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Evaluation of the new Mediapulse Television Panel with Respect to its Suitability for Local Television Channels

Auditors' Report

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Contents

1 Introduction

On 26. 2. 2013 we received from Mediapulse the task to evaluate, *i.e.* to audit, the new Media-pulse television (TV) panel used to analyse Swiss TV usage with respect to its suitability for local TV channels.

This report contains a summary of our findings. In Section 2 we investigate the differences between the previous and the new TV panel from a statistical point of view (Section 2.1) and based on observed panel data (Section 2.2). Section 3 compares the methods of extrapolation used in both panels. The computation of TV audience indicators and related variance estimation are briefly mentioned in Section 4. Almost every section ends with an 'Intermediate summary' paragraph. These are meant to summarise its contents, to discuss any limits of our evaluation and to give an outlook to open questions or serve as bridge for the subsequent sections. Finally, Section 5 gives the overall conclusion with respect to local TV channels and provides recommendations.

Our approach

To perform our evaluation we were looking for issues which in our eyes could have the potential to induce systematic statistical errors ('biases'). As such, we focused on home (household) size, homes with and without children (aged 0–14), and individual's age at the level of the linguistic regions and at level of the concession areas.

Important notes

We did not evaluate the metering technology (*e.g.* the audio matching technology) used for collecting the Swiss TV usage data, nor did we evaluate the data preprocessing (*e.g.* data filtering, data cleaning, application of data corrections) which was performed on the raw data to get the final 'valid' data used for extrapolation and for subsequent computation of TV audience indicators (*e.g.* rating, reach), nor did we evaluate the computation of such audience indicators.

2 The previous and the new TV panel

The previous panel has been operated by GfK Switzerland till 31. 12. 2012. This panel and GfK Switzerland will be hereafter referred to as 'GfK'. The new panel is operated since 1. 1. 2013 by Kantar Media (Switzerland) and will be hereafter referred to as 'Kantar'.

2.1 Sampling and recruitment methodologies

Several key elements are different in the new TV panel. Detailed lists of changes have been already extensively documented by Mediapulse. Herein we will only summarise the ones related to the underlying statistical methodological issues.

First, consider the samples from the previous GfK and the new Kantar panel.

1. The **sampling frame** has been changed from the landline phones registered in the telephone directory to the list of postal addresses in Switzerland. This latter list is exhaustive and includes every residence in Switzerland. Around 20% of homes in Switzerland are not listed in the telephone directory. More precisely, for the Kantar panel Mediapulse's 'Establishment Survey' (ES) creates the basis for recruitment (whose sampling frame is based on postal addresses). As we did not, *per se*, evaluate the ES, we assume in what follows that the ES is representative.

2. The **sample design** for the most recent version of the GfK panel was a stratified sampling design, whereas the Kantar panel (more precisely, the ES) uses a stratified cluster design outside agglomerations with communities as primary sampling units and a stratified sampling in agglomerations. It is important to note that new sample points are drawn annually to update the Kantar panel. The GfK panel inherited some cluster sampling as well. Any cluster effects will be transmitted to the TV audience indicators.

3. The **sample size** for the previous GfK panel was (according to the contract) $1'918$ installed homes (households), whereas the Kantar panel has a minimal (contract) sample size of $1'870$ reporting homes (not installed homes) requiring a panel of some $2'060$ installed homes (as proposed by Kantar). Furthermore, Mediapulse indicated that as of $30.1.2013$ there were $2'117$ installed homes with an average of $1'985$ homes reporting 'valid' data on a daily basis. Moreover, the sample covers the three different linguistic regions ('Deutschschweiz', 'Suisse romande' and 'Svizzera italiana') on a disproportionate basis, *i.e.* its coverage of French- and Italian-speaking Switzerland is greater (in comparison to the number of inhabitants in both these regions) than its coverage of German-speaking Switzerland.

4. **Stratification** in both panels is based on twenty-five elementary zones. However, the previous GfK panel had as requirement a minimal sample size of 25 households per elementary zone. Note that elementary zones are used as geographical characteristics within the linguistic regions and unions of elementary zones define the thirteen concession areas ('Konzessionsgebiete', hereafter referred to as 'KG'), *i.e.* the current licensing areas.

Second, there are also differences with respect to the mode of recruitment.

5. The **recruitment region** for both panels is the linguistic region with supplementary objectives at the elementary zone's level.

6. The **control categories** (or control variables) for the previous GfK panel were

    – household (HH) size $(1, 2, 3, 4+)$;

- age of housewife (15–$29, 30$–$44, 45$–$64, 65+$);
- HH with children aged 0–14 (yes, no).

And the ones for the Kantar panel are

- number of working TV sets per HH ($0, 1, 2, 3+$ sets);
- HH size ($1, 2, 3, 4, 5+$);
- presence of children aged 0–2 in the HH (yes, no);
- presence of children aged 0–14 in the HH (yes, no);
- reception type (in order of hierarchy set by Mediapulse: IPTV, digital cable, satellite, analog cable, digital terrestrial, computer only).

For households which receive TV exclusively over the Internet only 'HH size', 'presence of children 0–2 in the HH' and 'presence of children 0–14 in the HH' will be used as control categories.

It is also important to note that no households from the GfK panel seem to have been transferred to the Kantar panel (as indicated by Kantar).

Third, in both panels the reporting samples (households) of a panel are extrapolated to the population estimates, allowing the produced results to be representative of the respective population, *i.e.* the respective **universe**.

- The universe for the previous GfK panel was the permanent resident population of Switzerland aged three and above ('3+') in private households with TV set ('Fernsehhaushalte'). The universe of the GfK panel was based on data from the 2000 (complete) census from the Swiss Federal Statistical Office (FSO) and the results of ESPOP ('Statistik des jährlichen Bevölkerungsstandes'). The complete universe was forecasted by GfK's proprietary model. No age-adjusted TV density has been used.

- The universe for the Kantar panel comprises again the permanent resident population of Switzerland aged '3+' in private households but now with at least one TV set or a computer with Internet connection ('Haushalte mit fernsehfähigen Geräten'). As such, the universe for the Kantar panel has been extended and relies directly on the results of STATPOP ('Statistik der Bevölkerung und der Haushälte'). STATPOP is based on the annual (registry-based) census made by the FSO and since 2010 replaces completely ESPOP. To adjust for TV usage the results from the ES, weighted by the STATPOP data, were used. Thus, TV density is automatically age-adjusted.

It is important to note that we did not evaluate, *per se*, the appropriateness of Mediapulse's definitions of the target universes. As such, we assume in what follows their appropriateness.

Intermediate summary

From a statistical point of view the sampling frame, the sample design, the stratification, the mode of recruitment and the universes are different for both TV panels. As such, these panels can not be compared directly and any statistical summaries and hence TV audience indicators based on the resulting TV usage data must be compared with extreme caution, if at all.

2.2 Observed differences in size and composition

As indicated in Section 2.1 above, the results of the two TV panels refer to different populations (universes) and are difficult to compare. However, the raw size and composition of the two panels can be compared and one can investigate whether major differences could originate from the sampling frame, the sample design or the recruitment process. Hence, we decided to use for each TV panel some observed sample data on reporting homes and on individuals, both delivering 'valid' data only.

– For the previous GfK panel we considered sample data consisting of averages of daily numbers of reporting homes and individuals delivering 'valid' data over the entire year 2012. Split by linguistic region these data can be summarised as:

GfK	Number of homes	Number of individuals
Switzerland (CH)	$1'755$	$3'830$
'Deutschschweiz'	945	$2'063$
'Suisse romande'	567	$1'240$
'Svizzera italiana'	243	527

Note that for Switzerland $1'755$ homes delivered (in average) 'valid' data and that the minimal (contract) sample size was $1'918$ installed homes.

– For the Kantar panel we considered data consisting of averages of daily numbers from 11. 2. 2013 to 3. 3. 2013 (three recent complete weeks for the Kantar panel) of reporting homes and individuals delivering 'valid' data. Split by linguistic region these data can be summarised as:

Kantar	Number of homes	Number of individuals
Switzerland (CH)	$2'018$	$4'509$
'Deutschschweiz'	$1'073$	$2'370$
'Suisse romande'	629	$1'414$
'Svizzera italiana'	316	725

Note that for Switzerland $2'018$ homes delivered (in average) 'valid' data, which is considerably larger than the minimal (contract) sample size of $1'870$ reporting homes.

To have similar data structures for both TV panels the sample data on reporting homes and individuals were split by

– the thirteen concession areas (KG) to enable the observation of differences with respect to local TV channels.

Moreover, the sample data on reporting homes were also split by

– home (HH) size $(1, 2, 3, 4+)$;

– homes with and without children 0–14 ('presence of children aged 0–14 in the HH').

And the sample data on individuals were also split by

– individual's age (3–14, 15–29, 30–39, 40–49, 50–59, 60+).

Sample data on reporting homes

Figure 1 shows the number of homes delivering 'valid' data by linguistic region for both sample data and indicates as expected that there are more homes in the sample data from the new Kantar panel.
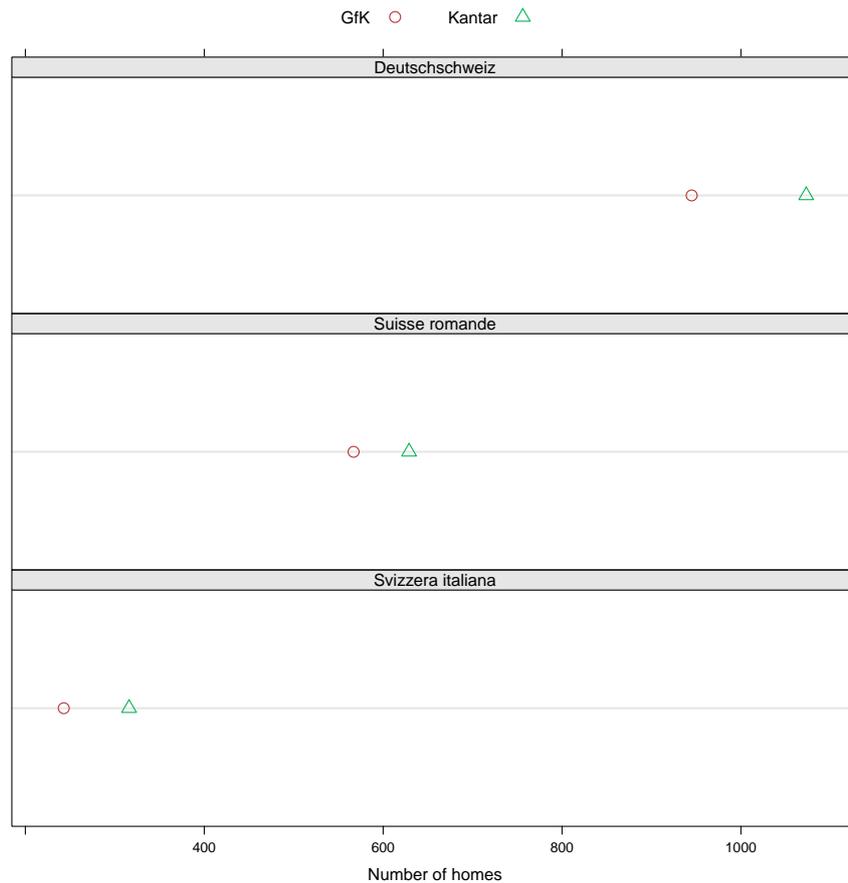

Figure 1 *Number of homes delivering 'valid' data by linguistic region for the sample data from the previous GfK panel and the Kantar panel.*

The number of homes delivering 'valid' data by concession area (KG) is illustrated in Figure 2. One notes, for example, that there are much more homes within the Kantar sample in 'KG5 Bern' and small observed differences for the other KGs. These observed differences are however not problematic as the method for extrapolation has been changed by Mediapulse as of 1. 1. 2013 and 'weighting' of the KG has been implemented (more precisely, of the elementary zones); see also the examples below and Section 3 for detailed information.

By splitting these data further by home (HH) size we get Figures 3 and 4 which contain the graphics of the proportions of homes delivering 'valid' data for each linguistic region and for each KG, respectively.
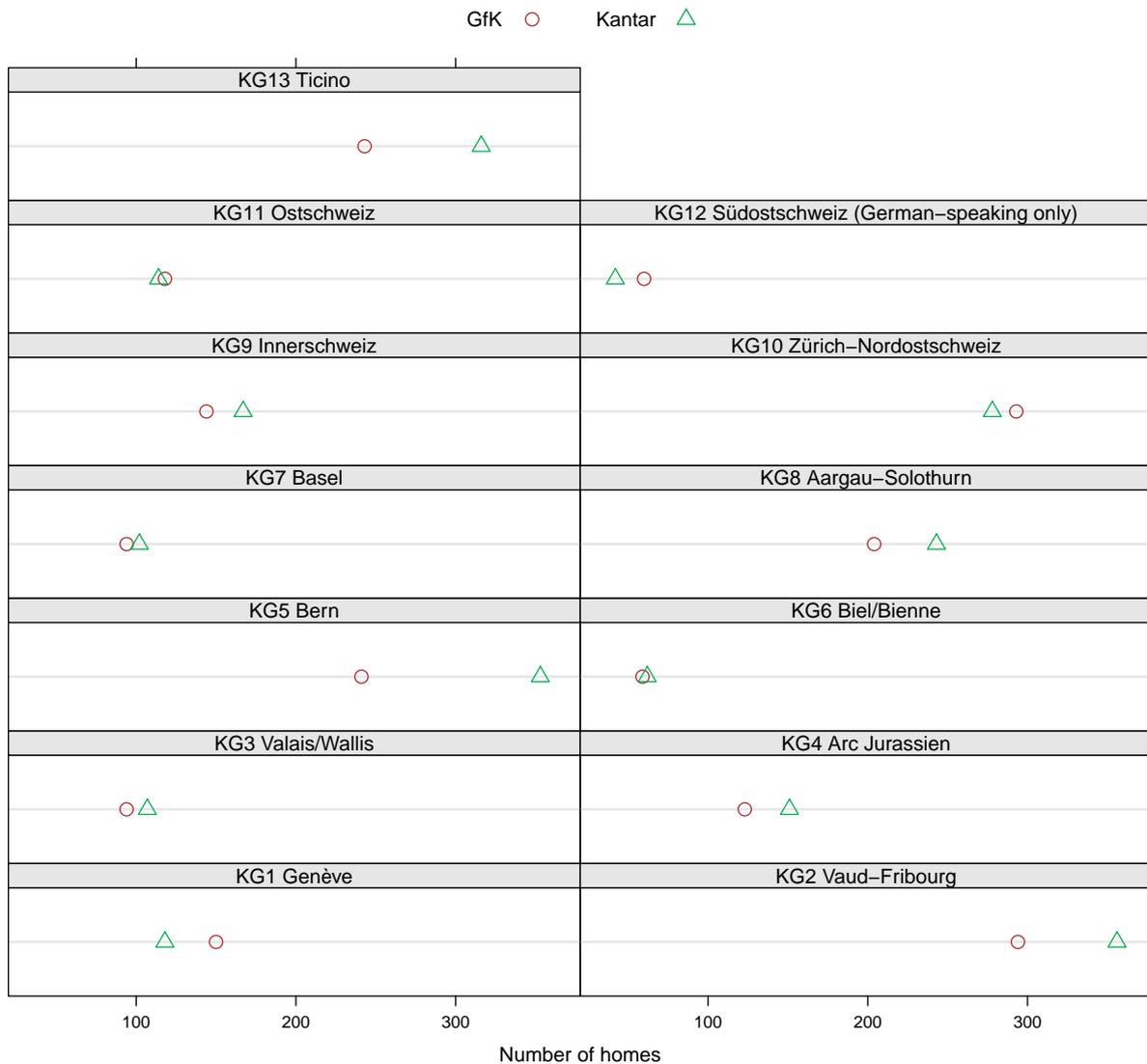
Figure 2 *Number of homes delivering 'valid' data by concession area (KG) for the sample data from the previous GfK panel and the Kantar panel.*

From Figure 3 one notices for Switzerland (CH) and especially for 'Deutschschweiz' differences for the groups 'Homes with 1 person' ('1') and 'Homes with 2 persons' ('2'). For the Kantar panel these values (30.7% for '1' and 36.8% for '2' for Switzerland, and 29.5% and 40.8% for 'Deutschschweiz') will be extrapolated and weighted towards the values of the corresponding 2013 ES estimated universe (which are given in Mediapulse's 2013 ES estimated universe: 36.9% and 34% for Switzerland, and 36.8% and 35.2% for 'Deutschschweiz'). As the 'weighting' of linguistic regions is implemented (see Section 3 for details) exactly this happens when extrapolating, and the weighted values correspond, as expected, to the 2013 ES estimated universe's values.

Figure 4 on the other hand illustrates minor differences for most of the KGs. However, there are several KGs where larger differences occur. Let us consider, for example, 'KG7 Basel' as
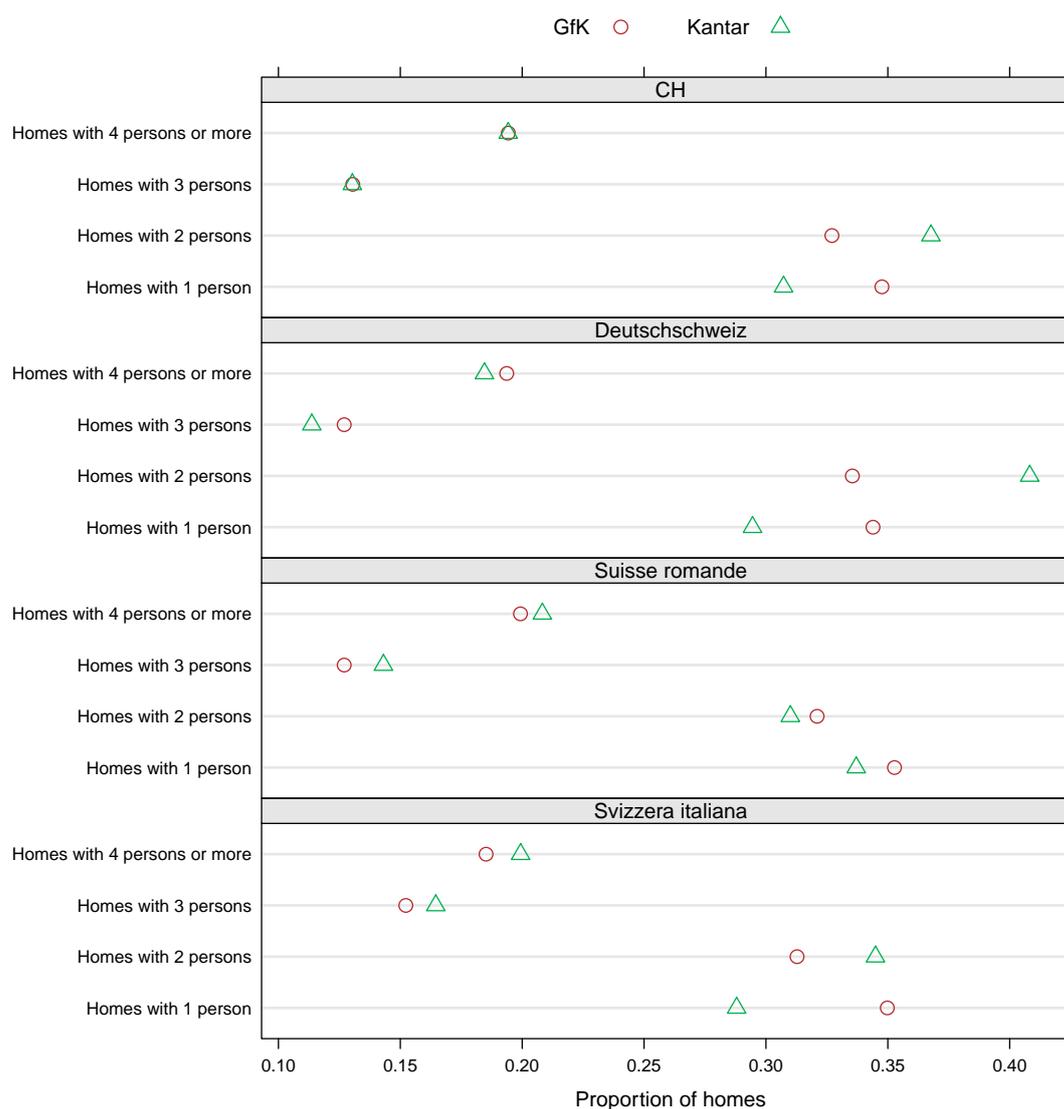
Figure 3 *Proportion of homes delivering 'valid' data by linguistic region and by home (HH) size for the sample data from the previous GfK panel and the Kantar panel.*

visually the differences seem to be the largest overall. The following table lists for 'KG7 Basel' within the Kantar panel the observed sample proportions of homes, the weighted proportions and the proportions from the corresponding 2013 ES estimated universe (which are given in Mediapulse's 2013 ES estimated universe):

'KG7 Basel' (Kantar)	Observed	Weighted	ES estimated universe
'Homes with 4 persons or more'	13.7%	12.7%	14.2%
'Homes with 3 persons'	11.8%	11.6%	10.4%
'Homes with 2 persons'	45.1%	38.1%	31.9%
'Homes with 1 person'	28.4%	37.3%	43.5%

As 'weighting' of home (HH) size within KG is not implemented in the extrapolation method (see Section 3 for details) the weighted proportions do not correspond to the ones from the ES

estimated universe. Especially for 'Homes with 1 person' and 'Homes with 2 persons' there are notable differences. However, it is important to mention that the ES estimated universe's proportions are point estimates which are not calibrated in the ES and therefore also have an uncertainty (variability) attached.
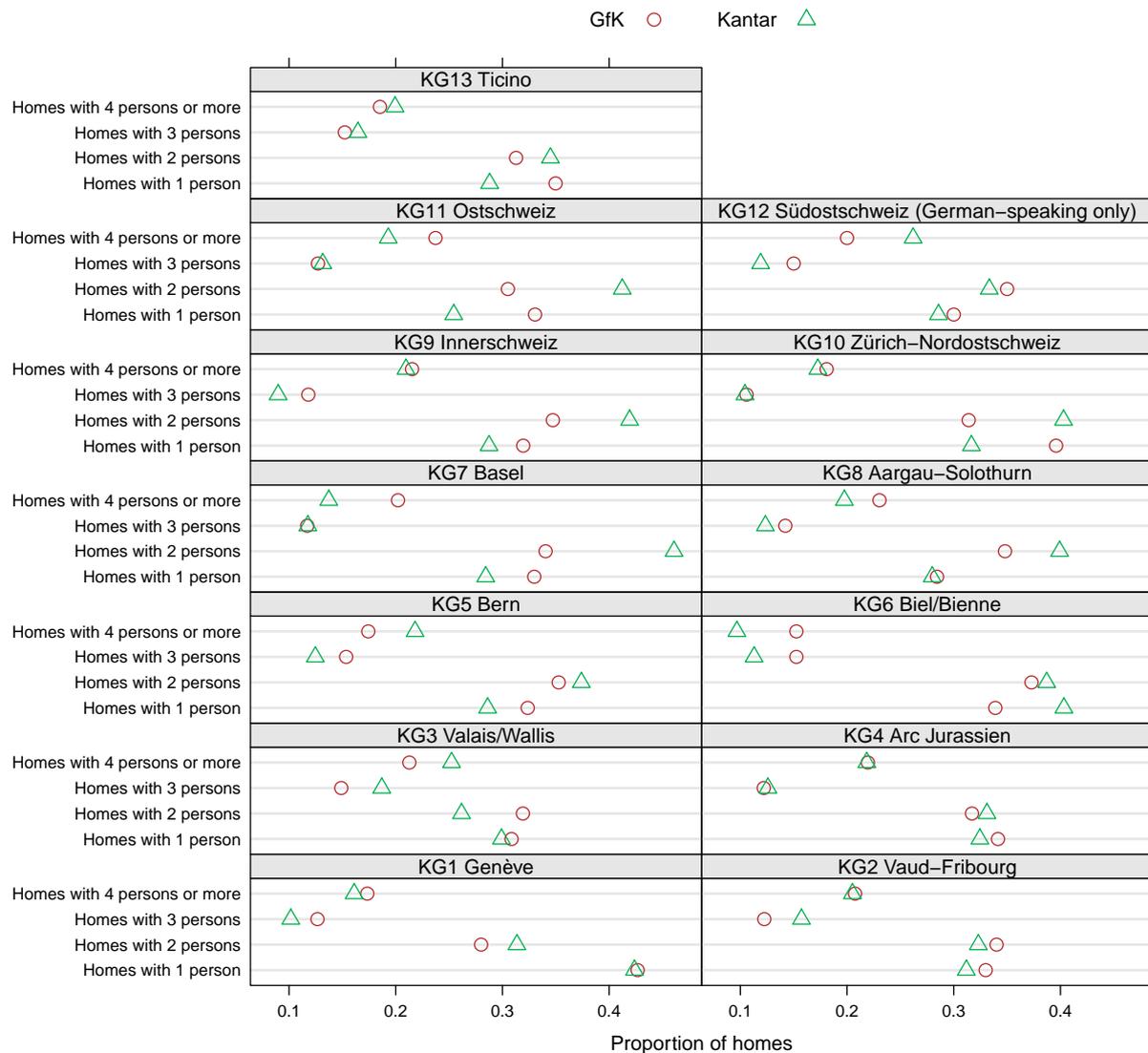

Figure 4 *Proportion of homes delivering 'valid' data by concession area (KG) and by home (HH) size for the sample data from the previous GfK panel and the Kantar panel.*

The graphics for the proportions of homes delivering 'valid' data for 'homes with and without children 0–14' by linguistic region (Figure 5) or KG (Figure 6) illustrate that the respective observed differences are small. As such, they will not be further pursued herein.
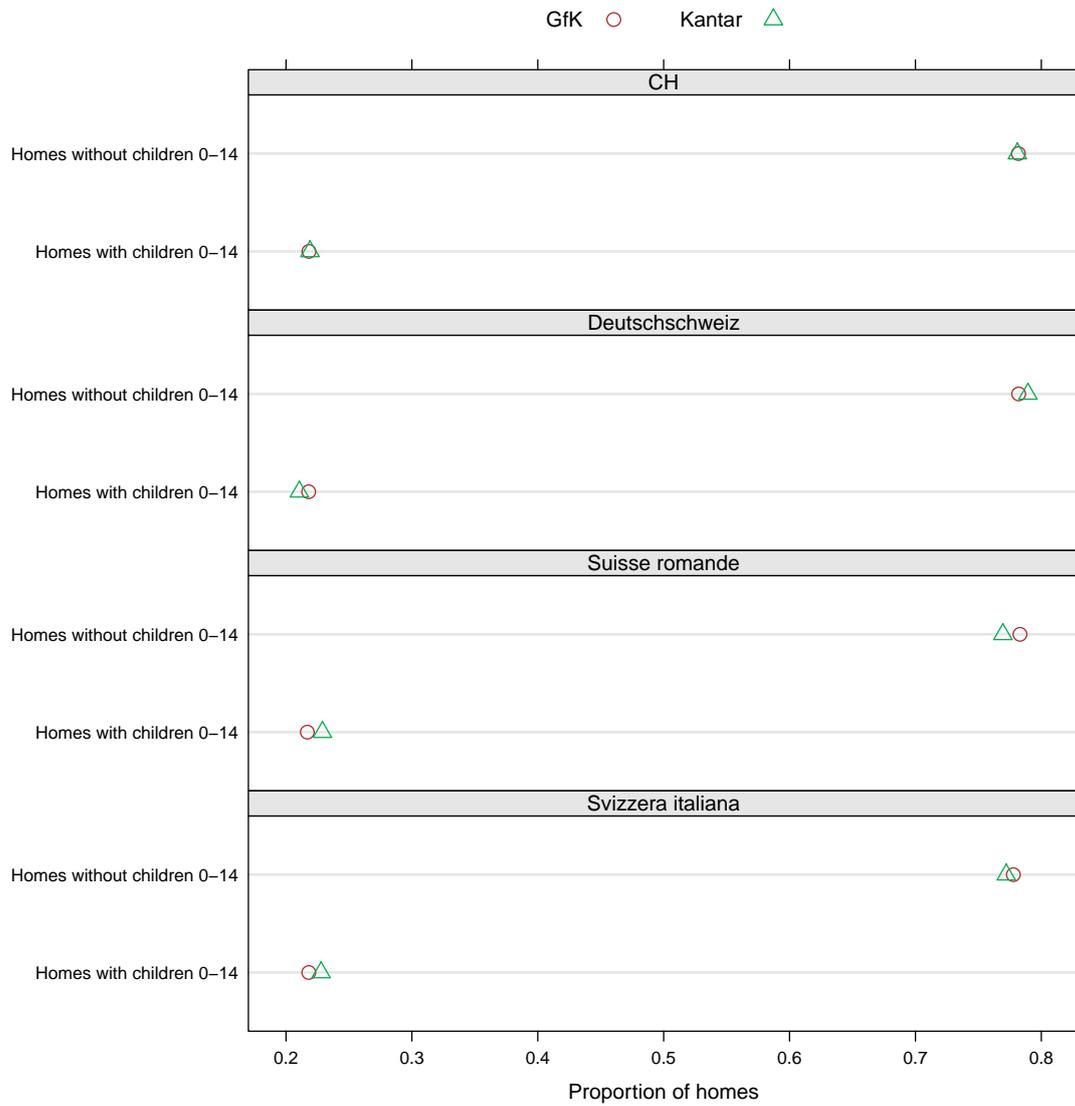
Figure 5 *Proportion of homes delivering 'valid' data by linguistic region and by 'homes with and without children 0–14' for the sample data from the previous GfK panel and the Kantar panel.*
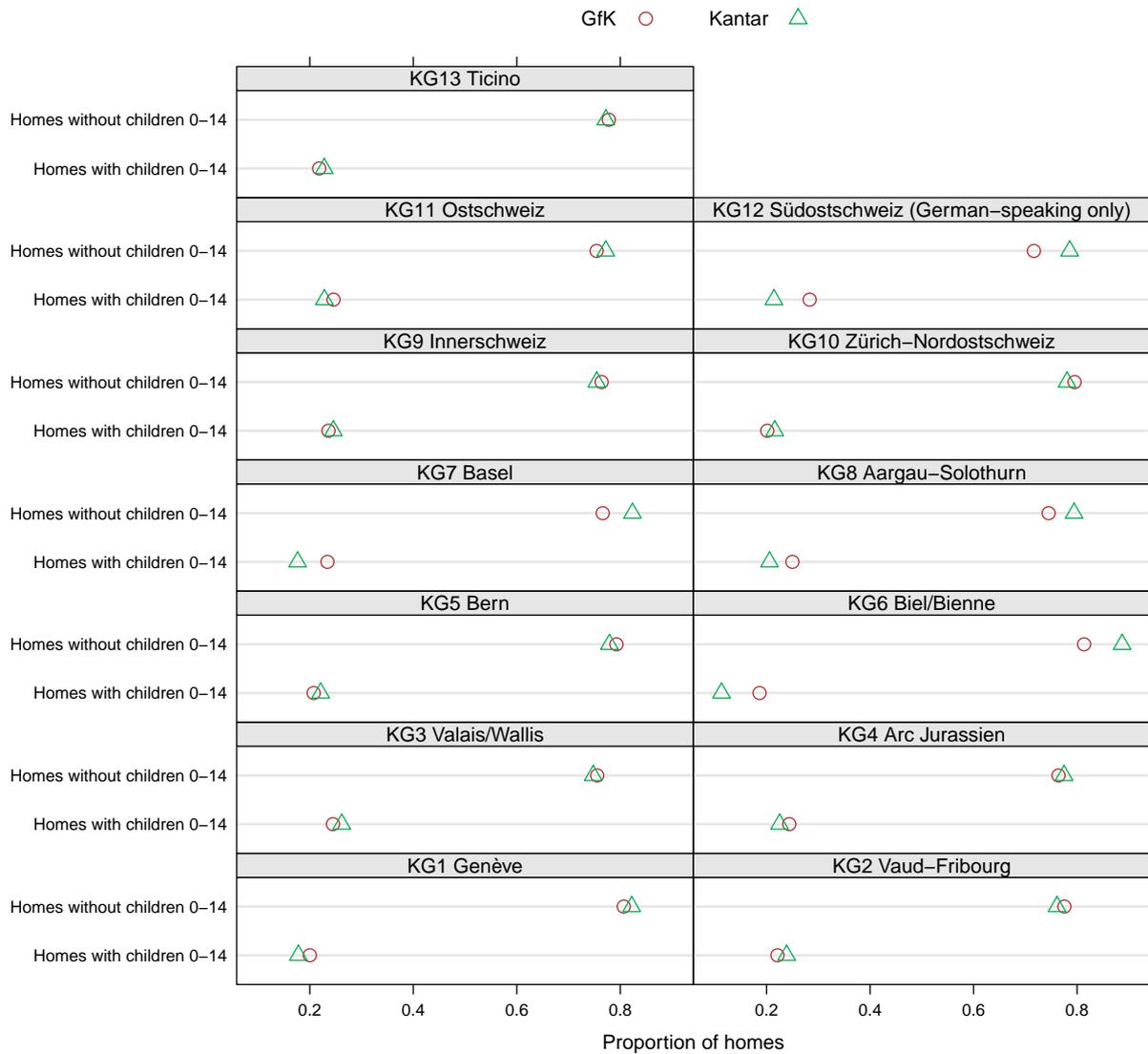
Figure 6 *Proportion of homes delivering 'valid' data by concession area (KG) and by 'homes with and without children 0–14' for the sample data from the previous GfK panel and the Kantar panel.*

Sample data on individuals

Figure 7 shows the number of individuals delivering 'valid' data by linguistic region. One notices again that the sample data from the Kantar panel contain more individuals than within the previous GfK panel.
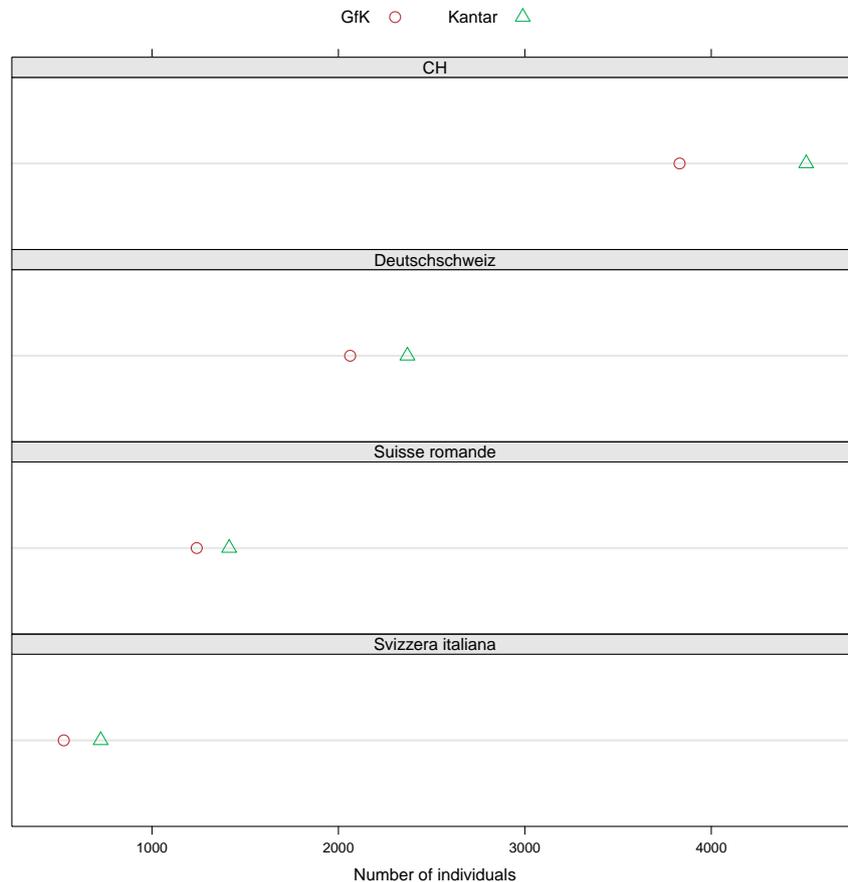

Figure 7 *Number of individuals delivering 'valid' data by linguistic region for the sample data from the previous GfK panel and the Kantar panel.*

The number of individuals delivering 'valid' data by KG shown in Figure 8 again highlights some larger differences for several KGs. However, this is again not problematic as the 'weighting' of the KG has been implemented (more precisely, of the elementary zones) and hence the weighted proportions correspond exactly to the ones from the 2013 ES estimated universe (which are given in Mediapulse's 2013 ES estimated universe and will not be reported herein).

The proportions of individuals delivering 'valid' data by linguistic region and by age group are given in Figure 9. Recall that, for ease of comparison, the individual's age was grouped as follows: '3–14', '15–29', '30–39', '40–49', '50–59' and '60+'. As 'weighting' of linguistic regions is implemented for the Kantar panel (see Section 3 for details) the observed differences are not problematic. However, it seems that the Kantar panel has a quite large proportion of the age group '60+'. For example, the sample proportion of the Kantar panel for the age group '60+'
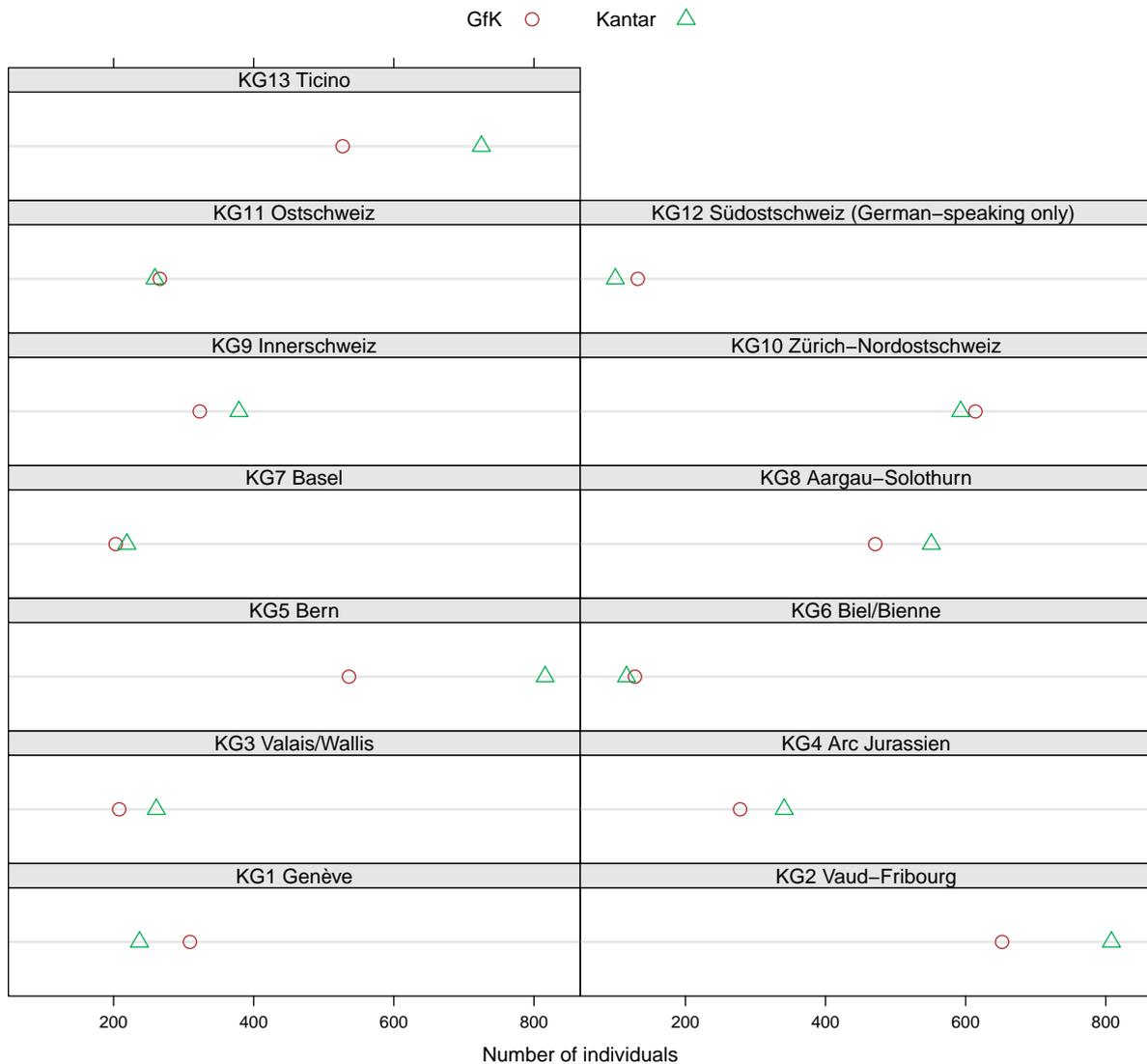
Figure 8 *Number of individuals delivering 'valid' data by concession area (KG)*
for the sample data from the previous GfK panel and the Kantar panel.

for 'Deutschschweiz' is 28%, the weighted proportion is 24.2% which corresponds exactly, as expected, to Mediapulse's 2013 ES estimated universe proportion. Also for the other two linguistic regions the sample proportions of age group '60+' are decreased when extrapolating: from 25.2% to 22.5% for 'Suisse romande' and from 29.9% to 27.7% for 'Svizzera italiana'. On the other hand, the proportions for the age group '15–29', for example, are increased when extrapolating: from 12.7% to 18.7% for 'Deutschschweiz' from 15.8% to 19.5% for 'Suisse romande' and from 14.3% to 16.7% for 'Svizzera italiana'. Similar increases can be observed when extrapolating for the age group '30–39'.

Figure 10 illustrates the proportions of individuals delivering 'valid' data by KG and by age group. Overall similar differences can be observed among the KGs. For illustration, we consider 'KG1 Genève' and 'KG7 Basel' as these two KGs visually show the largest differences overall. The
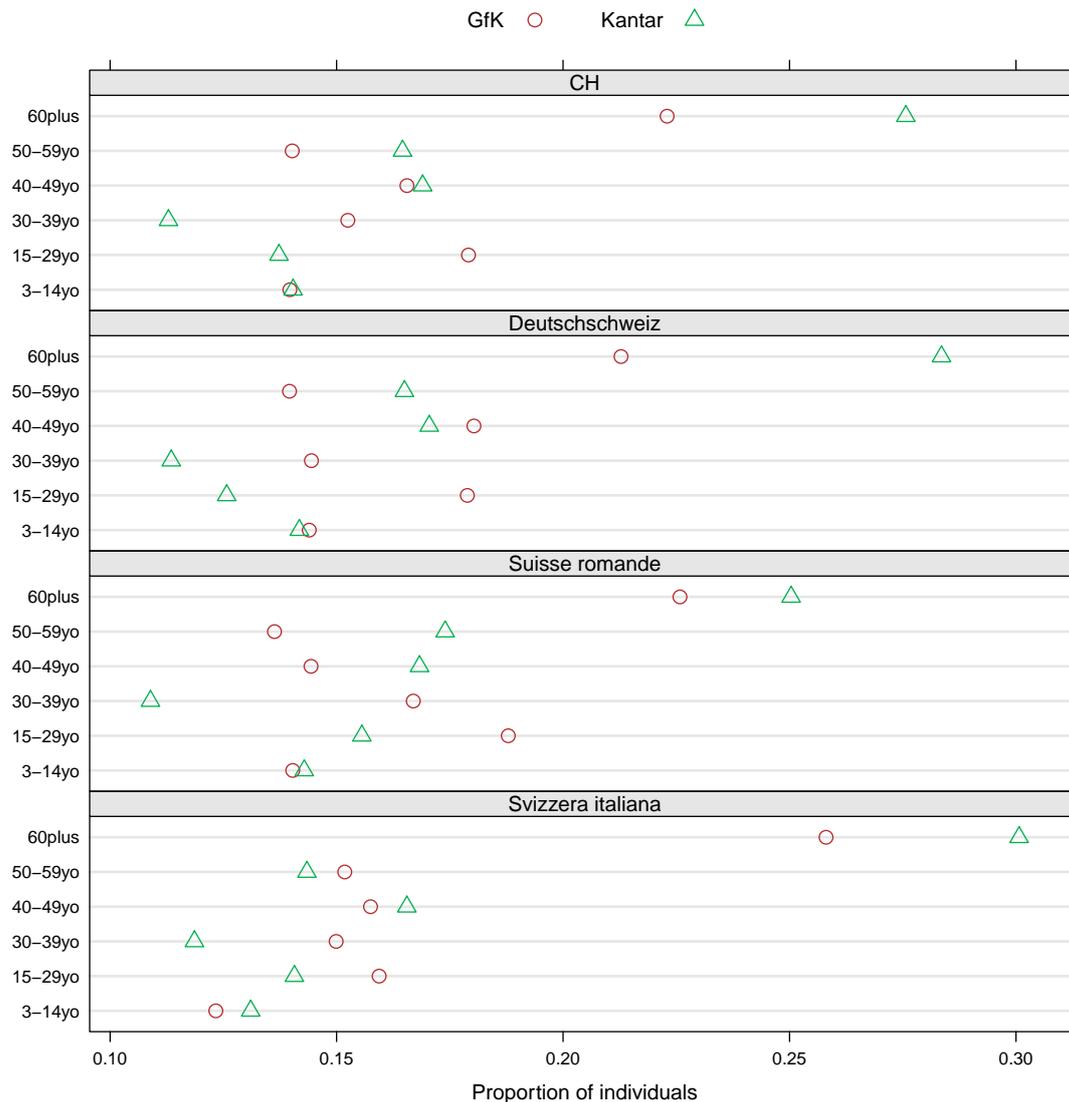
Figure 9 *Proportion of individuals delivering 'valid' data by linguistic region and by age group for the sample data from the previous GfK panel and the Kantar panel.*

following table lists for 'KG1 Genève' within the Kantar panel the observed sample proportions of individuals, the weighted proportions and the proportions from corresponding 2013 ES estimated universe (which are given in Mediapulse's 2013 ES estimated universe):

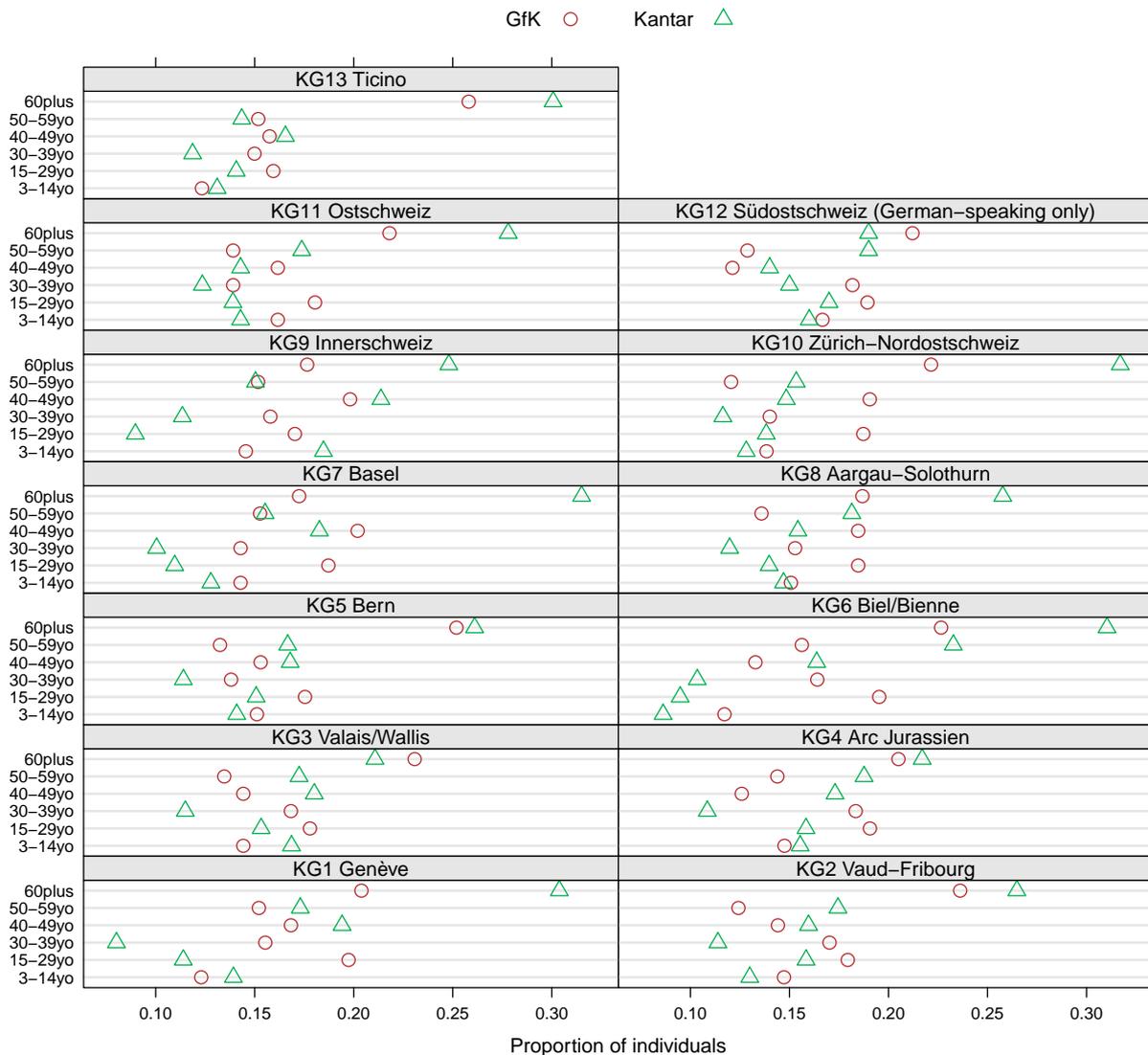| 'KG1 Genève' (Kantar)	Observed	Weighted	ES estimated universe
'60+'	30.4%	26.4%	23.1%
'50–59'	17.3%	13.3%	12.8%
'40–49'	19.4%	20.8%	17.0%
'30–39'	8.0%	11.1%	15.8%
'15–29'	11.4%	14.9%	18.2%
'3–14'	13.9%	13.5%	13.1%

Figure 10 *Proportion of individuals delivering 'valid' data by concession area (KG) and by age group for the sample data from the previous GfK panel and the Kantar panel.*

As 'weighting' of individual's age within KG is not implemented in the extrapolation method (see Section 3 for details) the weighted proportions do not correspond exaclty to the ones from the ES estimated universe, especially for the age groups '$60+$', '$30–39$' and '$15–29$'. Moreover one notices that the observed proportions for the age group '$40–49$' was weighted by an increase whereas the one from the ES estimated universe is smaller than the observed one. As a second illustration consider the corresponding table for 'KG7 Basel' within the Kantar panel:

'KG7 Basel' (Kantar)	Observed	Weighted	ES estimated universe
'60+'	31.5%	26.4%	27.0%
'50–59'	15.5%	13.9%	13.6%
'40–49'	18.3%	17.9%	17.9%
'30–39'	10.0%	12.4%	12.9%
'15–29'	11.0%	18.6%	17.3%
'3–14'	12.8%	10.5%	11.4%

One notices that even without an implemented 'weighting' of individual's age within KG (see Section 3 for details) the weighted proportions are quite similar to the ones from the ES estimated universe.

It is important to mention again that the ES estimated universe's proportions are point estimates which are not calibrated in the ES and therefore also have an uncertainty (variability) attached.

Intermediate summary

Considering observed sample data on homes and individuals for the Kantar panel leads us to the conclusion that the new TV panel seems to be in accordance with Mediapulse's 2013 ES estimated universe on the level of the linguistic regions and also on the level of the KGs (as 'weighting' of the KG was additionally implemented — more precisely, of the elementary zones).

On the level of linguistic regions, we noticed within the sample data on homes that for Switzerland and especially for 'Deutschschweiz' the home (HH) size groups 'Homes with 1 person' and 'Homes with 2 persons' are quite different (compared to the ES estimated universe) in the Kantar panel which will be taken into account by the method of extrapolation. Furthermore, looking at the sample data on individuals we observed that the Kantar panel has quite large proportions (compared to the ES estimated universe) for the age group '60+', and small proportions (compared to the ES estimated universe) for the age groups '15–29' and '30–39' which again will be taken into account by the method of extrapolation.

On the level of the KGs and with respect to the suitability of the new TV panel for local TV channels, we observed differences for home (HH) size and individual's age. Nevertheless, we consider these differences to be too small to induce large systematic statistical errors ('biases'). However, we advise to monitor these differences. If these differences remain persistant it may be worthwhile investigating further whether 'weighting' of home (HH) size and/or individual's age within KG should also be implemented in the extrapolation method.

In summary, the Kantar panel is a valid basis for inference on the new TV population. In particular, the new TV panel is suitable with respect to avoidance of systematic statistical errors ('biases') for local TV channels.

It is important to note that our findings concerning the new Kantar panel above are based on averaged data over three complete weeks of reporting homes and individuals delivering 'valid' data. The underlying daily variability was not taken into account.

3 Extrapolation

In both TV panels the reporting samples of a panel are extrapolated to the population (universe) estimates, allowing the produced results to be representative of the respective population (universe), *i.e.* of the TV panel's target audience.

Kantar uses a calibration to derive a daily weight per individual (person) which should allow near 'unbiased' estimation of the population characteristics. The calibration is known as 'Iterative Proportional Fitting' (IPF) or raking and is called 'RIM weighting' by Kantar. The Kantar methodology is similar to the one from GfK but differs in the weighting model used (see Table 2 and comments below).

The weighting procedures for the weights per individual (person) are compared in Tables 1 and 2. The target values for the weighting classes (variables) stem from the same respective universes as the universes for the control categories; see Section 2.1.

As can be seen from Table 1, the weighting classes (variables) of the Kantar panel contain more classes than the previous GfK panel. They take into account the presence of children and the type of reception. Moreover, the age group '15–29' of the GfK panel is split into '15–19' and '20–29'. The KG parts ('Teilgebiete', 'TG') of the GfK panel correspond to the elementary zones ('Elementarzonen', 'EZ') of the Kantar panel, except for two EZs in the canton of Valais which constitute a single TG. From the point of view of the weighting classes the new Kantar panel is finer than the previous GfK panel. Note, however, that too many and too small weighting classes may lead to instability of the IPF algorithm and to more variable weights.

The weighting models of the previous GfK and the Kantar panel, as summarised in Table 2, differ in some aspects. First, of course, there are more variables (weighting classes) involved in the Kantar model. If these variables have explanatory power for the response process then the Kantar model would be superior in that aspect. Kantar crosses all variables with linguistic region, giving the linguistic region very high importance. On the other hand the EZs, which are nested within linguistic regions, are not crossed with age and gender as for the TGs with the previous GfK model.

Intermediate summary

In summing up, the Kantar calibration is suitable. It may suffer somewhat from the fact that the weighting class EZ is not crossed with individual's age and home (HH) size. However, the quantitative effect on TV audience indicators is unclear without more detailed studies. In any case, the effect of weighting individual's age and home (HH) size also at the level of EZs should be only moderate since individual's age and home (HH) size are taken into account at the level of the linguistic regions. Moreover, it is important to note that there are no formal criteria which would make weighting of individual's age and home (HH) size at the level of EZs compulsory.

Overall, the Kantar panel is a valid basis for statistical inference on the new TV population.

Table 1 *Weighting classes (variables) for the previous GfK and the Kantar panel. DS denotes 'Deutschschweiz', SR 'Suisse romande' and SI denotes 'Svizzera italiana'. Concession areas are denoted by KG ('Konzessionsgebiete') and elementary zones by EZ ('Elementarzonen').*

GfK Calibration class	GfK Item levels	Kantar Calibration class	Kantar Item levels
Linguistic region (LR)	DS, SR, SI	Linguistic region (LR)	DS, SR, SI
Indicator housewife (HW)	0, 1	Indicator housewife (HW)	0, 1
HH size (Size)	$1, 2, 3, 4+$	HH size (SizeK)	$1, 2, 3, 4, 5+$
		In HH with children 0–2 (Ch2)	0, 1
		In HH with children 0–14 (Ch14)	0, 1
		Adult or children (AdCh)	man 15+, woman 15+, child 0–14
Gender	1, 2	Gender	1, 2
Age	3–14, 15–29, 30–39, 40–49, 50–59, 60+	Age (AgeK)	3–14, 15–19, 20–29, 30–39, 40–49, 50–59, 60+
KG parts ('Teilgebiete', TG)	24	EZ	25
		Reception type (Rec)	IPTV, digital cable, satellite, analog cable, digital terrestrial, computer only

Table 2 *Weighting models for the previous GfK and the Kantar panel; see Table 1 for a detailed description of the weighting classes (variables). '×' can be read as 'crossed by', and '/' as 'nested within'.*

GfK	LR + TG + Age×Gender + HW + Size + LR×Age×Gender + LR×HW + LR×Size + TG×Age×Gender + TG×HW
Kantar	LR + LR×HW×SizeK + LR×HW + LR×Ch2 + LR×AdCh + LR×Ch14 + LR×AgeK×Gender + LR/EZ + LR×HW×Rec

4 Computation of TV audience indicators and variance estimation

We did not evaluate the computation of TV audience indicators (*e.g.* rating, reach). However, as a deliverable of the Kantar panel an uncertainty (variability) measure called 'standard error' is given for each audience indicator. Although according to further description it seems that actually the 95% margin of error and not the standard error is provided. However, the documentation included with 'InfoSys+' (the new program used by Mediapulse for TV usage data) is not sufficiently detailed to serve as a basis for an evaluation of the variance estimates. As such, we are not in position to provide an objective statement on its validity and hence on its usefulness as measure of uncertainty (variability) of an indicator.

However, we would like to stress the usefulness of an indicator of uncertainty (variability). Such an indicator was lacking in the previous GfK panel. Due to the inherently small samples for a KG it is not possible to appreciate any (point) estimate for a TV audience indicator without an appropriate measure of its uncertainty (variability). Taking the measures of the Kantar panel as a 95% margin of error, many TV audience indicators seem to show too high variability to be interpreted safely (at least in a sample of daily data provided to us by Mediapulse). This is mainly due to the small overall sample sizes of the panel. Increasing the overall sample size considerably to raise the sample sizes of the KGs would therefore be advisable but obviously the cost would be much higher.

5 Summary of key points, overall conclusion and recommendations

The present report described so far the findings of our evaluation (audit) of the new Kantar TV panel with respect to its suitability for local TV channels. Recall that in Section 2 we investigated the differences between the previous and the new TV panel from a statistical point of view (Section 2.1) and based on observed panel data (Section 2.2). Section 3 compared the methods of extrapolation used in both panels. The computation of TV audience indicators and related variance estimation were briefly mentioned in Section 4. Almost every section ended with an 'Intermediate summary' paragraph which already discussed any limits of our evaluation (which will not be reported hereafter again).

We now give our overall conclusion and provide recommendations. To do so, we start by summarising key points already discussed in detail previously.

Summary of key points

– The sampling frame of the 'Establishment Survey' (ES), which is the basis for the new Kantar panel, is the list of postal addresses of Switzerland. This is the best sampling frame for Switzerland available to date.

– The sample design of the ES uses sampling points outside agglomerations. There may be a cluster effect due to the use of such sampling points, which would increase the uncertainty (variability) of TV audience indicators. Note that new sample points are drawn annually to update the Kantar panel.

– The sample size of the new Kantar panel is slightly higher than the one of the previous GfK panel.

– The recruitment control categories for the new Kantar panel are similar to the ones of the previous GfK panel. They include more technical variables. Neither the GfK nor the Kantar panel do control individual's age and home (household, 'HH') size at the level of the concession areas ('Konzessionsgebiete', 'KG'); more precisely, at the level of the elementary zones ('Elementarzonen', 'EZ').

– Comparison of observed individual's age and home (HH) size distributions within certain KGs revealed differences between the Kantar panel and Mediapulse's 2013 ES estimated universe. Nevertheless, we consider these differences to be too small to induce large systematic statistical errors ('biases'). However, we advise to monitor these differences.

– The weighting procedure of the Kantar panel takes into account similar characteristics as the recruitment control categories. The Kantar weighting model does calibrate on home (HH) size and individual's age at the level of the linguistic regions but not at the level of the KGs.

– Sample variance measures provided by the Kantar panel show that the uncertainty (variability) of local TV audience indicators may be high and should be taken into account.

Overall conclusion

These key points and additional comments given in previous sections of the present report lead us to an overall conclusion.

1. The TV audience indicators of the Kantar panel should not be compared with the ones from the previous GfK panel. The sampling frame, the sample design, the stratification, the mode of recruitment and the target universes are all different for both TV panels.

2. The Kantar panel is a valid basis for statistical inference on the new TV population.

3. The Kantar panel is capable of delivering local TV audience indicators.

4. The sample size of the Kantar panel, as well as the sample size of the previous GfK panel, is small for certain KGs and therefore TV audience indicators for KGs should be interpreted only with the assistance of a related uncertainty (variability) measure, *e.g.* through a confidence interval as given by the new Kantar panel.

Recommendations

– Home (HH) size and individual's age at the level of linguistic regions and at the level of KGs (more precisely, at the level of the EZs) should be monitored. If differences remain persistent it may be worthwhile investigating further whether 'weighting' of home (HH) size and/or individual's age at the level of KGs (more precisely, at the level of the EZs) would be needed.

– Indication of resulting uncertainty (variability) estimates should be an integral part of the results, *i.e.* every TV audience indicator, in particular for local TV channels, should be accompanied with its variance estimate. Moreover, the variance estimation method for the TV audience indicators should be studied further.

– Comprehensive and coherent documentation of the statistical methodology at all levels and of all processes should be further established and maintained up-to-date.

Limitations and liability

– It should be understood that the validity of the results regarding the statistical data analysis extends only to the range of data available for this analysis. Other important antecedent of the data and/or outcomes, besides those considered may well exist. This 'unknown variable' problem is common in all forms of statistical data analysis, and should be borne in mind when interpreting the results summarised in this report.

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