Affordability of utilities' services: extent, practice, policy

Research Paper 7: Simulations of Policies to Alleviate Utility Affordability Issues in Estonia: Evidence from the Household Budget Survey 2012

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1. Introduction

This document is based on the publically available data from Estonia's 2012 household budget survey. While analysis of Estonia is interesting as it is the only new member state in our simulations, unfortunately the data is very limited compared to the UK or Ireland. In the Estonian survey, only 14 high-level expenditure categories (broadly matching those of the COICOP[1] categories used by Eurostat) are available. As a result, simulations for expenditure on energy and water cannot be run. Also, the two categories for which we can carry out simulations 'Communications' and 'Transport' do not match the definitions used for the UK and Irish data. In particular, 'Communications', if it follows Eurostat's classification, will include expenditure on postal services as well as those on telecoms. The main issue with 'Transport' is that we cannot exclude expenditure on the purchase of vehicles.[2]

Another difference between the Estonian household budget survey and the others we have analysed is the methodology. The procedure in Estonia involved sampling individuals rather than households. The weighting system applied to the data then provided a correction to make the sample representative of the population of Estonian households as a whole. This emphasis on individual sampling is also reflected by the fact that the raw expenditure data is provided as expenditure per household member. The figures in this document are based on total household expenditure which is obtained by multiplying expenditure per household member by the number of household members. Unfortunately, the number of household members is top coded with the highest category being '5 or more members', and expenditure per person was multiplied by 5 for this group. Consequently the level of household expenditure of the very largest households is under-recorded in the data used for the simulations.

Lastly, compared to the UK and Irish data, three of the groups used for targeting policy interventions are defined rather differently. Firstly, in the Estonian data single parent households are identified by a category 'lone parent with child(ren) aged less than 25', rather than simply being any household involving a single adult and children aged 18 or under. Secondly, in the Estonian data an unemployed household is identified by the survey respondent being unemployed rather than a household where at least one member is unemployed. Thirdly, in the Estonian data a household with children only includes children up to the age of 14 rather than up to the age of 18.[3]

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[1] COICOP is an internationally agreed method of classifying household expenditure and stands for 'Classification of Individual Consumption by Purpose'.

[2] Additionally, the documentation available in English is limited so we cannot confirm the precise definition of these two expenditure categories.

[3] Unfortunately, the indicator variable for single parent households in Estonia is only available based on children being included up to the age of 25. This is the reason for the discrepancy between the definition of single parent households and households with children.

2. Description of population and household groups

Looking at the estimated demographic structure of Estonia it would appear that the country is more youthful than the UK. The estimate of the percentage of households containing someone aged 65 or over in Estonia is around 4 percentage points lower than that in the UK, but about 6 percentage points higher than in the Republic of Ireland. However, in Estonia there is a greater percentage of households with children than in either the Republic of Ireland or the UK.[4]

Chart 1: Estimated Percentage of Households in Each Group: Estonia 2012
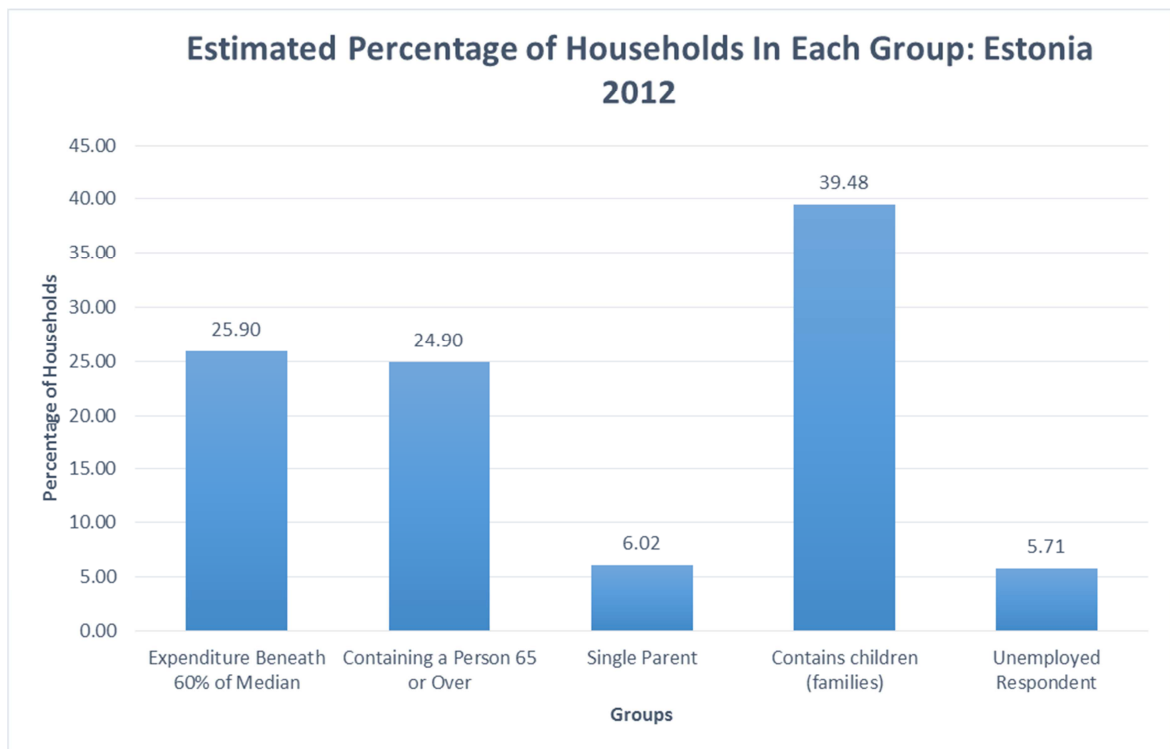
Source: Estonia household budget survey, 2012

Far more striking than these demographic differences is that the estimated medians of total household expenditure in Estonia are much lower than in the UK and Ireland. In 2012 median total household expenditure across all households in Estonia is less than a third of the equivalent figure for the UK. Such a large difference in total expenditure means that even if the expenditure *share* devoted to a particular utility were common to both the UK and Estonia, the actual *level* of expenditure would be very different. Without knowing the prices of individual commodities in the

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[4] This is despite the fact the Estonian definition of households with children only including children up to the age of 14 rather than 18.

UK and Estonia it is impossible to know to what extent these different levels of expenditure would translate into different levels of consumption.

Turning to the relative levels of total expenditure across different household groups, the pattern in Estonia seems broadly similar to those in the UK and Republic of Ireland with households containing children having by far the highest level of total expenditure.

Chart 2: Estimated Median Household Expenditure by Group: Estonia 2012
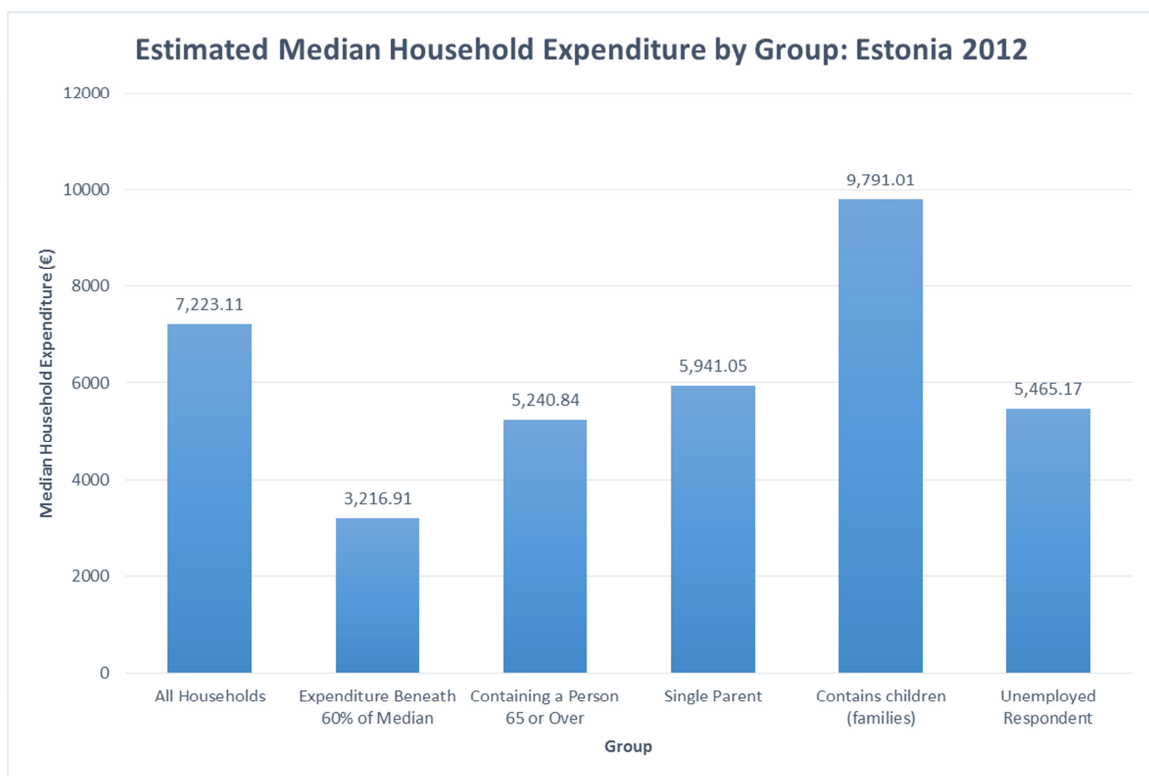
Source: Estonia household budget survey, 2012

Chart 3: Estimated Median Expenditure Shares Spent on Different Utilities by Group: Estonia 2012
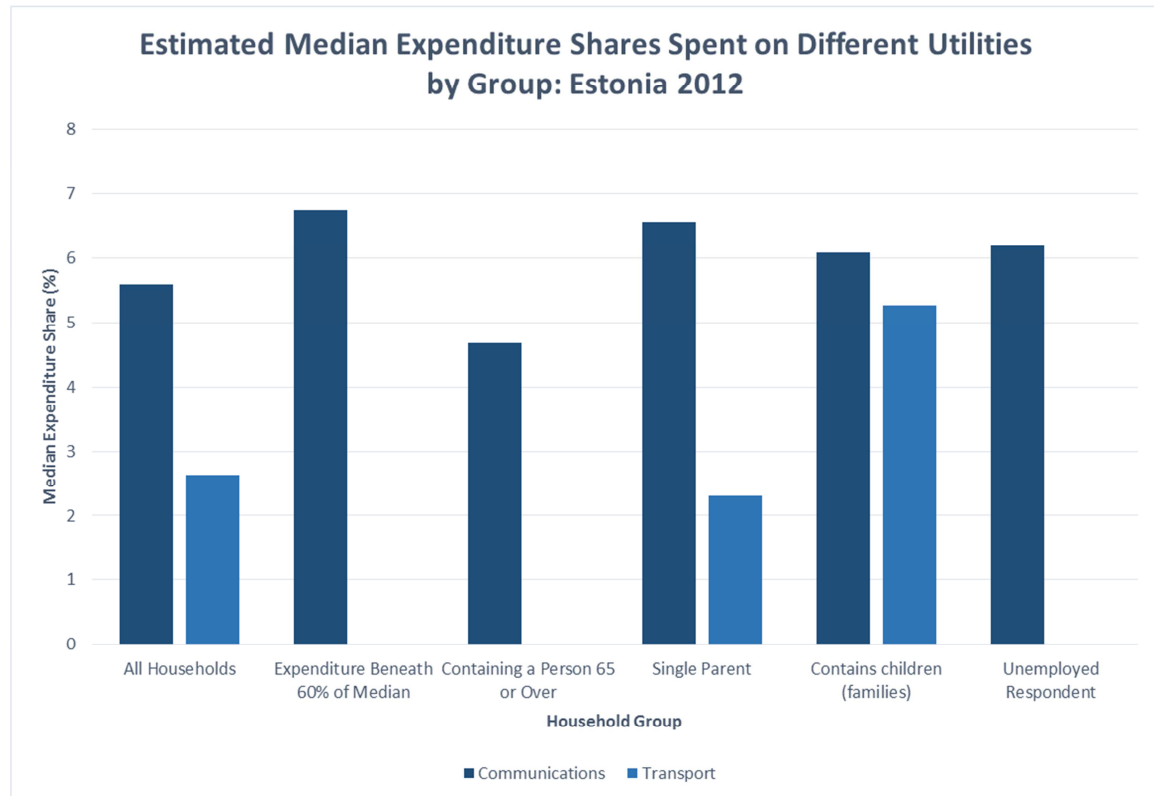
Source: Estonia household budget survey, 2012

Due to the fact that the expenditure categories 'Communications' and 'Transport' are different from those in the UK and Republic of Ireland, the conclusions one can draw from cross-country comparisons are relatively limited. However, it is clear that the median expenditure share across all households devoted to 'Communications' in Estonia is much higher (almost double) the expenditure share devoted to 'Telecoms' in the UK and Republic of Ireland. This seems to imply that either around half of 'Communications' expenditure in Estonia is devoted to postal services[5] or that Estonian households devote a greater proportion of their expenditure to telecoms services.

Even more noticeable is that the proportion of expenditure devoted to 'Transport' is much lower in Estonia despite it apparently including the extra cost of vehicle purchases. In particular, median expenditure on transport is recorded as zero for households whose total expenditure is below 60% of the median, households containing someone aged 65 or over and where the survey respondent is unemployed. There are two possibilities for this finding: (i) large groups within Estonian society

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[5] This statement assumes that there is no other expenditure within the 'Communications' category beyond telecoms and postal services.

receive free transport; or (ii) there is a serious deficiency with the Estonian data being used. Even in the Estonian group with the highest median expenditure share devoted to transport (households with children) the expenditure share devoted to transport is less than half the figure for the equivalent group in the UK.

Chart 4: Estimated Median Expenditure Share Spent on Different Utilities by Total Expenditure (Proxy Income): Estonia 2012
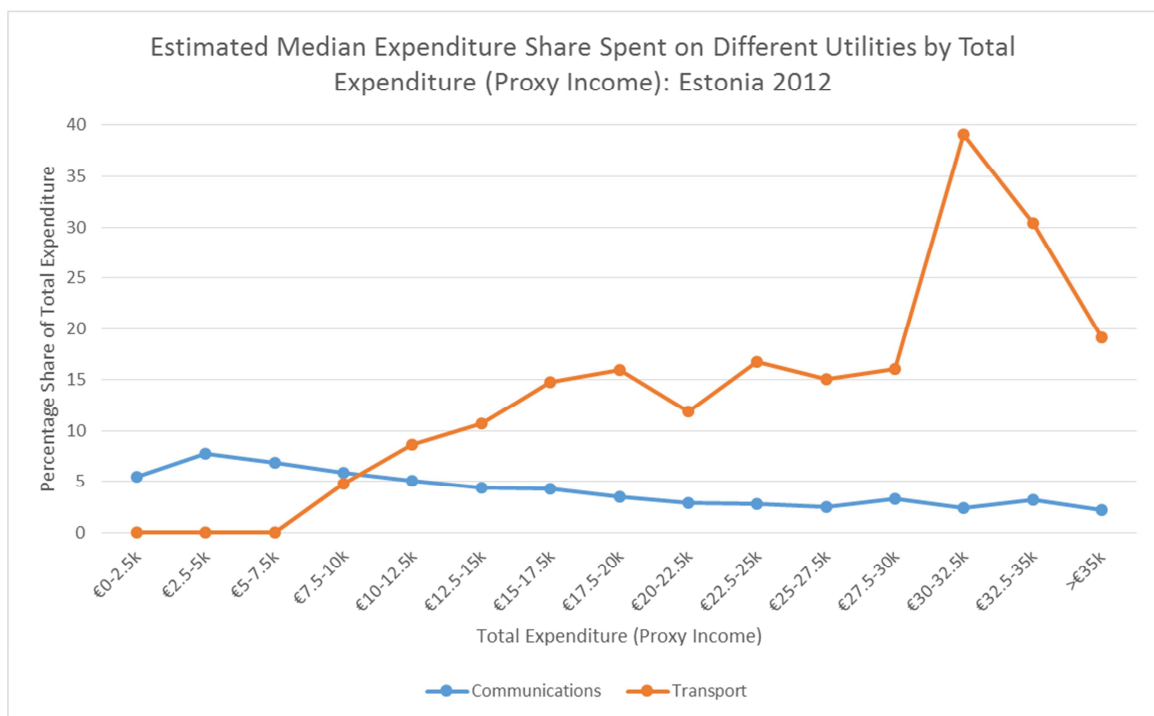
Source: Estonia household budget survey, 2012

Turning to Chart 4 and the relationship between utility expenditure shares and total expenditure (a proxy for household income) the patterns are similar in broad terms to those for the UK and Ireland, though we note that the total expenditure categories are much narrower in Estonia than those used in the other two countries.[6] The expenditure share devoted to Communications generally falls as total household expenditure increases and the expenditure share devoted to transport increases rapidly up to a total expenditure of €20,000 (the same level as the turning point in the Republic of Ireland). The exception to these similarities is the exceptionally high transport expenditure share in Estonia when total expenditure is in the range €30-35,000. The most obvious explanation for these two anomalous expenditure share figures is that they are distorted upwards by the cost of vehicle purchases.

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[6] Narrower categories are used due to the much lower level of household expenditure in Estonia.

3. Communications – Baseline

Looking at Chart 5 the most striking contrast with the UK and Republic of Ireland is the much greater percentage of households spending over 5% of their expenditure on 'Communications' in Estonia compared to the percentages spending over 5% on telecoms in the other countries. 56% of Estonian households spend over 5% on communications compared to only 16% of UK households spending over 5% on telecoms. This difference probably results from the broader range of expenditures included in communications combined with the much lower total household expenditure in Estonia. In contrast, the other three relative metrics record percentages of households which are much closer to the figures for the other countries. This suggests that the relative dispersion of expenditure shares across households is similar between the different countries. This is despite the twice median expenditure share and 5% expenditure share threshold representing completely different proportions of households in Estonia. That these two metrics are no longer comparable reinforces the argument that having common fixed expenditure share thresholds across countries may not be desirable when countries are in significantly different economic situations. An expenditure share which may be exceptional in one country can be the norm in another country.

Chart 5: Estimated Percentages of Households above Expenditure Thresholds in Communications: Estonia 2012
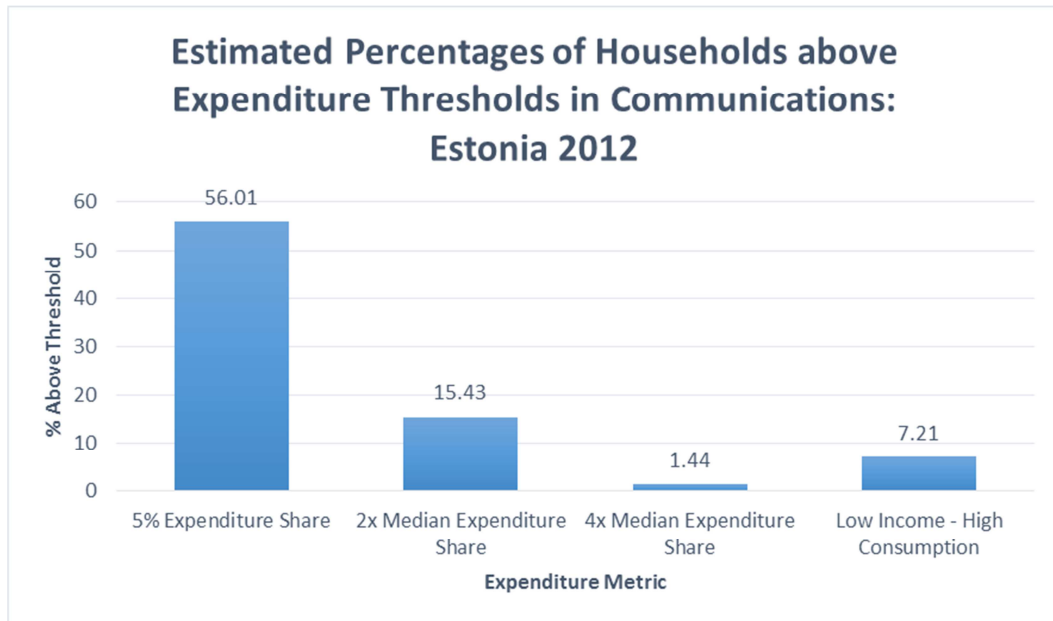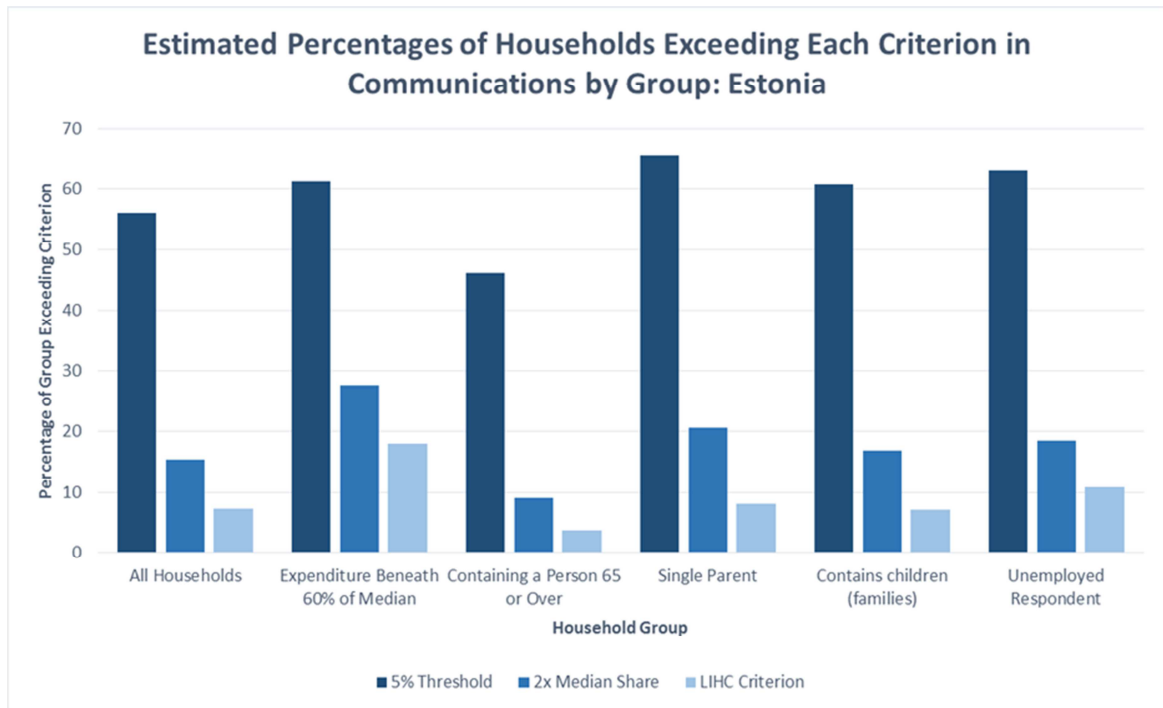

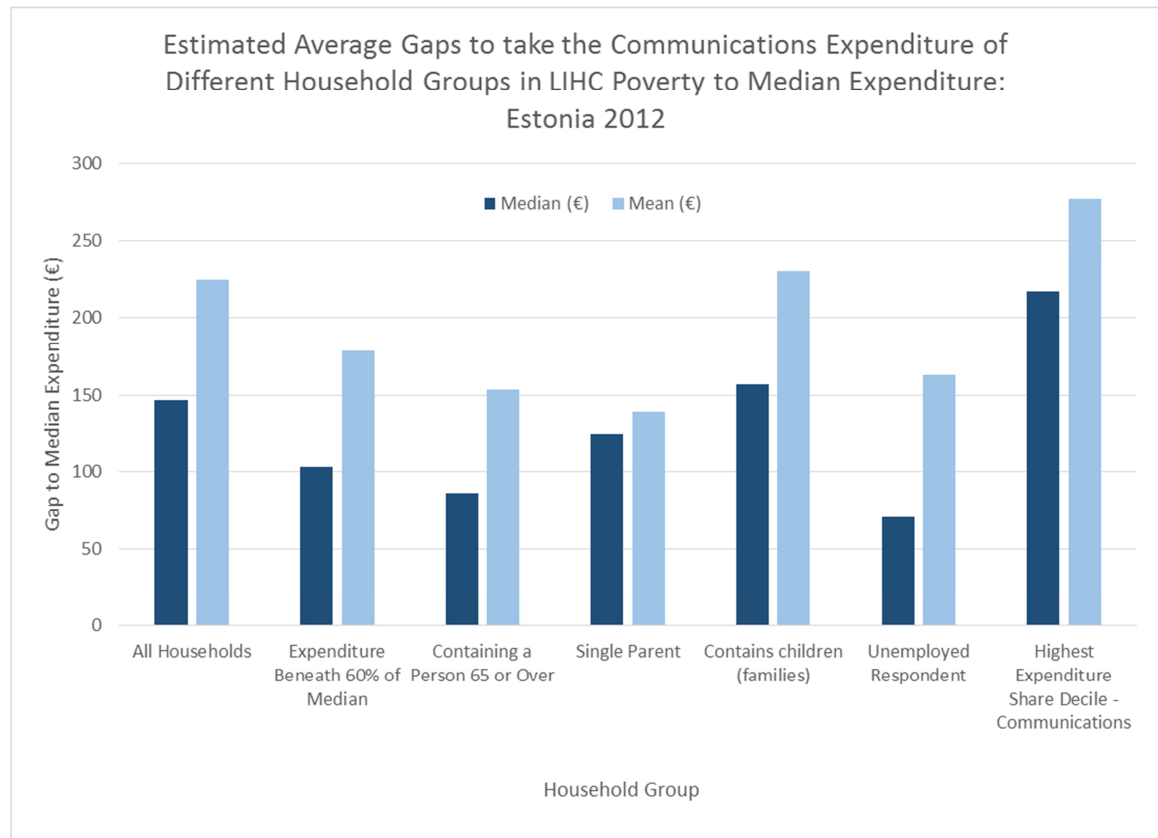*Source: Estonia household budget survey, 2012*

Turning to the percentage of different household types facing Communications affordability difficulties, the main point to note is that the 5% expenditure share threshold shows relatively little difference across the six different household types. This highlights that if an expenditure share threshold is set too low, so that a majority of households lie above it, then the chosen threshold may no longer be an effective metric to differentiate between the situations faced by different groups.

Chart 6: Estimated Percentages of Households Exceeding each Criterion in Communications by Group: Estonia

Source: Estonia household budget survey, 2012

Chart 7: Estimated Average Gaps to take the Communications Expenditure of Different Household Groups in LIHC Poverty to Median Expenditure: Estonia 2012

Source: Estonia household budget survey, 2012

As in the UK and Republic of Ireland, Chart 7 shows that if a household faces affordability difficulties relating to communications/telecoms according to the LIHC criterion, it is households containing children which face particularly deep affordability difficulties. Another similarity with the other two countries is that the mean and median figures for single parent households are particularly close, suggesting that this group of households faces a depth of affordability difficulties which is relatively homogeneous. The major difference is that, despite communications being a broader category than telecoms, the average expenditure gaps are much lower in Estonia compared to Ireland. All the gaps in Chart 90 appear to be less than half the size of the equivalent gaps for the Republic of Ireland. This result probably reflects the much lower median communications expenditure in Estonia compared to median telecoms expenditure in the Republic of Ireland. In turn, this is likely to be due to the very different average total household expenditure (income) levels in these two countries.
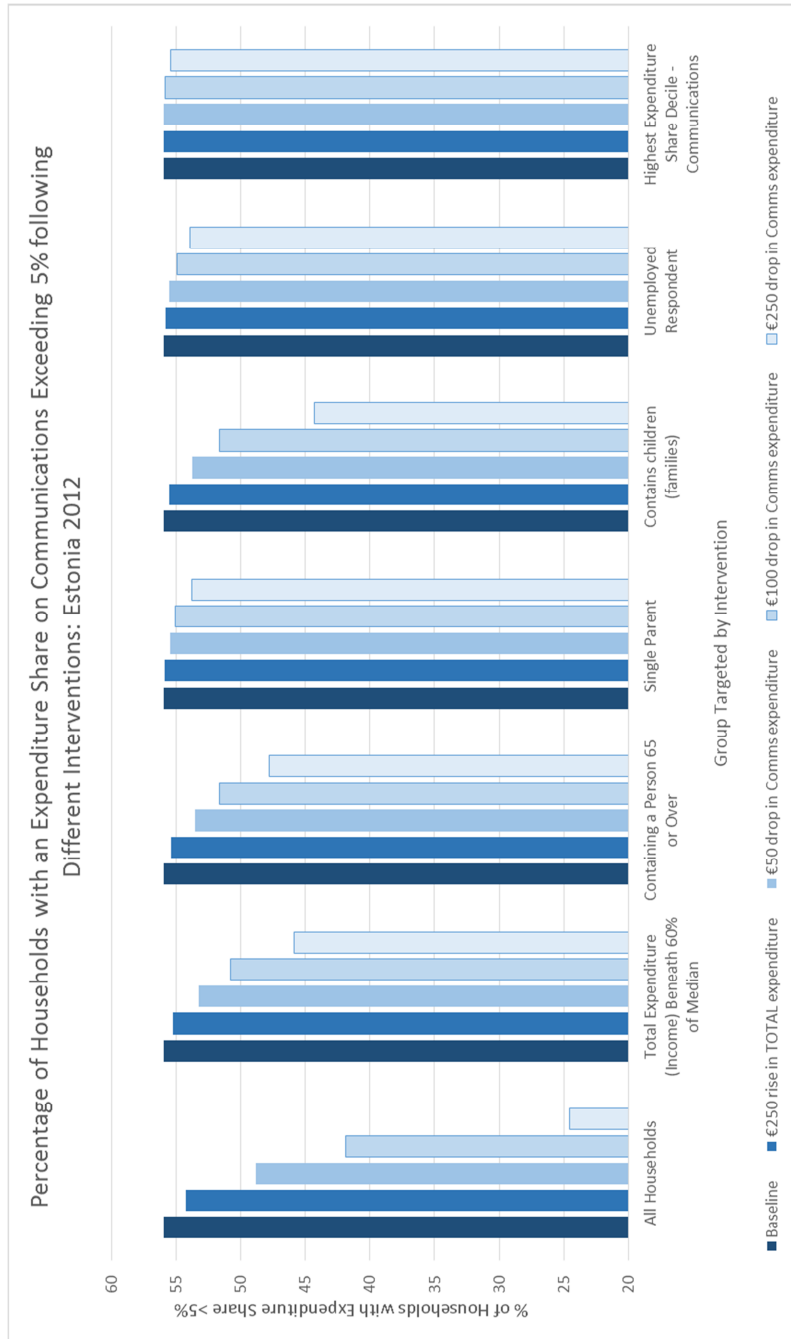
4. Communications – Simulations

The simulations clearly show that for households with the highest 10% of expenditure shares dedicated to communications, none of the policy interventions have any impact on the percentage of households spending over 5% of their expenditure on communications. This indicates that households with a particularly high share of expenditure devoted to communications have a level of expenditure which places them significantly above the 5% expenditure share threshold. Another thing to note in the Estonian data is that a €250 reduction in communications expenditure targeted at households with children reduces the headline rate of communications affordability difficulties by a larger amount than if the same expenditure reduction were applied to households with total expenditure below 60% of the median or households containing someone aged 65 or over. In the telecoms data for the UK and Republic of Ireland, the relative desirability of these three groups as targets for intervention are reversed, since in these countries targeting households with children has the smallest impact.

The other thing immediately apparent in Chart 8 when compared to the UK and Irish data is that the percentage point drops in the proportion of households above the 5% threshold resulting from particular expenditure reductions are far greater in Estonia. For example, a €250 expenditure reduction given to all households in the UK and Republic of Ireland results in the percentage of households spending over 5% of expenditure on telecoms falling by around 8 percentage points. In contrast, giving a €250 communications expenditure reduction to all Estonian households results in the percentage of households devoting more than 5% of expenditure to communications to fall by around 30 percentage points. This large difference results from the absolute levels of household expenditure in Estonia being much lower than in the other two countries, so that the same expenditure reduction in absolute terms would have a far greater impact on the Estonian affordability metrics.

The effectiveness metric in Chart 9 shows that in Estonia, as in the UK and Republic of Ireland, the most effective group at which to target interventions are low income households. However, in contrast to the UK and Republic of Ireland, targeting other groups such as households containing elderly individuals, single parent households and households where the respondent is unemployed is also relatively effective. Indeed, when viewed relative to targeting resources at low income households, targeting resources at households with children is more effective in Estonia than when tackling telecoms affordability issues in the UK and Republic of Ireland.

Chart 8: Percentage of Households with an Expenditure Share on Communications Exceeding 5% following Different Interventions: Estonia 2012

Source: Estonia household budget survey, 2012

Chart 9: Effectiveness Metric for Different Interventions on Communications 5% Threshold: Estonia 2012
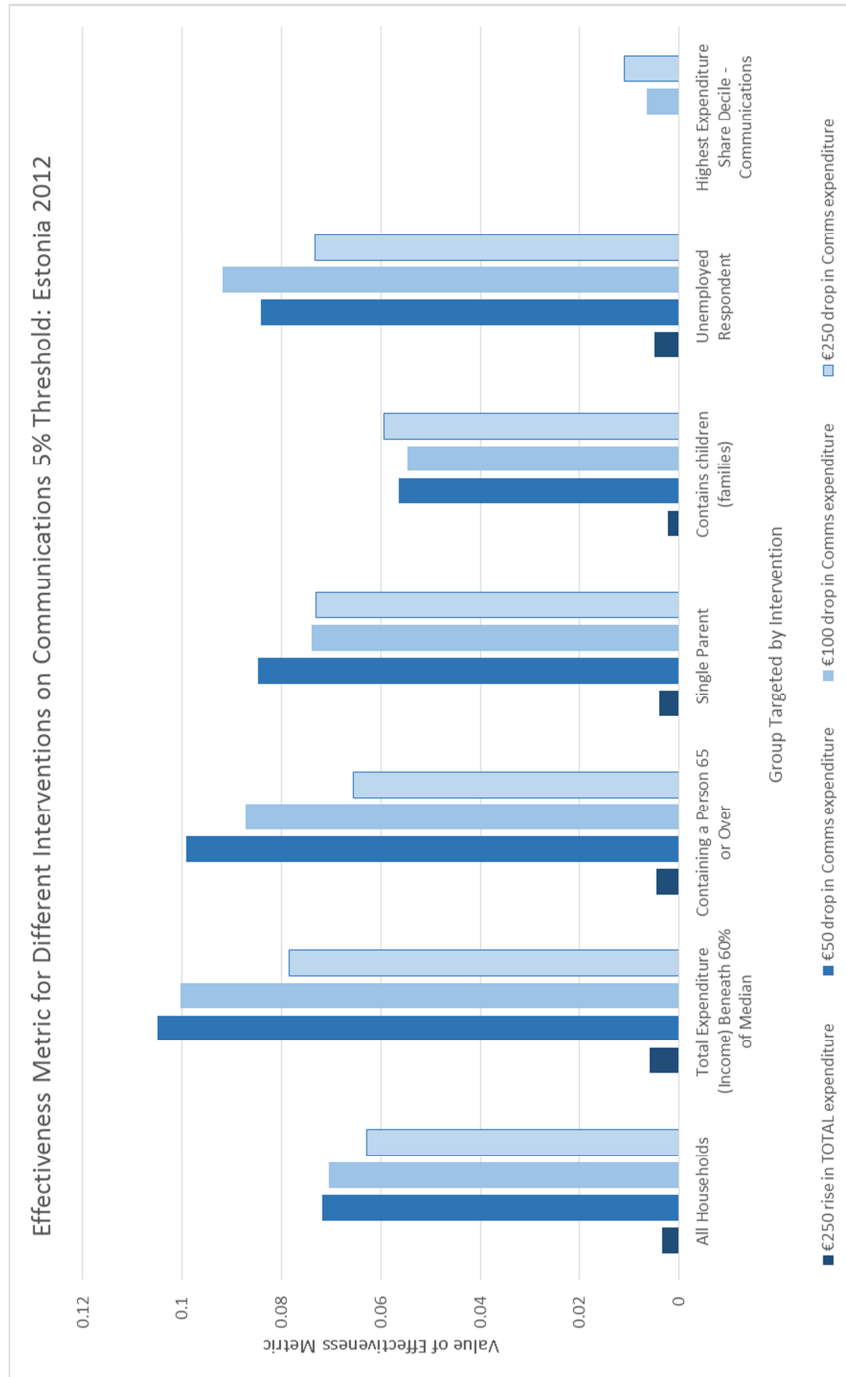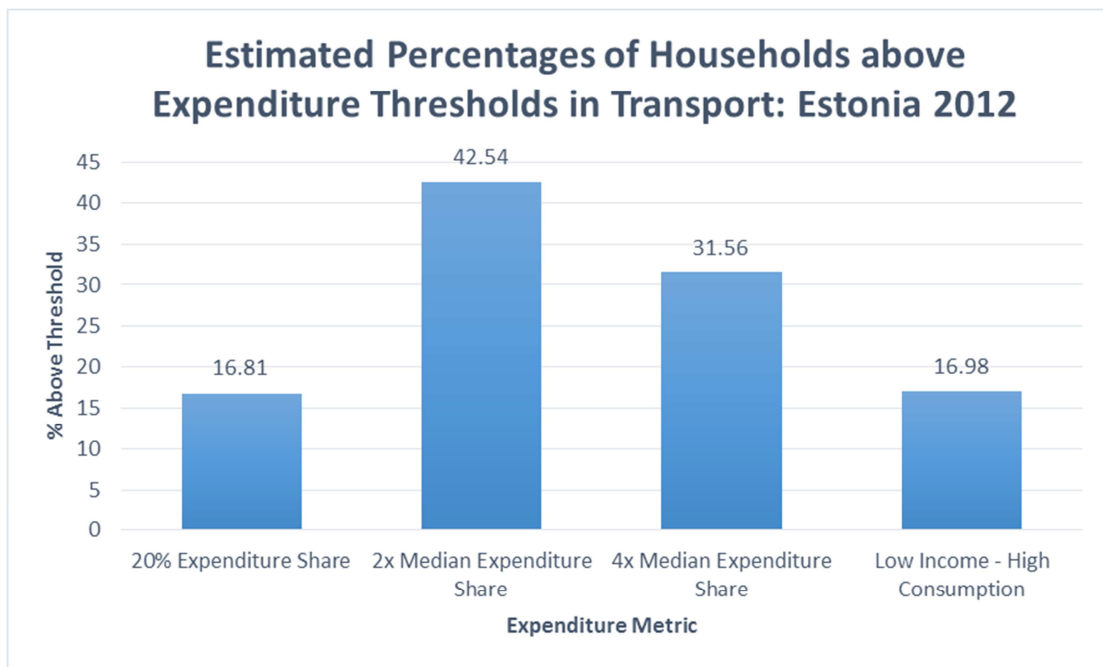

Source: Estonia household budget survey, 2012

5. Transport – Baseline

Despite the transport expenditure category being broader and total expenditure being lower, the percentage of households devoting 20% or more of their expenditure to transport in Estonia is comparable to that in the UK. When compared to the Republic of Ireland in 2010 the percentage of households with a transport expenditure share exceeding 20% is almost 8 percentage points higher in Estonia in 2012. The more dramatic contrast with the UK and Republic of Ireland in Chart 10 concerns the relative metrics. In Estonia there is a much greater proportion of households which have shares of expenditure devoted to transport which are far in excess of the median. In particular, the share of households in Estonia spending more than four times the median share on transport is 31.6% compared to only around 1% in both the UK and Republic of Ireland.

Chart 10: Estimated Percentages of Households above Expenditure Thresholds in Transport: Estonia 2012
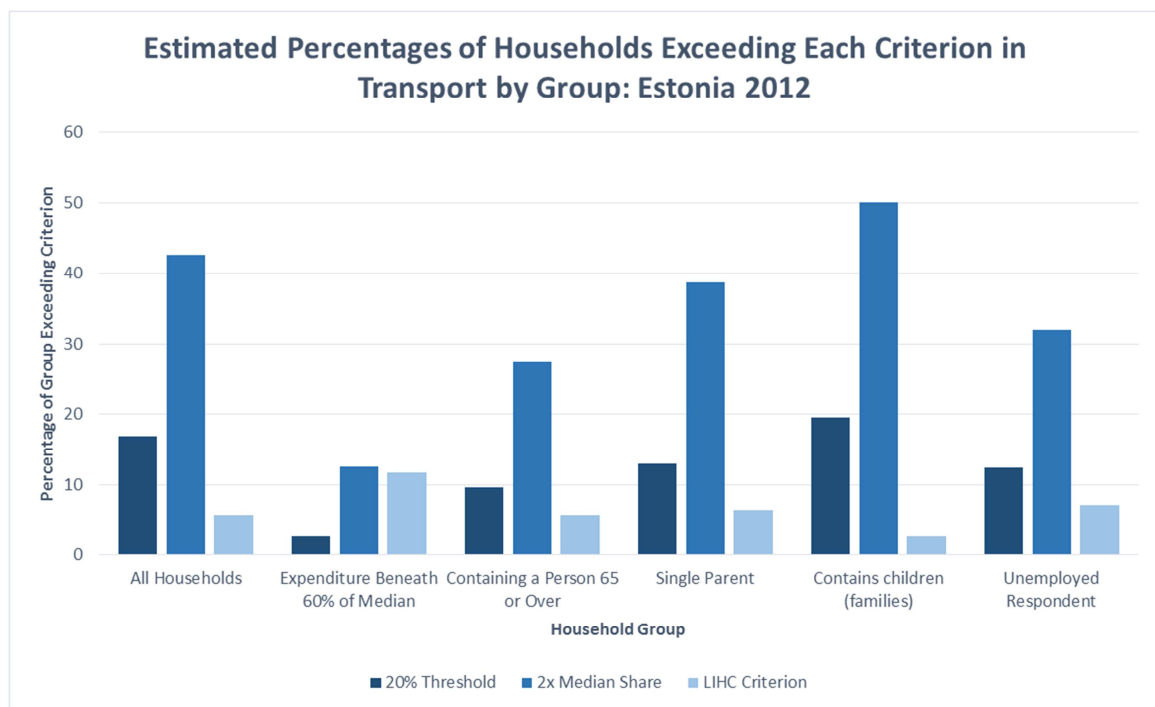

Source: Estonia household budget survey, 2012

The impact of the records of zero transport expenditure in the Estonian data can also be seen in Chart 11. For example, the percentage of Estonian households with total expenditure beneath 60% of the median spending over 20% of their total expenditure on transport is less than a third of the figure for UK households. Additionally, for each Estonian household group, except those with total expenditure beneath 60% of the median, the percentage of households in Estonia above twice the median expenditure share is often more than double that in the UK and Republic of Ireland. However, the percentage of households identified as having transport affordability difficulties

according to the LIHC criterion is broadly in line with the UK figures. The one exception to this pattern is for households with total expenditure beneath 60% of the median. Estonian households in this group have a rate of affordability difficulties according to the LIHC criterion which is approximately double that for the UK.

Chart 11: Estimated Percentages of Households Exceeding Each Criterion in Transport by Group: Estonia 2012

Source: Estonia household budget survey, 2012

Chart 12: Estimated Average Gaps to take the Transport Expenditure of Different Household Groups in LIHC Poverty to Median Expenditure: Estonia 2012
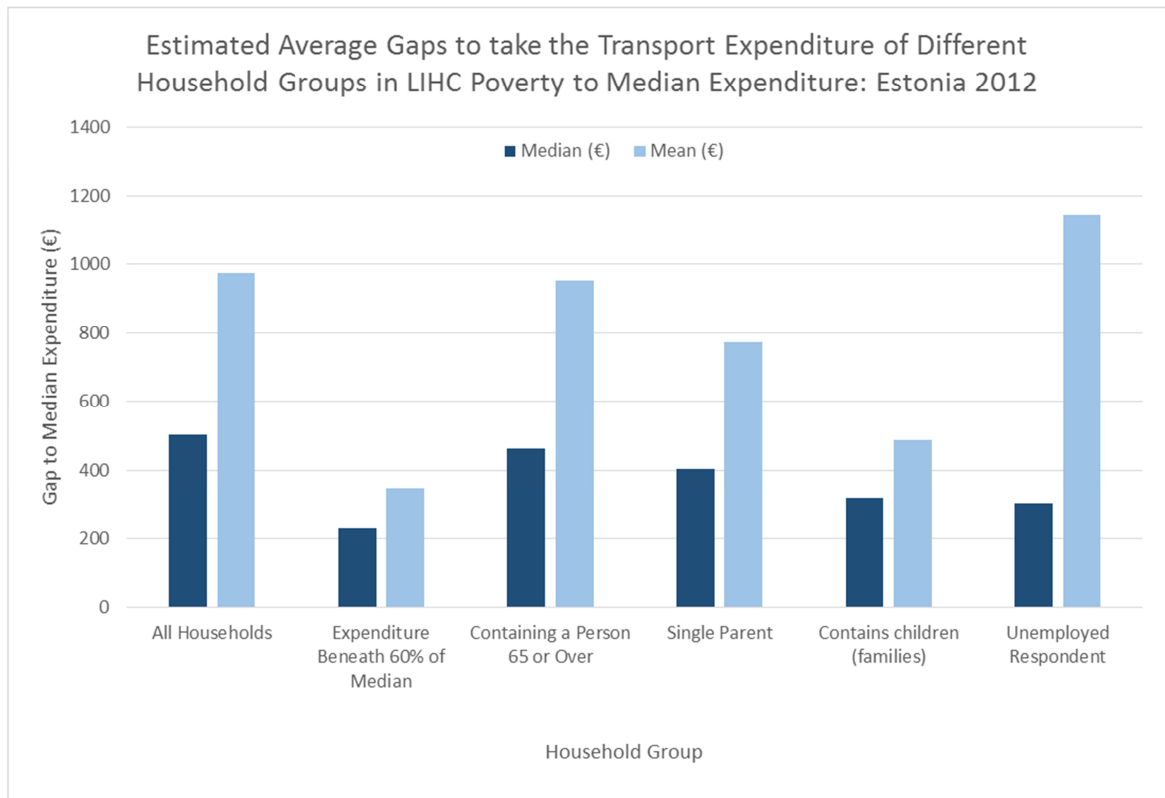
Source: Estonia household budget survey, 2012

As one would expect given the lower absolute expenditure on transport in Estonia, the average LIHC gaps are much lower than in the UK or Republic of Ireland. The other differences with the UK and Republic of Ireland relate to the relative size of the mean and median gaps for particular types of household. In Estonia the difference between the mean and median gaps for households with children seems low compared to the UK and Republic of Ireland. In these latter two countries the mean LIHC gap is around double the median LIHC gap suggesting that there is a long tail of families with high transport expenditures. In Estonia, the mean LIHC gap is only around 50% higher than the median LIHC gap. In contrast, for households where the respondent is unemployed the difference between the median and mean LIHC gaps is particularly large in Estonia when compared to the difference in the other two countries. In Estonia the mean LIHC gap for households where the respondent is unemployed is almost four times the median LIHC gap.

6. Transport – Simulations

Regarding the impact of the policy interventions on the 20% threshold metric, Chart 13 shows a general pattern of results which is similar to that in the UK. For example, targeting interventions at households in the highest expenditure share decile in transport has essentially no impact on the percentage of households spending more than 20% of their total expenditure on transport in either country. The main difference between Estonia and the UK relates to the impact of the interventions targeted at households with total expenditure beneath 60% of the median. In the UK targeting a €250 expenditure reduction at this group reduces the percentage of households spending over 20% of their expenditure on transport by around 0.5 percentage points. In Estonia the same intervention reduces the percentage of households spending over 20% on transport by only around 0.25 percentage points. This relative lack of impact in Estonia probably reflects the large number of Estonian households in this group which have transport expenditure recorded as zero even before any policy intervention takes place.
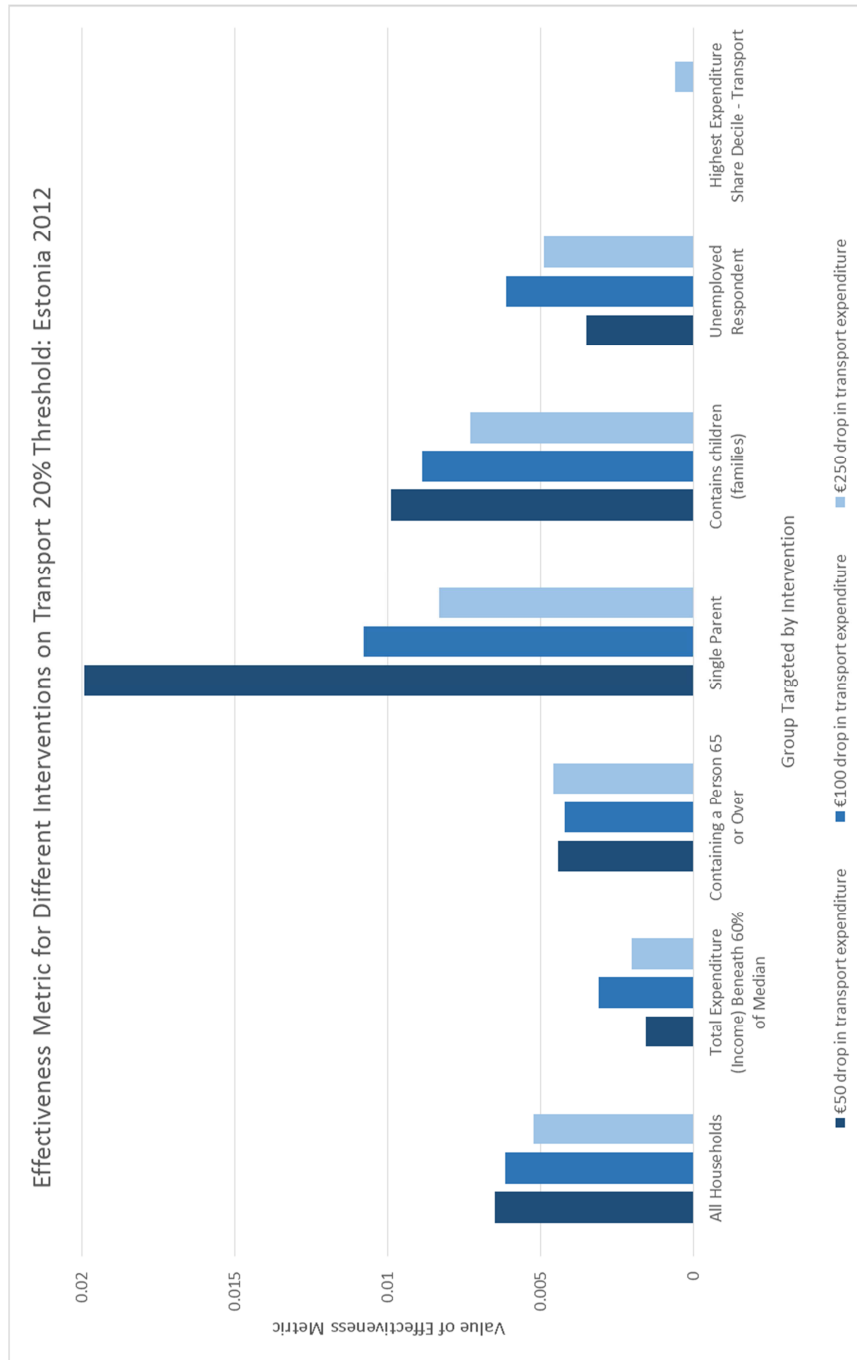
Turning to the effectiveness metric in Chart 14, it is clear that targeting a €50 expenditure reduction at single parent households is by far the most effective policy to shift the affordability metric, with an effectiveness rating twice that of the next most effective intervention, a €100 expenditure reduction, also targeted at single parent households. The relatively poor performance of the different targeting mechanisms evaluated in the simulation is indicated by the fact that the effectiveness of targeting 'All households', i.e. not targeting any individual household types at all, is the third most effective targeting option in Chart 14. Lastly, Chart 14 confirms the low effectiveness of targeting households with total expenditure beneath 60% of the median and households in the highest transport expenditure share decile.

Chart 13: Percentage of Households with an Expenditure Share on Transport Exceeding 20% following Different Interventions: Estonia 2012
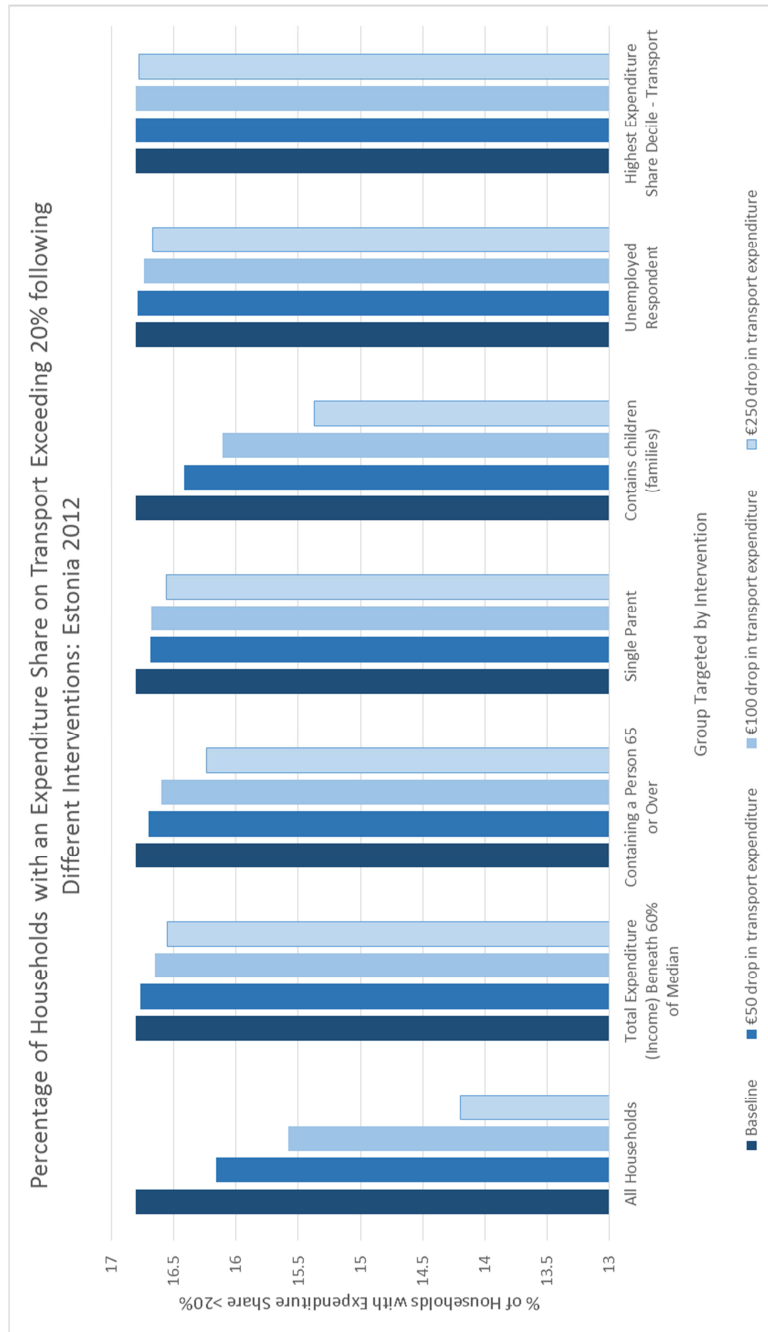
Source: Estonia household budget survey, 2012

Chart 14: Effectiveness Metric for Different Interventions on Transport 20% Threshold: Estonia 2012

Source: Estonia household budget survey, 2012