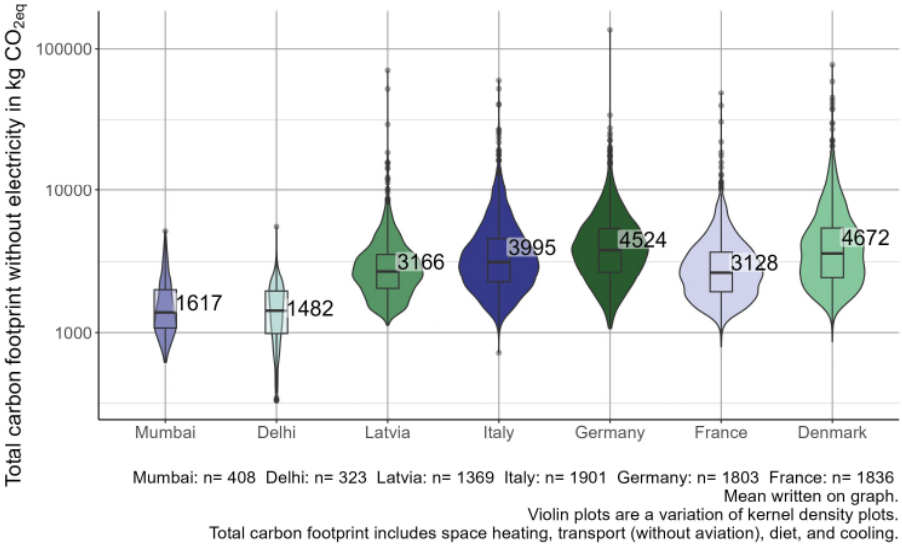

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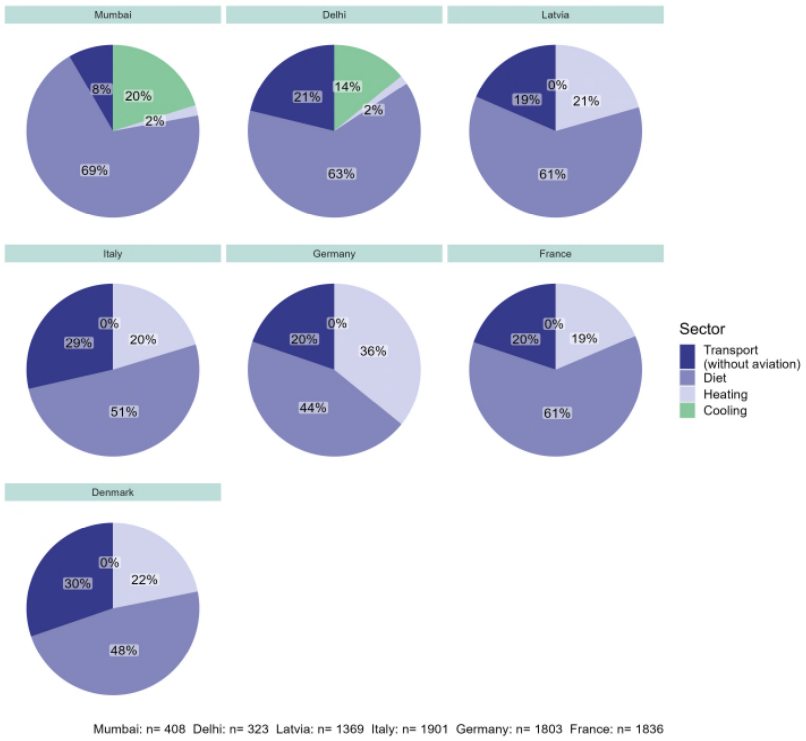
Figure 94 Pie charts of total carbon footprint of respondents in India in 2022 and in Europe in 2021



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Regarding, the total carbon footprint displayed in Figure 93 and Figure 94, one notices the following: The share of cooling on the total carbon footprint in India resembles the share of heating on the total carbon footprint in Europe. The share of transport in India is smaller than in Europe. However, one needs to consider that we focused on cities in India (i.e., Mumbai and Delhi) and thus transport options and distances travelled differ from country averages in Europe.

Table 21 Average well-being index and correlations with the carbon footprint (and its parts) for the four examined European countries (without France) and the two cities in India

	M (SD)	Reliability (Cronbach's alpha)	CF total	CF transport	CF cooling	CF diet
Mumbai (n=391)	3.44 (0.42)	.76	.33***	.18***	.31***	.02
Delhi (n=316)	3.47 (0.58)	.85	.65***	.48***	.48***	.47***
	M (SD)	**Reliability (Cronbach's alpha)**	**CF total**	**CF transport**	**CF heating**	**CF diet**
DK (n=1756)	3.74 (0.70)	.88	.02	.08**	.06*	.04
DE (n=1735)	3.66 (0.65)	.85	.02	.10***	-.02	.01
IT (n=1819)	3.47 (0.63)	.84	.06*	.07**	.04	.06*
LV (n=1300)	3.52 (0.55)	.80	.11***	.11***	.06*	-.01

The correlation between the well-being index and the total carbon footprint is higher in India than in Europe. One reason for this finding could be that the living standards in Europe are higher and that for larger shares of the population basic needs are more frequently fulfilled. However, the average level of well-being does not differ largely when comparing the means of the well-being index between Europe and India (see Table 21). Combining this with the overall higher total carbon footprint in Europe compared to India highlights the need for sufficiency: Although the examined households in India have a lower total carbon footprint than respondents in Europe, respondents in Mumbai and Delhi report similar levels of well-being. It is of course relevant to note, that the well-being measure is self-reported and, thus, subjective and does not take into account variables such as life expectancy, medical data or actual vulnerability.

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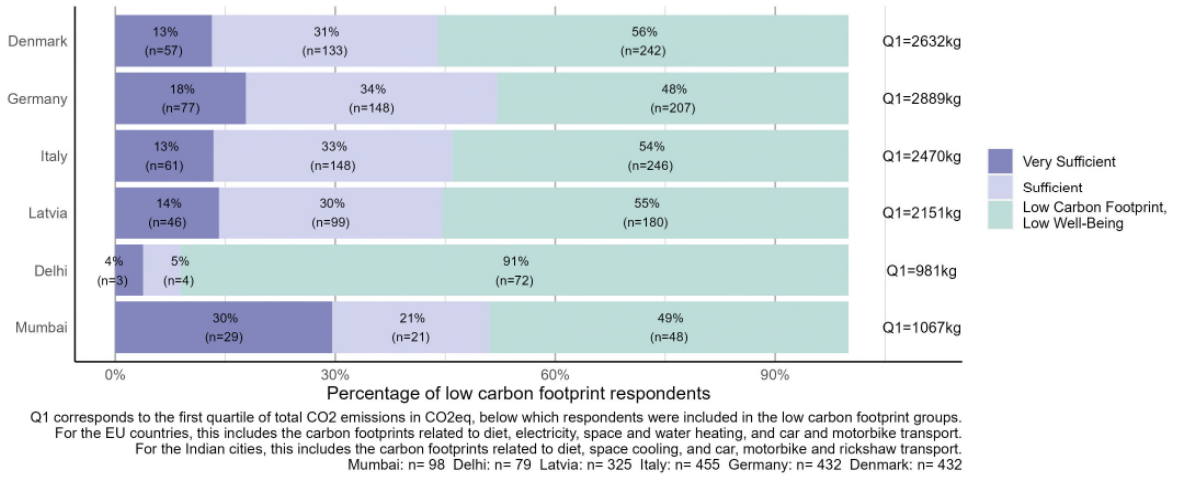
Figure 95 Comparison of the share of very sufficient, sufficient and low carbon footprint-low well-being groups in the two mega cities in India and the four examined European countries



Q1 corresponds to the first quartile of total CO2 emissions in CO2eq, below which respondents were included in the low carbon footprint groups.
For the EU countries, this includes the carbon footprints related to diet, electricity, space and water heating, and car and motorbike transport.
For the Indian cities, this includes the carbon footprints related to diet, space cooling, and car, motorbike and rickshaw transport.
Mumbai: n= 98 Delhi: n= 79 Latvia: n= 325 Italy: n= 455 Germany: n= 432 Denmark: n= 432

Looking at the 25% of people with the lowest carbon emissions in all studied samples, Figure 95 indicates a broad variety regarding the share of sufficient lifestyles, i.e. people who have a low footprint but high well-being: The share of the very sufficient group is higher in Europe (13% to 18%) than in Delhi (4%). Mumbai varies with 30% from the results in Europe but also from the results in Delhi. A similar pattern occurs for the sufficient group: A very small share in Delhi (5%), about one third in Europe (30% to 34%) and about one fifth in Mumbai (21%). The differing results in Mumbai may be caused by the two peak shaped distribution of the well-being index in Mumbai. Overall, living on relatively low emission levels is more likely to be combined with high well-being in Europe than in the Indian sample.

8.4. Conclusions

In the next steps of the project, the survey will be repeated to examine the persistence of lifestyles and to analyse in more detail the consequences of lifestyles, such as rebound effects. In addition, the second survey will explore the acceptability of policy instruments to increase highly sufficient lifestyles. This second survey will also provide an opportunity to address some of the methodological shortcomings of the first round.

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Annex 1: Citizen Survey Codebook for Europe

Intro

Welcome to our study and thank you for your participation!

Please read each question carefully before answering. The notes will help you with your answers.

Procedure

You will be asked to complete an online questionnaire in a moment. After you have answered a question, please press "Continue". To continue, you must answer most of the questions (or blocks of questions) completely. If you want to change your answer(s) before submitting them, you can go back to an earlier question. Please press "Back" to do so.

Data protection

All data collected is stored anonymously and analysed on an aggregated basis. This means that no identifying conclusions can be drawn about individual persons.

Participation

Participation in this study is voluntary. You have the right to terminate the questionnaire at any time and to withdraw your consent to participate until the end of the survey.

By clicking "Continue" you confirm that you have read and understood the consent above and that it is your own free will to participate in this study.

Thank you for your participation in this study.

Filter questions

F1

In which year did you move into your 2021 residence?

1. In or before 2020
2. In 2021

F2

Do you live in a dorm, hostel, army base or similar?

1. Yes
2. No

F3

In which month of 2021 did you move into your 2021 residence?

1. January
2. February
3. March
4. April
5. May
6. June
7. July

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8. August
9. September
10. October
11. November
12. December

Socio-demographics

SD1

What is your gender?

1. Male
2. Female
3. Gender-queer/non-binary/other

SD2

How old are you ?

SD3_DK

In which region do you live?

1. Hovedstaden
2. Midtjylland
3. Nordjylland
4. Sjælland
5. Syddanmark

SD3_FR

In which region do you live?

1. Auvergne-Rhône-Alpes
2. Bourgogne-Franche-Comté
3. Bretagne
4. Centre - Val de Loire
5. Corse
6. Grand Est
7. Hauts-de France
8. Île-de-France
9. Normandie
10. Nouvelle Aquitaine
11. Occitanie
12. Pays de la Loire
13. Provence-Alpes-Côte d'Azur

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SD3_DE

In which region do you live?

1. Bayern
2. Baden-Württemberg
3. Berlin
4. Brandenburg
5. Bremen
6. Hamburg
7. Hessen
8. Mecklenburg-Vorpommern
9. Niedersachsen
10. Nordrhein-Westfalen
11. Rheinland-Pfalz
12. Saarland
13. Sachsen
14. Sachsen-Anhalt
15. Schleswig-Holstein
16. Thüringen

SD3_IT

In which region do you live?

1. Abruzzo
2. Basilicata
3. Calabria
4. Campania
5. Emilia-Romagna
6. Friuli-Venezia Giulia
7. Lazio
8. Liguria
9. Lombardia
10. Marche
11. Molise
12. Piemonte
13. Puglia
14. Sardegna
15. Sicilia
16. Toscana
17. Trentino - Alto Adige / Südtirol
18. Umbria
19. Valle d'Aosta

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20. Veneto

SD3_LV

In which region do you live?

1. Kurzeme
2. Latgale
3. Pierīga
4. Rīga
5. Vidzeme
6. Zemgale

SD10

What is your household's approximate annual income, after tax?

Please include income from everyone in your household from all sources, including wages, government and company pensions and benefits, and investment dividends, rents. If you do not know the exact figure, please estimate.

1. Less than 15,600€
2. between 15,600€ - 31,200€
3. between 31,200€ - 43,200€
4. between 43,200€ - 60,000€
5. more than 60,000€

SD4

What is the highest level of education that you have completed?

1. No school completed
2. Primary education
3. Secondary education
4. Vocational/technical training or education
5. Academic degree
6. Prefer not to answer

SD5

Which of the following categories describes your current situation best?

1. Full-time employed
2. Part-time employed
3. Self-employed
4. In training/education
5. House wife/house husband
6. Looking for work/currently unemployed

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7. Retired
8. Other:
9. Prefer not to answer
10. Other: ____

SD5

Which of the following categories describes your current situation best?

1. Full-time employed
2. Part-time employed
3. Self-employed
4. In training/education
5. House wife/house husband
6. Looking for work/currently unemployed
7. retired
8. Other: _____
9. Prefer not to answer

SD7

How many hours do you usually work per week?

1. Hours per week:____
2. Prefer not to answer

SD8

Please provide your postcode.

SD9

Including yourself, how many people of each age group live in your household?

1. Children under 6 years old: ____
2. Children between 6 and 17 years old: ____
3. Adults of 18 years or older: ____

Socio-demographics II

SD11

How would you describe your household's current income?

1. Finding it very difficult to live on current income
2. Finding it difficult to live on current income
3. Coping on current income
4. Living comfortably on current income
5. Living very comfortably on current income

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SD12

Do you rent or own your dwelling?

1. My household rents the dwelling I'm living in.
2. My household owns the dwelling I'm living in.
3. Other:____

SD14

In your household, who mostly does the following things?

Please choose the option that comes closest.

	Me	Other household member	Equally shared	A third person	Does not apply
Cleaning the house	□	□	□	□	□
Buying/shopping for groceries and other household goods	□	□	□	□	□
Doing the laundry	□	□	□	□	□
Organizing social life	□	□	□	□	□
Paying bills and keeping financial records	□	□	□	□	□
Making enquiries and taking decisions around contracts, external services, and investments	□	□	□	□	□

SD15

How does your household organise the income?

Please choose the option that comes closest.

1. I manage all the money and SD15 give my partner/the other adults their share.
2. My partner/another adult in the household manages all the money and gives me my share.
3. We pool all the money and each take out what we need.
4. We pool some of the money and keep the rest separate.
5. We each keep our own money separate.
6. Does not apply
7. Prefer not to answer

SD17

Do you or another member of your household have a medical restriction/ chronic disease/ disability that impacts daily life or requires special care?

1. No
2. Yes
3. Prefer not to answer

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SD18

Do you have close family members living in another country who you meet regularly?

1. No
2. Yes, in:____

SD19

Do you have a second home?

1. No
2. Yes, in the same country
3. Yes, in a different country

General Questions

GQ1

Now we will ask you some questions about your housing, travel, and lifestyle in 2021. If you moved during 2021, please answer all questions for the dwelling where you lived the majority of 2021. What was your primary residence in 2021?

1. A detached house
2. A terraced house
3. A multi-family house
4. An apartment block
5. Other:____

GQ3_DE

What year was the building you lived in in 2021 in built?

1. Before 1918
2. 1918-1948
3. 1949-1978
4. 1979-1990
5. 1991-2000
6. 2001-2008
7. 2009 or later

GQ4

What size is the living space of your 2021 dwelling ?

Please estimate if you are not sure.

Electricity

E1

How much did you pay overall for consuming electricity in 2021?

Please check your bills and include all taxes and levies. If you don't have the bills at hand, please provide an estimate.

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1. € based on bill
2. € based on an estimate

E2

How high was your total electricity consumption in 2021?

Please check your bills and include all taxes and levies. If you have several meters, please add up across them.

1. ____kWh
2. I don't know

E3

In 2021, did you own a photovoltaic system generating electricity?

1. Yes, a small plug-in/feed-in PV system
2. Yes, a regular PV system
3. Yes, both plug-in and regular PV systems
4. No
5. I don't know

E3

In 2021, did you own a photovoltaic system generating electricity?

1. Yes, a small plug-in/feed-in PV system (often designed for a balcony, with electricity only used for own use).
2. Yes, a regular PV-system (e.g. on the roof, in the garden, or building-integrated, that is connected to the electricity grid).
3. Yes, both plug-in and regular PV systems.
4. No
5. I don't know

E4

How was the electricity from the photovoltaic system used?

1. It was used by our household.
2. It was used to feed the grid.
3. Both
4. I don't know

E5

How much electricity was generated by the photovoltaic system in 2021?

Please check your bills. If you don't have them at hand, please provide an estimate.

1. ____kWh based on bill
2. ____kWh based on an estimate
3. I don't know

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E6

Did you subscribe to a fully green electricity tariff in 2021?

A green electricity tariff provides you with 100% electricity from renewable sources.

1. Yes, for the whole year
2. Yes, but only for a number of months:___
3. No
4. I don't know

E7

How many of the following items did you have and use in your household in 2021?

- Tumble dryer:____
- Electric sauna:____
- Hot tub:____
- Swimming pool:____
- Air conditioner:____
- Aquarium:____
- Water bed:____
- None of the above

LS1

Which of the following digital devices do you own and use personally for private purposes?

- Smartphone
- Tablet
- Laptop/Desktop PC
- E-Book-Reader
- Wearable Device
- Virtual Reality Goggles
- Digital assistance/smart home system to control household devices, lighting, heating, etc.
- Smart TV
- Gaming Console
- Connected exercise machine
- Wireless accessories
- Projector
- None of the above

Heating

H1

How is your dwelling primarily heated?

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If you have multiple heating systems, you will be able to indicate that in subsequent questions.

1. Natural gas
2. Liquified petroleum gas
3. Biogas
4. Heating oil
5. Electricity
6. Electric heat-pump
7. District heating
8. Wood/biomass
9. Solar thermal energy
10. Other:____
11. I don't know

H2

How high were your annual heating costs for your primary heating system for your household in 2021?

Please check your bills and include all taxes and levies. If you don't have the bills at hand, please provide an estimate.

1. ____€ based on bill
2. ____€ based on an estimate

H3

You indicated that your heating system runs on electricity. Do you know how much electricity was used for heating in your household in 2021?

1. ____kWh
2. I don't know

H4

You indicated that your heating system runs on gas. Do you know how much gas was used for heating in your household in 2021?

1. ____kWh
2. I don't know

H5

Do you regularly use a secondary heating system in your home?

1. No
2. Yes, running on solar thermal energy
3. Yes, running on natural gas
4. Yes, running on liquefied petroleum gas
5. Yes, running on biogas
6. Yes, running on heating oil
7. Yes, running on electricity

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8. Yes, running on electric heat pumps
9. Yes, running on district heating
10. Yes, running on wood/biomass0
11. Yes, running on:___

H6

To what temperature did you typically heat your main living room during daytime when you were at home?

Please refer to the time in 2021 when the heating was turned on and estimate the temperature if you are not sure.

1. ____°C based on the thermostat or a thermometer
2. ____°C based on an estimate
3. I don't know

H9

How much of your living space was typically heated?

Please estimate if you are not sure.

H7

Has the dwelling you lived in in 2021 ever experienced any of the following work done after it was built?

1. The roof/loft was insulated
2. The exterior wall was insulated
3. The basement ceiling was insulated
4. The windows have been replaced
5. The heating system was updated/replaced
6. No
7. I don't know

H8

When was the *[following structural element]* last insulated?

	1949 - 1978	1979 - 1994	1995 - 2001	2002 - 2009	2010 - 2015	2016 or later	I don't know
Roof/loft	□	□	□	□	□	□	□
Exterior wall	□	□	□	□	□	□	□
Basement ceiling	□	□	□	□	□	□	□
Windows	□	□	□	□	□	□	□
Heating System	□	□	□	□	□	□	□

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SP1

How do you perceive the size of your dwelling?

1. I could do with some more space.
2. Overall it is fine as it is.
3. I could do with less space.

DE

The following questions refer to your situation in 2021.

	Never	In 1 or 2 months	Some months	Almost every month
How often did you worry that you wouldn't be able to pay your home energy bill?	□	□	□	□
How often did you have a supplier threaten you to disconnect your electricity or home heating fuel service, or discontinue making fuel deliveries?	□	□	□	□
During the winter months, how often did you keep your home at a temperature that you felt was unsafe or unhealthy?	□	□	□	□
During the summer months, how often did you keep your home at a temperature that you felt was unsafe or unhealthy?	□	□	□	□

Hot water

HW1

Is your hot water heated as part of your primary heating system?

1. Yes
2. No
3. I don't know

HW3

How is your hot water mainly heated?

1. With electricity
2. With natural gas
3. With wood/biomass
4. With liquefied petroleum gas
5. With heating oil
6. With solar energy
7. Other:____
8. I don't know

HW2

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Does your dwelling have a solar thermal system?

1. Yes, for hot water only
2. Yes, for hot water and heating
3. No
4. I don't know

SP3

On average, how many times per week do you take a hot shower or bath?

Attention Check

Please provide the result of 2 + 4.

Transport

Car

Now we would like to know whether you used the following means of transport for personal use in 2021. Please tick all that apply. Include commuting to and from your workplace, but not business trips.

1. Automobile
2. Motorbike or scooter
3. Plane
4. E-Bike or E-Scooter
5. None of the above

T1

How many kilometres did you drive in a car or van in 2021 approximately ?

Please count both kind of trips - driving yourself or as a passenger. If you used several cars, including car sharing and rented cars, please estimate the combined kilometres you have driven.

T2

What fuel does the car or van you used most in 2021 run on?

1. Petrol
2. Diesel
3. Compressed Natural Gas (CNG)
4. Biogas
5. Liquefied Petroleum Gas (LPG)
6. Biodiesel/Ethanol
7. Hybrid: Electricity and Petrol/Diesel
8. Electricity
9. Other:____

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T3

Where was your car predominantly charged?

1. At home
2. At work
3. At public charging stations
4. Other:____

T4_1

How much fuel (l/100km) does the car or van you used most in 2021 consume?

Please estimate if you do not know exactly. Enter the amount as a whole number/integer.

T4_2

How much CNG (kg/100km) does the car or van you used most in 2021 consume?

Please estimate if you do not know exactly.

T4_3

How much electricity (kWh/100km) does the car or van you used most in 2021 consume?

Please estimate if you do not know exactly.

T4_4

How much LPG (l/100km) does the car or van you used most in 2021 consume?

Please estimate if you do not know exactly.

T5

What type of vehicle is the car or van you use the most?

1. Upper class incl. SUV (e.g. Mercedes S-Klasse; Audi A7, A8, Q7; BWM 6er, 7er; VW Phaeton, Tiguan, Multivan)
2. Mid-size/compact (e.g. Mercedes A-Klasse, C-Klasse; VW Golf, Passat; Audi A4, A5; BMW 1er, 3er; Opel Astra, Insignia; Ford Focus, Mondeo; Toyota Auris Avensis)
3. Small car (e.g. Audi A1; BMW i3; Ford Fiesta; Opel Corsa; VW Polo; Toyota Yaris)

Motorbike

T6

How many kilometres did you ride on motorbike or scooter in 2021 approximately?

T7

What fuel does the motorbike or scooter you used the most in 2021 run on?

1. Petrol
2. Diesel
3. Other:____

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T8

How much fuel does the motorbike or scooter you used the most in 2021 consume?

Please estimate if you don't know for sure.

T9

What type of motorbike or scooter did you drive?

1. Scooter/small motorbikes up to 300 cm³
2. Motorbike between 300 - 600 cm³
3. Motorbike between 600 - 1000 cm³
4. Motorbike over 1000cm³

Plane

T10_DE

How often and how far did you travel by air in 2021?

Please only consider flights for a private occation such as vacation or family trips, i.e., no business-only trips. Please count the outward and return flights separately as two flights. Flights with stop-overs are one flight. For reference: - A flight from Berlin to Munich is around 500km- A flight from Berlin to London is around 1000km- A flight from Munich to New York is around 6500km- A flight from Frankfurt to Singapore is around 10300km.

1. Very short trips up to 500km:____
2. Short trips between 501 and 1500km:____
3. Medium trips between 1501km and 3000km:____
4. Long distance trips between 3001km and 10000km:____
5. Very long distance trips over 10000km:____

Sufficiency practices

SP4

How many cars do you have in your household?

1. None
2. Number of cars:____

SP5

How often do you use the following modes of transport?

	(Almost) never	Less than 1-3 times a month	1-3 times per month	1-3 times per week	(Almost) daily
Walking	□	□	□	□	□
Cycling	□	□	□	□	□
Long-distance train or bus	□	□	□	□	□
Local and regional public transport such as metro, tram, bus	□	□	□	□	□

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SP7a

Are the following destinations accessible for you within 15 minutes of walking?

	Yes	No	Don't know or not relevant1-3 times per month
Health care, e.g., hospitals, pharmacies and nursing homes	□	□	□
Education, e.g., kindergarten, elementary schools, highschools	□	□	□
Commercial, e.g., supermarkets and clothes stores	□	□	□
Culture, e.g., theaters, museums, libraries and cinemas	□	□	□
Recreational, e.g., playgrounds, recreational areas such as parks and green spaces	□	□	□
Sports, e.g., swimming pools, sports grounds	□	□	□
Your workplace	□	□	□

SP7b

Are the following destinations accessible for you within 15 minutes of cycling?

	Yes	No	Don't know or not relevant1-3 times per month
Health care, e.g., hospitals, pharmacies and nursing homes	□	□	□
Education, e.g., kindergarten, elementary schools, highschools	□	□	□
Commercial, e.g., supermarkets and clothes stores	□	□	□
Culture, e.g., theaters, museums, libraries and cinemas	□	□	□
Recreational, e.g., playgrounds, recreational areas such as parks and green spaces	□	□	□
Sports, e.g., swimming pools, sports grounds	□	□	□
Your workplace	□	□	□

SP8

How many weeks were you away from home for holiday travel in 2021?

Deprivation of transport services

DT

The following questions refer to your situation in 2021.

	Never	In 1 or 2 months	Some months	Almost every month

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How often were you unable to participate in cultural events or in sports activities, visit a doctor or keep an appointment with the administration because you did not have the transportation you needed?	□	□	□	□
How often did you worry about inconveniencing your friends, family, or neighbours because you needed help with transportation?	□	□	□	□
How often do you think that someone did not invite you to something because of problems on your side with transportation?	□	□	□	□

Diet

D1

How would you characterise your main diet?

1. Highly meat-based
2. Mixed diet
3. Flexitarian
4. Pescatarian
5. Vegetarian
6. Vegan

D2

How often do you consume regional food products?

1. Never
2. Rarely
3. Sometimes
4. Almost always
5. Always

D3

How often do you consume non-seasonal food products?

1. Never
2. Rarely
3. Sometimes
4. Almost always
5. Always

D4

How often do you eat red meat?

Red meat includes beef, pork, goat and lamb.

1. Never

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2. Less than 1-3 times per month
3. 1-3 times per month
4. 1-3 times per week
5. daily

Diet Deprivation

DN

The following questions refer to your situation in 2021.

	Never	In 1 or 2 months	Some months	Almost every month
How often were you unable to afford eating balanced meals?	□	□	□	□
How often were you worried food would run out before you got money to buy more?	□	□	□	□
How often were you unable to eat as much meat as you would have liked because it was too expensive?	□	□	□	□
How often were you unable to eat as much dairy products as you would have liked because it was too expensive?	□	□	□	□
How often were you unable to afford purchasing locally grown or seasonal products because they were too expensive?	□	□	□	□

Miscellaneous

M1

Over the course of 2021, did you have the following pets and if so, how many?

- I didn't have any pets
- Cats:____
- Small dogs (less than 10kg):____
- Medium dogs (10-20kg):____
- Large dogs (over 20kg):____
- Other small pets like fish, hamster, guinea pig:____
- Other pets:____

M2

What diet did your dog/your dogs predominantly have in 2021?

1. Raw meat, organs, and bones
2. Conventional dog food
3. Insect-based
4. Plant-based or vegetarian

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M3

How many new clothes of the following categories did you buy in 2021 ?

- Small items of clothing :____
- Medium items of clothing :____
- Large items of clothing :____
- No new clothes

M4

Did you personally compensate some of your carbon emissions in 2021 and if so, how much?

1. Yes (in T):____
2. Yes (in €):____
3. No
4. I don't know

Deprivation at the Aggregated Level

DA_1 to DA_6

The following questions refer to your situation in 2021.

	Never	In 1 or 2 months	Some months	Almost every month
How often did you reduce your expenses for what you consider to be basic household necessities?	□	□	□	□
How often were you unable to afford an unexpected required expense and pay through your own resources?	□	□	□	□

	No	Yes
I was unable to afford spending a week's vacation away from home although I wanted to go.	□	□
Do you or your household receveive any form of public support on a monthly basis such as social welfare payments or housing allowances?	□	□
Do you or your household receveive any form of public support on a monthly basis such as social welfare payments or housing allowances?	□	□
My monthly income situation is mostly stable.	□	□

Sufficiency-oriented practices in general

SO1

How strongly do you agree with the following statements?

	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree

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Through my lifestyle I want to use as little resources as possible .	□	□	□	□	□
I find it desirable to possess only few things.	□	□	□	□	□
Please select 'agree' to show that you're paying attention to this question.	□	□	□	□	□
All the new things that are sold all the time are a big waste of resources to me.	□	□	□	□	□
I think it is unnecessary to have this affluence of different products in our supermarkets.	□	□	□	□	□

SO2

Even with products that I can financially afford I consider...

	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
...borrowing them from friends or acquaintances.	□	□	□	□	□
...whether I can rent them instead of buying them.	□	□	□	□	□

Health and well-being

WB11

How would you rate your quality of life?

1. Very poor
2. Poor
3. Neither poor nor good
4. Good
5. Very good

WB1

	Not at all	A little	A moderate amount	Very much	An extreme amount
How much did you need any medical treatment to function in your daily life?	□	□	□	□	□
To what extent did you feel your life to be meaningful?	□	□	□	□	□
To what extent did you have the opportunity for leisure activities?					

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WB2

The following questions ask you to say how good or satisfied you have felt about various aspects of your current situation in general.How satisfied are you with...

	Very dissatisfied	Dissatisfied	Neither dissatisfied nor satisfied	Satisfied	Very satisfied
...your health?	□	□	□	□	□
...your work?	□	□	□	□	□
...yourself?	□	□	□	□	□
...the support you get from friends, family, and relatives?	□	□	□	□	□
...the conditions of your living place?	□	□	□	□	□
...your transport?	□	□	□	□	□

WB3

How often do you have negative feelings such as blue mood, despair, anxiety, depression?

1. Never
2. Seldom
3. Quite often
4. Very often
5. Always
6. Prefer not to answer

Values/Ideological Beliefs

EID

How strongly do you agree with the following statements?

	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
I think of myself as an environmentally friendly consumer.	□	□	□	□	□
I think of myself as someone who is very concerned with environmental issues.	□	□	□	□	□
I would be embarrassed to be seen as having an environmentally friendly lifestyle.	□	□	□	□	□

PO

How strongly do you agree with the following statements?

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	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
I identify with nationally oriented policies.	□	□	□	□	□
I identify with socially oriented policies.	□	□	□	□	□
I identify with conservative policies.	□	□	□	□	□
I identify with liberally oriented policies.	□	□	□	□	□
I identify with environmentally oriented policies.	□	□	□	□	□

Income_DK
What is the annual net income of your household?

Please consider the income of all persons in your household from all sources, including wages, state and company pensions and social benefits as well as capital gains and rent. If you do not know the exact figure, please estimate it.

1. Less than 63.700 DKK
2. Between 63.700 DKK and 127.400 DKK
3. Between 127.400 DKK and 191.100 DKK
4. Between 191.100 DKK and 250.000 DKK
5. Between 250.000 DKK and 308.000 DKK
6. Between 308.000 DKK and 419.600 DKK
7. Between 419.600 DKK and 530.200 DKK
8. Between 530.200 DKK and 650.000 DKK
9. Between 650.000 DKK and 800.000 DKK
10. More than 800.000 DKK
11. Prefer not to answer

Income_FR
What is the annual net income of your household?

Please consider the income of all persons in your household from all sources, including wages, state and company pensions and social benefits as well as capital gains and rent. If you do not know the exact figure, please estimate it.

1. Less than 3.600€
2. Between 3.600€ and 7.200€
3. Between 7.200€ and 12.000€
4. Between 12.000€ and 24.200€
5. Between 24.200€ and 34.400€
6. Between 34.400€ and 41.800€
7. Between 41.800€ and 49.000€

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8. Between 49.000€ and 56.700€
9. Between 56.700€ and 65.200€
10. Between 65.200€ and 75.200€
11. Between 75.200€ and 88.000€
12. More than 88.000€
13. Prefer not to answer

Income_DE
What is the annual net income of your household?

Please consider the income of all persons in your household from all sources, including wages, state and company pensions and social benefits as well as capital gains and rent. If you do not know the exact figure, please estimate it.

1. Less than 3.600€
2. Between 3.600€ and 7.200€
3. Between 7.200€ and 12.000€
4. Between 12.000€ and 24.200€
5. Between 24.200€ and 34.400€
6. Between 34.400€ and 41.800€
7. Between 41.800€ and 49.000€
8. Between 49.000€ and 56.700€
9. Between 56.700€ and 65.200€
10. Between 65.200€ and 75.200€
11. Between 75.200€ and 88.000€
12. More than 88.000€
13. Prefer not to answer

Income_IT
What is the annual net income of your household?

Please consider the income of all persons in your household from all sources, including wages, state and company pensions and social benefits as well as capital gains and rent. If you do not know the exact figure, please estimate it.

1. Less than 3.600€
2. Between 3.600€ and 7.200€
3. Between 7.200€ and 12.000€
4. Between 12.000€ and 24.200€
5. Between 24.200€ and 34.400€
6. Between 34.400€ and 41.800€
7. Between 41.800€ and 49.000€
8. Between 49.000€ and 56.700€
9. Between 56.700€ and 65.200€
10. Between 65.200€ and 75.200€
11. Between 75.200€ and 88.000€
12. More than 88.000€

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13. Prefer not to answer

Income_LV
What is the annual net income of your household?

Please consider the income of all persons in your household from all sources, including wages, state and company pensions and social benefits as well as capital gains and rent. If you do not know the exact figure, please estimate it.

1. Mazāk kā 3.000 €
2. No 3.000 € līdz 6.000 €
3. No 6.000 € līdz 7.500 €
4. No 7.500 € līdz 9.000 €
5. No 9.000 € līdz 12.000 €
6. No 12.000 € līdz 15.000 €
7. No 15.000 € līdz 18.000 €
8. No 18.000 € līdz 21.000 €
9. No 21.000 € līdz 24.000 €
10. Vairāk kā 24.000 €
12. Nav datu

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Annex 2: Citizen Survey Codebook for India

Questions for interviewer

QI10

What is the persistant ID of the interviewee?

QI1

In which city are you?

1. Mumbai
2. Delhi

QI2

Please provide the respondent's/interviewee's zone:

1. North
2. East
3. South
4. West
5. Center

Date

What is the current date?

Time

What is the current time?

Please fill in the time in the format indicated below.

Q2

Please provide the respondent's/interviewee's area

QI5

What is your interviewer ID?

QI6

What is your gender?

1. Male
2. Female
3. Other

QI7

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How old are you?

How long have you worked for SPER? (q_51960 - Typ 144)

I*f you have worked for SPER for less than 1 year, please enter the time period in months.*

1. Years:___
2. Months:___

QI9

How many professional interviews have you conducted during your life?

If you do not know the exact amount, please estimate.

Interview start

F1

In which language would you like to answer the questionnaire?

[Interviewer instructions: Please chose the language according to the answer in the right-hand corner.]

1. English
2. Hindi

Filter questions

F2

Is this a dormitory, hostel, army base or similar (not including flatshares)?

1. Yes
2. No

Socio-demographics

SD1

What is your gender?

1. Male
2. Female
3. Other

F4a

How old are you ?

5. F4b
6. [Instructions to the interviewer:Please select the age group that fits the age of the interviewee. This is essential for the quotas.]

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1. 18 - 29 years
2. 30 - 44 years
3. 45 - 59 years
4. 60 years or older

F5

What is your household's approximate annual income, after taxes are paid? (q_51999 - Typ 141)

Please include income from everyone in your household from all sources, including wages, government and company pensions and benefits, and investments dividends, rents.Please make sure to substract the taxes that are paid. If you do not know it exactly, please estimate.

F6

On average, what is your monthly consumer expenditure per person in your household?

Please include all expenditures incurred on domestic consumption for one person. This includes e.g. expenditures on food, on fuel/ light, rent, tax and cesses, clothing and footwear, education, medical expenditures, consumer services, entertainment and so on. If you do not know it exactly, please estimate.

[Instruction to interviewer: Make sure that it is the amount for one person. If necessary, please divide it by the number of persons in the household]

1. Less than 2300 INR
2. 2300 - 3100 INR
3. 3101 - 4400 INR
4. 4401 - 7600 INR
5. More than 7600 INR

F7

What is the highest level of education that you have completed?

1. No schooling
2. Some schooling but less than primary/elementary education
3. Up to elementary education (8th grade)
4. Secondary school certificate (SSC) (10th grade)
5. Higher secondary school certificate (HSSC) (12th grade)
6. Graduate
7. Post graduate or higher
8. Prefer not to answer

F7a

Are you able to read and/or write?

1. No
2. Able to read
3. Able to write
4. Both, able to read and write

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5. Prefer not to answer

F8

Which of the following categories describes you best?

1. Scheduled castes (SC)
2. Scheduled tribes (ST)
3. Other backward classes (OBC)
4. General
5. Other:
6. Prefer not to answer

F9

Are you currently doing paid work?

1. No
2. Yes, full-time employed
3. Yes, part-time employed
4. Yes, self-employed
5. Yes, on an hourly basis (not regularly)
6. Prefer not to say

SD5

Which of the following categories describes your current situation best?

1. In training/education
2. House wife/house husband
3. Looking for work/currently unemployed
4. Retired
5. Other: _____
6. Prefer not to answer

SD7

How many hours do you usually work as part of your job(s) per week?

1. Hours per week:____
2. Prefer not to answer

F10

Have you lived in your current dwelling in 2022?

1. Yes
2. No

F11a

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When did you move into your current dwelling?

1. In or before 2021
2. In 2022

F11b

In the following we are interested in the dwelling you lived in in 2022. Therefore we want to know: In which year did you move into your 2022 dwelling?

1. In or before 2021
2. In 2022

SD12

Do you rent or own your dwelling?

1. My household rents the dwelling I'm living in.
2. My household owns the dwelling I'm living in.
3. Other:____

SD9

Including yourself, how many people of each age group live in your household?

1. Children under 6 years old: ____
2. Children between 6 and 17 years old: ____
3. Adults of 18 years or older: ____

Socio-demographics II

SD11

How would you describe your household's current income?

1. Finding it very difficult to live on current income
2. Finding it difficult to live on current income
3. Coping on current income
4. Living comfortably on current income
5. Living very comfortably on current income

SD13

Please chose the option that best describes your household.

1. Male headed household
2. Female headed household
3. Equally shared
4. Other

SD14

In your household, who mostly does the following things?

Please choose the option that comes closest.

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	Me	Other household member	Equally shared	A third person	Does not apply
Cleaning the house	□	□	□	□	□
Buying/shopping for groceries and other household goods	□	□	□	□	□
Doing the laundry	□	□	□	□	□
Organizing social life	□	□	□	□	□
Paying bills and keeping financial records	□	□	□	□	□
Making enquiries and taking decisions around contracts, external services, and investments	□	□	□	□	□

SD15

How does your household organise the income?

Please choose the option that comes closest.

1. I manage all the money and SD15 give my partner/the other adults their share.
2. My partner/another adult in the household manages all the money and gives me my share.
3. We pool all the money and each take out what we need.
4. We pool some of the money and keep the rest separate.
5. We each keep our own money separate.
6. Does not apply
7. Prefer not to answer

SD17

Do you or another member of your household have a medical restriction/ chronic disease/ disability that impacts daily life or requires special care?

1. No
2. Yes
3. Prefer not to answer

SD18

Do you have close family members (partner, children, parents, sibling, grandparents) living in another country?

1. No
2. Yes, in:___

GQ2

What type of a building structure did you live in in 2022

1. Pucca or pakka (a permanent structure, e.g. walls and roof made from metal, concrete, brick)

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2. Semi-pucca (semi-permanent, e.g. either wall or roof is made of permanent material (and the other of temporary material))
3. Kutcha/ kachcha/ katcha (a temporary/ not a permanent structure, walls can be made e.g. of grass, bamboo, plastic)
4. I don't know.

SD19

Do you have a second home?

1. No
2. Yes

General Questions

GQ1

What was your primary dwelling in 2022?

1. A detached house
2. A terraced house
3. A multi-family house
4. An apartment block
5. Other:____

GQ6

How many rooms has your dwelling/the dwelling you lived in in 2022?

Count the kitchen as a separate room but do not count the bathroom.

GQ4

What size is the living space of your 2021 dwelling ?

Please estimate if you are not sure.

1. in square feet:___
2. in square meters:___

Electricity

E0

Did your dwelling in 2022 have an electrical connection?

1. Yes
2. No

E1

How much did you pay overall for consuming electricity in 2022? Please include all taxes and levies. Please check your bills and add them up if needed. If you don't have them, please provide an estimate.

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[Instructions for the interviewer: If you get the monthly costs, please multiply by 12 to get the annual costs.]

1. € based on bill
2. € based on an estimate

E2a

Did you receive subsidies for your electricity?

Please check your bills. If you are not sure, please choose "I don't know".

1. Yes
2. No
3. I don't know

E2

How high was your total electricity consumption in units in 2022? Please check your bills and include all taxes and levies. If your household has several meters, please add up across them. Please do NOT add meters from tenants or other households.

[Instructions for the interviewer:If you get the monthly units, please multiply by 12 to get the annual consumption.]

1. ____kWh
2. I don't know

E3

In 2021, did you own a photovoltaic system generating electricity?

1. Yes, a small plug-in/feed-in PV system (often designed for a balcony, with electricity only used for own use).
2. Yes, a regular PV-system (e.g. on the roof, in the garden, or building-integrated, that is connected to the electricity grid).
3. Yes, both plug-in and regular PV systems.
4. No
5. I don't know

E5

How much electricity was generated by the photovoltaic system/solar panels in 2022?

Please check your invoice or provide an estimate if they are not available.

1. ____kWh based on bill
2. ____kWh based on an estimate
3. I don't know

LS1

Which of the following digital devices did you own and use personally in 2022?

- Smartphone
- Tablet
- Laptop/Desktop PC

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- E-Book-Reader
- Wearable Device
- Virtual Reality Goggles
- Digital assistance/smart home system to control household devices, lighting, heating, etc.
- Smart TV
- Gaming Console
- Connected exercise machine
- Wireless accessories
- Projector
- None of the above

Cooling

How many of the following items did your household own and use (regularly) in 2022?

- Room air conditioners:___
- Air coolers/desert coolers:___
- Fans:___
- None of the above

C3

To what temperature did you typically cool your main living room in summer in 2022 during the daytime when you were at home?

Please refer to the time in 2022 when the cooling system was turned on and estimate the temperature if you are not sure.

1. °C based on the thermostat or a thermometer:___
2. °C based on an estimate:___
3. Other:___

C4

For how many months did you cool your dwelling in 2022?

C5

During this time in 2022, for how many hours per day did you typically cool your dwelling?

C6

Was your main room air conditioner in 2022 an inverter (rather than fixed-speed)?

1. Yes
2. No
3. I don't know

C7

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How much of your living space was typically cooled most of the day when you were at home in 2022 (regardless of the type of cooling, incl. fans)?

[Instructions for the interviewer:It is enough if the interviewee answers for square feet OR square meters.]

1. in square feet:___
2. in square meters:___

Heating

H0

Did you have a means of heating your dwelling in 2022

1. Yes
2. No

H1

How was your dwelling primarily heated?

1. Heat Convector
2. Electric heater - with a fan
3. Electric heater - with halogen/ Halogen Room Heater
4. Electric heater - oil-filled/ oil-based
5. Gas heater
6. Heating stove or fireplace
7. Cooking stove/ Chulha with firewood
8. Heating system with water heated by the sun (Solar thermal energy)
9. Others, please specify

H2

For how many months did you heat your dwelling in 2022?

H3

During this time in 2022, for how many hours per day did you typically heat your dwelling?

H4

How much of your living space was typically heated ?

Please estimate if you are not sure.

1. in square feet:___
2. in square meters:___

H5

How many rooms of your living space were typically heated in 2022?

DE

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The following questions refer to your situation in 2021.

	Never	In 1 or 2 months	Some months	Almost every month
How often did you worry that you wouldn't be able to pay your home electricity bill?	□	□	□	□
How often did you have a supplier threaten you to disconnect your electricity or gas service, or discontinue making fuel deliveries?	□	□	□	□
During the winter months, how often did you keep your home at a temperature that you felt was unsafe or unhealthy?	□	□	□	□
During the summer months, how often did you keep your home at a temperature that you felt was unsafe or unhealthy?	□	□	□	□

SP1

How do you perceive the size of your dwelling?

1. I could do with some more space.
2. Overall it is fine as it is.
3. I could do with less space.

Hot water

HW4

How much hot water in L did your household use per day on average in 2022?

HW2

Which of the following appliances were generally used for heating water in your entire dwelling in 2022 (including the bathroom, the kitchen and any other room)? How many of these did you own and use regularly in 2022?

- Electric Geyser
- Immersion rod
- LPG gas-based water-heater
- LPG/PNG stove
- Chulha (Firewood)
- Kerosene stove
- Electric coal stove
- Solar water heater
- None of the above
- Other, please specify and enter the amount:

Transport

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Now we would like to know whether you used the following means of transport for personal use in 2022. Please tick all that apply. Include commuting to and from your workplace, but not business trips.

Select all of the following means of motorised transport that you used for personal use in 2022.

1. Automobile
2. Motorbike or scooter
3. Plane
4. 3-Wheelers
5. None of the above

Car

T1

How many kilometres did you drive in a car or van in 2021 approximately ?

Please count both kind of trips - driving yourself or as a passenger. If you used several cars, including car sharing and rented cars, please estimate the combined kilometres you have driven.

T2

What fuel does the car or van you used most in 2021 run on?

1. Petrol
2. Diesel
3. Compressed Natural Gas (CNG)
4. Biogas
5. Liquefied Petroleum Gas (LPG)
6. Biodiesel/Ethanol
7. Hybrid: Electricity and Petrol/Diesel
8. Electricity
9. Other:____

T3

Where was your car predominantly charged?

1. At home
2. At work
3. At public charging stations
4. Other:____

T4_1

How much fuel (l/100km) does the car or van you used most in 2022 consume?

Please estimate if you do not know exactly. Enter the amount as a whole number/integer.

T4_2

How much CNG does the car or van you used most in 2022 consume?

Please estimate if you do not know exactly.

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T4_3

How much electricity does the car or van you used most in 2022 consume?

Please estimate if you do not know exactly.

T4_4

How much LPG (l/100km) does the car or van you used most in 2022 consume?

Please estimate if you do not know exactly.

T5

What type of vehicle is the car or van you use the most in 2022?

1. Large cars incl. SUV (e.g. Hyundai Creta, Hyundai Verna, Hyundai Venue, Tata Nexon, Tata Harrier, Tata Safari, Tata Nexon, Mahindra XUV 700, XUV 400, Mahindra Scorpio, Mahindra Thar, Mahindra Bolero, Toyota Fortuner, Toyota Innova, MS Ertiga, MS Breezza, Jeep Meridian, VW Vento, Kia Seltos)
2. Middle Size cars (e.g., Hyundai i20, Hyundai Verna, Tata Punch, Tata Tigor, Tata Altroz, MS Swift Desire, MS Baleno, VW Polo)
3. Small Cars (e.g., MS Alto K10, MS Wagon R, Hyundai i10, Tata Tiago, Mahindra KUV100, MS Swift, Hyundai Santro)
4. Vans (e.g. MS Omni)
5. Various for ride-sharing

Motorbike

T6

How many kilometres did you ride on motorbike or scooter in 2022 approximately?

T7

What fuel does the motorbike or scooter you used the most in 2022 run on?

1. Petrol
2. Diesel
3. Electricity
4. Other:____

T8

How much fuel (km/L) does the motorbike or scooter you used the most in 2022 consume?

Please estimate if you don't know for sure.

T8b

How much electricity does the electric motorbike or e-scooter you used the most in 2022 consume?

Please estimate if you don't know for sure.

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T9

What type of motorbike or scooter did you drive?

1. Scooter/small motorbikes up to 300 cm³
2. Motorbike between 300 - 600 cm³
3. Motorbike between 600 - 1000 cm³
4. Motorbike over 1000cm³
5. Other:

T11

How many kilometers did you travel by 3-wheelers in 2022 (including auto-/rickshaw)?

Please also include thekm of ride sharing. Also include the way to or back from work (but do not include pure business trips). If you don't know for sure, please estimate. Enter the amount as a whole number/integer.

Plane

T10

How often and how far did you travel by air in 2022? (q_39864 - Typ 121)

Please only consider flights for a private occation such as vacation or family trips, i.e., no business-only trips. Please count the outward and return flights separately as two flights. Flights with stop-overs are one flight.For reference: - a flight from Mumbai to Ahmedabad is around 500km - a flight from New Delhi to Mumbai is around 1100km - a flight from New Delhi to London (UK) is around 6500km - a flight from New Delhi to New York (USA) is around 11800km

- Very short trips up to 500km:____
- Short trips between 501 and 1500km:____
- Medium trips between 1501km and 3000km:____
- Long distance trips between 3001km and 10000km:____
- Very long distance trips over 10000km:____

Sufficiency practices

SP4

How many cars, motorbikes/scooters and 3-wheelers did you have in your household in 2022?

- Number of cars:____
- Number of 2-wheelers (e.g. motorbike):____
- Number of 3-wheelers (e.g. rickshaw):____

SP5

How often do you use the following modes of transport?

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	(Almost) never	Less than 1-3 times a month	1-3 times per month	1-3 times per week	(Almost) daily
Walking	□	□	□	□	□
Cycling	□	□	□	□	□
Long-distance train or bus	□	□	□	□	□
Local and regional public transport such as metro, tram, bus	□	□	□	□	□

SP8

How many weeks were you away from home for holiday travel in 2021?

Deprivation of transport services

DT

The following questions refer to your situation in 2021.

	Never	In 1 or 2 months	Some months	Almost every month
How often were you unable to participate in cultural events or in sports activities, visit a doctor or keep an appointment with the administration because you did not have the transportation you needed?	□	□	□	□
How often did you worry about inconveniencing your friends, family, or neighbours because you needed help with transportation?	□	□	□	□
How often do you think that someone did not invite you to something because of problems on your side with transportation?	□	□	□	□

Cooking

CK1

What was your primary source of energy for cooking in 2022?

1. Piped gas (PNG)
2. LPG gas
3. Biogas
4. Electricity
5. Firewood and chips
6. Coal/charcoal lignite
7. Kerosene
8. Other:

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9. No cooking arrangement

CK2

How many cylinders of LPG of the following sizes did you buy in 2022 for cooking?

1. Large cylinders (14.2kg):
2. Small cylinders (5kg):
3. Other, please specify size and quantity

CK4

How much PNG did you buy in 2022 for cooking?

If you don't know for sure, please estimate. Enter the amount as a whole number/integer.

Diet

D1

Do you eat...

	Yes	No
Dairy products (such as milk)?	□	□
Eggs?	□	□
Fish?	□	□
Meat?	□	□

D4

How often do you eat red meat?

Red meat includes beef, pork, goat and lamb.

1. Never
2. Less than 1-3 times per month
3. 1-3 times per month
4. 1-3 times per week
5. daily

D6

How often do you eat dairy products? (q_53475 - Typ 111)

Dairy products include milk, cream, and cheese (among others).

1. Never
2. Less often than once a month
3. 1-3 times per month
4. 1-3 times per week
5. (Almost) daily

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D5

How much rice do you eat per week? (q_52376 - Typ 111)

[Instruction to the interviewer: Please enter the number of kg/week per person OR per household]

1. per person ___ kg/week
2. per household ___kg/week
3. I don't know

D5b

On average, for how many meals per week do you have rice?

Diet Deprivation

DN

The following questions refer to your situation in 2021.

	Never	In 1 or 2 months	Some months	Almost every month
How often were you unable to afford eating balanced meals?	□	□	□	□
How often were you worried food would run out before you got money to buy more?	□	□	□	□
How often were you unable to eat as much meat as you would have liked because it was too expensive?	□	□	□	□
How often were you unable to eat as much dairy products as you would have liked because it was too expensive?	□	□	□	□
How often were you unable to eat as much high quality food such as special fruit or vegetables as you would have liked because it was too expensive?	□	□	□	□

Deprivation at the Aggregated Level

DA_1 to DA_6

The following questions refer to your situation in 2022.

	Never	In 1 or 2 months	Some months	Almost every month

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How often did you reduce your expenses for what you consider to be basic household necessities?	□	□	□	□
How often were you unable to afford an unexpected required expense and pay through your own resources?	□	□	□	□

	No	Yes
I was unable to afford spending a week's vacation away from home although I wanted to go.	□	□
Do you or your household receveive any form of public support on a monthly basis such as social welfare payments or housing allowances?	□	□
My monthly income situation is mostly stable.	□	□

Sufficiency-oriented practices in general

SO1

How strongly do you agree with the following statements?

	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
Through my lifestyle I want to use as little resources as possible .	□	□	□	□	□
I find it desirable to possess only few things.	□	□	□	□	□
All the new things that are sold all the time are a big waste of resources to me.	□	□	□	□	□
I think it is unnecessary to have this affluence of different products in our supermarkets.	□	□	□	□	□

SO2

Even with products that I can financially afford I consider...

	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
...borrowing them from friends or acquaintances.	□	□	□	□	□
...whether I can rent them instead of buying them.	□	□	□	□	□

Health and well-being

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WB11

How would you rate your quality of life?

1. Very poor
2. Poor
3. Neither poor nor good
4. Good
5. Very good

WB1

	Not at all	A little	A moderate amount	Very much	An extreme amount
How much did you need any medical treatment to function in your daily life?	□	□	□	□	□
To what extent did you feel your life to be meaningful?	□	□	□	□	□
To what extent did you have the opportunity for leisure activities?					

WB2

The following questions ask you to say how good or satisfied you have felt about various aspects of your current situation in general.How satisfied are you with...

	Very dissatisfied	Dissatisfied	Neither dissatisfied nor satisfied	Satisfied	Very satisfied
...your health?	□	□	□	□	□
...your work?	□	□	□	□	□
...yourself?	□	□	□	□	□
...the support you get from friends, family, and relatives?	□	□	□	□	□
...the conditions of your living place?	□	□	□	□	□
...your transport?	□	□	□	□	□

WB3

How often do you have negative feelings such as blue mood, despair, anxiety, depression?

1. Never
2. Seldom
3. Quite often
4. Very often
5. Always
6. Prefer not to answer

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Values/Ideological Beliefs

EID

How strongly do you agree with the following statements?

	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
I think of myself as an environmentally friendly consumer.	□	□	□	□	□
I think of myself as someone who is very concerned with environmental issues.	□	□	□	□	□
I would be embarrassed to be seen as having an environmentally friendly lifestyle.	□	□	□	□	□

Religiousness

Do you consider yourself to be religious?

1. No
2. Rather not
3. Neither nor
4. Rather yes
5. Yes
6. Prefer not to say

Questions interviewer post survey

QI10

Were you and the interviewee alone?

1. Yes
2. No

QI11

How many other people were in the room during the interview?

QI12

Was the interviewee able to answer the questions without disruption (e.g., from other persons or events happening around you)?

1. Yes, always
2. Yes, almost always
3. Sometimes

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4. Rarely
5. No, never

QI13

How noisy was the environment during the interview?

1. Very noisy
2. Mostly noisy
3. Neither nor
4. Mostly quiet
5. Very quiet

QI14

If you have any comments and/or noticed anything during the interview that should be mentioned, please enter it here (in English please)

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